

## < POTUS Ping Notes:

- Since Astronomers can not verify most of their observations empirically they tend to come to their conclusions as a result of what they like which would invariably be what they want which is shaped and informed by what a consensus of their fellow Astronomers would like/want to be true. And they will never like/want their Marvelous Universe to be seen as a dangerous place, a threat to Mankind.
- When I write I have to blend cosmological dynamics and available technologies and rational logics to build a soup that both tastes wise and is palatable.
- There is no comprehensive rational assessment that could conclude that the next asteroid to strike will not do so tomorrow or that it will not be a 10 km extinction level event. Prepare for the worst!
- The Greater Threat, dear Brutus, is not in our stars, but in ourselves, that we are fools.
- This is War. And this enemy takes no prisoners, shows no mercy, gives no quarter. This enemy will never surrender, never retreat, never ever stop... even after we are all dead. This enemy is Forever.
- To find the courage to tell truth to power, first find the power that has the courage to hear the truth.
- The time to be afraid is Now! After we see it coming may well be too late.
- Astronomers seem to look at fearful things through the wrong end of the telescope. They have built a Fear of Fear consensus/conspiracy/cult: See No Fear/Hear No Fear/Speak No Fear/Think No Fear.
- In the face of Truth, Wisdom can not exist in the absence of Honesty.
- When it comes to Planetary Defense, save Hope for *after* we have become Prepared to effectively respond to the worst case scenario and Trained and experienced to the level of expertise and Vigilant to the degree of maintaining a real time full spectrum surveillance of the entire area of interest 24/7/52... Forever, and then the day comes when we have to do this for real and it has to work... or we die trying. Plan B: Make sure Plan A works.
- The 5<sup>th</sup> Horseman of Apocalypse
- Even if the astronomers were calculating their statistical impact probabilities on the right asteroid population they would still be strategically irrelevant. When scientists can not know information that is relevant they have a tendency to present information that they can know (or fabricate) as such.
- The problem here it that the astronomical 'experts' have chosen to believe in a fabricated truth that is comfortable rather than understand a rational truth that is fearful. 'Fear of Fear itself' made manifest. The objective of any risk assessment is to determine a course of action. Not to make us feel good.
- Any consensus is like an institution. Once built, very quickly it has a life of its own where its first order of business becomes self preservation, survival. At any cost. By any means. Regardless of any inconvenient new truths...
- I am the speaker for the worst case scenario. A harbinger of death by rock from sky. I am what stares back into you when you dare to stare long enough into this abyss...
- The threat of Cosmic Impact. In terms of the general existential condition: Earth is not safe. It never has been safe and never will be safe. And as things stand, it is not remotely prepared to defend itself. In terms of the specific existential threat: the next large Asteroid or Centaur or Comet on its way to strike Earth is closing at over A Million Miles A Day and there is no better time to begin to become prepared than *Now*. Time is simply not on our side here.
- You already know that asteroids exist. And that at random, asteroids can strike Earth with the possibility of doing great harm including our extinction. And that we have evolved the technological potential to defend ourselves against this existential condition. Now, understand that this potential can only become manifest as a standing tested capability once we have codified a policy to respond to this threat and delegated a qualified agency to become responsible

and expert in executing this policy.

- When your thoughts take you to the end of the atmosphere of Earth understand that 'Beyond Here... Thar Be Monsters'!

- Once again we find ourselves in the position where 'one small step for a man' will be the next 'giant leap for mankind' when the thousand mile journey of building an effective Planetary Defense begins with the single step of delegating a National Planetary Defense Agency.

- Any asteroid of any size anywhere in the Solar System discovered or undiscovered, can be perturbed into an Earth impact threat at any time.

- Since the threat of asteroid impact includes the prospect of our random extinction, therefore, because we can, building an effective response to this threat in its worst case manifestation rises to the level of the most important thing Mankind can ever do. How can anything less be wise?

- When you choose to have only a small hammer you only ever see the problems that are small nails.

- How can the issue of Cosmic Impact not be a topic for the NSC? And since it includes the prospect of our sooner-or-later random extinction, the most important thing on its agenda. It seems to be that this domain is nothing more than just another venue to exercise our national vain glorious ego to make us think we are better than everyone else and not the source of our doom.

- Humanity works best under the thrall of Optimism Bias. Consequentially, Risk Management should be left to the pessimists. Who in the face of Random Chance expect Bad Luck and are compelled to stack the deck, fix the race, load the dice... game the system. Cheat. And leave nothing to chance.

- You can not avoid an unspeakable tragedy by not speaking about it.

- Extinction is where We-The-Species become never have been.

- If in deflecting the next asteroid on its way to strike Earth Failure is Not an Option then the the key to success is self confidence. And the key to self confidence is preparation... and we are not prepared.

- Blah, Blah, Blah... BANG!

- A US NPDA would be the first step for Mankind to take into Harm's Way between the next extinction level impact event and its survival.

- Dismissing the greater threat due to low probability is little more than a rationalization to take the risk, do nothing and gamble. Not to manage the risk and become prepared to respond. The expression of an expectation of good luck in the face of random chance: Hope... A paved road to Hell.

- The best Risk Managers are hard core pessimists. They think in terms of the worst case scenario. It makes them happy! Anything less is a good day. And when they are right they get to say 'I told you so.'

- The greater the Fear the greater the tolerance for the Cost of an effective response.

- since it includes the prospect for our random extinction, and because we can, knowing which asteroid is the next asteroid on its way to strike Earth will always be the most important thing Mankind can ever know. And deflecting it will always be the most important thing Mankind can ever do. And being prepared to effectively defend against this threat in its worst possible manifestation will always be the most important thing Mankind can ever be... And we are not remotely prepared.

- The next large asteroid on its way to strike Earth is out there now. We don't know which one it is therefore we don't know when it will strike or how large it is. Worse, strategically, we don't know when we are going to know which, when or how large until it is... Now! But we do know that we are not remotely prepared to defend against it.

- In October of this year, the Congressional Mandate for NASA to Survey the proximate rogue asteroid population will expire and the authority for this effort will end. As will those charged with executing this mandate lose the legal ability to fund it. And they will be forced to cease their

efforts, turn off their telescopes and go home. Mission only half complete.

- Implied by the Congressionally mandated part (b) SEC. 808 of the 2010 Space Act would be a Codified National Policy to endeavor to defend against this threat... After all, before we can delegate this responsibility don't we have to first assume it? And decisions such as this, to defend against and prevent an act of Nature, something we have never done, needs to be codified. Unlike much of core government policy, this can not be left tacit.

- On NEOSM vs Man On The Moon 2.0: What happens if we fail to go back to the Moon? Nothing... What happens if we fail to detect the next asteroid on its way to strike Earth? Best worst case: Millions die. Worst worst case: Mankind goes extinct. We need to get Planetary Defense on our National 'Things To Do' list. And time is not on our side here.

- The Asteroid Grand Challenge is focused on finding all asteroid threats to human populations and knowing what to do about them.

All asteroid impact events are random: without any recursive pattern, both in their occasion and magnitude. Therefore there is no reason to think that the next large asteroid on its way to strike Earth will not result in a human extinction level impact event. Then, because we can, knowing which asteroid is the next large asteroid on its way to strike Earth will always be the most important thing Mankind can ever know. And deflecting the next large asteroid on its way to strike Earth will always be the most important thing Mankind can ever do. And being prepared and trained and vigilant to defend against the threat of the next large asteroid on its way to strike Earth will always be the most important thing Mankind can ever be...

You want to save the world? Do this: Execute part (b) SEC. 808 of the 2010 Space Act, and delegate NASA and USSF as our National Planetary Defense Agency.

General Notes:

<Notes- Hope

- In the face of a random and potentially dire threat, an expectation of good luck is never a reliable strategy. However, an expectation of bad luck manifests caution and compels preparation, training and vigilance.

- When we see no Fear and speak no Fear and hear no Fear and think no Fear we only serve the consequences of fearful things.

- "Dream no small dreams for they have no power to move the hearts of men". - Goethe

- It seems that everyone we want to trust is only willing to go out on someone else's limb... can't or just won't bother to think for themselves.

- "To sin by silence when we must protest makes cowards of men." - Ella Wheeler Wilcox

- "The will to conquer is the first condition of victory." - Ferdinand Foch

- Post Hoc Ergo Propter Hoc. After this, therefore because of this. Rational Determinism.

- The engineers of technology and method subjectively take over where the scientists objective

experimentation and observation ends.

Science is to conduct an experiment and objectively observe and report on a condition. Where as a Strategy (aka Risk Management) is to subjectively define those elements that are essential to the conduct of implementing a response (threat assessment, tactics, logistics, funding, intelligence, command and control, preparation, training and vigilance).

- The subjective Strategic arts pick up where the objective Science ends. Strategic arts can be defined as those elements that are essential to the conduct of implementing a response: Threat Assessment, Tactics, Logistics, Preparation, Training and Vigilance.

- 'I may be disappointed if I fail. But I will be doomed if I don't try.' - B. Sills

- In the face of a dire threat Optimism kills. We can only ever afford to Hope for the best after we have become adequately prepared for the Worst.

- Mankind has evolved to master the aptitude for ignoring the truth in favor of the fiction. Ignoring what is in favor of what they like.

- People are entitled to their opinion... no matter how stupid it may be. Unless of course it effects the wellbeing of everyone else.

- GS Thesis: We The Species are not prepared to address the worst possible event of asteroid impact. And we could and should be. But first we must stop seeing this threat through the starry-eyed rose colored glasses of the Astronomers who seem to be looking at this threat through the wrong end of their telescopes.

- You just can't play Russian Roulette every day betting on the odds and expect to always win. Sooner-or-later you blow your head off. And we've been playing this game of Cosmic Russian Roulette every day now for 65 million years... When you chose to bet on the odds to win, ignoring the magnitude of the loss when inevitably you do lose, sooner-or-later Mankind goes extinct.

- PD disciplines and skills in the attic: Astronomy, Aerospace Engineering, Orbital Mechanics, Physics, Nuclear Physics, Risk Management, Threat Assessment, Tactics, Strategy, Logistics, Executive Decision Making, Semantics, Dialectics, Rhetoric, Salesmanship, Psychology, Politics, Law, Philosophy, Determination, Integrity, Courage... TIF.

- It is the remit of all Governments to defend the society it is responsible for from all threats foreign and domestic. It is not to chase the pipe dreams and ambitions of some minority. Therefore, it will never fund the ambition of some few to colonize Mars on a mere dream but it would do so to defend its citizens form extinction.

- "Lies must be challenged" Picard

- "When it comes to getting people to deny their own immediate needs in favor of a greater good, asking nicely almost never works." - Trejo. Book 9 Expanse

- With the Astronomers, they like the odds. But it's like playing Russian Roulette. The odds may be in your favor. But given the magnitude of the loss it's just not worth playing the game. Save your odds for Vegas.

- I would endeavor to save the world through rigorous rational analysis and convey my conclusions by precision semantics, unimpeachable dialectics and rapier rhetoric to those to whom this should concern.
- Consider Gaiashield as a punctuation of the equilibrium in the current nascent perception of the threat of asteroid impact... an intellectual evolution writ large. A rational next step. A consequence of letting the Science speak for itself.
- The only Hope we should ever suffer is that we can muster the Political Will to do this right and have a hundred years to build it... before we actually need it or go extinct.
- Impossible to accurately confirm DART's effectiveness and try to confirm Momentum Enhancement because they don't know the actual mass of Dimorphos.
- When NEO Pucker Time comes a Nuclear mission would be far easier to execute and far less likely to fragment the asteroid and in terms of payload mass to force generated 10,000 times more effective than a KI mission and even the capability to accelerate an asteroid if required ...
- In the face of fearful things, Fear compels the best response to the question: Fight, Flee or Freeze.
- There will always be War, and Asteroids and rumors of War... and Asteroids.
- Any risk assessment that attempts to forecast asteroid impacts based on the mathematical averaging of these random occurring events is little more than self delusion.
- How can we successfully deal with a fearful thing unless we know the truth. The whole truth and nothing but the truth?
- "It is difficult to get a man to understand something when his salary depends on his not understanding it." Upton Sinclair. A Universal Truth of cowards... RTD/D
- I have come to the conclusion that it's a waste of time to try to teach someone what is a bad strategy when they have no idea what a good strategy should look like.
- There have been scores of documentaries on the science of asteroid impact (if you like your truth grossly misrepresented and mitigated).
- I'd hate to think that I'm the only one that can think about this and get it right...
- I may be early. Not in the prospect of when We The Species will suffer the prospect of extinction by asteroid impact. No one can know that until, at random, it has become... NOW! But rather in the evolution of Mankind to become prepared to do something about it. So my mission has become to evolve the species... punctuate the equilibrium.
- It's not the role of the scientist to stand in harm's way. His job is to objectively observe, take copious notes, analyze and report. The role of standing in harm's way is the mission of the soldier.
- Fear focuses the mind on finding a way to best deal with fearful things.

\_ In this, ignorance is not bliss... it's extinction.

- Where am I wrong: Agency, NASA/USSF Hybrid, Random, Perturbation, Nukes, Launch/Transit Windows, Preparation, Training, Surveillance...?
- 6 RTD key points: Random, Perturbation, Surveillance, Predeployment, Nukes, Agency.
- The truth is often not for the faint of heart.
- Hope is for those who lack the ability to plan and act.

<Notes - Blair

- 6 RTD key points: Random, Perturbation, Surveillance, Predeployment, Nukes, Agency.
- The truth is often not for the faint of heart.
- Hope is for those who lack the ability to plan and act.
- Random renders any and all efforts and estimates as to when or how large useless until we see it coming. Random defines the scope of the Risk which determines the magnitude and scale of our Strategy and the criticality dictating the Executive Decisions and Political Will required to become prepared to successfully defend ourselves from this threat.
- You can't trust Optimism to help you overcome obstacles or defend against potential threats or to keep what you've earned. Pessimism is always the best first line of defense and the vanguard for any attack. Trust Optimism only after you have done all you can to do to succeed.
- Save your optimism and Hope for generating sufficient Fear to get a NPDA soon and the \$100b a year allowance and having the 100 years we will need to build a comprehensive PD before we actually need it.
- Reserve your Hope for only after you have done all you can to win the War.
- See something *do* something.
- Deceive, Inveigle and Obfuscate.
- My five forms:
  - A. Deferential
  - B. Collegial/Tutorial
  - C. Dutch Uncle
  - D. Come to Jesus
  - E. Shit Storm
- Looking for those with the courage to hear the Truth and see the Truth and speak the Truth and think the Truth, the whole Truth and nothing but the Truth, and then help in the building of a comprehensive Planetary Defense in time to save Mankind from extinction by asteroid impact.
- B A S U R A S U C A S I A M I M
- "The optimist only ever sees the opportunity in any difficulty and becomes overwhelmed. The

pessimist first sees the difficulty in any opportunity... and succeeds." - Churchill revised.

- You can ever justify trusting and not verifying in the absence of either opportunity or ability.

- As always: Mich nicht umbringt, macht mich stärker.

- First question is, are you smart enough to be afraid? Then the question would be, do you have courage enough to be *this* afraid?

- Review the semantics, dialectics and rhetorics then the facts, logics and conclusions.

- Cold War cost for US by 1996 (in 1996 \$): \$13T. In 2022\$ \$650T (per yr over 40 years \$16.25T).

- Anyone who saw Hubble's images of Comet Shoemaker-Levy 9 impacting Jupiter knew we had to do something to defend the planet from Cosmic impact. But nobody could say what! So the Star Gazers came up with the strategy that if we say that the next asteroid to strike Earth will always be small and the Detection-To-Impact window will always be large then we don't have to come up with any 'what' until after we've seen it coming! Genius... or suicide by NEO?

- Chaos Theory is the qualitative study of unstable aperiodic behavior in deterministic nonlinear (random) dynamical systems.

- The People only ever vote for what they want. But only after the Politician has decided what it is he may be able to do and then tells them what they 'need'... And if they try, sometimes they get what they 'need'.

- Note to Petraeus: What you can find with the Astronomers would be the complete absence of any clear coherent Risk Assessment, Strategy and Executive Decision recommendations.

- Astronomer's mistakes, omissions, misleadings and lies.

- "The only man who doesn't ever make mistakes is the man who never does anything." - TR

- I'm a whistle blower... I'm not saying that the Astronomers are knowingly lying or intentionally being fraudulent in service to their short-term self interest. Perhaps they are just stupid. But I do see things so I do say things.

- As to the treaty banning the proliferation of Nukes into Space: "In times of War the law falls silent." - Cicero. Make no mistake, Planetary Defense is War.

- The Pessimist will look first to find a worst case scenario. Then failing to find any, he then becomes an Optimist hoping that a worst case scenario does not find him...

- "Move fast and break things." Move slow and get it right.

- Don't Look Up: A movie that demonstrates the consequences of following the Astronomer's Risk Assessment, Strategic recommendations and Executive Decision making.

- Main reason to Project Power to Sun/Mars L3, 4 and 5

<<https://www.cnet.com/science/space/nasa-cancels-2022-mission-to-valuable-asteroid-psyche-on-a-falcon-heavy/>>

- 4th Contingency Variable: Loosely bound rubble pile - X 10.
- When you live in Montana, and you hear hoof beats you think 'Horses' not 'Zebras'.
- "Belief is so often the death of reason." GOT
- Dart's Flaws:
  - A. It will likely miss. 4 Body problem Diddymoon's, Diddymo's, Dart's and Earth's orbits.
  - B. Falcon 9 launch. Retrograde trajectory or only rocket Musk had on hand.
  - C. Diddymoon's mass unknown. Impact test impossible to meter accurately.
- In War, when you are losing the battle, a wise General knows when to withdraw... lest he lose the War entire. - Sun Tzu II
- Why couldn't the Astronomers understand that we needed to start building a comprehensive Planetary Defense when they witnessed Comet Shoemaker-Levi impact Jupiter 25 years ago?
- The only thing necessary for stupidity to prevail is for wise men to do nothing.
- "War is a bad place for good men." - Amos
- The Astronomers want to be Heroes... So... since the only skill they understand is Astronomy and the only tools they know how to use are telescopes they grossly understate the scope of the threat and scale of the response required so as they can Save the World with Astronomy and telescopes alone...
- "Courage is Resistance to Fear, Mastery of fear not Absence of Fear." M. Twain
- My 5 Forms:
  1. Differential
  2. Collegial
  3. Tutorial
  4. Come to Jesus
  5. Shitstorm
- RTD. In Academic parlance, an equation. To save the world... perhaps someday worthy of a Nobel Prize:) (Far lesser formula have received them.)
- A critical pitfall in the acquisition of a higher education can be becoming conditioned to trust and *not* verify the facts and logics anyone having superior educations or credentials offer.
- Since the best laid plans of mice and men oft gang a-glee, Plan B will always be Make Plan A Work...

<Notes: Strategy

- A critical pitfall in the acquisition of a higher education can be becoming conditioned to trust and *not* verify the facts and logics anyone having superior educations or credentials offer.
- Will there ever be enough time for the Astronomers to learn to think like Soldiers? Do they

even know they should? Can they... even if they try?

- The Astronomers tell us that since the odds are in our favor we can afford to gamble and only prepare for the best and need only hope against the worst. However, wisdom has always been that we can only ever afford to hope for the best once we have become prepared for the worst.

- The Astronomers tell us that since the odds are in our favor we can deal with this threat as things stand. So don't worry, be Happy. The question then becomes do we trust in the Astronomers' Good Luck or in becoming Forever Prepared, and Trained and Vigilant to defend against a worst case. Do you feel *that* lucky? Well do ya...? RTD.

- I've never prejudged the Astronomer's work products by their absence of experience credentials in Risk Management or Strategic Thinking or Executive Decision Making. But by the clear fact that they some of their conclusions and assessments are wrong or often misleading and occasionally can be seen to be a lie. So, their absence of such experience or credentials does seem to be a valid characterization or excuse after the fact.

- The Astronomers strategic thinking goes along the lines that since the odds are in our favor we should gamble and prepare for the best and only hope against the worst. Every master gambler knows that it's not the odds that determine whether or not we should gamble and throw the dice, but the magnitude of the loss if we lose. - Probability: When in your hands your fate you take and probability you chose, remember what the boys in Vegas always say. You can bet the farm or bet the dog or even bet your shoes. Just never bet anymore that you can afford to lose... Burma Shave.

- Although some of the facts and realities I present can be somewhat complex and hard to follow by some, I don't think that it's my writing style that is unacceptable but rather the dire conclusions that my logics comes to are. So... shoot the messenger. Or ignore him.

- I am not a PhD or President or some Billionaire that you can chose to believe whatever truth you like. However, I am a high IQ contrarian autodidact and master strategist with a firm grasp of this situation. All I can do is try to educate by pointing to the rational facts and trust that you can understand. And hope that you may be smart enough to connect the dots, brave enough to be afraid and strong enough to help do what must be done.

- New Tack: The Big Belief. That Mankind is here to inhabit and dominate the Universe. A potential Destiny if you like... And the dire prospect of our extinction by asteroid impact will impede and terminate that potential... The challenge here is to master that obstacle. Control the left over debris from the formation of our own planet and Solar System.

- An endorsement by NAS to robustly support the PDCO as any kind of Planetary Defense agency would be academia trespassing into risk management, strategic thinking and executive decision making territory... Politics. Not a landscape they are or have ever been capable of understanding or navigating well... if at all.

- Good judgement comes from experiencing the consequences of bad judgement.

- When the pessimist is wrong he becomes joyful and celebrates the good outcome. When the optimist is wrong he becomes depressed and despairs the bad outcome.

- Speculating on our future or past rational ignorance does not make not knowing the behavior does not make it Meta. Does not make it above or beyond physics.

- The pessimist *can* see *the difficulties* in every opportunity. *While* The optimist *only* sees the *opportunities* in every difficulty. Churchill, rewritten.

- All that is required for stupidity to prevail is for wise men to remain silent.

- Optimism is fine... that a policy based on pessimism is good enough.

- Things Astronomers et al get wrong:

a. Deflecting to the West, ahead of Earth

b. Inadvertently exploding an asteroid with Nukes

c. We can wait until we see one coming before we build a response

e. Statistical Probabilities are rational and relevant information

f. The 'Survey' is the same as 'Surveillance'

g. The orbits of discovered asteroids do not change

h. NASA alone can handle this

i. Nukes have infinite power and as-is will work in Space

j. Fail to acknowledge the random nature of the dynamics of asteroids

k. In service to their short-term self interests, consistently avoid the whole truth

l. Think optimism and hope are valid perspectives for determining risk and policy

k. Using the term 'mitigation' when they mean 'deflection' confusing decision makers

- How can we rationally think that colonizing any other planet is in any way wise when we are not remotely prepared to protect the one we were created on from the Cosmic flotsam left over from its formation?

- Part (b) SPEC. 808 of the 2010 Space Act from 2008 Space Act: (2) recommend a Federal agency or agencies to be responsible for (A) protecting the United States from a near-Earth object that is expected to collide with Earth; and (B) implementing a deflection campaign, in consultation with international bodies, should one be necessary.

- Johnson's current National NEO Preparedness Strategy and Action Plan with FEMA assumes that his narrow sighted perception of a hasty 11th hour kludge of a mission resulting from the scientific strategy in response to the threat will fail. And without a great deal of very good luck, odds are... it will. See RTD.

- Strategic: What is essential to the conduct of implementing an effective Response (aka Tactic).  
Re Planetary Defense:

a) Political Will to respond to this threat and delegate a responsible agency and the appropriation of sufficient funding to execute this will

b) Comprehensive potential threat assessment to worst case possible not merely the most likely

c) Effective tactical determination and selection for all threat levels

d) Tactical selection development and design

e) Test, Build, Train operational personnel, Deploy

f) Practice, Practice, Practice

g) Implement Strategy capable of responding to a worst case NOW!

h. Implement Response as needed

<Notes: Sound of The Guns

- GS Thesis: We can never know how large the next asteroid on its way to strike Earth is or when it is going to strike until we see it coming. Therefore we must become effectively vigilant and prepared and trained to the best of our technological capability to defend against the worst imaginable case possible. Which includes the prospect for our extinction.

- Long Term Agenda:

- A) Agency Delegation to POTUS
- B) GS Strategy to Agency
- C) Fear of EL Asteroid to public

- A tactic is an effective response. A strategy is what is necessary to implementing that response. Therefore, the tactic will dictate the strategy. However, the Astronomers et al have got it backwards. Based on a preferred and suitable assessment of the threat, they have an ideal strategy they like: do nothing until we see it coming. Then dictate a tactic that suits that strategy and services a suitable assessment of the threat.

- Just because someone understands what is said does not mean that they have understood they understand why it is true... or not. Usually it is only believed it is true because they like it or you. (or it is going to be on the test and they want to get an A.)

-It is the delusion of the stupid to think that to believe what is true is the same as to understand what is true and often conflate the two terms. It makes them think they are smart enough to make decisions. The foundation for a liberal democracy.

- DARTs to Deflect 100m Asteroid:

160m - 0.4mm  $\Delta V$  (test mission)

100m - 1.6mm  $\Delta V$

for 1cm  $\Delta V$  -  $x6 = \sim 10$  DARTs

Mass  $x2$ , Probability Ellipse  $x3.5$ , Technology Confidence  $x3 = 210$  DARTs

- NASA 2006 NEO Workshop Nukes  $>100$  than KI:

X 10 at surface

X 2 sans armor/variable yield

X 2.5 B-41/dirty yield

X 2 KI impact @ 5km/s not 10km/s

$> = >10,000$  times KI

- If you want to get more wisdom and more money out of Congress, *Scare* them better!

- Given: The greatest obstacle and threat to developing a comprehensive Planetary Defense would be Mankind's overall *belief* in God in some form. From which they then can derive a seemingly rational *understanding*. The logic they would apply would be that "No benevolent God would suffer his Chosen Species the prospect of its extinction by asteroid impact". Therefore any endeavor to defend against such a dire potential threat would be unnecessary.

A counter argument would be that since religious dogma (Christian?) proffers that God would not suffer man with a burden he can not bear, why then has He evolved His Chosen Species with the technology and potential capabilities to defend against such a threat without the wisdom to actually do so?

Then, given there is a God, being only human how could we ever presume to know His mind.

We can only take Reality as we see it. Then we can rationally see that the next extinction level Asteroid or Centaur or Comet is on its way to strike Earth now. And we are not remotely prepared to defend ourselves against it. But we could be. And the Gods laugh.

Then, there must be those that although they do understand that these things occur at random must believe we will perpetually be lucky. And in this game of Cosmic Russian Roulette the hammer will just never fall on one of those extinction level impact loaded chambers...

A man is sitting on his planet Earth looking up to Space. He's been praying to God to save him from an extinction by large asteroid impact for 50 years and finally he sees one coming. God finally answers him. "I've sent you Space capable observatories, thermonuclear explosive devices and the rockets to get them where they need to be to defend you're self. What where you waiting for? You had to know that sooner-or-later you would have to be prepared to use them..."

- "vincit omnia veritas" truth conquers all things.

- invictus maneo - "I remain unbeaten"

- Optimism is fine. As long as it is not used to influence policy.

- The threat of large asteroid impact makes Climate Change look merely like an inconvenience.

- Simply put, Infinity is beyond measure. Be it time, matter, being or nothingness.

- Earth Orbit Crossing Objects: Asteroids as much as twice a year to once every 2 or 3 years. KBOs every 50 to 70 years. LPCs once every hundreds of thousands years.

- I love our existence and war against our extinction by asteroid impact. All's fair in Love and War.

- How many small asteroids do we need to deflect before we are prepared for the big one? Practice/Practice/Practice.

- In the face of a threat, the weak will invariably choose to rely on the odds and expect a desirable outcome. Gamble.

- The problem that Astronomers are mired in is in thinking about the large number of asteroids and consequentially have been thinking statistically... Scientifically. When the threat, the actual problem, will always be about just One Rock: TNLA (The Next Large Asteroid on its way to strike Earth). In the end, it will only take one. One Rock to kill us all.

- When faced with a fearful thing we must address, Fear is our friend. Fear focuses the mind and energizes our actions. Tells us it is fight, flight or freeze time. It reminds us there are dire consequences if we fail. Fear Defines Necessity.

- The greatest failure of major media today is by being distracted by covid/covid/covid and climate/climate/climate and ignoring the *Fact* of the far more dire threat of random large asteroid impact and our inevitable extinction... Blame the Astronomers.

- Courage is being scared to death and saddling up anyways. The Duke

- The longer the war and harder fought the sweeter the victory.
- Since there will always be far more small asteroids than there are large it will always be more probable that the next asteroid to strike Earth will be small but it will also always be possible that it will be large. Question is: Do we prepare to defend against the probable or the possible? Here, consider that preparing to defend against the possible will defend against the probable as a matter of course.
- I think outside the Astronomer's box. Which is walled by their short-term self interests.
- The Butterfly Effect: "Whatever you do in life may be insignificant but it is important that you do it because you can't know." M. Gandhi
- I wear many hats: Soldier, Scientist, Engineer, Entrepreneur, Philosopher, Lawyer, Salesman, Father/Brother/Son... All of which go into making me a highly effective Risk Manager, Strategist and Executive Decision Maker.
- "The Only Thing Necessary for the Triumph of Evil is that Good Men Do Nothing." ???
- Science time is over. It's time to Act! Scientists can watch and observe and learn... It's what they do.
- I am Paladin. Defender of the faith: Truth, the whole Truth and nothing but the Truth.
- How do you eat an elephant? One bite at a time.
- You can see intellectual cowardice when the truth of a fearful thing is denied.
- (I always thought that) As the honest broker of information is it not the responsibility of the journalist to find, witness and research and come to understand and present the truth, the whole truth and nothing but the truth? (Was I wrong?) (And that) Merely presenting stupidity and misleadings and lies of others between quotation marks is no insulation from a failure of this responsibility.
- You can't beat Mother Nature. Sooner-or-later, the House always wins. I just hate to think that here we will lose because we were too stupid to even try.
- Simply because We The Species has not faced extinction for 65 million years does not mean that we will be lucky Forever... Truth here is that Time is not on our side: Tick Tock.
- The effective defense will address not only the most probable but the merely possible as well. Particularly when the merely *possible* represents a worst case scenario. And then, First!.
- In politics, it is common to kill the messenger in the delusion it will eliminate the context of the message.
- RTD International  
 помним динозавров.  
 erinnern uns an Dinosaurier.  
 souvienez-vous que du dinosaure

- Our political candidates need to be not the best looking snake oil salesman who tells the people what they want to hear but rather the highly trained master strategist and expert engineer of method who can tell the people what needs to be done.
- Scientists are always right... until they're wrong.
- We must martial our best technology and brightest troops and with a dire unwavering resolve begin to march to the sound of the guns... NOW!

<Notes: Astronomical Odds

- We must martial our best technology and brightest troops and with a dire unwavering resolve begin to march to the sound of the guns... NOW!
- Space Race 2.0: Mankind vs The Next EL Asteroid on its way to strike Earth.
- At any time any asteroid in our Solar System can become perturbed to be observably manifest as an impending Earth impact threat. In order for us to know when that happens we would need to be able to watch every asteroid in Real Time all the time... Forever. We can't do that. Yet.
- A good lie is easier to believe than the truth... Old Ferengi saying. And the current Astronomer's philosophy for Planetary Defense. The Big Lie! Adolph would be proud.
- It may be that the Warriors get the glory but it is the engineers of technology and method that build societies.
- Musk post DART launch: Congratulations. You just successfully launched the world's first Planetary Defense mission. Now, as you plan and work to colonize Mars, try to keep in mind that there's no place like home. And Remember the Dinosaurs...
- The Probability is Low but: life, health, fire insurance. Fire dept, standing military,
- "*In times of deceit (or stupidity?), telling the truth is a revolutionary act.*" Orwell
- "To sin by silence, when we should protest, Makes cowards out of men." Wilcox
- Metaphysics: Meta - above/beyond. Where one has abandoned rational deterministic causality and embraced an idea you like beyond understanding... mystical.
- A comprehensive and effective Planetary Defense strategy such as Gaiashield would be the largest and only project Mankind has ever built. Requiring the participation of every nation state and benefit every man, woman, and child on the planet.
- If not "Remember The Dinosaurs" then perhaps we need a fresh wake up call. A 1,000m asteroid strikes London. Then the Battle Cry would be "Remember *England!*"
- "At the head of all understanding – is realizing what is and what cannot be, and the consoling of what is not in our power to change."— Solomon ben Judah

— Solomon ben Judah

- The odds/probability is not a reason. Just because the odds you will not blow your head off playing Russian Roulette are 5 in 6 is not a *reason* to play Russian Roulette.

- When you think about Space, think *Large*... And be afraid. Be *Very* afraid.

Like food, shelter, clothing, energy, clean water, clean air, Planetary Defense will be just another Cosmic cost of living whose time has come...

Until we have a Planetary Defense that aspires and has a reasonable expectation of success in addressing the worst case, we will have no Planetary Defense.

- The Probability for extinction level asteroid impact is low. This is only a probability of 'When' not 'If'... Here, it means that sooner -or-later, at random, it will happen. Like perpetually casting a fist full of dice. The probability in any given cast that they would all come up 6 would be low. But sooner-or-later, at random, low probability or not, they will. Even the first time. And we have been casting these dire dice every day for 65 million years now... In other words, the Probability for 'If' rises to the level of a virtual certainty.

- No benevolent God would ever suffer his chosen species the prospect of its Extinction by Asteroid Impact without also endowing them with the potential ability to defend against it. All that chosen species would need to do is then find the wisdom and the courage to actually do it...

- The Dots: The Scientist must have the *Intelligence* to 'objectively' discover all the Dots and the integrity to report their nature clearly. The Engineer must be *Educated* enough to 'subjectively' determine what Dots are or are not relevant to a given objective and then have the experience and developed the aptitude to be *Smart/Clever/Wise* enough to connect the relevant Dots into the best means to achieve the given objective.

- The threat of a low probability extinction level asteroid impact is not a political issue or a matter of race or gender or nationality or religion. When, sooner-or later, at random, we loose this bet... we all die. And we already have have the technological and financial ability not to. We lack only the strategic wisdom to not gamble. Until we can defend the planet form the worst case possibility we have no Planetary Defense.

- When you choose to contest the random vagaries of Nature, *always* proceed with an abundance of caution commensurate with the magnitude of any loss if you are wrong.

- Thinking things through for yourself is not so hard... once you get the hang of it.

- Let's save our 'Hope for Good Luck' for when our rigorous vigilance, preparation to the best of our ability and training to the point of expertise has failed and Murphy's Law is about to bite us in the ass.

- The Parable of Katrina: In early August 2008 a Cat 5 hurricane struck New Orleans. 1,800 dead, \$125 billion in property damage. Several years before this event the US Army Corps of Engineers, the Federal agency responsible for maintaining the levies protecting New Orleans, advised the local powers-that-be that their levies needed to be upgraded and improved to withstand such an event. The city and state not having the money successfully solidified Federal funds. However, scientists (Climatologists) told the local politicians that the probability of a Cat 5 hurricane striking New Orleans was very low... So, in service to their short-term political self-interests, they retasked the Federal funds appropriated for improving the levies to building a bridge over lake Pontchartrain. Making the electorate happy. The lesson here is that even if the

odds are in your favor, if you chose to gamble, never bet against the House (Nature). Sooner-or-later the House/Nature always wins. (Nature can be... *is*, a random, capricious and fickle bitch.) .

Therefore:

If in your hands your fate you take,  
and probabilities you choose.  
Remember what the boys in Vegas always say.  
You can bet your house or bet your dog  
and even bet your shoes.  
Just never bet any more than,  
you can afford to lose.

#### Burma Shave

- One thing they don't seem to teach in school is how to think things through for yourself. If we expect to ever have an effective democracy we all better learn to do this... and do it right.
- The truth about the threat of asteroid impact is not for everybody... although it should be.
- The War against the Greater Threat is a War of First Principles.
- Engineers of Technology manipulate energy and matter. Scientists objectively observe and report. They don't manipulate anything. They do not do. Engineers of Method manipulate ideas and logics... and make work for Engineers of Technology and Scientists. Often by finding problems for them to solve. So Engineers of Method do need to at least understand the basics of what Engineers of Technology and Scientists can and can not do.
- The Art of Thinking.
- You believe what you like. Belief is the refuge of ignorance. Ignorance is stupidity. Stupidity is bliss.
- "*The pessimist sees difficulty in every opportunity. The optimist sees opportunity in every difficulty.*" - W. Churchill. It's the pessimist that sees the problems that need to be solved. But I would just swap out optimist for entrepreneur... or even master strategist.
- "*Our greatest weakness lies in giving up. The most certain way to succeed is always to try just one more time.*" - T. Edison
- When you hear about this issue from a scientist you are hearing it from someone with a pigeon hole education and understanding. Therefore you can expect a very narrow myopic point of view. They have no skill or aptitude for connecting the dots outside their singular expertise. As an example, the Astronomers think Planetary Defense is only about the astronomy. That's like going bear hunting with a telescope. Then when you find one you go running back to the cabin to invent and build a gun.
- Social Media  
Instagram  
YouTube  
Facebook

Twitter  
TikTok  
Pinterest  
Snapchat

- GEOFFREY SOMMER, Astronomical Odds

<Notes GS Work

- Astronomers candy-assed nukeaphobic assessments.

- Re SpaceX: The Gaiashield Planetary Defense Strategy affords every man and woman and child on the planet with a rational, practical motive and dire urgency for We The Species to go to Mars. All that we have now is that for some it would be... neat.

- We can call this *War*. After all, we have had a War on Poverty and a War on Drugs. And here, as a matter of Global *Security* we must *Defend* the planet and Mankind from extinction with kinetic Space *Bullets* and high yield *Thermonuclear Explosive Devices*. Just because we are not killing each other over social or economic or religious principals or territory... how can we not wage this as War?

- A Scientific Survey does not even come close to being a Security grade Surveillance.

- An EL Asteroid impact tomorrow may be unlikely. Unlikely yes... but nonetheless, *always* possible. The question here is, since it is not necessary to be all that smart and wise to be prepared to defend against the likely (even a caveman can do that much), given that the dire magnitude of the loss would potentially be the survival of our species, are we smart and wise enough to be prepared to defend against what is always possible?

- The role of a pessimist as risk manager is to work from the perspective of Plan B when Plan B is make Plan A work! We work to find the flaws and see the things that others have missed or ignored or intentionally misstated so they can be addressed and/or corrected.

- Re The Astronomers: I've never found anyone so afraid to see that they have been wrong.

- The Astronomer's Survey approach is a poor means to a first stage in defending against asteroid impact. With only 3 small field main telescopes, it only operates part time (at night), at the dark of the Moon, weather permitting, with limited range and spectrum, only addresses finding those asteroids that have been perturbed prior to discovery, and overall aspires to discover only their own 90% estimate of the total NEO population. Then, once their general, one-time Survey, only tracking asteroids long enough to get good current orbital elements has been completed, they will declare victory, turn off their telescopes and go home. This may work for objective Science purposes but not anything close to a the real-time perpetual vigilance and Surveillance this dire existential threat warrants.

- This is War. And any soldier knows that in War you must always be prepared to defend against the worst the enemy can bring against you. And always begins... NOW! But Astronomers know nothing of War.

- Defending the planet and mankind from extinction from asteroid impact will be a War. I

understand that such a War will require Global Political Will, billions in funding annually Forever, Planetary Defense platforms deployed to the orbit of Mars, tens of Gigatons of thermonuclear explosive devices and scores of Space Based observatories. I can not wage *this* War. However, I *can* War against the Greater Threat. A War that must be waged and won *first*: The Astronomers in their default position of authority and their suicidal strategic logics. For that, I need only precision semantics, unimpeachable dialectics and rapier sharp rhetoric... That, I got. So, No Prisoners, No Quarter, No Mercy. This War began 20 years ago and I haven't won... yet.

- "Chance is irrelevant... We will succeed." - 7of 9.

- Small minds think alike... When everyone thinks the same way they're usually wrong.

- As a rule, Astronomers have become educated in finding their dots. And they are apparently born with an intelligence high enough to understand what they find... However, they seem to have no aptitude whatsoever in connecting those dots... strategic talent.

- Form a company of Planetary Defense strategic and tactical engineers of method and technology.

- Just waging a one-man War to defend Mankind from extinction here. So... No Prisoners. No Quarter, No Mercy. And it begins with the architects of the consensus of willful stupidity: The *Astronomers*. Since they do not seem to even want to get smart, I give it to them like a USMC Drill Sergeant. I'm far more civil when I'm addressing those who, like it or not, *want* to see the truth... .

Astronomers know nothing of War.

**Remember The Dinosaurs**  
**A Compendium and Tutorial**  
**For the Art of Planetary Defense**

- Re POTUS Pings: "*Our greatest weakness lies in giving up. The most certain way to succeed is always to try just one more time.*" - Thomas A. Edison

- None of the small group of Astronomers and miscellaneous academics that have shaped and informed the current official assessment of the threat and the response required to defend against it, seem to even have the strategic sense God gave a bucket of frogs...

- Ignorance is not bliss. Ignorance is stupidity. Stupidity is bliss. Either way, bliss has never a reliable survival trait.

- The advantage of being a high IQ contrarian autodidact over a PhD is that your interests and ideas are not shaped and constrained by any consensus of your superiors or peers and your thinking and learning limited by the boundaries of your discipline. You are free to investigate, learn and understand anything you may need or want to. Particularly when it is clearly 'not your business' or in opposition to the status quo.

- Should we fail to build a Gaiashield class Planetary Defense, sooner-or-later we will look up and see just what form of bliss our collective ignorance has wrought. Our extinction by asteroid, 10 seconds away from impact.

- Some people think it best they die young and leave a beautiful corpse. For some others, best they had they never been born. The rest die kicking and screaming 'life is too short'!

- Marx died 40 years before his principles in Das Kapital and his Communist Manifesto actually became manifest with the USSR... And he was a notable well credentialed philosopher. How can I expect anything more with Gaiashield. Hell, I'm just the guy doin the thing.

- Remember The Dinosaurs: Either a formula for Saving The World or an "I told you so" for just before Mankind goes extinct by asteroid impact...

- Carl von Clausewitz: "On War", Sun Tzu: "The Art of War".

-We are Bowie and Travis at the Alamo, Russia at Stalingrad, the US Air Cavalry at la Drang.

- Art courtesy David A. Hardy, [www.astroart.org](http://www.astroart.org)

- Proofread this compendium of by best insights, ideas and logics to defend the planet from asteroid impact for grammar, clarity, logic and any relevant ideas and insights I may have missed. Basic skills required: risk management, strategic thinking, executive decision making, basic physics, engineering, military philosophy, probability theory, psychology, government, logical argument... or some number of these talents.

- Read the attached PDF. If you don't take the prospect of Mankind's extinction by large asteroid impact personally and understand it to be a credible and potentially imminent threat, read this... you will.

- Remember The Dinosaurs: A compendium of all my insights, logic, dialectics, rhetoric and wisdoms...

- Grammar/English Second would be coherency Third, is my argument convincing. With this compendium I would leave a legacy of critical ideas expressed in several effective ways in order to suit various opportunities with those to whom this should concern. A legacy of unique, clever and forceful ways to express important insights and ideas.

- Listing on website:

A Compendium on The Art of Planetary Defense:  
Waging A Forever War

A work in progress. Comments and insights welcome.

- This is War. With War there is victory or defeat. Then Peace. But with this War, there is no Peace... ever.

- Strategic capabilities not only apply to what is essential to the conduct of implementing a response but to assessing the essential behavior of the causal elements that generate a threat.

-“Science is about learning things once thought impossible, and Engineering is about making the impossible work.” - J. Campbell Science Time is over. We already know what we need to know. Time to Engineer the shit out of it and turn it into plans to defend the planet from Asteroid and Comet impact... Then fuckin' build it!

- Just trying to start a War here...'*Remember The Dinosaurs!*'

- RE The End of Days: If '*It Is Written*' and the divine will of God, then Mankind would not be able to do anything to prevent it. Since God has blessed us with the ability to prevent a

Extinction Level Asteroid impact, then this ain't it. Perhaps God not only gave us asteroids to help build the Solar System but to get Mankind's ass into Space!

- My credentials... 50 years a serial entrepreneur. PhD in School of Hard Knocks.

- First line in my obituary: He told them how to save the world... they didn't care.

- Argument for the Atheist: No God would suffer his Chosen Species the prospect of extinction by asteroid impact... Therefore, there is no God. And for the Faithful: No God would suffer his Chosen Species the prospect of extinction by asteroid impact without also giving it the ability to defend against it. As well as a dire and fearful necessity to justify mastering Space in the process.

- When we think about Space, where others may see the pipe-dream of human colonies on the the surface of the Moon and Mars someday, I only see "*Here, there be Dragons*". Sooner-or-later coming to Earth to kill us all...

- When we go to Vegas and gamble, we think 'What is Probable'. When we go to War and defend, we think 'What is Possible'. Astronomers know nothing of War...

- "Better to be lucky rather than good." is only good advice for the stupid and incompetent. Are we stupid and incompetent?

- Planetary Defense is Nationally/Globally/Humanly strategically critical: Essential to the conduct of implementing Mankind's Being. Defending against Nothingness...

- When someone is trying to tell you a secret of the Universe... PAY ATTENTION!

- Facebook:

Waging The Forever War  
The Art of Planetary Defense  
The Gaishield Strategy

Once upon a time...

- The next large asteroid on its way to strike Earth is closing at a million miles ad day. And there is no reason to think we can believe how large it is or trust how large it is not.

- GS Trust:

Maintain Website: annual hosting, domain registration, webmaster

Conventions: travel, lodging, food

Advertising

Letters: printing, postage

Meetings: government, whales, key personnel

Books: printing, distribution, promotion

Personal Loans: secured emergency interest bearing

- Bezos: Planetary Defense is where your Blue Origins, Space, meets your Earth Fund, Planet Sustainability. [earth@earthfundglobal.org](mailto:earth@earthfundglobal.org)

- Robert Frost: "Everything I've learned in life can be summed up in three words: It Goes On." Until it doesn't... DonQ

- Save your Optimism for when you *have to* gamble (or want to). For this... we don't.
- Forum Reminder: In the last 3 months the next large - extinction level, asteroid on its way to strike Earth has traveled 90 million miles closer to impact... 'something evil this way comes'. And we are not remotely prepared. Tick Tock.
- Looking for "The Right Stuff"... "A Few Good Men" that can handle the dire truth. They need to abandon the habit to just believe in what truth they like and what they are told and are instead compelled to understand what the truth is. Be able to rationally analyze and explain and formulate an argument. Then have the courage to champion and defend the truth and persuade, promote and teach truth to power and make this happen. Simply learning this by rote is next to worthless. It will make them nothing more than tools.
- Since they are not Engineers of technology or method, Astronomers are unable to conceive of anything large enough that we can possibly employ to defend against a worst case threat. So they choose to not even imagine a worst case threat... And ignorance is bliss. When it comes to their risk assessment, it's as if they are looking through the wrong end of the telescope.
- The Astronomer's Strategy would be to Hope that they "Find Them Early" and Hope that they are always small and Hope that when they find them, somebody will do something. And if/when they fail, they Hope that they are not at Ground Zero when it strikes... Hope has never been a reliable survival trait. Leave Nothing To Chance!
- Save Hope only for when all that can be done is done and what is left must be left to Chance.  
5,972,000,000,000,000,000,000 kilograms

Read more at: <https://www.deccanherald.com/science-and-environment/can-changing-the-earths-orbit-reverse-the-effects-of-climate-change-998910.html>  
5,972,000,000,000,000,000,000 kilograms

Read more at: <https://www.deccanherald.com/science-and-environment/can-changing-the-earths-orbit-reverse-the-effects-of-climate-change-998910.html>  
5,972,000,000,000,000,000,000 kilograms

Read more at: <https://www.deccanherald.com/science-and-environment/can-changing-the-earths-orbit-reverse-the-effects-of-climate-change-998910.html>

- The only Hope we can ever afford to have is that we become Prepared and Trained and Vigilant enough to effectively defend against the worst case before we have to... or go extinct.
- Truth is not a democratic product.
- War Games (training) afford us the opportunity to discover problems that even the smartest of us did not think of before the fact. Weaknesses that we need to address in order to have the most effective response when we need it.
- The mountainside is littered with the bones of those who having climbed to within sight of the peak, have stopped to rest... and died.
- DIU: Defense Innovation Unit [<https://www.diu.mil/>](https://www.diu.mil/)
- There is no human survival or evolutionary advantage to Man on Mars.

- It is written that in a true democracy the power is with the people. However, since the politicians only ever tell the people what they want to hear, the people trust their politicians to tell them what to think. And the power is where it has always been... with the government. So if you would tell truth to power, teach the shepherds not the sheep.

- The sheep are generally either too lazy or too stupid to understand so they will rely on belief. And since belief is only ever available in the absence of understanding you are free to believe anything you choose. So why would anyone choose to believe something they don't like? Therefore, to get elected, politicians tell them they bring the truths they like and believe. Don't Worry. Be Happy. Comfort-food-for-thought.

- The Carbon Tax would be a far better idea if the revenues generated were dedicated to funding the promoting the scrubbing and sequestering atmospheric carbon. See artificial trees.

- In managing any risk you always look to address the worst case first. Regardless of its likely hood. And here, the likely hood for the worst case is only 'when' and not 'if'. And everybody knows we can never trust random chance to be on our side.

- Dear Planetary Society: I'm getting old and there is much left to do. I need a successor to carry on the work and promote the Gaiashield Planetary Defense Strategy. The mission will come with a \$120,000.00 warchest. Interested?

- There is only one aspect of this issue that we can ever justify and afford to invest our optimism and hope. That if the World would begin to invest \$100 billion a year for the next 100 years that we can complete building an effective Planetary Defense capable of responding to the worst case 10km extinction level impact threat... before we actually need it.

- The Gaiashield Planetary Defense Strategy is a rational and coherent contradiction to the kludge of short-term-self-interest driven misunderstandings, misconceptions and lies of the consensus of 'expert' Astronomers and assorted academics.

- Most people resort to some safe belief when a rational understanding brings fear. Most people are cowards.

- In terms of Cost: In contrast to expense, consider the principal of Cost as Stimulus. A \$100b/yr Forever Warchest = jobs and profits and taxes... Forever. Oh my.

- If you would become an expert risk manager or master strategist or effective executive decision maker, think for yourself. To simply parrot the thinking of others, of what you've been taught, makes you next to worthless. A drone...

- The only Hope we can afford to have is that we are lucky enough to have the time we need to build an effective Planetary Defense against the next extinction level impact threat before we actually need it... Tick Tock.

<General Notes: Доверяй, но проверяй>

- Being rational and being right, when everyone else is not, has always made me feel good...

- To be rational, information must be either be the potential or manifest effect of a tangible cause

and the potential or manifest cause of a tangible effect. The root of the word rational is reason.

- Planetary Defense is not something We The Species has any choice in. We do this, and do it right, or sooner-or-later we die.

- There will always be some remote but dire scenario that, sooner-or-later, will defeat any standing defense effort. Therefore it must be designed to be in a constant state of evolution.

- How can we allow ourselves to be defeated by the bliss of ignorance?

- When it comes to teaching a truth, the Sheep can not verify and understand. They can only trust and believe. Therefore when you go to the Sheep, credentials are required.

- I work the dictums: See Something Say Something, Tell Truth To Power, Do What You Can With What You Have From Where You Are.

- Fareed Zakaria GPS@CNN.Com Speaking of just how poorly we have come to appreciate risks.

- We can only hope that We The Species gets smart enough soon enough.

- The best Planetary Defense computer simulations are going to be next to worthless until they are being programed by those who have actuality deflected or destroyed an asteroid.

And our first mission to deflect or destroy any asteroid on course to strike Earth is far more likely to fail if it is being conducted by those who have never learned by practice, practice, practice and become trained.

After all, this is War. And long ago we learned that going to war only with an army of farmers and shepherds and merchants commanded by elite nobles that have never waged a war was doomed to fail. And this War is not a thing for scientists and academics to wage. In this role they will do little more than pave a road to Hell. So, when NEOPucker Time comes, who ya gona call, soldiers or scientists?

- Belief Perseverance

- Paper identifying PD community flawed perceptions.

Impact Probability

Fixed Asteroid Orbits

Retire The Risk

Subject For Science Investigation

Extemporaneous 11th Hour Response

Expectation Of Good Luck

- Scholarship: "GaiaShield - A Philosophy for Planetary Defense"

- Chris: Unwarranted derogatory characterizations and imaginary short comings.

- If you gamble and you win even when the odds are in your favor it is good luck. And the only thing you can ever count on with a run of good luck is that sooner or later it runs out. As a matter of random chance, 65 million years ago a 10km asteroid struck the Earth bringing the dinosaurs to their extinction. We have been lucky but time is not on our side here. so... any day now. Tick

Tock.

- The Astronomers think that Planetary Defense begins and ends with finding all the asteroids that are not on their way to strike Earth. When in fact it is only an element of the greater mission that requires we find the next one that is... Forever.

- There is too much that even the 'powers that be' want to know here.

- Always trust the science... if you can understand it. However, when it comes to the scientists, always trust but verify. After all, they are people, they can be stupid. Often willfully so or as a consequence of fear and get things wrong. They can have short-term self-interests and be inadvertently misleading and even knowingly lie. So if you can not understand it, you are just sheep.

- Barbee: *Being able to reliably intercept such small NEOs is important because smaller NEOs are exponentially more numerous than larger NEOs, so we are statistically more likely to face an impact threat from a smaller NEO,*

A counter with reductio ad absurdum

Here, he clearly implies that the next asteroid on its way to strike Earth will likely be small and that we need only to be prepared to defend against a small asteroid impact threat. However, since there will always be far more small asteroids than large, then by his logic we therefore will never need to be prepared to defend against a large asteroid impact impact threat...

How can he rationally think that the next asteroid on its way to strike Earth will not be large until he knows when it will?

- The Astronomers need to understand that in doing their part in Planetary Defense, 'Watching The Wall', they need to do it better and start thinking that they will need to do it... Forever.

- Scientists have told us that 'the probability for large asteroid impact in the next century is low'. We take that as meaning that there is some future century where the probability is high... However, that is not true. With this form of probability in any 100 year increment of time the probability for large asteroid impact will always be low. Even in that next century where a large asteroid will strike Earth. If you look up in the sky and see a large asteroid 10 seconds away from impact the probability will still be low. With this kind of probability the expression of a randomly occurring event does not effect its probability of occurring. Therefore we can not take the scientists assessment to be in any way predictive or useful. Merely a metric for Hope.

- POTUS Ping 4: When you chose to pass on the opportunity to help save the world from asteroid impact and Mankind from extinction today, then hope that by random chance you are lucky and have grown old and died before you have to regret that decision... and despair. Time is not our side here... Tick Tock.

Random

Perturbation

No reason to think

NPDA

- In terms of asteroid threat surveillance, what we are doing now is like standing in the middle of the Great Gogomain Swamp looking through a soda straw and by counting the mosquitoes

looking to find the next one to bite us in the ass.

Laptop/Thumb to Web:

GS Email

STTAG

Counter Arguments

GS Notes

- GS 101:

TFSW

TCFPD Now

STTAG Bezos

All Notes

All POTUS Pings (To page 55)

All Congress Pings (from page 55)

Notes Insights: problems and solves introduced into PD understanding.

- We can understand that at random, sooner-or-later, Earth will be struck by a 10km extinction level asteroid. Therefore, the probability that we will be struck by a EL Asteroid is 100%.

- Once you have come to understand that all asteroid impact events occur at random. And that there is no reason to think that the next asteroid on its way to strike Earth will not be a 10km extinction level asteroid. Then you come to appreciate that the rational defense we need to have in response would require a standing, nuclear payloaded force of hundreds of deep space rockets. Why then would we even consider needing any alternative tactics available for smaller threats when a mere small portion of our standing nuclear capability would serve?

- Since we can not know how large the next asteroid to strike Earth will be until we see it coming. And since there is no reason to think it will not be a >10km extinction level asteroid. How can we have a comprehensive rational strategy to defend the planet from asteroid impact that does not begin with this scale of the threat and then recommend the preparation, training and vigilance that would be required to effectively defend against it?

- Near-Earth Object Preparedness Strategy and Action Plan - June 2018

<<https://www.nasa.gov/sites/default/files/atoms/files/ostp-neo-strategy-action-plan-jun18.pdf>>

Near-Earth Object Impact Threat Emergency Protocols - January 2021

<<https://trumpwhitehouse.archives.gov/wp-content/uploads/2021/01/NEO-Impact-Threat-Protocols-Jan2021.pdf>>

- Johnson: Preparing for Planetary Defense 1995

<<https://commons.erau.edu/cgi/viewcontent.cgi?article=1632&context=space-congress-proceedings>>

USAF 2025 (Urias)

Brigadier General John M. Urias

Col. John M. Urias

for USAF 2025 (Urias) 1996

<<https://space.nss.org/wp-content/uploads/1996-Planetary-Defense-Catstrophic-Health-Insurance-For-Planet-Earth-Urias.pdf>>

Mitch: 810.241.9999

Chris: (203) 497-9129  
810-241-7956

Long term site hosting  
GS Thumb Drive distribution  
Trust Kids to follow will  
Find issue based successor  
Deep Pocket sponsor

- Both a rational appreciation of both the true scope of the threat and the realistic scale of the response required to effectively defend against it, scares the Hell out of the astronomers and assorted academics currently in a default position of authority in this issue. Consequentially they chose to always portray this threat in its best case and the response as something we can easily do extemporaneously from our current standing capabilities in Space. How is this not an absence of integrity and courage?

- Like Russia, I can be a riddle wrapped in a mystery inside an enigma.

- orthogonal

- "Do what you can with what you have where you are." TR

- The first step in developing a plan and strategy to achieve a desirable outcome would be to determine exactly what a desirable outcome would be.

(For Johnson et al)  
Watching The Wall  
When you are watching the wall  
To look for the greater harm  
Look first to your false all-clears  
And not to your false all-arms.

(For Harris et al)  
The Gambler  
When in your hands your fate you take  
And probabilities you chose  
Remember what the boys in Vegas always say:  
You can bet the farm or bet the dog  
Or even bet your shoes  
Just never bet any more than  
You can afford to lose.

- On Syal et al's paper: I can't imagine any other constructive purpose to this paper if it is not to shape, inform and encourage rational and diligent... wise, preparation. And in that direction, at this point, Optimism is anathema. Optimism should be reserved for our actions. And then only when they are the product of our best efforts. Not that the task will require only our least and most convenient abilities.

- It's not a matter of 'if' but 'when'. At random, Extinction Level Asteroids can, and sooner-or-later will, strike Earth. How can we possibly think we can know that some EL Asteroid will not be the next asteroid to strike Earth unless and until we can somehow actually know when the

next one will?

- Short version: Since we can only ever know when some asteroid is on course to strike Earth only if and when we see it coming, it is impossible to know when one is not.

- The relative Frequentist/Statistical probabilities of small and large asteroid impact that are often compared as a rationalization for some expectable occurrence of asteroid impact events, can rationally only convey the relative number of these events that will likely occur at random over some large period of time. They can in no way shape or inform any rational expectation for how large the next asteroid threatening to strike Earth might be.

- Hell, All the relevant Science, Knowledge, Understanding, Logic, and Wisdom wrapped in an instinct for The Survival of Our Species are on my side here... what more do you want? The Word of God!!!

- Strategic and Tactical Insights for problems and solves I introduced into PD understanding.

NPDA (NASA/DoD) as PD linchpin legislation

Moved "Brown Act" out of committee

Lobby POTUS for NPDA E.O.

Determine true scope of threat and scale of response

Project Power to orbit of Mars... Gaiashield

Randomness

Statistical Probability Conflation/Abuse/Unqualified Population

Only Fear Defines Necessity

Launch Window availability

VASIMR NEO Interceptor Tug

Nukes - The one solve that fits all size threats

TNLA as threat definition

NEO Net

NASA NEO Workshop

Perturbation

Near Miss Risk

Shocked Acceleration explosion in atmosphere and on impact

Low percentage of force (0.3%) from explosion on impact

Forever Threat. no elimination

No worst case defense no Planetary Defense

The Water Age and NASA KSLC sea level

Common Cause approach to Nukes in Space Treaty

part (b) SEC. 808 of the 2010 Space Act

<2021 PDC Scenario /Water Age Notes>

- The Frequentist/Statistical probabilities of small and large asteroid impact that are often compared to rationalize some expectable occurrence of asteroid impact events, can actually only convey the relative number of these events that will likely randomly occur over some large period of time. They can in no manner inform or shape any rational expectation as to how large any next asteroid threatening to strike Earth will be.

- The Risk Manager is a hard core Pessimist. He is a Pessimist in the morning, a Pessimist at night, a Pessimist all day long. On the other hand, the Optimist is a Gambler. He will always approach Risk with Hope and an expectation of Good Luck. Optimism should be reserved for the efficacy of our best possible efforts and actions.

- Hope is no substitute for Understanding.

- The Next Water Age: Another Inconvenient Truth?

Dr. Benny Peiser

**The Global Warming Policy Foundation**

email: [info@thegwpcf.org](mailto:info@thegwpcf.org)

- As an expert risk manager, master strategist and professional executive decision maker, when addressing a threat I find wisdom in starting with it's worst case scenario.

- Reducing atmospheric carbon is only the terrestrial aspect of the global warming equation. There is a Cosmic aspect.

- Only ever go to the scientists for the science (then trust but verify). Never go to them for what to do. Scientists seldom have the strategic sense God gave a bucket of frogs.

- Would it not it be far better and more effective to adapt to the coming Water Age now, while we have the full capabilities and resources to do so instead of later once we have lost, or even just begun to loose, those critical capabilities and resources? Which, in this current war against Climate Change, would include the intentional sacrifice of our well established fossil fuel based capabilities...

- Only a fool would ever just prepare for the best and only hope against the worst.

Addressing the threat of Global Warming by only reducing atmospheric carbon is like seeing victory in the last voyage of the Titanic... and getting us only half way there.

Fukushima

methane hydrate

[team@gatesnotes.com](mailto:team@gatesnotes.com)

- Iridium: <<https://www.forbes.com/sites/davidbressan/2021/02/24/scientists-find-traces-of-asteroid-that-wiped-out-the-dinosaurs/?sh=70a977ee584d>>

- The actual scope and understanding of the threat and the full scale and nature of the response required to defend against it.

- I have found that to influence someone it is often more effective when you shape the argument so that they can win and find understanding by making your true position.

- Climate Change: But if you want to see the evidence to understand climate change well enough to talk to me about it, do some homework. Read up on The Ice Age (and what I have termed the reciprocal *Water Age*) on Wiki. Specifically the "Ice Age Temperature Changes" graph. <[https://en.wikipedia.org/wiki/Ice\\_age](https://en.wikipedia.org/wiki/Ice_age)>. Then check out the "Milankovitch Cycles" and the ~100,000 year Earth/Jupiter perturbation and see the primary cause of the recursive Ice/Water Age cycle. And start connecting some dots... think strategically. You'll see that this is just another one of those pesky Cosmic events...

albeit a survivable one.

- NASA/USSF MOU:

<[https://www.nasa.gov/sites/default/files/atoms/files/nasa\\_ussf\\_mou\\_21\\_sep\\_20.pdf#page=1&zoom=auto,-99,792](https://www.nasa.gov/sites/default/files/atoms/files/nasa_ussf_mou_21_sep_20.pdf#page=1&zoom=auto,-99,792)>

howley1@llnl.gov

amainzer@lpl.arizona.edu

lindley.johnson@nasa.gov

jeff@amazon.com

- "Our greatest weakness lies in giving up. The most certain way to succeed is always to try just one more time." - T. Edison

- You're wrong. Is it a lack of courage or diligence or integrity that keeps you so far away from Truth? I can't tell from here...

- Risk Assessment: They say Life is Risk. But sometimes we have a choice. Today, we understand the rational reality that at random, sooner-or-later, Mankind will suffer the threat of an extinction level asteroid impact event. This poses two contradictory risks. Given such events occur at random, prior to its discovery and any exact empirical determination, the rational chance for either must therefore be seen as equal.

A) Sooner: which would have us investing the money (a proxy for human endeavor - jobs, profits and taxes) in building a comprehensive Planetary Defense *Now... ASAP*, and take the chance that we may have a million years or more before such a threat actually manifests and not need it until then. So here, we risk the expense of all that time and money to build and maintain a worst case level Planetary Defense long before we actually needed it. Or

B) Later: which would have us waiting for some unknowable long period of time (perhaps on the basis of some arational optimistic belief) and take the chance that such a threat would not actually present itself in the near term. And then if wrong, see that we should have spent the money when we had sufficient time to become adequately prepared to defend against it. So here, we risk the very survival of our species in order to avoid spending all that money.

So the question here would be, what are we willing to put at risk, our money or our existence?

Clearly, not a decision that should be left to astronomers or scientists. Perhaps a good answer here would be: they also say "Better to have it and not need it than need it and not have it."

Precautionary Principle: Governments should take action to prevent harm even when it is unknown if, when or where the harm will occur.

- To be assessed as a frequentist probability an event must be an *existential* phenomenon that at *random* has an *opportunity* to occur.

- Hell, All the relevant Science, Knowledge, Understanding, Logic, and Wisdom wrapped in an instinct for The Survival of Our Species are on my side here... what more do you want? The Word of God!!!

- Do what you can with what you have where you are. Roosevelt.

- Bezos:

Post

Origin

Fund Strategic assessment

Fund STTAG

Jeff Bezos <media@blueorigin.com>

Bill Gates <media@gatesfoundation.org>

Warren Buffett <berkshire@berkshirehathaway.com>

Mark Zuckerberg <Mark.zuckerberg@gmail.com> <zuck@fb.com>

Charles Koch <grants@charleskochfoundation.org>

Elon Musk <media@spacex.com>

Jody Allen <press@vulcan.com>

- *Trust, but verify* (Russian: Доверяй, но проверяй, tr. *Doveryai, no proveryai*)

- Post Truth World: He who tells the best narrative wins.

- With PD Now: PD... NOW! contains an outline of the basic strategy for Plan A. Plan B would be : Make sure Plan A works...

- In war, when you choose to be prepared only for the best case, you must also be prepared to loose.

- GS Thumb Drive: Insights and information driving a strategy to save the world with.

Admin NASA

Com USSF

Marks

Barbee

Chodas

- Skills and disciplines relevant to understanding Risk Management, Strategic Thinking and Executive Decision Making for an effective Planetary Defense:

Newtonian Physics

Astrophysics

Nuclear Physics

Earth Science

Aerospace Engineering

Politics

Psychology

Philosophy

Liberal Arts of Semantics, Dialectics and Rhetoric

- Biden Ping:

"There are truths and there are lies."

You already have Congressional approval for responding to this dire truth.

<https://www.marketwatch.com/story/all-of-president-bidens-key-executive-orders-in-one-chart-2021-01-21>

- ELE Impact Not a Black Swan event. A Black Swan event would not be an event that you could not actually imagine before it does but rather an event you can imagine but think it can not actually happen... until it does.

- When faced with a random chance to achieve a desirable outcome, and and choose Hope rather than deliberate action, expect to loose.

- Conjecture: the basis for BLM.

- Generally, those who come to think best about how to do a thing are those who are qualified and delegated to be responsible for doing it.

- Projects and Influencing:

POTUS Letters w/copy to VIP To Whom This Should Concern

POTUS Pings for NPDA w/copy to Congress, US NSC and To Whom This Should Concern

Shape and teach current PD principals

GS website w/ papers and commentaries

School media on PD

Solicit whales for STTAG

'The Day Before' art film

- Insights: problems and solves introduced into PD understanding.

Determine true scope of threat and scale of response

Project Power to orbit of Mars... Gaiashield

Randomness

Probability Conflation/Abuse/Unqualified Population

Only Fear Defines Necessity

Launch Window availability

VASIMR NEO Interceptor Tug

Agency Delegation (NASA/DoD) as PD linchpin

Nukes - The one solve that fits all size threats

TNLA as threat definition

NEO Net

NASA NEO Workshop

Perturbation

Near Miss Risk

Shocked Acceleration explosion in atmosphere and on impact

Low percentage of force (0.3%) from explosion on impact

- 2021 PDC Scenario

Paul,

I got the IAA invitation to submit an abstract for a solution to address your 2021 PDC scenario but thought I'd send my perceptions <Below> along to you instead. You're in a better position to actually make things better in The Real... Done right, this scenario may

start the PD community thinking rationally about Preparation, Training, Vigilance... Perhaps you could even have the 700m version hit DC. Always think *worst* case scenario... Scare them better!

<Below>

In your 2021 PDC impact scenario, there simply is no realistic solve, so you may as well just pray for Good Luck that this one too will miss. After all, the odds are in our favor... That approach would conform to the current Hope based academic consensus and apparent Planetary Defense strategy. Given the inevitable random chance impact of the next asteroid on its way to strike Earth, this strategy assumes:

- A) That it is already an NEO.
- B) That it will be found in the 90% of the discovered population.
- C) That once it has been discovered, tracked, catalogued and characterized as safe its orbital elements will not change.
- D) That it will be small and any large and extinction level impact threats will be at least millions of years in the future.
- E) That when it eventually has gradually become apparent as an impending Earth impact threat we will see it coming early enough before impact to prepare an effective response.
- F) That whatever extemporaneous ad hoc resources we do happen to have on hand at that time will be sufficient to prepare and mount an effective defense against it.
- G) That, when we need them, there is certain to be enough launch windows suitable for deploying our response through.
- H) That all the technology and systems that we do manage to employ in our hasty, 11th hour effort to try to defend the planet will work as required.
- I) That all the politicians will quickly make the best decisions and appropriate the necessary funding and compel all institutional and industrial resources to perform as needed to conduct the mission successfully.
- J) That "Murphy's Law" and "Shit Happens" will take the day off and no Bad Luck will come to spoil the outcome of our response.
- K) That We The Species is somehow special... Forever.

All fostered by pathological optimistic expectations of Good Luck or misconceiving some form of Frequentist/Statistical probability as meaningful rational information.

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly. Adapt or die.

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group: <<http://Gaiashield.Com>>

The Falling Stars War: <<http://Gaiashield.com/TFSW>>

The Case for Planetary Defense...NOW! <<http://Gaiashield.com/TCFPDN>>

<Planetary Defense 2020>

Dr. Syall,

I recently came across your 2020 paper "Options and uncertainties in planetary defense:". However I did not see a need to go any further than it's abstract. I trust your thinking has not evolved since then and thought you might benefit from my comments and insights... or not.

Abstract:

Though rare **<And random. Which in terms of when and how large makes them all equally completely unknowable in any rational probability for Earth impact.>**, asteroid impacts are inevitable, and with the current state of technology, kinetic impactors are the preferred but not the complete solution. If the time to impact is short, or the threatening body too large, nuclear deflection serves as a final option **<The only option after 200m.>**. This work is part of an integrated study by National Aeronautics and Space Administration (NASA) and the National Nuclear Security Administration (NNSA) to better determine the relative efficacy of these complimentary approaches **<None of which is based on empirical information or physical experiment.>**. In particular, we examine the important material properties that affect each approach, to improve critical characterization efforts, and reduce uncertainty in the limits of the impactor technology.

Impact speeds for kinetic impactors on Near-Earth Object (NEO) intercept trajectories commonly range from 5 to 20 km/s **<20 km/s is hard to believe as anything probable and something we could expect since relative impact velocity is that of the asteroid and interception is acute and pro-grade extremely atypical. Best think 5.>**, resulting in significant crater ejecta and a momentum enhancement **<Not a principle that has ever actually been scientifically tested and supported by any valid empirical experiment, even though it could easily be done on the cheap simply 'behind the barn'.>** above that carried by the impactor. This enhancement depends substantially on the strength and porosity of the asteroid, as well as the impact speed. Here simulations from different codes are presented, along with constraints from experimental measurements. The uncertainties due to ignorance of the strength and porosity of the impact point are significant in determining the limits of impactor sufficiency.

The nuclear approach is considered within the context of current capabilities, posing no need to test **<Even though no thermonuclear device has ever been detonated after withstanding heliocentric orbital launch velocities and then tolerating the -240C, Hard Vacuum, Zero G environment outside Earth's Magnetosphere for months or even years?>**, as extant and well-understood devices are sufficient for the largest known Potentially Hazardous Objects (PHOs) **<Here is where all the wheels fall off their 'nuclear need' wagon. Since at any time any asteroid of any size anywhere in the Solar System can become kinetically or gravitationally perturbed into being a PHO or ECA if not directly into the next asteroid on its way to strike Earth, the actual asteroid candidates that constitute a potential impact threat is far greater than merely the current discovered PHO population.>**. Results of x-ray sources with realistic spectra as well as blackbody spectra are given, along with some assessment on composition dependence **<But we have never actually Nuked an asteroid.>**.

You folks really need to start thinking bigger... Think 10 km Extinction Level Asteroid. Think all there is, gone... Forever.

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly. Adapt or die.

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group: <http://Gaiashield.Com>

The Falling Stars War: <http://Gaiashield.com/TFSW>

The Case for Planetary Defense...NOW! <http://Gaiashield.com/TCFPDN>

<The Water Age: Plan A>

Mr. Gates,

The Ice Caps have begun to melt... Coming soon to a planet near you: The next Water Age. We have reached the latest tipping point for 5,000 years or more of no ice, no snow, no frozen tundra or methane hydrates. Sea levels will rise. The Gulf Stream, harbors, ports and coastal cities of the world... gone. Deserts become rain forests. Rain forests become deserts. Billions starving when agriculture shifts or becomes impossible. Feral bands of marauding human predators supplanting social order and law with dystopian chaos after governments and economies fail and collapse.

Not because Mankind could not control it's carbon emissions and failed to balance the atmosphere to maintain an optimal carbon cycle. But because Mankind can not control the orbital mechanics of Jupiter and Earth. And because Mankind failed to understand it needs to dramatically adapt to the coming dire clear and inevitable new reality.

Plan A: Someone needs to get the best climatologists and geologists and astrophysicists money can buy into the same room and get them to account for the periodic Ice Age cycle and the Milankovitch Cycles along with our fossil fuel emissions and provide an accurate and comprehensive assessment of the threat. Then, get the best risk managers and strategists and executive decision makers money can buy to come up with a solution: seawalls and dikes, retreat to high ground... what? A plan to adapt the world. Then, get the best salesmen, mavens and politicians money can buy and scare the world into implementing the solve. Or else civilization, life as we know it... will die. Plan B: Make sure Plan A works.

So what do you think Bill? You '*Someone*'? You're already in for the penny. You in for the pound? Do something that will work? Save the civilization of Mankind... And if necessity is the mother of invention, then fear would be the father of necessity. Since only fear defines necessity, are you up to scaring the world in order to save it here, Bill?

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly. Adapt or die.

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group: <<http://Gaiashield.Com>>

The Falling Stars War: <<http://Gaiashield.com/TFSW>>

The Case for Planetary Defense...NOW! <<http://Gaiashield.com/TCFPDN>>

<The Water Age>

Mr. Gates,

I saw you plugging your book "*How To Avoid A Climate Disaster*" on GPS. I haven't read it, but from its title and your interview it appears that you think we can actually prevent the planet from warming... We can't. Global Warming is inevitable. It is primarily an orbital mechanical phenomenon that we can do nothing about. New atmospheric CO2 only exacerbates this natural condition.

With a purely a rational, accurate and honest assessment of global warming we can understand the primary cause as something we can not even remotely prevent. And that it should be on the list of dire Cosmic phenomena with Rogue Black Holes and Gamma Bursts. Instead, we can and need to begin to adapt. Evolve our civilization. A much greater effort than merely reducing carbon emissions. And we may need the advantage of fossil fuels to do it.

CO2 or no, the planet is gradually getting warmer and the climate will change, sea levels will rise and the eventual consequences will be catastrophic. So, when we consider adaptation, even though we may have a thousand years (probably less), we do need a plan... *NOW!*

If you want to see the evidence for a comprehensive and honest understanding of climate change read up on The Ice Age (and what I have termed the reciprocal *Water Age*) on Wiki: <[https://en.wikipedia.org/wiki/Ice\\_age](https://en.wikipedia.org/wiki/Ice_age)>. Specifically the "Ice Age Temperature Changes" graph. Then check out the "Milankovitch Cycles" and the ~100,000 year Earth/Jupiter perturbation and see the primary cause of the recursive Ice/Water Age cycle. Then just connect some dots. You can see that this is just another one of those pesky Cosmic events... albeit a survivable one.

In short: we can't afford to do the wrong thing here. It is already 3°C above anomalous zero and the ice caps are already beginning to melt. We're on the cusp of the next Water Age. And if we completely stopped burning all fossil fuels and scrub all the CO2 out of the atmosphere *today* the planet would still continue to warm another 3°C or more. Think 10 to 15 meters of sea level rise for the next ten thousand years or more... We need to begin to adapt: tic toc.

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly. Adapt or die.

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group: <<http://Gaiashield.Com>>

The Falling Stars War: <<http://Gaiashield.com/TFSW>>

The Case for Planetary Defense...NOW! <<http://Gaiashield.com/TCFPDN>>

<Bad PD Ideas/2010 Space Act>

General Notes:

- Abuse of frequentist probability occurs when the *if* or *when* of random events is mistakenly perceived when such fabrications can only express how many events randomly occur in a given increment of time or number of opportunities.

- A statistically low probability impact expression does not mean it will not happen or that it will not happen soon or that it will not happen next. It just means that it does not randomly occur very often over a large interval of time or large number of opportunities.

- Johnson or David? *That's a task of planetary defense, an "applied planetary science" to address the near-Earth object (NEO) impact hazard.*

We can never think this will be well done as some supersized science fair project. Though we can trust science to objectively discover and understand the dots they are generally next to useless when the time comes to subjectively connect them in any manner that could be considered wise

or advantageous. Particularly when those dots are not scientifically related to each other.

- I'm a master engineer of method (strategist, risk manager, decision maker). I manipulate ideas and logics. And manage and make work for engineers of technology who manipulate energy and mater. I do the dot+dot+dot... So, let's go to Mars thang!

-  $4.18e23$  or 418,000,000,000,000,000,000 joules or 100 million Mt TNT

- Scientific Method is not a license to abandon rational thinking and logic and common sense... *wisdom*.

- As long as you hold all these truths to be self evident, it doesn't really matter what color lipstick you put on this fearsome pig... until you go to sell it.

- The mountain side is littered with the bones of those who having nearly climbed the mountain, on seeing the summit, have stopped to rest... and died.

- To those with the aptitude and training and experience to be brave, Only Fear Ever Defines Necessity. Fear energizes the body and focuses the mind. It reminds us there are dire consequences if we fail. Fear is our friend.

- The Sky Is Falling... NOW!: Even if it is not observable as such, the next asteroid on its way to strike Earth is out there. And all the perturbing kinetic and/or gravitational deterministic elements that will make it an apparent and identifiable impending Earth impact threat are already in place or in motion to make it so. At risk of sounding metaphysical: It Is Written. And we can never know which asteroid it is until we see it coming. And we can never know when we will see it coming until we do... This logic is applicable to any size asteroid.

Will: Beneficiaries: Shall receive one fourth of the Merrill Lynch capital portfolio, Chase checking account and cash stashed in my suit. Then one third joint interest in my house and property at 1400 Kra-Nur Drive Burton, MI along with all my personal property contained therein to be distributed, shared or disposed of by my children at their discretion along with the five domain names Aferoil.com, .net, .org, .biz and .us.

4th Beneficiary: Gaiashield. Employing the remaining one fourth of the Merrill Lynch capital portfolio, to the best of their ability, the beneficiaries shall jointly hold themselves to be responsible for promoting, developing and as necessary, rationally modifying and evolving the Gaiashield planetary defense strategy and maintain my archived body of work and legacy through and by maintaining the Gaiashield.com website adding any new works as they come to pass, in perpetuity. (Teach your children to defend the planet... to the best of their ability.)

- "We can all be better teachers." CJ Craig

- Pilot/Proto Global Mutual Planetary Defense Treaty: How about a cart before the horse approach to agency?

- We Americans are gamblers... despite any wisdoms, they loves their odds. We must think we are born lucky. Which would not be nearly so problematic if they knew and could tell the difference between Frequentist and Bayesian probabilities and when they were offered could see which was which. This inability often results in stupid conclusions and behavior.

- I can imagine only 4 reasons for someone to get something wrong: A) they are poorly informed. B) they are well informed but their short-term self-interests take precedence. C) they refuse to acknowledge the truth due to fear. D) they are stupid.

Anyone who lived through the Cold War and its attendant arms races can appreciate these consequences and see potential of developing more nuclear weapons of war to kill each other with as a dire fearful thing and to be avoided. However, coupled with the dire prospect of our extinction by asteroid impact, this then gives us two fearful reasons to restrain development to only those Space capable nuclear tools necessary to defend the planet with and avoid those sociopolitical consequences you forecast in your ASCEND work. Given the scale of such a retasking and development for a comprehensive Planetary Defense this can be seen as a total Swords to Plowshares endeavor.

- I've find that those responsible for doing a thing will invariably have the best ideas on just how a thing should be done right. Their first mission would be to provide a rational assessment of the scope of the existential threat and the scale of the strategic response that would be required to effectively defend against it... Forever.

- Fear Defines Necessity. For those of us with the aptitude and training and experience to deal with fearful things, Fear energizes. It focuses the mind. It reminds us there are dire consequences if we fail. Fear is our friend. Fear *evolves*. Fear Defines Necessity.

- Planetary Defense: We can't stay home without it.

- Whether you casting a D6 or a D12 the next time you cast the die it can come up 6. The odds are irrelevant to 'will'. All that is relevant is the the magnitude of the loss if you loose... even when the odds are in your favor. So. 'do you feel lucky? Well do ya punk?'

- In War, when you have become prepared to defend against only the probable you must also be prepared to be defeated by the improbable. Sun Tzu II

If you are wrong in your first probabilistic estimate and the asteroid is large then a second probability will be, in effect, that it would be probable that 1Mt would not be enough... that even 1,000 1 Mt Nukes would not be enough. And if a few B-83s are all we have available to defend the planet with, then it it becomes probable that on impact, Mankind would go extinct.

- Promoting a fearful thing in the absence of promoting an effective response to address such a thing would be reckless and irresponsible. Apparently, the astronomers presently trusted with the responsibility for promoting the true scope of this threat can not appreciate the true scale of the response we can and must urgently develop to address it.

- Barbee ASCEND:

1 Senior Engineer, Engineering and Applied Sciences Department; AIAA Senior Member.

[josburg@rand.org](mailto:josburg@rand.org)

2 Political Scientist, Defense and Political Sciences Department. [ablanc@rand.org](mailto:ablanc@rand.org)

3 Aerospace Engineer, Navigation and Mission Design Branch; AIAA Senior Member.

[brent.w.barbee@nasa.gov](mailto:brent.w.barbee@nasa.gov)

4 Harvey & Susan Perlman Alumni and Othmer Professor of Space Law, AIAA Senior Member.

[fvonderdunk2@unl.edu](mailto:fvonderdunk2@unl.edu)

- Derek Muller, Dave Jewitt

- Scientists: Biased, Incompetent, Short-term self-interest, Fear, Stupid.

- In the science fiction movie "Armageddon", everything the humans did was the fiction and everything the asteroid did was the science. In short, in the science fiction movie "Armageddon" the alien monster was *real*...

- Michael Owen LLNL 2015 pdc

- The next asteroid on its way to strike Earth, in that it is always subject to some gravitational or kinetic perturbation, may not now be on its final terminal trajectory to strike Earth. For that reason, by observation, it will not be apparent that it *is* The Next Asteroid On Its Way To Strike Earth. Consequentially, since we can never think we know 'which' asteroid is The Next Asteroid On Its Way To Strike Earth, then we can never think we can know when The Next Asteroid On Its Way To Strike Earth will strike or how large it will (or will not) be until we think we actually see it coming.

- Short Paper: The Case For Planetary Defense

- A) Perturbation
- B) Random
- C) No Reason
- D) Most Important Thing
- E) Gaishield
- F) First Step

- STTAG: We have built it because it will come.

- Precautionary Principle: Governments should take action to prevent harm even when it is uncertain if, when and where this harm will occur.

- This is War. And the Cosmos has already fired the next shot... When will we decide to defend ourselves?

- We have been playing Russian Roulette every day now for 65 million years and not gone extinct by asteroid impact. That doesn't mean it's a good idea to play Russian Roulette again tomorrow...

- Trump Last Calls - 62 days/32 days having the foresight to see this threat coming before it can actually be seen...

- Biden Cover: Welcome to The Falling Stars War. It comes with the job... Questions? You should already know a few things:

- Always trust the Science. Never trust the odds. Even when you play Russian Roulette and the statistical odds are 5 in 6 in your favor, if you think you are not going to blow your brains out, you're a fool. And when it comes to scientists, 'Trust But Verify'. They are all too human. They can get things wrong: even when ideas become codified and expressed by a consensus, They can be misleading: ideas can be subject to both personal bias, inability to communicate and even politics. And they can lie: in order to promote their professional and financial short-term-self-interests or when they lack the courage to face a fearful truth.

\*Derived from Statistical/Frequentist Probabilities

- Conjecture: the basis for BLM.
- When you set out to save the world it helps to have a massive ego...

#### Bad PD Ideas:

- "Since there are far more small asteroids than there are large the next asteroid on its way to strike Earth will likely be large. Therefore we only need to be prepared to defend against small asteroids."  
(Prepared for the easy/Good Luck.)
- On the current NEO Survey: "once we have observations on the object and can establish its orbit, it's going to stay on that orbit."
- "The probability for large asteroid impact in the next century is low".
- Nukes are a bad idea and we should consider a nuclear option only as a last resort.  
(>100m/short DIW/rubble pile)
- We will have sufficient time post detection to prepare and mount an effective response.
- NEO defines only current impact threat class.
- Impact events occur periodically.
- We should wait until we see the next one coming before we build a means to deflect or destroy it.
- Since the Odds are always in our favor we will always be lucky.  
(Russian roulette/Leave nothing to chance/Prepare for the worst)
- SEC. 808. <<NOTE: 42 USC 18387.>> NEAR-EARTH OBJECT SURVEY AND POLICY WITH RESPECT TO THREATS POSED. (a) Policy Reaffirmation.--Congress reaffirms the policy set forth in section 102(g) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2451(g)) relating to surveying near-Earth asteroids and comets. (b) Implementation.--The <<NOTE: Deadline.>> **Director of the OSTP shall** implement, before September 30, 2012, a policy for notifying Federal agencies and relevant emergency response institutions of an impending near-Earth object threat if near-term public safety is at risk, and **assign a Federal agency or agencies to be responsible for protecting the United States and working with the international community on such threats.**
- part (b) SEC. 808 of the 2010 Space Act. All in your authority by Executive Order.

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly.

A Million Miles A Day,  
R. Dale Brownfield  
Gaiashield Group: <<http://Gaiashield.Com>>  
The Falling Stars War:<<http://Gaiashield.com/TFSW>>

The Case for Planetary Defense...NOW! <<http://Gaiashield.com/TCFPDN>>

Dear POTUS: <<http://dearpotus.com/>>

Email to POTUS et al: <<http://gaiashield.com/PingArc/POTUS-Ping-Arc.pdf>>

<RE: comet or asteroid (Email to Marks)>

Both iridium and osmium are heavy metals. Members of the platinum group. And extremely unlikely to be found in anything but a very minor trace in the Oort cloud.

And given my "Near Miss" impact scenario, I would cede that the impactor could easily be smaller than 10km... 5km even. Then, an asteroid could be struck by Earth with nearly the same relative velocity as that of a Comet impact. I'll be sending along a copy of my Near Miss Impact Risk assessment to Moore.

And with a Comet the only "*dust and gas thrown up into the atmosphere*" would have been snow and steam... and that, not very far. Perhaps as clouds.

And if "*The authors suggest that 75% of the impactor mass is distributed globally,*"... bullshit. 90% of the asteroids mass was vaporized through shocked acceleration within a fraction of a second of impact. Shocked acceleration is when a rapidly moving object is dramatically decelerated (or an inert object is dramatically accelerated) and undergoes extreme compression and consequentially extreme heating. In this case heating to the point of near complete vaporization and explosion. Throwing the unvaporized 100 billion tons of both asteroid and molten planetary material as far as LEO to fall as hot debris world wide. Hot enough to kindle fires.

You need to understand that when an asteroid or Comet strikes the Earth the common metric of "Megatons of TNT" used to characterize the energy generated is a representation of the kinetic force (joules) imparted. Not the separately metered explosion that would occur from its shocked acceleration by moving from 20 or 60kms to Zero instantaneously. Having a low temperature (100C) that force would be negligible compared to the inelastic shock imparted to the Earth's crust and mantle. A 10km Comet at 60kms would ring the planet like a bell. Richter Scale 10 Earthquakes world wide. Whole cities falling... But no great explosion. With a vaporization temperature of 2,500C asteroids would be more so. And with ejecta. But in terms of force: still negligible (0.33%) compared to the inelastic shock imparted to the planet. For a Comet, with a much lower expansion velocity of water ice, the explosive force would be a far, far smaller percentage of the overall event.

This looks like a pissing contest between academics... the principal one of which is dead and they are just trying to make a name for themselves by starting a controversy over something they don't fully understand. What we have here is a paleontologist and Earth sciences professor. No sign of any astrophysics and understanding how the Solar System was formed or how it operates.

But still, COMETS BAD! Get me THE EXPANSION VELOCITY OF VAPORIZED WATER ICE IN SPACE!!! and I can complete my BFN Point Defense strategy.

AMMAD/D

On 1/1/2021 11:00 AM, Joel Marks wrote:

"The people that produce the literature on *Chicxulub* apparently don't think about things as well as I do... connect the dots. You haven't figured that out by now??? They just get where they want to (or thought they should) go then quit thinking."

I can actually accept that to some degree, DonQ, believe it or not.

"what have you got that would suggest it was a Comet... besides your bias that you *want* it to be a Comet to support your personal Cometary agenda?"

<https://www.bbc.com/news/science-environment-21709229>

And here's the paper (abstract):

11:00 a.m. Moore J. R. \* Hallock H. R. Chipman J. W. Sharma M. Iridium and Osmium Fluences Across the K-Pg Boundary Indicate a Small Impactor [#2405]  
Reconciling global iridium and osmium fluences associated with the K-Pg impact indicates that the Chicxulub impactor was relatively small (~320 Gt or less).

abstract: <https://www.lpi.usra.edu/meetings/lpsc2013/pdf/2405.pdf>

On Thursday, December 31, 2020, 08:18:49 PM EST, Gaiashield Group <[rbrown98@comcast.net](mailto:rbrown98@comcast.net)> wrote:

On 12/31/2020 3:09 PM, Joel Marks wrote:

Interesting comet comments, DonQ. But if you are right (putting aside for the moment about supervolcanoes mooting your point) then why has none of the literature on whether Chicxulub was a comet or an asteroid mentioned this as supporting evidence for asteroid?

The people that produce the literature on *Chicxulub* apparently don't think about things as well as I do... connect the dots. You haven't figured that out by now??? They just get where they want to (or thought they should) go then quit thinking.

And my understanding is that current evidence favors comet.

I thought the most convincing (and first) evidence was the iridium (a heavy metal found in asteroids not Comets) layer discovered in the 80s by Alvarez at the Cretaceous Tertiary boundary world wide ... Other than a rational probability, what have you got that would suggest it was a Comet... besides your bias that you *want* it to be a Comet to support your personal Cometary agenda? ( for that bias see your own P.S. here)

AMMAD/D

-- Sancho

P.S. Personally I'd like to see a T-shirt showing a comet kicking an asteroid out of the way en route to Earth with the logo "Kiss yer *as*teroid goodbye!"

On Wednesday, December 30, 2020, 06:08:15 PM EST, Gaiashield Group <[rbrown98@comcast.net](mailto:rbrown98@comcast.net)> wrote:

On 12/30/2020 12:41 PM, Joel Marks wrote:

My friend (at my suggestion, as he was looking for guidance about what to give the man who has everything) bought me an amazon gift certificate for the amount of the rental.

And you have Prime? Ain't technology great!

The film is absurd in several ways (of course), but the ending in particular because, while indeed the dino-killer hits, the folks who have managed to take refuge in a (u.s. gov built) bunker in Greenland emerge 9 months later to a broken but to all appearances still perfectly habitable landscape ... completely ignoring the "nuclear winter" that is probably what really did in the dinosaurs. But also, as your film scenario suggests, the human all too human beings who have been saved by the omniscient wise and benign Homeland Security Department (unlike the worse than useless NASA folk, whose sole appearance in the film is to inform everyone on Earth that they are about to be incinerated) appear to be absurdly well adjusted and all set to repopulate the planet with truly noble specimens of our species.

It was a Comet! Consequentially, although the velocity was 3 times greater and with stone potentially the kinetic force would be 9 times greater, since it was water ice and not stone it was only 4.5 times greater per cubic meter of volume. Still, at 10km that would be a whole lot of tectonic shakin' goin' on. However, as water ice, since it would also have vaporized and exploded at 100C and stone would have done so at 2500C and the heat, force, shock wave and climate effects of a Comet would have been relatively negligible. Flash boil the local plant and animal life and make a lot of new clouds. No long range atmospheric shock wave or fires and smoke and debris and ash falling world wide.

So the bunker idea would work fine (except at Ground Zero). Hell, even your basement should do.

However 2.0, there is always the very real possibility that with this much very strong tectonic activity we could see a general cascade of the world's 20 or so Super Volcanoes. Then we get the heat and ash and smoke and climatic effects. So, Comet Impact, Bad.

And we are likely to see more human death in some version of my "Day Before the End of Days" if we don't have an established and well trained Global PD to cover our collective ass... Panic and Despair and Chaos oh my...

Did you *really* make a film, DonQ?? So when do I get to see it? Your story line sounds exactly like one I've been pondering for a few years myself (and idly wishing I could pitch to a Hollywood mogul), namely, that humanity would have destroyed

itself *before* the strike (and perhaps, with a really twist ending, having it not strike after all). In my scenario it would not only be because the entire infrastructure of modern civilization would go instantly tilt once people realized there's no point even staying on the job (and every "point" not to, that is, for themselves individually) and so lawlessness and anarchy and starvation etc. etc. would take over entirely, but also because there was a global nuclear war. The latter would be the case especially if this were *not* a dino-killer but just an ordinary city-buster, but headed toward, let's say, Washington D.C.; so the U.S. announces matter-of-factly that we're going to deflect it, and Moscow says "oh no you're not" as soon as they realize that the point of possible impact will pass over Moscow in the course of the deflection. So Moscow says if we launch our missiles at the asteroid, it will take out D.C. and also NYC for good measure with nukes. Well, we brush that off and launch. And so do they. And the rest is ... well, *Homo sapiens* is history.

Came up with this in 04. But the art houses were in bad shape and I had no resources to promote this to any film developers. Bounced it off Grig Richters but he was still healing from his flop of "50 Degrees".

Can't find my notes from then so I'm working to reconstruct them for my archive. My kid might be interested... I'll send them along to you when I've purged my memory. Maybe you can add something.

AMMAD/D

-- Sancho

On Wednesday, December 30, 2020, 11:25:31 AM EST, Gaiashield Group <[rbrown98@comcast.net](mailto:rbrown98@comcast.net)> wrote:

On 12/29/2020 8:00 PM, Joel Marks wrote:

Yeah, a friend for the end of the world treated me to the movie for xmas. I'd never pay that much myself unless it were on the big screen.

Did he somehow *send* you a copy?

"did the Comet strike and Mankind go extinct?"

It struck and it was a dino-killer for sure. But the film title should be the giveaway. It's absurd, though, because ... [want more spoilers?].

Yes please.

But it doesn't sound as fearful as my movie: "The Day Before The End Of Days". 10 years ago, despite our best efforts, we failed to deflect a 10km asteroid and tomorrow it will strike and Mankind will go extinct. Civilization has completely collapsed: vignettes of rape gangs, suicide cults, murder for sport... It's a 30 minute art film. No dialogue. Just a variety of drums, from tabla to timpani, alternating with snapshots of the asteroid beautifully rotating through Space to the sound of "The Blue Danube" waltz. No main character just a Mankind gone insane. You'd love the ending...

AMMAD/D

-- Sancho

On Tuesday, December 29, 2020, 04:07:45 PM EST, Gaiashield Group <[rbrown98@comcast.net](mailto:rbrown98@comcast.net)> wrote:

Thanx for the spoiler alert. Checked on ComCast and they want \$20.00... I'll pass till the price goes down. So I read your review in case it sold me (not). Just one question: did the Comet strike and Mankind go extinct?

AMMAD/D

On 12/29/2020 2:49 PM, Joel Marks wrote:

I saw *Greenland*, DonQ. Without revealing spoilers (I hope -- don't read further if you are afraid I might), I will say that it is fairly competent about comets but oddly (albeit perhaps realistically?) contains no attempt to "mitigate" whatever. I found the movie viscerally intense -- *too* intense for my delicate constitution (really) -- so that I can't say I enjoyed it, nor was I entertained. (*Meteor* does a hell of a lot better in that regard.) But if you want to "scare 'em," this might be the flick to do it. Unfortunately as film it is 100% (or perhaps 110%) formula. But that never stopped a movie from being a blockbuster. It will be interesting to see if this causes a blip in interest (fear). In a way it is a documentary of the future. The question is: "Are these the shadows of the things that Will be, or are they shadows of things that May be, only?"

-- Sancho, aka the ghost of Christmas Yet to Come!

<RE: The Plan (Email to Marks)

As to your Qs below:

On 12/19/2020 9:52 AM, Joel Marks wrote:

Great, DonQ. Some questions below **in boldface**. -- Sancho

On Saturday, December 19, 2020, 12:54:06 AM EST, Gaiashield Group <[rbrown98@comcast.net](mailto:rbrown98@comcast.net)> wrote:

Pick individual elements and ask specific questions on what it is you think you will need to understand better to present this strategy. It's a fool's errand, but I'll try and teach you some of the logics of physics.

AMMAD/D

Excerpt from The Case for PD:

At 10 years before impact,

**Then first you would need a much enhanced detection/surveillance system, since present lead time could be only months (or even none at all according to you). What would this surveillance system look like? You write "a score of full spectrum Space Based observatories strategically deployed for near real-time surveillance of our theater of operation in the Inner Solar System." But we would need to peer into the Outer Solar System to have a 10-year warning, wouldn't we? So right off the bat your proposal seems to be ruling out any kind of rapid response system. Have you "given up" on that, DonQ?**

*10 years (for a typical asteroid 4 to 5 orbits/3.65 billion miles) from impact is just an arbitrary (but optimistic) number that I can use. Since the magnitude of the force required is principally determined by the time/distance from impact, then at 5 years X 2, 1 year X 10 and at 20 years X 0.5. 1,000 Mt would only impart 1cm/sec DV to a 10km asteroid which would increase to 8,000 miles (one Earth diameter) of displacement in 10 years.*

*Not that I am not saying "10 years warning". With GS, from 3 preprepared locations at the orbit of Mars, we may only need a year or two 'warning'. Sitting flatfooted and unprepared on Earth, as things stand today, we would need 30 or even 50 years warning... see it coming... detect it before impact with Earth. We probably could not determine that accurately today even if we were looking right at it.*

*As to the "need to peer into the Outer Solar System" at that distance our observational capabilities today would not afford us the ability to determine any reliable probability of an Earth impact and we could never be justified in launching a deflection mission. Accuracy here is expressed in terms of a probability ellipse. Using the objects speed, direction and position relative to Earth, and taking into account that their measurements have error margins a simple explanation would be seeing Earth as a two dimensional target with an area of 50 million sq/miles (8,000 miles in diameter). If the asteroid can be fairly accurately placed in the center of an ellipse with an area of 500 million sq/miles (25,000 miles in diameter) the asteroid can be said to have an impact probability of 1 in 10 or 10%. In an area of 5,000 million sq/miles (80,000 miles in diameter): 1 in 100 or 1%. 50,000 million sq/miles (250,000 miles in diameter) 1 in 1,000 or 0.5%.*

*The problem is that the further away from the observer in terms of miles the less accurate the measurements will be and the larger the probability ellipse. So for an asteroid passing through the ECA zone of observation (which it must be doing to be an impact threat) we would likely have several opportunities to get accurate observations and further away from impact. However, to meter the trajectory of an LPC, say at the orbit of Pluto, we would be trying to get measurements 3.5 billion miles away... We'd be lucky to get a probability ellipse the size of the orbit of Mars. Hence: GS 2.0. Observatories and PD platforms deployed to the Outer Solar System. First things first.*

*Further, a deflection mission would also be beyond our capabilities to execute effectively in either size or speed. So if you are seeing the need to respond to LPCs, that too would be only addressed effectively in GS 2.0 from the orbit of Saturn or so. For now, in large part, that is what the 'Big Fucking Nuke Point Defense' is for. Just how big a Nuke completely depends on the expansion velocity of vaporized water ice in Space!!!*

effectively responding to this threat and deflecting it would require the near surface detonation of 1,000 Megatons of Nukes. However, there are 3 major contingencies we need to consider: target mass, technological failures, and impact probability assessment.

**Does that third item mean we're not yet sure of impact trajectory? Again this sounds like a detection problem. It could also refer to nongrav forces. But what is your point in mentioning it here? It seems the wrong category.**

*The only practical and safe response I can imagine to say even a 10% probability ellipse (which would still be only a best educated guess) would be to displace it completely out of the ellipse... So at 10% that would multiply the deflection target factor by 3.5. And the total corresponding force required by 3.5 as well. Open to alternatives here other than ignoring it.*

*As for mass, astronomers assess mass by albedo and assume silica/stone and get 2.2 tons per cubic meter. Problem is that the surface of these rocks can just be covered with a veneer of the dust in the Solar System. They could actually be completely or partially composed of iron ore at 3 or 4 tons/cu meter or even uranium and lead at 5 or 6 tons/cu meter.*

*If there is time and we are adequately prepared, we need to send a precursor recon mission to orbit the threat and better assess it's mass as well as serve as a transponder to help shrink that pesky probability ellipse.*

*As far as the technological failure multiplier, things can fail to perform as advertised anywhere along the line. Even Chodas has realized that and has been sending 3 times what would be considered minimal/surgical and demonstrating why in his PDC scenarios. The US Military has a standard doctrine: If you absolutely positively have to deliver one piece of steel on target, send three. However, this multiplier can only be reduced by training: Practice, Practice, Practice!!!*

**Isn't mitigation about removing a known threat, not merely a possible one?**

*"To mitigate: reduce the severity" of a thing does not mean to eliminate it. You can not "mitigate" an asteroid! You can only mitigate the threat or even the impact of an asteroid. Having an effective Planetary Defense only reduces the severity of: mitigates, the threat of asteroid impact. It does not ensure it will work every time. Humans here...*

Which can conspire to increase the mission to 20,000 Megatons. Which may be halved by a fast recon mission.

**Not clear why exactly you say so: to pin down trajectory? mass? composition? configuration (e.g. binary?)?**

*Those three variables are constructive to each other I give probability ellipse a x3.5, mass x2 and technological failure x3. So  $3.5 \times 2 \times 3 = 21$  and my 1,000 Mt turns into 20,000 Mt.*

**The "may" in "may be halved" means it might or might not be, right?**

*Of course. It could make it worse. It could be made of gold at 6 times the mass! (Mine this motherfuckers!) And since it was a hasty mission, the transponder failed to help reduce that damn probability ellipse.*

All delivered by 400 Atlas V class rockets as 25 Megaton high-yield space capable nuclear NEOMines. Providing that random chance has been kind and we are still lucky and there are sufficient suitable launch windows to actually do so.

**Is this all a single condition, or are these three distinct factors?**

*If I understand your question, the delivery system, payload yield and launch windows are three distinct variables in any effective response.*

However, clearly not a mission we can afford to design, develop, build and train for as a hasty 11th hour situation and expect a successful outcome.

**Ten years' warning is an 11th-hour situation? Ten months, I'd say.**

*Pay attention. In this example the 1,000Mt force must be 'applied' 10 years before impact just to achieve a surgical displacement of only one Earth diameter... To do what would need to be done for such a mission described here ad hoc would likely require 40 to 50 years warning... Hell, the politics alone could take a decade.*

*At ten months 1 cm/sec of deflection would get you less than 400 miles of displacement.*

To address the random chance Launch Window problem and strategically advantage our response, our Planetary Defense can be predeployed in no less than three omninational manned outposts - each capable of defending against a 10km threat - into heliocentric orbit.

**Why manned? In case need repairs? Wouldn't redundancy compensate for being unmanned? Or is hacking the problem?**

*"The best computer to put in a spaceship is the human brain." ...Wernher von Braun. I would prefer to at least see human brains as close to the battle front as possible. Particularly given the delay factor of radio communications. Then there is the Skynet factor and the idea of putting Gigatons of Nukes into the virtual hands of a computer. And there's the aspect of attracting the support of the Martian wannabes. And then there is the reality that the things we humans make sooner-or-later tend to break. And I've never seen a machine that could fix itself. And here, everything needs to be working at its best all the time and when it is not, be repaired ASAFP!*

**How long would such a deployment be? What if someone gets sick? If doctor on board, what if doctor dies in accident? What about the stress? The folks chosen to sit in the missile silos on Earth get spelled on a daily basis, I would imagine.**

*Missileers get spelled on regular 8 hour shifts/40 hours a week. But I would guess if PD Command put out a recruiting notice for Planetary Defenders to go to the orbit of Mars for 4 or 5 year billets (depends on orbital mechanics) it would get over 100,000 volunteers just in the US. Think submarine duty on a Boomer writ large with bigger crew quarters (and spin gravity) a*

*really great view and perhaps even a Hooters franchise at the supply depot on Mars for a little R&R. And of course a doctor/medic to fix the human machines when they break.*

Ideally, Sun/Mars L3, L4 and L5. Not having to launch delivery vehicles out of Earth's gravity well would afford the benefit of delivering maximum payloads. And being fully replicated in multiple locations, optimize interception opportunities against impending threats. Such a projection of power would be in support of a massive Point Defense in orbit around Earth or on the Moon. This deflection capability would be informed by a score of full spectrum Space Based observatories strategically deployed for near real-time surveillance of our theater of operation in the Inner Solar System

The first step to being prepared to defend against this dire threat to Mankind's survival is for the President to execute part (b) SEC. 808 of the 2010 Space Act and delegate a National Planetary Defense Agency.

#### **Housed in the DoD?**

*Well, my study is probably not big enough. So I would say the Pentagon. They likely have the extra office space. And after all, DoD will be making the largest budget contribution and they will be speaking with the voice of the proverbial 800 pound gorilla when the meetings of the world Space agencies come along.*

#### **And would this be separate from the Space Force and the USAF?**

*And NASA... But eventually. A discrete USPDA would need to first grow and evolve its own core institution and mindset... and budget appropriation.*

AMMAD/D

On 12/18/2020 2:52 PM, Joel Marks wrote:

DonQ,

Please let me have the link to your definitive plan, from soup to nuts, including 360x360 detection and Chicxulub deflection or disruption. A single document, please, and the most narratively laid out. I'm working on the Big Picture with folks who matter and I'd really love your input in a concise and reader-friendly form so that I am well informed when I make my own suggestions.

Thanks -- Sancho

<USSF/NASA Deal

Hoi,

Just sent this along to the boys and girls at USSF.

AMMAD/D

The USSF has an agreement to work with NASA on several issues. The most critical of which can be seen as merely a nod in the direction of the existential threat of asteroid impact. A small step, but from there you should be able to hear the sound of the guns. Note that neither agency has yet been given the responsibility for actually defending the planet from the next asteroid on its way to strike Earth by deflecting or destroying it, and to become adequately prepared, expertly trained and sufficiently vigilant to successfully do this. The current strategy for some hasty 11th hour post detection ad hoc response is not likely to succeed.

Just helping NASA comply with its mandate to only count rocks in Space is next to nothing... Perhaps the USSF can point this out to this administration and encourage them to comply with part (b) SEC. 808 of the 2010 Space Act and delegate a National Planetary Defense Agency. Make no mistake this is War. And we are not even thinking about winning it yet.

<Obama

Just sent this out <Below>. Thought he would make a good spokesman for PD. Like Gore did for Global Warming, da/nyet?

AMMAD/D

<Below>

Mr. President,

Elections are over. Chaos has been purged from The Oval.  
Now, We The Species could use your help...

All asteroid impact events are random: without any recursive pattern, both in their occasion and magnitude. Therefore, there is no reason to think that the next asteroid on its way to strike Earth will not do so tomorrow. And no reason to think it will not be a 10,000 meter human extinction level impact event. And, as things stand, no reason to think we are certain to even see it coming. But we can be certain it is coming and closing at a million miles a day. And we can be certain that we are not remotely prepared to defend against this threat... But we could be.

Here, with your help, I would propose founding a well funded Strategic Think Tank and Advocacy Group to promote a rational and effective response to defending Mankind from this perpetual existential threat. With you in the principal leadership role.

Want to help save the world?

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly.

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group: <http://Gaiashield.Com>

The Falling Stars War: <http://Gaiashield.com/TFSW>

POTUS Pings: <<http://gaiashield.com/PingArc/POTUS-Ping-Arc.pdf>>

< Notes: TPS/Momentum

- 16 Psyche is said to be worth \$ 10,000,000,000,000,000,000.00... if it were on Earth. But since it would cost 2,000,000,000,000,000,000,000.00 (200,000 times that) just to go get it and bring it all back to Earth (freight), how much is it *really* worth... to us? Today, iron ore, processed, pelletized, FOB your train car, is worth ~\$100.00/ton... Gold ore ~\$500.00/ton.

- Given the 1,000 times greater harm, we should be far more concerned and prepared to deal with the 1,000 m asteroid impact threat than the 100 m asteroid impact threat and given the 1,000,000 times greater harm, concerned and prepared to deal with the 10,000 m asteroid impact threat most of all. And we are not.

- When you play Russian Roulette, even though the odds are in your favor, if you are not prepared to lose your head you are a fool...

- When it comes to being prepared for the worst case:  
"Better to have it and not need it than need it and not have it."

- When in your mind  
the greater threat you seek.  
Look first to the false all clears  
And not to the false all arms.

- Foresight, in a strategist, is the art of seeing 10 steps ahead and designing a program that addresses to their advantage not the most likely but the most detrimental to their objectives.

Negar Feher <[negar@momentus.space](mailto:negar@momentus.space)>

Ian Murray <[ian.murray@momentus.space](mailto:ian.murray@momentus.space)>

- Show you a more compelling and viable market than you have now and at the same time recruit a more powerful advocate for a rational Planetary Defense... Win/Win

- Momentum  
PD Recruit  
Conduit to Musk  
STTAG  
Lobby POTUS  
Design GS

Offer better context for Space w/GS

Hook for Moon/Mars

Why Space:

Launch Windows

Maximize Payload/High Speed Delivery System  
Multiple Strategic Locations: Projecting Power/Proximity

- The current market for Momentum relies on the delusional pipe dreams of colonizing the Moon and Mars and the thin facade of an asteroid mining scam proffered by some fast talking con men and servicing the useless and obsolete international peace symbol in LEO. These emperors have no clothes... But the threat of asteroid impact is a dire reality and defending against it in its worst case is a feasible critical necessity and this condition will be with us Forever.

- The Astronomer's Hope based strategy, that assumes the asteroid will be small and the warning time to impact will be large, is to wait until we see it coming before we codify a National Policy, delegate a qualified National Agency, compile an international consortium and from a hasty, 11th hour effort Macgyver together some technology to deflect it.

- The only time and place we can afford to hope for Good Luck is we have the 100 years we might need to build and deploy a response capable of defending against a worst case scenario.

- Insights and Problems Discovered:

Need for Policy and Agency delegation

Space capable Nukes

Expansion velocity of vaporized water in Space

Near Miss Risk

Magnitude of ELAsteroid response

Relative effectiveness of high yield Nukes

- *Trust, but verify (Russian: Доверяй, но проверяй, tr. Doveryai, no proveryai*

You can always trust the science. But when it comes to the scientists: *Doveryai, no proveryai.*

After all, they *are* all too human. They can get things wrong and have their biases and short term self interests and fears and can be misleading... and even lie.

- Biden: I will defend us from every attack every time.

- Great spirits have always suffered violent opposition from mediocre minds.” ~Albert Einstein.

Bruce Betts <[bruce.betts@planetary.org](mailto:bruce.betts@planetary.org)>

Casey Dreier <[casey.dreier@planetary.org](mailto:casey.dreier@planetary.org)>

[bill.nye@planetary.org](mailto:bill.nye@planetary.org)

[tps@planetary.org](mailto:tps@planetary.org)

- The next asteroid on its way to strike Earth, will be, or already has been, diverted from a relatively stable orbit anywhere in the Solar System into an Earth orbit crossing orbit and inevitably into an impact with Earth or even directly into an Earth impact orbit. Therefore, we can not trust that any asteroids we have discovered and observed to be 'safe' will stay that way.

- It is not the comfort that we hope to find in the fabrication of randomly occurring events into probabilities that is real but the fear at the fact that they occur at random.

- When it comes to Luck, expert risk managers, master strategists and professional decision makers never assume the Good. Just the Bad. And therefore always endeavor to Leave Nothing

to Chance.

- PS: TPS is just noticing the echo of the sound of the guns here. It is not yet charging into the teeth of the beast.

Funding:

Promote NPDA: NASA + USSF

Upgrade Message... Scare them better

Help recruit deep pocket STTAG

Contact Match Donor

Preserve GaiaShield

NEOTug

Brown Act

NEO Workshop

NPDA Legislation

Near Miss Risk

Perturbation

Random

Policy/Agency

We can have no Planetary Defense until there has been a codified expression of political will to defend the planet from this threat and the manifest expression of a fundable agency to be responsible for executing such a policy.

- Wrong: Perturbation/NEO threat

Misleading: Probability

Lie: Fixed Orbit/Survey

- In the hindsight of loss is not all wisdom easy?

- "When we fail to plan, we plan to fail."

- Science is the art of certainty. Strategy, the art of probability.

- part (b) SEC. 808 of the 2010 Space Act. All in your authority by Executive Order.

- Scope of threat and Scale of response:

Wisdom here is that we can only ever afford to Hope for the best after we have Prepared for the worst.

A) Since all asteroid impact events are completely random and aperiodic: without any recursive pattern, both in their occasion and magnitude. And since, at random, any asteroid (discovered or undiscovered) of any size (10m to 10,000m) anywhere in the Solar System (PHA, NEO, NMO, Main Belt or Trojan) can become kinetically or gravitationally perturbed into an Earth orbit crossing orbit and inevitably an Earth impact or even directly into an Earth impact, at any time... and we wouldn't even know it happened. There is no reason to think that the next asteroid on its way to strike Earth will not do so tomorrow. And no reason to think it will not be a 10,000 meter human extinction level impact event. And, as things stand, no reason to think we are certain to even see it coming. And we are not remotely prepared to defend against this threat... But we

could be.

B) Since all asteroid impact events are random: without any recursive pattern, both in their occasion and magnitude there is no reason to think that the next large asteroid on its way to strike Earth will not result in a human extinction level impact event. Therefore, since it includes the prospect of our extinction and because we can, knowing which asteroid is the next large asteroid on its way to strike Earth will always be the most important thing Mankind can ever know. And deflecting the next large asteroid on its way to strike Earth will always be the most important thing Mankind can ever do. And at any cost and by any means necessary, being prepared and trained and vigilant to defend against the threat of the next large asteroid on its way to strike Earth, even in its worst possible manifestation, will always be the most important thing Mankind can ever be. And always means Forever and Forever always begins... *Now!*

C) The Worst Case Scenario begins here: Consider that tomorrow NASA discovers that the next asteroid on its way to strike Earth may impact in 30 years and may be 10km in diameter. Not only every man, woman and child on the planet but every man, woman and child that ever *will* be on the planet is at risk here... We are looking at an extinction level event.

We will be lucky to see it coming. However, even at 10 years before impact, effectively responding to this threat and deflecting it will require the detonation of 1,000 Megatons of nukes (20% of the world's arsenal) near it's surface. But there are 3 major contingencies we need to address: technological failures, target mass and impact probability. All of which conspire to increase the mission to 20,000 Megatons. Which may be halved by an early fast recon mission. All hopefully to be delivered by 400 Atlas V class rockets as 25 Megaton high yield space capable nuclear NEOMines no later than 10 years before impact. Providing Random Chance has been kind and we are still lucky and there are sufficient suitable launch windows to do so. Clearly not a mission we can afford to design, develop, build and train for as a hasty 11th hour situation and expect a successful outcome.

To address both the risk of early detection and launch window problems we will need to Project Power and deploy this capability to several strategically advantageous locations around the inner Solar System. And to be sure we will see it coming would require a score of full spectrum Space based observatories strategically deployed throughout the inner Solar System to effectively inform our deflection capability... Forever.

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly.

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group: <<http://Gaiashield.Com>>

The Falling Stars War:<<http://Gaiashield.com/TFSW>>

Dear POTUS: <<http://dearpotus.com/>>

Email to POTUS et al: <<http://gaiashield.com/PingArc/POTUS-Ping-Arc.pdf>>

< TPS Notes

<https://singularityhub.com/2020/09/27/the-worlds-space-agencies-are-on-a-quest-to-deflect-an-asteroid/>

Jason Dorrier is a Writer - Singularity Hub at Singularity University.

[info@su.org](mailto:info@su.org)

@gmail.com @singularityu.org @su.org

Bruce Betts <[bruce.betts@planetary.org](mailto:bruce.betts@planetary.org)>  
Casey Dreier <[casey.dreier@planetary.org](mailto:casey.dreier@planetary.org)>  
[bill.nye@planetary.org](mailto:bill.nye@planetary.org)

Reality Check:

**Our Goal:**

**Decrease the risk of Earth being hit by an asteroid or comet**

- We help observers find, track, and characterize near-Earth asteroids and comets
- We support the development of asteroid mitigation technology
- We collaborate with the professional community and decision-makers to develop international response strategies to defend Earth from an asteroid or comet threat

- Our annual Day of Action brings Planetary Society members to Washington, D.C. to meet with their government representatives to advocate for planetary defense funding.

(If you want to get more money out of Congress, scare them better... then show them the solve. And the money will flow.) However, until the Executive Office complies with "part (b) SEC. 808 of the 2010 Space Act" there is no responsible and qualified agency they can actually appropriate any Planetary Defense dedicated funding to.

Dr. Betts/Mr. Dreier,

Scrolling through the Apophis T-9 Virtual Workshop I found your paper. You wrote: *"to raise awareness of all aspects of planetary defense, and to educate the public and policymakers about asteroid science, the actual nature of the broader asteroid threat, what is being done to reduce the threat, and pathways for improving future detection and deflection capabilities."*

Yet, within the TPS' own 'awareness' of any 'broader asteroid threat' an appreciation of the true scope of what constitutes the random worst case >10km extinction level asteroid impact or the true scale of just what level of preparation and training and vigilance would be required to have the capability to effectively defend against it, is nowhere to be found. Perhaps it's that you don't want to scare the sheep and are holding back? Or is it that you are just not able, or don't have the collective courage, to understand this fearful truth?

Speaking for the rational prospect of the worst case extinction level 'doomsday' scenario: If we are going to learn anything from the Covid pandemic that can be applied here, it should be that when you hold an executive understatement of the threat your response will be inadequate and you suffer greater loss. A mere disaster becomes a tragedy. Something that could have been avoided. And that if you wait until you can see just how great the threat is before you prepare a response, it can be too late. Therefore when you do not know when or how great, wisdom lies instead in seemingly overstating the threat and risk erring on the side of caution. Otherwise, by gross understatement you risk making the manifest threat worse and you have become a threat greater than the event itself. Promoting little more than a formula for our sooner-or-later suicide by asteroid impact.

Since there have been three feature films, half a dozen made for TV movies, a score of Discovery class documentaries and hundreds of professional papers and tens of thousands of articles posted on the net about asteroid impact (not to mention all the coverage on Chelyabinsk) It is hard to imagine that anyone on the planet not living in a cave is not already aware that asteroids are a threat to Earth. What they do need to become aware of is the full scope and scale of this threat. If the public and government needs to be made aware of anything here, it would be the truth: the

actual dire scope and scale and potential magnitudes of this threat. Your 'doomsday' free assessment of this threat that constitutes the 'bogusness' here.

But this is not an assessment for us to officially resolve. The best qualified to do this would be some strategic minded agency accustomed to dealing with dire and fearful things that has been formally delegated and funded to be *responsible* for defending against this threat. Only under the onus and burden of that pressure can we expect to get an assessment that finds the best truth. Let them judge and be the arbiter of wisdom here.

In that direction: help get the Executive Office to comply with "part (b) SEC. 808 of the 2010 Space Act"\*

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly.

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group: <<http://Gaiashield.Com>>

The Falling Stars War: <<http://Gaiashield.com/TFSW>>

Dear POTUS: <<http://dearpotus.com/>>

Email to POTUS et al: <<http://gaiashield.com/PingArc/POTUS-Ping-Arc.pdf>>

\* SEC. 808. <<NOTE: 42 USC 18387.>> NEAR-EARTH OBJECT SURVEY AND POLICY WITH RESPECT TO THREATS POSED. (a) Policy Reaffirmation.--Congress reaffirms the policy set forth in section 102(g) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2451(g)) relating to surveying near-Earth asteroids and comets. (b) Implementation.--The <<NOTE: Deadline.>> ***Director of the OSTP shall*** implement, before September 30, 2012, a policy for notifying Federal agencies and relevant emergency response institutions of an impending near-Earth object threat if near-term public safety is at risk, and ***assign a Federal agency or agencies to be responsible for protecting the United States and working with the international community on such threats.***

Dr. Betts/Mr. Dreier,

Scrolling through the Apophis T-9 Virtual Workshop I found your paper. You wrote: *"to raise awareness of all aspects of planetary defense, and to educate the public and policymakers about asteroid science, the actual nature of the broader asteroid threat, what is being done to reduce the threat, and pathways for improving future detection and deflection capabilities."*

Being that I see myself as the Harbinger of Death by Rock from Sky, Keeper of the Abyss and Stormcrow for our Extinction by Asteroid Impact, I take this

Here is my core rationale for the 'doomsday' asteroid impact scenario. You guys are pretty smart. See if you can find something wrong... punch some holes in it.

"Since all asteroid impact events are completely random and aperiodic: without any recursive pattern, both in their occasion and magnitude. And since, at random, any asteroid (discovered or undiscovered) of any size (10m to 10,000m) anywhere in the Solar System (PHA, NEO, NMO, Main Belt or Trojan) can become kinetically or gravitationally perturbed into an Earth orbit crossing orbit and inevitably an Earth impact or even directly into an Earth impact, at any time... and we wouldn't even know it happened. There is no reason to think that the next asteroid on its

way to strike Earth will not do so tomorrow. And no reason to think it will not be a 10,000 meter human extinction level impact event. And, as things stand, no reason to think we are certain to even see it coming. And we are not remotely prepared to defend against this threat... But we could be."

< Notes: 5km Risk - 10 Seconds

- STTAG: To bring the entire world a perpetual fear of the dire and potentially imminent existential threat of large asteroid impact and show them the strategy and tactics we must employ now and forever maintain to defend against it.

- First, you need to honestly and fully appreciate the fearful thing. Then allow the fear to focus your mind and energize your actions. Keeping in mind that there are dire consequences if you fail.

- Not only every man, woman and child on the planet but every man, woman and child that ever *will* be on the planet is at risk here...

<https://www.houstonchronicle.com/news/space/article/comet-NEOWISE-earth-defense-asteroid-nasa-15426190.php>

- Half smart is still completely stupid. and half right is still completely wrong.

- The difference between Trump and Biden would be that Trump can not be told what to think and Biden must be told what to think. What they have in common is that neither are very good at thinking.

- Wisdom: If scientifically we can objectively determine that at random something *can* happen then strategically we must subjectively prepare to respond as if sooner-or-later it *will*.

- When the term 'likely' is derived from the statistical (Frequentist) probability of a randomly occurring event it is not a metric of 'when' but rather 'if now'... and as such strategically useless. The probability/likelihood is valid, albeit moot, if it does or does not occur now.

However, assessed by conditional (Bayesian) probability, when an existential natural event is randomly reoccurring and inevitable, the longer we consider the potential for its expression the more likely it becomes. And since it has been 65 million years since the last extinction level asteroid impact event... time for Plan G: grab the wife and kids and head for Mars mother fuckers! Cause Mother Earth can go to Hell at any time now.

- There are two types of probability. They are unique and discrete from each other and incompatible with and nonconstructive to each other. However they do have the same nomenclature and semantics and so easily become conflated. Yet one has advantaged the evolution of mankind greater than the opposable thumb and the other may well bring us to our extinction.

- The problem with relying on the wisdom of statistical probability to forecast the occasion and scale of the next asteroid on its way to strike Earth is that the probability for large asteroid impact will always be low... even when the next asteroid on its way to strike Earth has been discovered and determined by conditional probability to be large. Scientifically speaking. The statistical forecast will only ever test true as a matter of random chance. Here, when we find it is

wrong we will be Dead Wrong.

- Risk Managers: We don't worry about Good Luck.

- Simon P. Worden, "NEOs, Planetary Defense and Government—A View From the Pentagon," < <http://abob.libs.uga.edu/bobk/ccc/ce020700.html>>

- Make no mistake: Planetary Defense is War. And rather than trying to teach a scientist to think like a soldier, it would be much easier and far more effective to task this mission in Space to a soldier to begin with. Left to the scientists they will just try and study this threat away.

- Re: NASA's Double Asteroid Redirection Test (DART) and ESA's Hera mission. If successful, asteroid impact may be considered the first natural catastrophe that can be avoided by humanity.

- S/L 9 images <<https://www2.jpl.nasa.gov/s19/s19.html>>

- Serve at the pleasure of the fearful truth. Not the pleasure of public comfort.

- A wise man gets more use from his enemies than a fool from his friends. Baltasar Gracian

- PD Firsts:

Promote need for National/Global Policy and Agency

Promote Randomness in all impact events

Condemned Frequentist Probability as a rational impact metric

Determined TNLA to be only working definition of threat

Promote predeployment of prepared response to heliocentric orbit

Described need for Space Capable High Yield NEO Mines

Challenge Survey as strategically useless given perturbation

Determined Space-based Surveillance over Survey from Earth

Discovered Near Miss risk

Determined problem of vaporization velocity with Comets

Promote pessimism over optimism in risk assessment

Promote Fear as defining necessity

Promote EL Asteroid over most statistically likely

Promote Preparation, Training and Vigilance over extemporaneous

Promote Forever over ending the threat by Survey

Challenged the intellectual integrity of the scientific experts

Promote a National PD strategic think tank and advocacy group

- Certainly, whatever it is, the annual statistical probability for large asteroid impact is low. However, when the odds are in your favor and you keep on playing, sooner-or-later you *will* loose. Therefore, the only way to win in this dire game of chance... is to stop playing. Leave Nothing To Chance!

- My conclusions and recommendations are informed by objective scientific information. However they are shaped by subjective foresight advantaged by rational conditional probabilities and magnitude of loss and tempered by the precautionary principle of leaving nothing to chance: Governments should take action to prevent harm even when it is uncertain if, when and where the harm will occur.

- Re: The Astronomers... It is not enough to cry Wolf when there are Lions and Tigers and Bears

lurking in the dark (oh my).

- Strategically relevant scientific objectives.
- Asteroid mass determination prior deflection.
- Develop high yield to mass nukes (B-41+).
- Expansion velocity of vaporized water ice in Space.
- Develop high energy concepts.
- High speed computerized asteroid orbital assessment.
- Deployment configuration of deep Space Real Time surveillance network.
- Develop high speed delivery system.
- Develop non optical observational technologies.
- Develop a means to remotely determine and asteroid's structure.

- In considering the magnitude of the threat for the next asteroid on its way to strike Earth, the pessimist will anticipate the worst case and with the manifest of the fact either be proven to be right or to be wrong and pleasantly surprised. Whereas the optimist in anticipating the best case will either be proven to be right or to be wrong... and dead. Where does wisdom lie here?

- Thang about the 'old dogs'... best place to learn the old tricks.

- There are always lessons in failure... why I am so wise.

- In our existential moments, as we are musing over being and nothingness, consider that although we are free to think greater than we are we can never be greater than we are.

- The Liberal: There is no such thing as a bad idea.

The Conservative: Every idea but the best idea is a bad idea.

-This threat is not some new virus that requires the dedication and diligent attention of our scientists. The threat of asteroid impact is a kinetic event that needs to be deflected or blown up. We already know all we need to know about asteroids to defend against this threat except which asteroid is the next asteroid on its way to strike Earth and from that, when it will strike and how large it is. This is not a job for scientists but one for soldiers. A mission of vigilant real-time surveillance not just a cursory survey and actually becoming prepared and trained to act quickly and effectively not just knowing how.

You might want to consider expanding your assessment. Since any asteroid (discovered or undiscovered) of any size (10 meters to 10,000 meters) anywhere in the Solar System (PHA, NEO, NMO, Main Belt or Trojan) can become kinetically or gravitationally perturbed into an Earth orbit crossing orbit and become an imminent Earth impact threat or even directly into an impending impact threat at any time, there is no such thing as a 'safe' asteroid unless we are looking right at it. Strategically speaking, as tools of Planetary Defense, the NEO Survey approach and catalogue are effectively useless. Doing a good job doing the wrong thing. Nothing more than just counting rocks in Space.

- Schwere Uber Alles!

- Planetary Defense must be embraced as a compelling new reality of our species not as just some compelling vision of one man that he can see come to completion in one lifetime. A multi generational project just to build. Then on the back of a never ending doctrine, a racial

philosophy... a religion even.

- Why Moon:  
Science  
Minerals  
Mars

<https://www.aip.org/fyi/2020/senators-examine-options-mitigating-space-hazards>

- "*But it's so unlikely!*"! You could say that. But then you would also have to say that the tens of millions of asteroids that have already come to strike Earth were also *unlikely*... So, nothing new here. And certainly no reason to ignore its potential event.

- "*But it's so unlikely!*"! Hopeful speculation. Gambling. The 'If' is certain. Only the 'When' can be said to be only a random statistical likelihood. Let's trust our survival to rational facts not random chance and Good Luck. Then, we can say we do not *know*... *Can* not know until we get a NEOSM or 10 up there watching our '6' to tell us, in fact, when the next 'When' is... *NOW!*.

(Make the argument conditional.)

- On NEOSM vs Man On The Moon 2.0: What do we lose if we fail to go back to the Moon? Nothing... What happens if we fail to detect the next asteroid on its way to strike Earth? Best worst case: Millions die. Worst worst case: Mankind goes extinct. Do the math.

- On detection: Until we have the intention and developed a reliable capability to detect these objects as soon as possible after they have become newly perturbed into an impact orbit with Earth, we're just not doing it right.

- Note here that to confidently deflect just a 10km asteroid (the lower threshold for the extinction level threat) 10 years away from impact, a reliable mission addressing the major margins of error would require 10 Gigatons (2x the world's current nuclear arsenal) of modern designed 'dirty' high yield Nukes and 400 Atlas V class rockets to deliver (4,000,000 Atlas Vs with the KI approach). Far too much to expect to be able to launch flatfooted from Earth or even have the suitable launch windows necessary. Therefore, if we expect to actually address just this first level of the worst case we not only need to design, build and test such devices but deploy them in some strategic heliocentric orbit as well - *before we see it coming*. (Which begins... *NOW!*) The orbit of Mars would do.

Behold! I have become:  
Keeper of the Dire Abyss.  
Sormcrow of Our Doom by Rock From Sky.  
Harbinger of NEOShiva: Cosmic Destroyer of Worlds.

- Not see it coming:  
Not looking where it's at  
From Sunward  
15 degrees above/below ecliptic  
Too far/dark to see  
Observed coming straight in  
Newly perturbed  
Student telescope operators

- Asteroid War?:

If someday you find yourself standing on your front lawn looking up at a 10km asteroid burning its way to Earth after 10 years of our failing to deflect it because we were not adequately prepared or trained or vigilant. And Mankind is only 10 seconds away from its extinction, this will sure as Hell feel like a War. A War we have fought and lost! Where we tried and died... Game Over... No Joy... Restart Darwin's Clock again. Better luck next time.

- Pro DoD: Like American Express... Don't try to save Home without it.

A. First to join NASA in Global Agency

B. Largest Space Agency in world

C. Nukes

D. Strategic defensive mindset

E. Large fungible budget

F. The space agencies of both Russia and China are components of their military

- What points should I compromise - Forever, TNLA, Perturbation, Random, EL Asteroid? Or maybe Preparation or Training or Vigilance? How bout Nukes or Fusion Drive or Projecting Power or a Massive Point Defense? Or Codified Policy or... Agency? Or do I just stop thinking like an Expert Risk Manager and Master Strategist and Executive Decision Maker? Maybe just tone down my Precision Semantics and Rapier Dialectic and Unimpeachable Rhetoric... - what do I throw under the bus for Friendship here?

- In support of your interest in Planetary Defense you might want to consider posting my recent strategic/risk management threat assessment: "The Falling Stars War".

<http://Gaiashield.com/TFSW>

- Planetary Defense is a complex and multi faceted endeavor. However, the Astronomers tend to think that simply failing to identify the next asteroid on its way to strike by briefly glancing at that small portion of asteroids that orbit near Earth one at a time makes us safe.

- The probability of the random impact of the next Extinction Level Asteroid as imminent should be seen as a potential condition - like Schrodinger's Cat.

The next EL Asteroid is either an imminent impact event or it is not. Here the only way to open the box and know which would be to see and identify the next EL Asteroid on its way to strike Earth as such. However, to look and be able to see it not coming would be impossible. Today, we can look and not see it coming but we can never look and know it is not coming. Look again tomorrow. Things change out there at a million miles a day.

A: Although, theoretically, we may be able to determine if any of the tens of thousands of extinction class asteroids are about to become perturbed it would never be possible to determine the exact effect of that perturbation and whether or not it would become an imminent impact threat. Therefore we can never determine the not.

B: It would not simply be a matter of not seeing an EL Asteroid's orbit that has already become manifest onto an impact trajectory with Earth. But determining that there is no potential for any random kinetic or gravitational perturbation. The effect of which, also at random, would cause an impact event as a result.

Therefore, like Schrodinger's Cat, since our ignorance here for either case is absolute and the triply compounded random chance probability for an imminent EL Asteroid impact will Forever present itself and persist simply as a unknowable, this will forever be a 50/50 proposition until it

*is.*

So, because we can, given the magnitude of the loss we should be perpetually prepared and trained and vigilant to defend against the never-ending potential for the 'is' and just ignore the potential for the 'is not'.

- RIF: reduction-in-force

- In the Kingdom of The Blind the ideas and realities of the One Eyed Man sound insane.

- A problem of conflating the two forms of impact probability is the tendency to like the odds and think it is safe to hold an expectation of good luck. This may be acceptable and sound thinking in the case of a conditional probability and imprecise metrics however in the case of a statistical probability and random chance it is just gambling...

- Although we can know when we are about to be struck by a large asteroid it is impossible to know when we are not.

- Corner stone in the Astronomer's fraud: "Then Amy Mainzer came on and assured us that *"There's really nothing terribly large headed our way."* " The best reply would be 'there will *always* be something terribly large headed our way'. We simply *can not* know which EL Asteroid/Centaur/Comet it is until, at random, after it has become perturbed onto an Earth impact orbit. And then, we *can* know which and how large it is and when it will impact, only if and until we are lucky enough to see it coming. In other words, Mainzer was the absolute opposite of being 'right': Criminally stupid.

- Sooner-or-later, at random, when the next large LPC enters the inner Solar System on an impact trajectory with Earth, we will need to defend the planet with Nukes. To do that effectively we will need to know just how much Nuke we will need. In that direction, do any of you know the expansion velocity of vaporized water ice in Space?

- You say you like the odds... It has been 65 million years since the last extinction level asteroid impact event. That the one thing you can count on with a run of good luck is that sooner-or-later, it runs out, is one thing every gambler's son doth know.

- Intellectual Dots:

Intelligence: The genetic ability to appreciate and understand the dots.

Education: The conditioned formal and/or experiential exposure to the dots.

Creativity: The seemingly genetic and conditioned ability to effectively connect the dots (ranging from clever and smart to wisdom and genius).

- "If they pull a knife,you pull a gun.*If they send one of yours to the hospital,you send one of theirs to the morgue.* Thats the Chicago Way." the untouchables

- We can afford to be optimistic only when we are confident we have a complete rational assessment of the risk, have a comprehensive understanding and identified an effective response to all the random variables and have manifested the Political Will and institutional components necessary to become prepared to execute a fully comprehensive response.

Gen. John Raymond  
Office of the Chief of Space Operations  
1690 Air Force Pentagon

Washington, D.C. 20330-1690

- Invest Hope in Mankind's finding the courage to see the wisdom to endeavor to do this right.
- The existential condition of random will always trump any human mathematical artifact of any statistical probability regardless of any high degree of rarity.
- Near Miss Impact: Typically, when we think of the lower threshold for an extinction level asteroid impact event we reference the ~10 to 12km Chicxulub asteroid. Here we envision this asteroid striking Earth at a relative impact velocity of 15 to 20kms and generating the kinetic energy equivalent of 50 to 100 million megatons of TNT.

However, consider that instead of Earth crossing the asteroid's orbital path resulting in a collision, the asteroid crosses Earth's orbital path ahead of Earth and before it can completely cross the 8,000 mile diameter of that path, which could take 15 minutes or more, Earth strikes the asteroid at a relative impact velocity of 30kms. This could potentially reduce the size of the asteroid required to achieve the kinetic energy threshold for an extinction level impact from 10km to 6.25km. Then if the asteroid has a high iron content it could be as small as 5km. Which, given the far greater number of >5km or just >6.25km asteroids than that of >10km asteroids in the Solar System, it would dramatically increase the prospect of our extinction from random asteroid impact. Then, since Risk Management is the art of dealing with the possible not just the probable, if we consider a retrograde orbit for the asteroid: with a potential relative impact velocity of 50kms we would only need a 3.5km asteroid.

Then given the area defined here, this aspect of the asteroid impact threat would increase the conditional 100% impact probability ellipse by a factor of 3 for all asteroids. It would also be twice as likely for any asteroid impact event to occur in this manner than that of an asteroid directly striking Earth. Then we would have to consider the potential center of the impact probability ellipse (ellipsoid?) now to be 4,000 miles ahead of Earth and any deflection from that point a minimum of +/- 12,000 miles and not the +/- 4,000 miles from the center of Earth. At least the capability for Nukes to accelerate an asteroid is back on its list of relative advantages.

The Near Miss Impact Risk for Long period Comets would go in the opposite direction. Generally, we see that when Earth crosses the orbit of a 6km LPC and the Comet strikes Earth at relative impact velocity of 60kms we get the same kinetic energy as the 10km Chicxulub extinction event. However, when an LPC crosses the orbit of Earth and at 30kms Earth strikes the Comet, in order to have the same kinetic energy as the Chicxulub event, the Comet then would need to be 9.5 km in diameter... Further, since it would take at least 4 minutes for the Comet to cross the orbit of Earth such a 'near miss' would increase the impact probability ellipse by only 50% and give us a 33% chance for such an impact to occur in this manner. Then, in a retrograde orbital scenario, at a collective 90kms relative impact velocity we can see the extinction level with as little as a 4.5km Long Period Comet...

The Near Miss Impact Risk should serve to increase both the general conditional potential and statistical frequency of asteroid impact by a factor of three. And by reducing their statistical survival from 100,000 to 35,000 years, explain the relatively small existent Earth-orbit Crossing Asteroid population.

I can see the general insight for an important paper here. For asteroids, it could triple the conditional impact probabilities and in the case of common asteroids potentially quadruple their effect on impact (8 times if our luck is really bad). But it needs someone to work the angles and do the maths... your wheelhouse. If you want to run with it let me know.

- part (b) SEC. 808 of the 2010 Space Act. All in your authority by Executive Order.

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly.

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group: <<http://Gaiashield.Com>>

The Falling Stars War:<<http://Gaiashield.com/TFSW>>

Dear POTUS: <<http://dearpotus.com/>>

Email to POTUS et al: <<http://gaiashield.com/PingArc/POTUS-Ping-Arc.pdf>>

< B-41 + Small Nukes/Large Nuke

Plan A for the astronomers is to send a fully payloaded (5,000 kg) Atlas V with a KI and impact the asteroid. For a 100m target this should typically get us ~2.5 cm/sec DV.

Plan A+ would be to send an under-loaded Atlas V with a 1 Mt Nuke (B-83/500 kg). At detonation, at or near surface, this would get us ~1,000 cm/sec DV.

Advantages would be:

- a. Dramatically increase the number of Launch Window opportunities due to a reduced payload mass.
- b. Increase the launch/interception speed due to a reduced payload mass.
- c. Afford a high speed flyby execution providing a marked targeting advantage.
- d. Afford a standoff option (reducing DV to ~100 cm/sec) and avoid disrupting any potential loosely bound rubble piles.
- e. Higher interception speeds afford earlier deflection which can result in greater target displacement on close passage and can allow a greater tolerance for a larger impact probability ellipse and the executive decision to act.
- f. Generally provide a far more effective and reliable response to those pesky short detection-to-impact windows with their potentially disastrous short deflection-to-impact windows..
- g. Afford the ability for a retrograde launch and interception with complete mission payload.
- h/i/j. ???

At the other end of the impact threat spectrum,  
Large Nukes:

First, the B-83 has a yield-to-weight ratio of 2:1

Then there is the B-41 circa 1960 with a yield-to-weight ratio of 5:1.

<[https://en.wikipedia.org/wiki/B41\\_nuclear\\_bomb](https://en.wikipedia.org/wiki/B41_nuclear_bomb)>

Then, "*The US claimed in 1963 that it could produce a 35 Mt fusion bomb, and put it on a Titan II (3,700 kg [8,200 lb] payload), almost doubling the yield-to-weight ratio of the B-41.*" which would give us a yield-to-weight ratio of 10:1. In short, we could put 50 Mt on an Atlas V... At 10 years from impact it would take 20 of these (at surface) to impart 1 cm/sec DV to a 10km threat... 200 such HAMMERS if we allow for major contingencies and margins of error.

<<https://www.quora.com/Where-does-the-6-kiloton-kilogram-maximum-achievable-yield-to-weight-ratio-figure-for-nuclear-weapons-comes-from>>

*This approach was first tested in the Pamlico shot (3.9 megatons) of Operation Dominic on 11 July 1962. A more sophisticated version, RIPPLE II, was tested in the Androskoggin shot of Operation Dominic on October 1, 1963 which fizzled due to a design error. After a hasty modification the design was retested in the Housatonic shot, which gave a yield 8.3 megatons on October 30. The YTW ratio for this last shot was 2.56 kt/kg, but did not represent the full potential of the design approach (and thus the possibility of a 35 Mt warhead on a Titan II). The tested designs were still preliminary and had been developed with limited resources on a very hasty schedule to get them into the Dominic series before it was closed.*

< Whales' Emails

<https://www.forbes.com/billionaires/list/#version:static>

Jeff Bezos

Bill Gates <[media@gatesfoundation.org](mailto:media@gatesfoundation.org)>

Warren Buffett <[berkshire@berkshirehathaway.com](mailto:berkshire@berkshirehathaway.com)>

Mark Zuckerberg <[Mark.zuckerberg@gmail.com](mailto:Mark.zuckerberg@gmail.com)> <[zuck@fb.com](mailto:zuck@fb.com)>

Charles Koch <[grants@charleskochfoundation.org](mailto:grants@charleskochfoundation.org)>

Elon Musk <[media@spacex.com](mailto:media@spacex.com)>

Jody Allen <[press@vulcan.com](mailto:press@vulcan.com)>

< 10,000 Times/Notes

- Given: Large asteroids can and will strike Earth in the future.

In order to know when they will *not* strike Earth you therefore must know when they *will*.

To know when they will, such events would need to be regular and periodic and occur in some recursive pattern (or you would need to be an oracle).

Q 1. What Cosmic mechanism (Astrophysics) can we see or understand or even imagine to exist that can cause such events to occur on a regular recursive and periodic basis? (Or what empirical impact evidence is there of any recursive pattern that suggests such a mechanism?)

Q 2. Then: How could such a phenomenon have the intelligence to order these impacts in terms of their relative size?

Q 3. Then: How could anyone know just what that recursive pattern is?

Q 4. Then: How could anyone know just when the last large asteroid struck Earth in order to determine just when the next large asteroid would be expected strike Earth.

- A brotherhood of PhDs in consensus can be a community of glass houses. No one throws stones. Better to trust the engineers. When they get it wrong shit doesn't work. Shit can break. Shit can explode and kill people. So they critically cross-check their work. When academics get it wrong they just take their mistakes to the grave and maybe the next guy can get it right.

- Risk Management is the art of being prepared for Bad Luck. Good Luck is for The Risk Taker. The Optimist. The Unprepared. The Gambler. In Risk Management pessimism rules.

- To compare and contrast large asteroid impact events with small asteroid impact events is only an intellectual device and distraction to help avoid the prospect of a large asteroid impact event

and what would be required to defend against it and the dire consequences if we fail.

Strategically, all asteroid impact events are unique and discrete individual acts of Cosmic nature and have nothing to do with each other. All that is required for one asteroid impact event is the behavior of just one asteroid. Therefore when we consider the prospect of large asteroid impact events any comparison to small or other asteroid impact events is irrelevant.

- A properly fabricated Frequentist/Statistical Probability does not in any way predict or forecast the expression of any randomly occurring event. All it does do is suggest the number of expressions that may occur over a large interval of time or large number of opportunities.

And since the current Asteroid Impact probability fabricated for this issue was done using the Near Earth-orbit Asteroid population and not the Earth-orbit Crossing Asteroid population it was done wrong. In order to have a probability of expression, the subject of a randomly occurring event must have a manifest opportunity for doing so. So, done right, only the asteroids in the ECA population have any such opportunity. Asteroids that are merely NEAs do not. Trying to calculate a valid statistical Earth impact probability of an NEA would be like calculating the probability of getting a 7 in casting a 6 sided die.

However, since this assessment would assume that the orbits of the asteroid population is fixed and immutable and in fact is not, then even an asteroid impact probability based on the ECA population would be wrong... Since at random, any asteroid of any size anywhere in the Solar System can become kinetically or gravitationally perturbed into a ECA orbit to become a credible imminent threat or directly into an impending impact trajectory with Earth at any time the onus of fabricating an Earth impact probability shifts from determining the asteroid population's current orbital status to the determining the Real Time probability of any asteroid being perturbed into becoming an ECA or directly into an Earth impact threat. Which would be impossible.

Therefore, even if we could do such a thing, since what is strategically relevant is knowing which asteroid is the next asteroid on its way to strike Earth and then from that when it will strike and how large it is, no Frequentist/Statistical Probability can ever be helpful even if we do it right. Given the existential reality, we can only become prepared and watch. Hoping that once it has become perturbed into an impact trajectory with Earth we see it coming early enough to effectively respond. A process of some applied Real Time Bayesian/Conditional Probability. Strategically, Frequentist/Statistical Probability is useless.

- General question: Why do you think you are qualified to shape and inform an executive decision as to whether or not to prepare and maintain a thermonuclear capability to defend Earth against an extinction level asteroid impact? Can you even discriminate between the misinformation, delusions and lies and the existential and strategic realities and facts? Would you even know what a 'stupid' idea looks like here? Do you '*understand*' or do you merely trust the assessment of others?

- Harford: To be clear, I am presenting you with an opportunity to use a little foresight and present a future 'Cautionary Tale' now that could never be told after the fact because sooner-or-later there would be no one around to either hear or tell it... Perhaps a 'Cautionary Tale' for the *next* so called intelligent species that evolves on the planet.

- Deceive, inveigle and obfuscate.

- In Risk Management, abandon all Optimism, expectations of Good Luck and Hope. Leave that

for the risk takers. The Gamblers. Where the only rational reason to gamble is just for the fun of it. In Risk Management, pessimism rules and Good Luck is for the unprepared.

- On Academics and (or as) Politicians: If the Truth offends thee, pluck it out.

- When you have assumed the responsibilities of a common soldier or the National Command Authority, you need to understand that Fear focuses the mind, Fear reminds you of there are dire consequences if you fail. Do not be afraid of Fear.

- It is a characteristic of academics that they resist learning something new that contradicts something they have already published.

- On Remo: In response to the Fermi Paradox, I would post-close his paper with the notion that if there are intelligent advanced aliens out there they would have likely chosen not to contact us until we have become wise enough to recognize a common threat. And abandoning our proclivities to wage wars over economic, political and religious principles, work together to defend our planet from the random impact and our extinction by the debris left over from the formation of our Solar System with thermonuclear explosive devices. And not blow ourselves up in the process.

- The path to being the smartest guy in the room is by being the best student in the room. Unfortunately, the path to stupidity is easier and shorter... and makes you feel better. Ignorance is bliss.

- The characterization of an extinction level asteroid impact as having a "non zero probability" is arational, meaningless and a gross mischaracterization. It appears to be a conflation of the applicability of the two general forms of probability theory: Frequentist and Bayesian.

- We can not allow what 'the people' will like to effect either the perception of the threat or the application of physics required in our response to defending the planet and still expect a satisfactory outcome.

- The only way to derive a rational probability of the next asteroid impact would be to constantly observe all the asteroids in the Solar System in Real Time and derive a metered Conditional/Bayesian Probability. Any Statistical/Frequentist Probability can only ever afford a non-rational assessment. Since such an assessment is fabricated by empirically observing or estimating the number of randomly occurring events over a large interval of time, then averaging them in order to express this condition as a percentage in some small increment of the overall time period as a probability. We have to appreciate that we have an assessment based on empirical information that has become corrupted by averaging and can no longer be considered rational. The only part of the Statistical/Frequentist Probability that is rational is that the original observation appreciates these events as occurring at random. Which is rational information. So the question here is do we want to build our assessment on the rational information or the probabilistic delusion of rational. If rational, then here random trumps such probability. As things stand we can never know the which, when or how large of the next asteroid on its way to strike Earth until and if we see it coming. To believe in the delusion here is nothing more than Mankind's sooner-or-later suicide by asteroid impact.

- Smetana: You seem to have taken it upon yourself to help shape and inform the strategic aspects of executive decision making on the issue of Planetary Defense. Welcome to my wheelhouse. Now, let's get it right. Shall we start with the Precautionary Principle?

"Governments should take action to prevent harm even when it is uncertain if, when or where the

harm will occur."

- To express the prospect of an extinction level asteroid impact in terms of a Frequentist Probability cedes the condition that such events do in fact occur and will do so at random. To characterize the probability of such events as low is nothing more than expressing an optimistic expectation of Good Luck. However, Risk Management is the art of applied pessimism and would be based on expectation of Bad Luck. Which would make the optimistic perspective little more than Gambling. Here, the pessimist will either be right or pleasantly surprised. The optimist runs the random chance of being either right or being dead wrong... So where does Wisdom lie? Are we looking for a rationale to manage this risk or a rationalization to gamble?

- I am constantly dismayed and appalled at just how little those that would discuss the various strategic aspects of Planetary Defense understand the relative differences between deflection tactics and even the capability of any one given approach to deflecting an Asteroid or Comet. How can you possibly effectively think strategically when you do not understand the tactics.

- The ethics and technology of Planetary Defense are dictated by the prospect of our random extinction by Cosmic Impact and the Laws of Physics... Nothing more.

- Strategic: what is essential to the conduct of implementing a response. In that as a master strategist and engineer of method I have promoted that is necessary and what will and will not work best and therefore what is wise to do in order to defend the planet from the worst case potential for Cosmic Impact, how am I not a philosopher for Planetary Defense?

- If ethics are the codified principles that govern a professional behavior or the conduct of an activity, then the ethics of Planetary Defense would follow the logics that any behavior that retarded the defense of the planet from Cosmic Impact would be anathema and condemnable. And in its worst case, given the potential magnitude of loss in failure, any and all behavior in support of this endeavor would be mandatory. At any cost and by any means necessary, failure is not an option. How can anything else be wise?

- If we only trust the next asteroid impact threat to fall into the narrow 'best case' conditions we see illuminated and studied at our Planetary Defense conferences, then We The Species are truly the optimistic fools we despise and deserve our extinction by Cosmic Impact.

- How can it ever be wise to be prepared to defend against only the most likely when the most unlikely is the worst case possibility?

- HERA: Given the far greater margin of error in the long-range ground based metrics of the original velocity of Didymoon and the very small DV imparted by DART, the comparatively more accurate proximate metrics of HERA can not verify the calculated effect of the KI. Further, given that the exact mass of Didymoon can not be known and its original velocity will not be exact, the notion of testing for the theory of Beta by comparing the final result with a calculated expectation of the baseline momentum transfer before Beta, is out of the question... HERA is a joke. And in the end, Astronomers will be free to do what they do best, and simply see whatever it is they want to see in the results.

Near Miss Impact Risk Heads Up:

- Barbee
- Melamed
- Ailor

- Wie
- Chodas
- IAA
- Lu
- Syal

From NASA NEO Workshop with Nukes at 100 times over KI:

- KI at NRC 5kms not 10kms: x2
  - Strip B83 down to physics package: x2
  - Nukes at surface not standoff : x10
  - Nukes at 1t/5Mt (dirty) not 1t/2Mt (stripped B83): x2.5
  - Modern design (Next Gen B41 after 60 years): x2
- = 20,000 times better than KI

< 1st Contact/Notes

- When has strategic wisdom been found in choosing to defend against only the most statistically likely and least harmful manifestation of a threat and not the least statistically likely and most harmful possibility? Would such a choice be motivated by having the least cost and least effort requiring the least fear to justify? A defense for the poor and incapable and cowardly? Such a strategy could not be said to be one of managing this risk but rather of taking it. Gambling, with an optimistic expectation of good luck. And bad gambling at that.

The boys in Vegas would look at the statistics and see that after 65 million years we have had a run of very good luck. And any gambler worth his salt knows that there is only ever one thing you can count on with a run of good luck... Sooner-or-later it runs out. And today, because now we can, it's time to hedge our bet, and at any cost and by any means necessary, build and deploy an effective means for dealing with the worst case possibility and defend ourselves from the prospect of our extinction by asteroid impact.

- I am the Storm Crow for death by rock from sky. Harbinger of extinction by asteroid impact. Keeper of The Last Abyss...

- The role of a Risk Manager would be to identify problems and find and develop effective solutions. The Strategist attends to what is essential to the conduct of implementing a tactical response. An effective Executive Decision Maker will reward those messengers who have the courage to tell truth to power. The truth, the whole truth and nothing but the truth, no matter what that truth might be... And only shoot those who do not.

- In Risk Management, the pessimist tends to think worst case. That way, in the face of the fact, you are always either right or wrong and pleasantly surprised. For the optimist you always risk being *Dead Wrong*...

- The Astronomers do not charge or run or ride or march to the sound of the guns. They only lean in that direction. They only hear the small arms. Are deaf to the artillery and bombs and most of all, the Mother of All Bombs...

- Only Fear can make us... Heroes.

- A higher education can serve to retard imagination and to think creativity.

- For the gamblers:

Since Chicxulub we have cast the Cosmic Dice every day for 65 million years now. Every time the odds have been in our favor and we have had a very long run of very good luck. There is only one thing you can ever count on with a run of good luck... sooner-or-later it runs out. But until now we've had no choice. Now we can fix the race, stack the deck, load the dice... Isn't it time to cash in some small portion of our chips and hedge our bet against this worst case probability: build an effective Planetary Defense? the Law of Large Numbers is no longer on our side here. It has become 'Later'. And like the boys in Vegas always say "The House always wins". And we ain't the House. So leave nothing to chance. Tic Toc...

- Executive Order on Policy: Executive Office shall assume responsibility for PD and encourages the Congress to codify and formally do the same in support...

- Optimism absent foresight... aka Blind Faith.

Things Astronomers ignore and/or lie about:

- Codified Policy/Agency Delegation
- Asteroid Grand Challenge
- Complete Absence of Strategic Acuity
- Launch/Interception Windows
- Surveillance Not Survey
- Asteroid/asteroid kinetic perturbation
- The Delusion of Statistical Probabilities (lie)
- Perception of Static Orbital Elements (lie)
- NEO Population Only Source of Impact Threats (lie)
- Nukes Only Blow Up Asteroids (lie)
- Next ELAsteroid Far In the Future (lie)
- The Brown Survey Will Make Us Safe (lie)
- Space Capable Nuclear NEO Mines
- Forever, TNLA, Perturbation, Random, ELAsteroid
- Centaurs/LPCs/ISOs
- Expansion Velocity of Vaporized Water Ice In Space
- The Near Miss Impact Risk (lie by omission)
- An Absence of Courage in the Face of Fearful Things

orthogonal

Survey Flaws:

- NEO/PHA only threat
- No response when we find one
- Discovered Asteroids fixed in orbit

- In the face of Random Chance, only a fool would hold an expectation of Good Luck. Even when the odds are in their favor.

- Risk Management is the art of dealing with the possible, not the probable.
- Wisdom in Planetary Defense is now and always will be the art of being prepared to defend against the possible, not just the probable.

STTAG: Its perpetual mission will be to promote the dire threat of a worst case extinction level Cosmic impact and what We The Species will need to do to effectively defend against it. Now

and Forever.

Dr Iain McDonald, a top scientist at the Cardiff University, Wales

<https://www.newsnation.in/science-news/warning-doomsday-asteroid-collision-with-earth-inevitable-say-experts-to-end-humanity-one-day-or-other-article-233730.html>

Yes! According to Dr Iain McDonald, a top scientist at the Cardiff University, Wales, our planet will 'Inevitably' get hit by a [doomsday asteroid](#) one day or the other. However, McDonald has not specified an exact date or time for the end of human civilization.

Speaking at the BBC's Today programme, the scientists cited several incidents of dreaded asteroid hits in the past, adding that the possibility of similar catastrophic events could not be ruled out in near or distant future.

"I try not to because it would be calamitous. As geologists, we recognise these events throughout history and we try and think of effects they must have had on life at that time. We know that these things will always happen. There are always rocks flying through space. Inevitably one of these will hit us and it will have pretty dramatic effects," McDonald was quoted as saying.

- It makes me sad. How can it be that We The Species is still so stupid We fail to appreciate all these near misses as very small examples of much, much larger things to come. Harbingers of Doom... It is as if the Cosmos is sending these as little warning shots across our bow... WAKE THE FUCK UP!

- Until we know which asteroid is the next asteroid on its way to strike Earth we can not know when it will strike or how large it is. Within that logic, if we do not know when the next EL Asteroid will strike we can not know when it will not.

- As to how large TNLA will be, all we have in the face of absolute ignorance are statistical probabilities: the odds. The odds are never reason to Think. The odds are only ever reason to Hope.

- Consider that given the geometry and dynamics of the billions of asteroids out there, any asteroid (discovered or undiscovered) of any size (10m to 10,000m) anywhere in the Solar System (PHA/NEO/NMO/Main Belt or Trojan) can, at random, become gravitationally or kinetically perturbed into an Earth-orbit Crossing orbit or even directly onto an impact trajectory with Earth at any time. Consequentially, all asteroid impact events are completely random: without any recursive pattern or periodicity, both in their occasion and magnitude. Therefore, there is no reason to believe that the next asteroid on its way to strike Earth will not do so tomorrow and no reason to believe it will not be a 10km Chicxulub Class extinction level event. And we are not remotely prepared. We are not even thinking about becoming this prepared.

< 2005 Space Act/Brown

<https://uscode.house.gov/statutes/pl/109/155.pdf>

## Subtitle C—George E. Brown, Jr. Near-Earth Object Survey

SEC. 321. GEORGE E. BROWN, JR. NEAR-EARTH OBJECT SURVEY.

(a) SHORT TITLE.—This section may be cited as the “George E. Brown, Jr. Near-Earth Object Survey Act”.

(b) FINDINGS.—The Congress makes the following findings:

(1) Near-Earth objects pose a serious and credible threat to humankind, as many scientists believe

that a major asteroid or comet was responsible for the mass extinction of the majority of the Earth's species, including the dinosaurs, nearly 65,000,000 years ago.

(2) Similar objects have struck the Earth or passed through the Earth's atmosphere several times in the Earth's history and pose a similar threat in the future.

(3) Several such near-Earth objects have only been discovered within days of the objects' closest approach to Earth, and recent discoveries of such large objects indicate that many large near-Earth objects remain undiscovered.

(4) The efforts taken to date by NASA for detecting and characterizing the hazards of near-Earth objects are not sufficient to fully determine the threat posed by such objects to cause widespread destruction and loss of life.

c) DEFINITIONS.—For purposes of this section the term “near-Earth object” means an asteroid or comet with a perihelion distance of less than 1.3 Astronomical Units from the Sun.

(d) NEAR-EARTH OBJECT SURVEY.—(1) SURVEY PROGRAM.—The Administrator shall plan, develop, and implement a Near-Earth Object Survey program to detect, track, catalogue, and characterize the physical characteristics of near-Earth objects equal to or greater than 140 meters in diameter in order to assess the threat of such near-Earth objects to the Earth. It shall be the goal of the George E. Brown, Jr. Near-Earth Object Survey Act. 42 USC 16691.42 USC 16676.42 USC

16675. Deadline. Ver Date 14-DEC-2004 07:21 Oct 30, 2006 Jkt 039194 PO 00003 Frm 00390 Fmt 6580 S fnt 6581 E:\PUBLAW\PUBL003.119 APPS06 PsN: PUBL003

119 STAT. 2923 PUBLIC LAW 109–155—DEC. 30, 2005 Survey program to achieve 90 percent completion of its near-Earth object catalogue (based on statistically predicted populations of near-Earth objects) within 15 years after the date of enactment of this Act. (2) AMENDMENTS.—Section 102 of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2451) is amended

(A) by redesignating subsection (g) as subsection (h);

(B) by inserting after subsection (f) the following new subsection: “(g) The Congress declares that the general welfare and security of the United States require that the unique competence of the National Aeronautics and Space Administration be directed to detecting, tracking, cataloguing, and characterizing near-Earth asteroids and comets in order to provide warning and mitigation of the potential hazard of such near-Earth objects to the Earth.”; and

(C) in subsection (h), as so redesignated by subparagraph (A) of this paragraph, by striking “and (f)” and inserting “(f), and (g)”. (3) FIFTH-YEAR REPORT.—The Administrator shall transmit to the Congress, not later than February 28 of the fifth year after the date of enactment of this Act, a report that provides the following:

(A) A summary of all activities taken pursuant to paragraph (1) since the date of enactment of this Act.

(B) A summary of expenditures for all activities pursuant to paragraph (1) since the date of enactment of this Act.

(4) INITIAL REPORT.—The Administrator shall transmit to Congress not later than 1 year after the date of enactment of this Act an initial report that provides the following:

(A) An analysis of possible alternatives that NASA may employ to carry out the Survey program, including ground-based and space-based alternatives with technical descriptions.

(B) A recommended option and proposed budget to carry out the Survey program pursuant to the recommended option.

(C) Analysis of possible alternatives that NASA could employ to divert an object on a likely collision course with Earth.

< Planetary Defense at RAND

Rainmaker, [giving@rand.org](mailto:giving@rand.org)

If RAND could show a serious interest in forming a Planetary Defense research division to develop a rational and comprehensive strategic assessment of the threat of asteroid impact and recommend a response to effectively defend against it, I would consider a modest (\$100k to \$250k) conditional donation or bequest to help support such an effort. I could also assist in facilitating solicitations to much deeper pockets: Bezos, Musk, Branson, the Allen foundation, for more substantial contributions.

Understand that before all else, since it includes the random prospect for our extinction, and because we can: A) The most important thing Mankind can ever know will always be which asteroid is the next large asteroid on its way to strike Earth. And B) Deflecting or destroying the next large asteroid on its way to strike Earth will always be the most important thing Mankind can ever do. And C) Being prepared to defend the planet from the threat of the next large asteroid on its way to strike Earth will always be the most important thing Mankind can ever be.

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly.

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group: <http://Gaiashield.Com>

Comments on JPL/NASA 10 Things: <http://Gaiashield.Com/10Things>

The Falling Stars War: <http://Gaiashield.com/TFSW>

< Effective PD Detection

An effective Planetary Defense detection effort would not just be a matter of making a cursory Survey of a proximate asteroid candidate population and not finding the next asteroid on its way to strike Earth. An effective Planetary Defense would be a comprehensive and perpetual Real Time Surveillance of an Area of Interest that would afford us a early warning of an impending impact threat coming from any asteroid population as soon as possible after the asteroid has become perturbed on to an impact trajectory with Earth.

If our current Survey program were specifically, oriented to a strategically rational Planetary Defense mission it would only be concerned with only those asteroids that have an existential opportunity for randomly striking Earth: the ECA (Earth-orbit Crossing Asteroid) population - which can be seen as Credible Imminent Threats - and not the entire NEO (Near Earth-orbit Object) population. Mere NEOs have no greater opportunity to even become perturbed directly into an Earth impact threat or an ECA than Main Belt asteroids.

Since it is likely that the ECA population is less that 5% of the overall NEO population, the time and effort saved by disregarding newly discovered asteroids as potential impact threats as soon as it was determined they were not ECAs would put the mission on track to be completed by its current 2020 deadline. But for some reason, a few years ago the Astronomers and scientists responsible for interpreting and executing this Survey eliminated the ECA category altogether. Folding the asteroids currently in that category into the PHA (Potentially Hazardous Asteroid) category. What we have now, detecting, tracking, cataloguing and characterizing the entire NEO population is driven more by the general objective motives of science and not the dire subjective compulsions of security... Survival.

Apparently, I have evolved the ability to penetrate that pesky synaptic firewall that keeps most people from even seeing fearful things... In the light of the fearful realities in this issue, I have apparently become the only person on the planet to have developed a comprehensive and honest

appreciation of the scope and scale of this threat and the true magnitude of the response required to defend against it.

## < 2008 Space Act NPDA

Within 2 <<NOTE: Deadline.>> years after the date of enactment of this Act, the Director of the OSTP shall--

- (1) develop a policy for notifying Federal agencies and relevant emergency response institutions of an impending near-Earth object threat, if near-term public safety is at risk; and
- (2) <<NOTE: Recommendations.>> recommend a Federal agency or agencies to be responsible for--
  - (A) protecting the United States from a near-Earth object that is expected to collide with Earth; and
  - (B) implementing a deflection campaign, in consultation with international bodies, should one be necessary.

## < 10 Things You Should Know About Planetary Defense

<https://www.jpl.nasa.gov/news/news.php?feature=7377>

JoAnna Wendel  
NASA Headquarters, Washington  
202-358-1003  
[joanna.r.wendel@nasa.gov](mailto:joanna.r.wendel@nasa.gov)

### **1. Why Asteroids Impact Earth**

Why do asteroids and meteoroids collide with Earth? These objects orbit the Sun just like the planets, as they have been doing for billions of years, but small effects such as gravitational nudges from the planets can jostle the orbits, making them gradually shift over million-year timescales or abruptly reposition if there is a close planetary encounter. Over time, their orbits may cross Earth's path around the Sun. During the millennia when an asteroid is in an Earth-crossing orbit, it is possible the asteroid and Earth may find themselves in the same place at the same time. An asteroid needs to arrive at the intersection point with Earth's orbit at the very same time Earth is crossing that point for an impact to occur. But even Earth is relatively small compared to the size of asteroid orbits, which is why asteroid impacts are so rare.

### **2. A Current Hazard**

We didn't always know that asteroid impacts were a modern-day possibility. In fact, this realization didn't come until scientists started proving that many of the craters on Earth were caused by cosmic impacts rather than volcanic eruptions (and similarly for the craters on the Moon). In the 1980s, scientists discovered evidence that the demise of the dinosaurs 65 million years ago was likely caused by an asteroid impact. After scientists found the Chicxulub Crater in the Gulf of Mexico, this idea became more certain. In 1994, the world witnessed similar-sized impacts happening in near-real time, when fragments of comet Shoemaker-Levy 9 impacted Jupiter - that's when we really started to understand that large asteroid impacts could still happen today.

### **3. Frequency of Impacts**

Every day, roughly 100 tons of interplanetary space material rain down on our planet, most of it in the form of tiny dust particles. Small planetary debris the size of grains of sand, pebbles and rocks also rain down daily into Earth's atmosphere, producing the meteors - commonly called

"shooting" or "falling stars" - that you can see on any dark clear night. Occasionally, Earth passes through denser streams of small debris released from comets - that's how we get meteor showers. Sometimes larger, chair-sized or even car-sized space objects enter Earth's atmosphere and create really bright meteors, called fireballs or bolides, which disintegrate as they explode in the atmosphere. Very rarely, every few decades or so, even larger objects enter the atmosphere, such as the house-sized object that streaked across the sky over Chelyabinsk, Russia, in 2013, producing a super-bright fireball and a shock wave that blasted out windows and broke down doors.

#### **4. World Asteroid Data Repository**

The Minor Planet Center has a modest name, but this office has a major job. Located in Cambridge, Massachusetts, and operating out of the Smithsonian Astrophysical Observatory, the Minor Planet Center (MPC) is the world's repository of all observations and computed orbits of asteroids and comets in the solar system, including all the near-Earth object (NEO) data. An NEO includes any asteroid, meteoroid or comet orbiting the Sun within 18,600,000 miles (30 million kilometers) of Earth's orbit. Any time an astronomer observes an NEO using a telescope on the ground or in space, they send their measurements of the object's position to the Minor Planet Center. The MPC's complete set of observations of an object from observatories around the world can be used to calculate the most accurate possible orbit around the Sun for the object to see if it could pose a risk of impact on Earth.

#### **5. Who Searches for Near-Earth Objects?**

In 1998, in response to a congressional directive, NASA established the Near-Earth Object Observations (NEOO) Program and has been tirelessly detecting, tracking and monitoring near-Earth objects ever since. Several astronomer teams around the country operate under NASA's NEO Observations Program, helping us discover, monitor and study NEOs. The observatories that currently make most of the NEO discoveries are the Catalina Sky Survey telescopes in Arizona and the Panchromatic Survey Telescope And Rapid Reporting System (Pan-STARRS) telescopes in Hawaii. NASA's NEOWISE space telescope also discovers NEOs and provides critical data on their physical size. Additional astronomers supported by the Near-Earth Object Observations Program use telescopes to follow up the discoveries to make additional measurements, as do many observatories all over the world. All these observers send their measurements of NEO positions to the Minor Planet Center. The Center for Near-Earth Object Studies, based at NASA's Jet Propulsion Laboratory, also uses these data to calculate high-precision orbits for all known near-Earth objects and predict future close approaches by them to Earth, as well as the potential for any future impacts.

#### **6. How to Calculate an Asteroid's Orbit**

Scientists determine the orbit of an asteroid by comparing measurements of its position as it moves across the sky to the predictions of a computer model of its orbit around the Sun. This model takes into account all of the known forces acting on the asteroids motion, consisting mostly of the gravity of the Sun, all the planets and some of the other larger asteroids. Then, for each asteroid, they refine the orbit model to determine what most accurately predicts the observed locations in the sky at the times of those observations. It is possible to calculate a rough orbit with only three observations, but the more observations that are used, and the longer the period over which those observations are made, the more accurate is the calculated orbit and the predictions that can be made from it.

#### **7. Finding the Large Ones**

NASA's NEO Observations Program began searching in earnest in 1998, when only about 500 near-Earth asteroids were already known. By 2010, NASA and its partners had identified more than 90 percent of the estimated 1,000 near-Earth asteroids that are 1 kilometer or larger. Large

asteroids were the first priority in NASA's search because an impact by any one of these could have global effects. NASA's search programs are still finding a few of these large asteroids every year, and astronomers think there are still a few dozen yet to be found. Because of NASA's efforts, 90% of the risk of sudden, unexpected impact of an unknown large asteroid has been eliminated.

## **8. Close Approach**

You may have heard about an asteroid or comet making a "close approach" to Earth. That happens when the object in its natural orbit about the Sun passes particularly close to Earth. There's no firm rule on what counts as "close," but it's not at all uncommon for small asteroids to pass closer to Earth than our own Moon. That might seem too close for comfort, but remember that the Moon orbits Earth about 239,000 miles (385,000 kilometers) away. If you represented Earth by a basketball in a scale model, the Moon would be the size of a tennis ball and about 21 feet (7 meters) away - the distance between the two posts of a professional soccer goal. At this scale, a 100-meter-wide (328-foot-wide) asteroid would be much smaller than a grain of sand, even smaller than a speck of dust.

## **9. Studying a Near-Earth Object Up Close**

There's currently a NASA mission called OSIRIS-REx studying a near-Earth object up close - an asteroid named Bennu. Scientists recently calculated that this asteroid has a 1 in 2,700 chance of hitting Earth in the late 22nd century (that's over 150 years away for now), but it has no chance of impacting any time before then.

Right now, OSIRIS-REx is orbiting the asteroid and studying its surface to prepare to take a sample and return it to Earth in 2023. The spacecraft is also studying a phenomenon called the Yarkovsky effect - which is a small force that shifts the asteroid's orbit slightly as its Sun-heated surface radiates heat back into space. By studying Bennu close-up with OSIRIS-REx, scientists will be able to understand just how much heat is being radiated from the various parts of the asteroid, which will help them ultimately better understand the Yarkovsky effect and better predict Bennu's orbit and its possible hazard to Earth.

## **10. Asteroid Deflection**

Asteroid impacts are the only potentially preventable natural disaster - provided we spot the threatening asteroid with enough lead time to launch a mission into space to deflect it. NASA and its partners are studying several different approaches to deflecting a hazardous asteroid. The most advanced of these techniques is called a kinetic impactor, and a mission to demonstrate this technology is called the Double-Asteroid Redirection Test (DART), is slated to launch in 2021.

Of course, we aren't going to meddle with the orbit of an asteroid that could pose a risk to Earth for a test. The target for DART is Didymos B, the moon of a larger asteroid, called Didymos A. The Smart Car-sized DART spacecraft will slam into the football-stadium-sized Didymos B at a speed of 13,000 mph (22,000 kph) to not only confirm the robustness of the targeting system, but also to see how much the collision changes the asteroid moon's orbit around Didymos A. Scientists have determined B's orbit around A from the ground, and will then measure the orbit again after the DART collision to see how much the orbit has changed. That will tell us how much the kinetic impactor could change an asteroid's path around the Sun if we needed to do so.

If a hazardous asteroid is found a decade or more before a potential impact, there would likely be time to launch a deflection mission to the asteroid, and we would only need to shift its orbit by just a bit - just enough to make it cross Earth's orbit only about 10 minutes "late," so to speak - to avoid the collision with our planet.

< Bezos Expeditions Notes

Bezos Expeditions  
1200 12Th Avenue South  
Suite 1200  
Seattle, WA 98144

Phone: 206-266-1000

[www.bezosexpeditions.com](http://www.bezosexpeditions.com)

[info@bezosexpeditions.com](mailto:info@bezosexpeditions.com)

Notes:

Spokesmen:

Michael Hayden

David Petraeus <[david.petraeus@kkr.com](mailto:david.petraeus@kkr.com)>

John Kelly

Colin Powell

COO:

Book Speaker

Fund Raising

Manage Investment

Advertising

- \$100m funding goal: operate off interest
- Design comprehensive Planetary Defense: Gaiashield Phase I
- Complete strategic and tactical formula on how to do this: Politics, funding, socioeconomic consequences and system.
- Punctuate Mankind's evolutionary equilibrium.

< My Job

As an expert Risk Manager and Master Strategist and professional Executive Decision Maker it is my job to determine: what is broke so we can fix it, what needs to be seen so we can look for it, what we do not have so we can get it, what to think about so we can think about it, everything we need to do so we can do it right. And tempered by only capability and value, Leave Nothing To Chance.

< Think Tanks

Do any of your experts follow the development of Planetary Defense and know how to spell asteroid as a threat? If so, can you give me their point of contact?

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly.

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group: <<http://Gaiashield.Com>>

The Case for a US Space Force <<http://Gaiashield.Com/DAMIEN>>  
2017 Strategic Assessment: <<http://Gaiashield.com/TFSW>>

Earth Institute: <[jjamal@ei.columbia.edu](mailto:jjamal@ei.columbia.edu)>  
Dr. Alex N. Halliday, Director <[AlexHalliday@ei.columbia.edu](mailto:AlexHalliday@ei.columbia.edu)>  
contact <[dramdawah@ei.columbia.edu](mailto:dramdawah@ei.columbia.edu)>

Heritage Foundation: <Form> <[info@heritage.org](mailto:info@heritage.org)>  
Director David Azerrad <[David.Azerrad@heritage.org](mailto:David.Azerrad@heritage.org)>

Brookings Institute: <[communications@brookings.edu](mailto:communications@brookings.edu)>  
President (General) John Rutherford Allen  
<Form: <<https://www.brookings.edu/experts/john-r-allen/>>>

Cato Institute <Form> <[ghealy@cato.org](mailto:ghealy@cato.org)>  
President David Boaz: <[dboaz@cato.org](mailto:dboaz@cato.org)>

RAND: <[Terrence\\_Kelly@rand.org](mailto:Terrence_Kelly@rand.org)> <Form>  
President Michael D. Rich <[michael.rich@rand.org](mailto:michael.rich@rand.org)>

Woodrow Wilson: <[wwics@wilsoncenter.org](mailto:wwics@wilsoncenter.org)>

Hoover Institution: <[schieron@stanford.edu](mailto:schieron@stanford.edu)>  
Director Thomas W. Gilligan <[schieron@stanford.edu](mailto:schieron@stanford.edu)>

Worldwatch Institute: <[worldwatch@worldwatch.org](mailto:worldwatch@worldwatch.org)>

New American Security: <[info@cnas.org](mailto:info@cnas.org)>  
President Richard Fontaine <[cstevens@cnas.org](mailto:cstevens@cnas.org)>

Baker Institute: <[bipp@rice.edu](mailto:bipp@rice.edu)>  
George W.S. Abbey <[gabbey@rice.edu](mailto:gabbey@rice.edu)>

Follow up:

In the absence of a codified policy expressing a clear political will to endeavor to deflect or destroy these objects as they present themselves to be impending impact threats, there is no justification for funding the execution of any action or logic to compel the creation of any dedicated agency to receive any funding and become expert in implementing such a policy.

part (b) SEC. 808 of the 2010 Space Act

Second ping:

The threat of asteroid impact is an existential condition. And since all asteroid impact events are random: without any recursive pattern or periodicity, both in their occasion and magnitude, there is no reason to think that the next asteroid on its way to strike Earth will not do so tomorrow and that there is no reason to think that it will not be an extinction level asteroid.

Since this threat includes the prospect of our extinction and it is a threat we have the potential capability to defend against, then knowing which asteroid is the next asteroid on its way to strike Earth will always be the most important thing Mankind can ever know. And deflecting the next asteroid on its way to strike Earth will always be the most important thing Mankind can ever do. And being prepared to effectively respond to this threat at any level will always be the most important thing Mankind can ever be... And today, we are not remotely prepared.

The extinction of our species is a primal instinctive concern of every man, woman and child on the planet. How can your institution not see this issue to be deserving of the highest and best use of its time and attention and thinking in addressing this perpetual threat and finding an effective solution to be the first thing on your list of 'things to do'?

How can anything less be wise?

Follow up 2:

All asteroid impact events are random: without any recursive pattern, both in their occasion and magnitude. Therefore, since there is no reason to think that the next large asteroid on its way to strike Earth will not result in a human extinction level impact event, then knowing which asteroid is the next large asteroid on its way to strike Earth will always be the most important thing Mankind can ever know. And deflecting the next large asteroid on its way to strike Earth will always be the most important thing Mankind can ever do. And being prepared to effectively respond to the threat of the next large asteroid on its way to strike Earth will always be the most important thing Mankind can ever be...

And despite the reality that We The Species have managed to evolve the potential to develop the technological capability to effectively defend the planet from this perpetual threat, we have yet to find the political will to become even remotely prepared to do so.

At present, there is a lot of bad thinking based on nothing more than hope and expectations of good luck shaping and informing our response to this threat. How is it that the RAND Corporation, the world's foremost independent strategic think-tank, does not have an expert Planetary Defense component dedicated to thinking about this right? If we can not even determine how to think about this right how can we ever expect to actually *do* this right?

Addressing this threat may not be your job. However, since the prospect of our extinction is a concern for every man, woman and child on the planet, this threat *is* your problem. You and yours are at Ground Zero. Time to take this issue personally... How can anything less be wise?

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly.

At your disposal and convenience:

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group: <http://Gaiashield.Com>

The Case for a US Space Force <http://Gaiashield.Com/DAMIEN>

2017 Strategic Assessment: <http://Gaiashield.com/TFSW>

Alt: How is it that the X, a world class think tank,

Bad Thinking: False Facts, Ignored Realities and Flawed Logics immersed in a consensus of compounding expectations of good luck in the face of random chance.

< If Johnson

When rational understanding leads you to discarding your belief and the truth you like, most people will choose to abandon understanding... particularly when understanding leads to undesirable or fearful things.

<https://www.nasa.gov/mediacast/gravity-assist-asteroid-hunting-with-lindley-johnson>

From Gravity Assist 07/17/18:

**Lindley Johnson:** <SNIP> *So, I don't think they understand that once we have observations on the object and can establish its orbit, it's going to stay on that orbit.*

If not by some gravitational or kinetic perturbation how did the NEO population become displaced from their original Main Belt orbits where they were formed? Does Johnson think that whatever forces caused this transition is no longer an existential condition in our Solar System?

Then, if Johnson narrowly defines the *Near Earth-orbit Object* population as the candidate population for Earth impact threats how can any of them ever come to strike Earth unless they become gravitationally or kinetically perturbed into an Earth-orbit *Crossing Object*? In order to hit each other two objects need to be able to be at the same place at the same time. We all get that intuitively before we even go to preschool...

If we afford Johnson some benefit of the doubt and say he is responding to his own job security and just toeing the company line then:

If Johnson had said "once we have observations on the object and can establish its orbit, '*most are*' going to stay on that orbit '*for 100 years or so*'" he could have still defended the Survey by describing what we are doing now as only a first and single step on a journey of a thousand miles and not the journey complete. Which would be a comprehensive Surveillance of the behavior of all the asteroids in the Solar System perpetually looking for the next asteroid on its way to strike Earth.

And then that the DART mission is nothing more than an initial test to help us determine which theoretical candidate would be the best tactic for developing a standing tested response to this threat in its worst case scenario. And that NASA's PDCO is at best only a precursor for a responsible and fundable National if not ultimately a Global Planetary Defense Agency.

Not only would he be defending his day job here but laying out a formula and vision for a never-ending strategic role justifying the necessity of NASA. Something it lost after Apollo.

However, such a position would make him a heretic in the PD Community and disqualify him from being the successor to Morrison and Schweikart as the maven for the NO Fear cult.

Thing is, if Johnson stays the course he gets both job and cult leadership... and Mankind goes extinct by asteroid impact.

Of course the above is predicated on the notion if Johnson does in fact understand that what he is doing and saying now is bullshit. If not he is just stupid.

< PD Notes

Here, the mission is not to defend the planet from the 'likely'. Otherwise, in the absence of any empirical evidence to the contrary, for any day in the life of Earth the most *likely* event will always be that Earth will not be struck by any asteroid whatsoever. Here, it will always be the most *unlikely* event that kills us all. That Shit Happens is unlikely. Yet Shit does Happen! Deal with it or Die...

Most catastrophic unlikely events are the consequence of a conspiracy of lesser unlikely events.

If Risk is Probability times Magnitude of Loss times our inability to Defend against it, then the formula for extinction by asteroid impact would be  $R = ? \times \infty \times 100\%$

Peer Review Aptitudes:

Physics

Astronomy

Astronautics

Strategic Thinking

Probability

Logic

Determinism

Psychology

Government

Economics

Semantics/Dialectics/Rhetoric

Decision Making

When your enemy is random chance, and you choose to prepare for the best and only hope against the worst, then know too that sooner-or-later your enemy will bring the worst...

As a means to discover The Next Large Asteroid on its way to strike Earth, the current Astronomer fostered Survey approach relies on a) the random chance that it is already a NEO, b) the random chance that it has already become manifest as an impact threat at the time of discovery, c) the random chance that it will be one of the 90% to be discovered by the terms of the Congressionally mandated mission objectives, and as things stand d) the random chance that they find it before the 2020 deadline, e) the random chance that it will be orbiting on the ecliptic, f) the random chance that the next large impact event it will not be an asteroid but a long period comet g) the random chance that our ad hoc extemporaneous response, comprised of technology all supplied by the lowest bidder, will perform as advertised the first time we really need it to... That is a whole lot of compound Good Luck to in any way be calling this approach a reliable Early Warning System. Win-the-lottery grade odds...

A Cosmic Cost of Living. One of Humanities basic necessities: Food, Shelter, Clothing... Planetary Defense.

People generally think of possibilities as things that have already happened.

Two points on HAMMER at >150m:  
50/50 chance of accelerate not decelerate.  
Kill the wolf. Don't just case it away.

Fear is healthy. Fear is our friend. Fear tells us when to run, when to hide, and when to fight. And for those accustomed to dealing with fearful things, fear focuses the mind... reminds them there are dire consequences for failure. Fear energizes their efforts. Fear fosters courage. And for those responsible for decisions in response to fearful things, Fear Defines Necessity... *Only* Fear Defines Necessity. However, Fear of Fear defines cowardice...

Astronomers have built a Fear of Fear consensus/conspiracy/cult: See No Fear/Hear No Fear/Speak No Fear/Think No Fear.

Rationalizations:

- The Probability is Low
- Impact events are periodic and have a regular frequency
- NASA's PDCO is a qualified PD agency
- We have cataloged all the EL Asteroids and we are safe
- Asteroids do not serendipitously change their orbits
- We can wait until we see one coming before we need to actually do anything
- We will see the next one coming
- The next one will be small
- The next one's detection-to-impact window will be large
- We will have a suitable launch/interception window
- Our technology will perform as advertised
- No God would suffer His Chosen Species the prospect of extinction by asteroid impact

The question is not deciding what we will choose to build and employ after we see it coming and know when it will strike and how large it is. Given the scope and scale of the response required may be if the asteroid is large and/or the Detection -To-Impact window is small, that would be nothing more than a formula for our sooner-or-later suicide by Cosmic impact.

The correct question would be what to build and employ before we see it coming. Before we know when it will strike and how large it is. And here we can only ever afford to hope for the best after we have become prepared for the worst. And before begins... Now!

And at even 10,000 times more effective than the first Second Best Alternative, that still means tens of gigatons of nuclear NEOMines predeployed to the orbit of Mars and a single very large nuke as a ready point defense either in LEO or on the Moon.

Therefore, strategically speaking, with the necessity and wisdom of having such a standing nuclear capability, other than to cater to those biased by a dire fear of Nukes, why would we ever need to consider using any of the Second Best Alternatives? Here, one tactic fits all size threats.

11.6 million years ago, Middle Miocene.

26.2

37.8 million years ago, Mid-Late Eocene.

28.2

66 million years ago, End Cretaceous.

27.9

93.9 million years ago, Cenomanian/Turonian.

51.1

145 million years ago, Jurassic/Cretaceous.

37.7

182.7 million years ago, Pliensbachian/Toarcian.

18.6

201.3 million years ago, Triassic/Jurassic.

50.9

252.2 million years ago, End-Permian.

26.2 - 28.2 - 27.9 - 51.1 - 37.7 - 18.6 - 50.9

If Siegal does not assume that the argument for periodicity includes the notion that all these extinction events are caused by the same existential condition Ie: Cosmic impacts, then if they have multiple causes he must be regard the periodic argument as their having some metaphysical cause Ie: God? Therefore, if he is being rational, in his counter argument for periodicity he must assume the same existential condition for all these events which clearly is not anywhere in evidence.

< (None)

While the impact of a large object would cause catastrophic damage, the damage caused by small impactors can still be immense.

4) mitigation through deflection and/or disruption;

The discovery and tracking of the near-Earth object (NEO) population is the first step in a viable planetary defense strategy.

Asteroid Grand Challenge, focused on “finding all asteroid threats to human populations and knowing what to do about them.”

Identifying all objects that pose threats to Earth is a fundamental objective of long-term planetary defense strategies that is accomplished by continually maintaining and improving survey capabilities.

characterization of NEOs is a key objective in planetary defense strategies.

< Notes: Too Late

After all, how can we think we are effectively preparing to defend the planet from the threat of cosmic impact events when we only ever consider the potential for the relatively small and and cheap and easy and lower harm threats and disregard those that are large and expensive and hard and cause the greatest harm of all? How is this wise?

In terms of the probability of both an asteroid's or comet's size for the next impact event, with the rational conditional probability, in general, the randomly occurring deterministic conditions that cause both large and small asteroids or comets to strike Earth are the same. Therefore the unobserved conditional probability for large or small asteroid or comet impact is always equal. There is no rational logic or comfort or safety to be found in the relative statistical/Frequency probabilities... unless we decide to do nothing.

STRATCOM

[<55wg.pa@offutt.af.mil>](mailto:55wg.pa@offutt.af.mil)

[<john.hyten@offutt.af.mil>](mailto:john.hyten@offutt.af.mil)

[<john.hyten@pentagon.af.mil>](mailto:john.hyten@pentagon.af.mil)

Gen. John E. Hyten, Sir:

At random, any asteroid of any size anywhere in the Solar System can become perturbed into an impact trajectory with Earth at any time. There is no reason to think that the next asteroid on its way to strike Earth will not do so tomorrow or that it will not be an extinction level impact event... Time is not on our side here and we have not even begun to become prepared to adequately respond to this threat. Today we can only pray for 100 years of continued good luck to become so.

This is not just some testosterone free super-sized science fair project for NASA. This is War. When will the US Military step up and stand in this Harm's Way?

2017 Strategic Assessment: [<http://Gaiashield.com/TFSW>](http://Gaiashield.com/TFSW). Hard copy delivered to President Trump and selected VIPs to-whom-this-should-concern under the cover: [<http://DearPOTUS.Com>](http://DearPOTUS.Com).

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly.

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group:

<http://Gaiashield.Com>

Typically, most impact events are by asteroids. And typically most of them are small. However, since all impact events, whether they are by Asteroids or Centaurs or Comets, are completely random, without any recursive pattern or periodicity, both in their occasion and magnitude, 'typical' does not translate to 'likely' next.

Therefore, since at random, any Asteroid or Centaur or Comet, of any size anywhere in the Solar System can become perturbed into an impact trajectory with Earth at any time. There is no reason to think that the next object on its way to strike Earth will not do so tomorrow or that it will not be an extinction level impact event... Time is not on our side here and we have not even begun to become prepared to adequately respond to this threat. Today we can only pray for 100 years of continued good luck to become so.

The history of failure in war, or in any other human endeavor, can be summed up in two words: "too late." – General Douglas MacArthur.

Risk Management is the art of rational applied pessimism. Optimism is anathema, Hope is a sin and appealing to random chance with expectations of Good Luck is just criminally stupid.

The Great Threat here would be when we look up in order to appreciate this condition and understand that at random the next asteroid impact could always occur tomorrow and that it could always be a extinction level event. The Greater Threat would be for those experts in a position of authority and influence to look up in order to appreciate this condition and fail to understand... or accept, this dire reality.

Enlightenment can be filled with fearful things. It takes courage to evolve.

#### First Principles of Risk Management

- 1) Define the threat.
- 2) Leave Nothing To Chance.
- 3) Optimism is anathema.
- 4) Trust but verify.
- 5) Prepare for the worst case first.
- 6) Only Fear Defines Necessity
- 7) Err on the side of caution, not cowardice.
- 8) Trust only in Preparation, Training and Vigilance for success.
- 9) Responsibility fosters superior foresight.
- 10) Ignore no relevant fact

On Fear: Since there is no rational reason to think that the next large Asteroid or Centaur or Comet on its way to strike Earth will not do so tomorrow and that it will not result in a Global human extinction level event, then in this there is no such thing as too much Fear.

*Victoria.P.Friedensen@nasa.gov*

Deciding to Act: Summary of NASA's Planetary Defense Coordination Office Activities to Define ,  
Thresholds for Government Decisions to Aid in Emergency Preparedness and Response

President Trump, Sir:

It has been 3,108 days since Bush signed the 2008 Space Act and first codified the Congressional mandate for the Executive Office to delegate a federal agency to address the threat of asteroid impact. Even though it was reiterated in Obama's 2010 Space Act, to date... No Joy. In that time, at A Million Miles A Day, The Next Large Asteroid on its way to strike Earth has closed 3,108 million miles closer to impact. Time is not on our side here... Tick Tock.

"The history of failure in war, or in any other human endeavor, can be summed up in two words... too late." - General Douglas MacArthur

The existential condition here is that any asteroid of any size anywhere in the Solar System, discovered or undiscovered, can become perturbed into an Earth-orbit crossing orbit and its inevitable or even immediate impact with Earth at any time. Due to the fact that there is no agency yet tasked with the funded mission and responsibility to fully address this threat, we are not even thinking about becoming prepared or trained or vigilant for this inevitability. Waiting until we see it coming before we decide to actually do what may need to be done in response is only likely to beg MacArthur's Too Late as Mankind's epitaph and famous last words.

Anything we can do before we see it coming we should do. And before we see it coming begins... Now!

Since this threat includes the prospect of our random, sooner-or-later extinction by asteroid impact, building and maintaining a comprehensive Planetary Defense will always be the most important thing Mankind can ever do. If you want America to be Great, Save the World. For

America to be First, take the first leading stem and show the planet how to save itself. And where Obama failed to find the courage to comply with his own law, execute part (b) SEC. 808 of the 2010 Space Act and delegate a responsible Federal Agency as the consequence of an Executive Order codifying our political will to deflect these objects as they become impending Earth impact threats and enabling the funding for our survival.

You can get up to speed here: 2017 Strategic White Paper at DearPOTUS.Com.

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly.

A Million Miles A Day,  
R. Dale Brownfield  
Gaiashield Group  
Gaiashield.Com

< Trump NEO Notes

We can only ever know when the next large asteroid on its way to strike Earth is not about to impact when we know, to a certainty, when it will...

We can only ever know when the next extinction level asteroid on its way to strike Earth is not about to impact when we know, to a certainty, when it will...

President Trump, Sir:

It has been 3,018 days, since Bush signed the 2008 Space Act and first codified the Congressional mandate for the Executive Office to delegate a federal agency to address the threat of asteroid impact. Even though it was reiterated in Obama's 2010 Space Act, to date: No Joy. In that time, at A Million Miles A Day, The Next Large Asteroid on its way to strike Earth has closed 3,018 million miles closer to impact. Time is not on our side here... Tick Tock.

Since this threat will always include the prospect for our extinction by some random large asteroid impact event, and because we can: Knowing which asteroid is The Next Large Asteroid on its way to strike Earth will always be the most important thing Mankind can ever know. Deflecting The Next Large Asteroid on its way to strike Earth will always be the most important thing Mankind can ever do. Being prepared to effectively respond to the threat of The Next Large Asteroid on its way to strike Earth will always be the most important thing Mankind can ever be.

**AND WE ARE NOT PREPARED.**

We have had the potential to develop the capability to respond to this threat for 50 years, since Apollo, and we knew of this threat even then. We had developed the capability to go to the Moon and Nukes enough turn the surface of the planet into a radioactive sheet of glass yet we lacked the wisdom to direct this ability to addressing this threat. So far we have done nothing more than count rocks in Space. This is War... and War is good for business: jobs and profits and taxes.

Except here, without all the dead soldiers and collateral damage. An economic stimulus.

Tomorrow, astronomers could discover the next 10 km extinction level asteroid on its way to strike Earth. On that day, the world will look to the US to take the lead in our response. By default, as its President, the responsibility will fall to you to know everything Mankind needs to know to save itself. On that day you will appreciate that we should have had some National Planetary Defense Agency becoming trained and experienced and expert in deflecting asteroids for 50 years. So before we see it coming would be the time to delegate such an agency and begin saving the world. And 'before' begins... NOW! Implement part (b) SEC. 808 of the 2010 Space

Act.

Strategic White Paper 2017: <http://DearPOTUS.Com>

The Universe is a dangerous place. It does not suffer dilettantes or fools gladly.

A Million Miles A Day,  
R. Dale Brownfield  
Gaiashield Group:  
<http://Gaiashield.Com>

Once upon a time there was a Big Bang... Cause/Effect, Cause/Effect, Cause/Effect and 15 billion years later, at A Million Miles A Day, we have some rock; hair-on-fire, screaming around our Solar System on course to the subjective center of the universe. On impact it will generate the equivalence of 1.2 Hiroshima bombs for every man woman and child on the planet: Game Over. No Joy. All there is, gone... Forever. Restart Darwin's Clock, again.

We have neither the standing tested capability  
to deflect even the smallest of these threats  
nor any reliable means to even see them coming.

What is required is a network of space based  
full spectrum surveillance observatories  
strategically deployed throughout the Solar System  
informing a squadron of nuclear armed BattleStar  
Class interceptor craft stationed to the orbit of Mars  
manned and operated by planetary defenders  
trained and experienced to the point of expertise.

We need to either build an effective Planetary Defense or  
expect to sooner-or-later go extinct by asteroid impact.

This existential condition will never change or go away.  
What we decide to do in order to effectively deal  
with this Cosmic Threat today we need to do forever.  
And what we can foresee we will need to do tomorrow  
we need to begin doing today!

Time is simply not on our side...  
The Sky Is Falling... *Now!*

And we start The Falling Stars War...  
here: <DearPOTUS.Com>

The Universe is a dangerous place.  
It does not suffer dilettantes or fools gladly.

*This Is War!*

Not some super-sized candy assed science fair project...

Si vis pacem inTerra, para bellum et Stellae!

Before you launch into your crusade against the wetlands of Washington, there is at least one important baby you do not want to throw out with the swamp water: part (b) SEC. 808 of the 2010 Space Act. To delegate a National Planetary Defense Agency to become prepared and expert in defending us from harm to the point of our random extinction by asteroid impact.

Your predecessor simply did not have the stones to comply with his own law and begin to wage this war.

You can single handedly Make America Great Again by taking the lead in saving Mankind from the threat of asteroid impact.

Stiffen the sinews, summon up the blood... Be copy now to men of grosser blood, And *show them how to war.*" -

Rep. James Bridenstine  
Mike Griffin

*Scott Pace* is the Director of the Space Policy Institute and Professor of the Practice of International Affairs at the George Washington University's Elliott School of International Affairs. ... His research interests include civil, commercial, and national security space policy, and ...

**Email:** [space1@gwu.edu](mailto:space1@gwu.edu)

**Address:** Elliott School of International Affairs; ...

**Phone:** 202-994-7292

Dr. Pace,

On the off chance you may have some influence on the next administration's space policy, I am sending you a working draft of my white paper <PDF attached> promoting the dire and urgent necessity for comprehensive and effective Planetary Defense. We can not allow this still newborn baby to be thrown out with the swamp water...

A Million Miles A Day

R. Dale Brownfield

Gaiashield Group: <<http://Gaiashield.Com>>

The Falling Stars War: <<https://youtu.be/9qmuQCFDjyc>>

Agency Delegation: <<http://DearPOTUS.Com>>

Mr. Coburn,

Nice reality check on colonizing Mars. You don't seem to be afraid to butcher a sacred cow or two. Want to try your hand on the logics of our nascent Planetary Defense program?

A Million Miles A Day

R. Dale Brownfield

Gaiashield Group: <<http://Gaiashield.Com>>

The Falling Stars War: <<https://youtu.be/9qmuQCFDjyc>>

Agency Delegation: <<http://DearPOTUS.Com>>

Daniel Ketchum

<http://www.inquisitr.com/3766555/asteroid-hitting-earth-could-kill-us-all-if-nasa-cant-stop-it-how-would-nasa-go-about-doing-this-when-the-time-comes/>

NASA Transition Authorization Act of 2016

<<https://www.congress.gov/bill/114th-congress/senate-bill/3346/text>>

< ELIE Table Notes

From Intro:

*the impact-cratering record, and come about because the record is short, incomplete, and may be a mixture of periodic and non-periodic components*

AKA: Random

Extended from Rampino:

*Table 2. Times of significant mass extinctions of marine genera for the last 260 Myr (after Raup & Sepkoski 1986, dates from Gradstein et al. 2012). Two potential extinction events are included.*

Extinction Age	(Myr)	Crater D/km	Interval	Asteroid D/km	Name
Middle Miocene	11.6	24	26	1	Ries

Mid-Late Eocene	37.8	90	28	4.5	Popigai
End Cretaceous	66	180	27	10	Chicxulub
Cenomanian/Turonian	93.9	25	20	1	Steen River
Aptian/Albiana	113a	39	32	2	Carswell
Jurassic/Cretaceous	145	70	23	3.5	Morokweng
Bajocian/Bathoniana	168.3a	40	14	2	Puchezh-Katunki
Pliensbachian/Toarcian	182.7	23	19	1	Rochechouart (?)
Triassic/Jurassic	201.3	85	51	4.5	Manicouagan
End-Permian	252.2	40		2	Araguainha

<i>Extinction Age</i>	<i>(Myr)</i>	<i>Crater D/km</i>	<i>Interval</i>	<i>Asteroid D/km</i>	<i>Name</i>
<i>Middle Miocene</i>	<i>11.6</i>	<i>40</i>		<i>2</i>	<i>Araguainha*</i>
<i>Mid-Late Eocene</i>	<i>37.8</i>	<i>&lt;51&gt;</i>	<i>85</i>	<i>26/39</i>	<i>~ Manicouagan</i>
<i>End Cretaceous</i>	<i>66</i>	<i>23</i>	<i>28/15</i>	<i>1</i>	<i>Rochechouart*</i>
<i>Cenomanian/Turonian</i>	<i>93.9</i>	<i>40</i>	<i>28/28</i>	<i>2</i>	<i>Puchezh-Katunki</i>
<i>Aptian/Albiana</i>	<i>113a</i>	<i>&lt;120&gt;</i>	<i>70</i>	<i>19/26</i>	<i>~ Morokweng</i>
<i>Jurassic/Cretaceous</i>	<i>145</i>	<i>&lt;150&gt;</i>	<i>39</i>	<i>32/30</i>	<i>~ Carswell</i>
<i>Bajocian/Bathoniana</i>	<i>168.3a</i>	<i>25</i>	<i>23/18</i>	<i>1</i>	<i>Steen River</i>
<i>Pliensbachian/Toarcian</i>	<i>182.7</i>	<i>&lt;176&gt;</i>	<i>19</i>	<i>15/8</i>	<i>~ Dellen</i>
<i>Triassic/Jurassic</i>	<i>201.3</i>	<i>180</i>	<i>18/25</i>	<i>10</i>	<i>Chicxulub*</i>
<i>End-Permian</i>	<i>252.2</i>	<i>24</i>	<i>51/51</i>	<i>1</i>	<i>Ries*</i>

<AIE actual>

/corrected from Table 1

\* correlation with Extinction Event

*Note. a potential extinction event*

Myr Intervals between selected >1km events:

SEE From Table 2: 51, 19, 14, 23, 32, 20, 27, 28, 26. (26.6 Myr avg.).

AIE From Table 1: 40, 13, 34, 22, 30, 24, 26, 31, 20. (26.6 Myr avg.).

Incidence Variance: 11, 6, 20, 1, 2, 4, 1, 3, 6.

Avg. Periodic Test: 30, 7, 3, 98, 4, 2, 76, 11, 9. (26.6 Myr avg.).

*SEE From Table 1: 26, 28, 28, 19, 32, 23, 15, 18, 51 (26.6 Myr avg.).*

*AIE From Table 2: 39, 15, 28, 26, 30, 18, 8, 25, 51. (26.6 Myr avg.)*

Even cherry-picked, not really periodic unless they are averaged. However, there is no general causality possible between AIE and SEE.

A) Only one actual ELIE: Chicxulub.

B) However, as a study on Categorically Large asteroid impact (over1km) - not included in his graph demonstrating periodicity:

5@ crater 20-24km/ Impactor 1-1.5km

Name/ Myr Ago/ Crater D/km/ Impactor D/km

Chesapeake Bay: 35/40/2

Montagnais: 50.5/45/2

**Kara: 70/65/3**

Manson: 73/35/2  
Manson: 74/35/2  
Dellen 89 ± 2.7/19/1  
**Tookoonoka: 128/55/3**  
Mjollnir: 142/40/2

Add these and the others to the graph and his periodic 'significant mass extinction' events become... random. You can usually get whatever result you want by cherry-picking: not considering all the evidence.

*Table 1. Ages with 1σ errors of the 37 impact craters used in the analyses (Impact Data Base 2015). Only ages >5 Myr ago and with errors of less than or equal to ±10 Myr were used and are listed here.*

Selection reduced the sample from ~68 to 37.

Impact crater:

*Graph/ Name/ Added/ Myr Ago/ Interval/ D >1km/ Interval >1km				
Steinheim	15.1 ± 1	0	4	
*Ries	15.1 ± 0.1	20	<b>24</b>	<b>20.2</b>
Chesapeake Bay	35.3 ± 0.1	0	<b>40</b>	<b>.4</b>
*Popigai	35.7 ± 0.2	0	<b>90</b>	<b>.7</b>
Mistastin	36.4 ± 4	1	<b>28</b>	<b>2.6</b>
Wanapitei	37.2 ± 1.2	5	7.5	
Haughton	39		<b>23</b>	<b>1</b>
Logancho	40		<b>20</b>	<b>9</b>
Logoist	42.3 ± 1.1	3	15	
Shunak	45 ± 10	1	3	
Ragozinka	46 ± 3	0	9	
Chiyli	46 ± 7	5	5.5	
Kamensk	49.0 ± 0.2	0	<b>25</b>	<b>1.5</b>
Gusev	49.0 ± 0.2	2	3	
Montagnais	50.5 ± 0.76	8	<b>45</b>	<b>14.5</b>
Marquez	58 ± 2	6	13	
*Chicxulub	64.98 ± 0.05	0	<b>180</b>	<b>.2</b>
Boltysh	65.17 ± 0.64	5	<b>24</b>	<b>9</b>
Kara	70.3 ± 2.2	4	10	
Manson	74.1 ± 0.5	2	<b>35</b>	<b>2.1</b>
Lappajarvi	76.2 ± 0.29	5	<b>23</b>	<b>12.8</b>
Wetumpka	81 ± 1.5	8	6.5	
Dellen	89 ± 2.7	2	<b>19</b>	<b>2</b>
*Steen River	91 ± 7	8	<b>25</b>	<b>24</b>
Deep Bay	99 ± 4	16	13	
*Carswell	115 ± 10	5	<b>39</b>	<b>5</b>
Oasis	120		<b>18</b>	<b>8</b>
Rotmistrovka	120 ± 10	1	3	
Mien	121 ± 2.3	2	9	
Vargeao Dome	123 ± 1.4	5	12	
Tookoonoka	128 ± 5	14	<b>55</b>	<b>2</b>
Tunnunik	130		<b>25</b>	<b>12</b>
Mjollnir	142 ± 2.6	0	<b>40</b>	<b>.5</b>



decades of darkness, and frozen in an ice age.

Now, a pair of researchers have new evidence to support a **link between cyclical comet showers and mass extinctions**, including the one that they believe wiped out the dinosaurs 66 million years ago. Michael Rampino, a geologist at New York University, and Ken Caldeira, an atmospheric scientist at the Carnegie Institution for Science, **traced 260 million years of mass extinctions and found a familiar pattern: Every 26 million years, there were huge impacts and major die-offs.** Their work was accepted by the Monthly Notices of the Royal Astronomical Society in September.

In recent decades, researchers using other methods have found evidence for a 26-million-year cycle of extinction on Earth, but the idea has remained controversial and unexplained. “I believe that our study, using revised dating of extinctions and craters, and a new method of spectral analysis, is strong evidence for the cycles,” Rampino told me.

“Kilauea is nothing. Kilauea is a flea.”

Other scientists who have researched mass extinctions are more measured about the latest findings. “I’m sort of agnostic [about the larger theory],” said Paul Renne, the director of Berkeley Geochronology Center. “But I was really disappointed to see they used an age-database for the craters which is full of outdated information.”

Renne is the author of [another new study](#) that focuses on the Chicxulub crater, the massive divot beneath the Yucatán Peninsula that was created by the same impact blamed for the extinction of the dinosaurs. Renne and his colleagues believe that the comet or asteroid that blasted into Earth and made Chicxulub also set off a global chain-reaction of volcanic eruptions that accelerated the end of the dinosaurs. Volcanoes were, they believe, erupting continuously for millions of years. Long enough to make Hawaii’s Kilauea, which has been flowing since 1983, seem laughable. (“Kilauea is nothing,” Renne told me. “Kilauea is a flea.”)

And while Renne is interested in the possibility that volcanism is tied to intervals of mass extinction, that possible connection doesn’t explain what kind of cycles might trigger the awakening of Earth’s most powerful magma systems on a global scale. That’s where theories about galactic periodicity come back into play.

“One of the earliest proponents of a periodic record [of mass extinction] was by a guy named Rich Muller,” Renne said. “He proposed a kind of phenomenological periodicity in which they didn’t really have a mechanism.” In other words, Muller found the 26-million-year pattern of mass extinctions on Earth, but didn’t immediately know what drove the cycle.

The latest findings from Rampino and Caldeira build on the idea that **regular comet showers cause intervals of mass extinctions**. The showers, the theory goes, are triggered by the movement of the sun and planets through the crowded mid-plane of our galaxy. As the sun crosses that region, it disrupts great clouds of space dust. Those clouds, in turn, throw off the orbit of comets, sending them careening toward Earth.

In another theory, planetary scientists suggested that one region of the solar system in particular, known as the Oort comet cloud, plays a key role in mass extinctions. The Oort cloud is a sprawling region at the border of our solar system that contains trillions of icy bodies. Muller put forth a popular hypothesis [in the 1980s](#) that said our sun has a sort of evil twin in the Oort cloud. This hypothetical star, he suggested, has an orbital cycle such that it would perturb its neighboring objects, and send 1 billion of them hurtling toward Earth every 26 million years. The star, a binary to the sun, was nicknamed Nemesis, and playfully referred to as the death star. “The binary star, or Nemesis theory, was an alternate to the Galactic-plane story,” Rampino told me. “But the star was looked for, but never found, so Nemesis theory is out of favor now.”

“[Muller] doesn’t even believe that anymore,” Renne told me.

If Rampino and Caldeira are correct, *the next mass extinction may not be far off—in geologic terms, anyway. Our little corner of the solar system crossed the plane about 2 million years ago, and we are now moving up and through it. “In the Galactic theory, we are near the Galactic plane, and we have been in the danger zone for a couple of million years,” Rampino said. “We are still close to the plane, maybe 30 light years above the plane, [and] a light year is 6 trillion miles ... We won’t come back across the plane for about another 30 million years.”*

<SS Galactic Year 250 M Earth Years>

**And while scientists can’t be sure when the next major comet or asteroid impact on Earth will be**, the one that is believed to have killed the dinosaurs still stands out as extraordinary, even by mass-extinction standards. The city-sized asteroid that created Chicxulub, for instance, released more energy than 1 billion nuclear bombs when it hit the Earth.

“There hasn’t been an impact large enough to cause a major mass extinction since the impact 66 million years ago,” Rampino said. “That was a 10-kilometer [six-mile] diameter asteroid or comet. The largest impactor in the last 66 million years was only 5 kilometers [3 miles] in diameter, which only has one-tenth the energy, so it probably wouldn’t have taken out the dinosaurs. In fact, if a 10-kilometer-sized object *had* hit in the last 66 million years, we wouldn’t be here. Our ancestors probably would have been knocked out.”

The obvious next question, of course, is how do we prevent the terrible fate the dinosaurs suffered? “These events are so rare in geologic time that the odds of even our great-great-great-great-great-grandchildren witnessing them are really low,” Renne said. “The ultimate proof, which is observation, is not going to be available to us, unfortunately.” (Or fortunately, depending on your priorities.)

In the meantime, scientists are actively scouring the skies, and calculating the orbits of monstrous comets and asteroids. “So far, none are on a collision course, but the work has just begun in earnest,” Rampino said. **“Once we know one is coming, then there are several options to divert the object. (You don’t want to blow it up, that will just increase the numbers of impactors.) One possibility is to have a nuclear explosion off to one side of the comet or asteroid, pushing it just slightly off course, or possibly just hitting the object with a rapidly moving space-craft would provide enough of a nudge.”**

< 51 U.S. Code § 20102

## **51 U.S. Code § 20102 - Congressional declaration of policy and purpose**

**(a) Devotion of Space Activities to Peaceful Purposes for Benefit of All Humankind.—** Congress declares that it is the policy of the United States that activities in space should be

devoted to peaceful purposes for the benefit of all humankind.

**(b) Aeronautical and Space Activities for Welfare and Security of United States.**— Congress declares that the general welfare and security of the United States require that adequate provision be made for aeronautical and space activities. Congress further declares that such activities shall be the responsibility of, and shall be directed by, a civilian agency exercising control over aeronautical and space activities sponsored by the United States, except that activities peculiar to or primarily associated with the development of weapons systems, military operations, or the defense of the United States (including the research and development necessary to make effective provision for the defense of the United States) shall be the responsibility of, and shall be directed by, the Department of Defense; and that determination as to which agency has responsibility for and direction of any such activity shall be made by the President.

**(c) Commercial Use of Space.**— Congress declares that the general welfare of the United States requires that the Administration seek and encourage, to the maximum extent possible, the fullest commercial use of space.

**(d) Objectives of Aeronautical and Space Activities.**— The aeronautical and space activities of the United States shall be conducted so as to contribute materially to one or more of the following objectives:

(1) The expansion of human knowledge of the Earth and of phenomena in the atmosphere and space.

(2) The improvement of the usefulness, performance, speed, safety, and efficiency of aeronautical and space vehicles.

(3) The development and operation of vehicles capable of carrying instruments, equipment, supplies, and living organisms through space.

(4) The establishment of long-range studies of the potential benefits to be gained from, the opportunities for, and the problems involved in the utilization of aeronautical and space activities for peaceful and scientific purposes.

(5) The preservation of the role of the United States as a leader in aeronautical and space science and technology and in the application thereof to the conduct of peaceful activities within and outside the atmosphere.

(6) The making available to agencies directly concerned with national defense of discoveries that have military value or significance, and the furnishing by such agencies, to the civilian agency established to direct and control nonmilitary aeronautical and space activities, of information as to discoveries which have value or significance to that agency.

(7) Cooperation by the United States with other nations and groups of nations in work done pursuant to this chapter and in the peaceful application of the results thereof.

(8) The most effective utilization of the scientific and engineering resources of the United States, with close cooperation among all interested agencies of the United States in order to avoid unnecessary duplication of effort, facilities, and equipment.

(9) The preservation of the United States preeminent position in aeronautics and space through research and technology development related to associated manufacturing processes.

**(e) Ground Propulsion Systems Research and Development.**— Congress declares that the general welfare of the United States requires that the unique competence in scientific and engineering systems of the Administration also be directed toward ground propulsion systems research and development. Such development shall be conducted so as to contribute to the objectives of developing energy and petroleum-conserving ground propulsion systems, and of minimizing the environmental degradation caused by such systems.

**(f) Bioengineering Research, Development, and Demonstration Programs.**— Congress declares that the general welfare of the United States requires that the unique competence of the Administration in science and engineering systems be directed to assisting in bioengineering research, development, and demonstration programs designed to alleviate and minimize the effects of disability.

**(g) Warning and Mitigation of Potential Hazards of Near-Earth Objects.**— Congress

declares that the general welfare and security of the United States require that the unique competence of the Administration be directed to detecting, tracking, cataloguing, and characterizing near-Earth asteroids and comets in order to provide warning and mitigation of the potential hazard of such near-Earth objects to the Earth.

(h) **Purpose of Chapter.**— It is the purpose of this chapter to carry out and effectuate the policies declared in subsections (a) to (g).

< SMPAG Things to do

***Functions proposed by Action Team on NEOs for the SMPAG (A/AC.105/C.1/1029)  
Work to be done (in the coming years)***

*44. A SMPAG should be established by MS with space agencies. Its responsibilities should include:*

*(a) Recommendation and promotion of key research required for planetary defence.*

- Develop a rational and strategically relevant assessment for the risk of asteroid impact in order to assess the scope and scale of any eventual response and justify the preparation, training and vigilance necessary for the conduct of effectively implementing that response.

Any assessment of the risk that is based in any part on Frequency/Statistical Probability will be inherently non rational and strategically irrelevant.

- Theoretical research in A) the operation of thermonuclear explosive devices in space and B) their effectiveness in terms of generating force. A precursor to a series of conformational empirical tests: reference missions.

If we are going to plan on using Nukes at any point we must have a reasonable expectation of their effect. A) The world's current nuclear arsenal is not designed for operating in the rigorous environs of space. B) The current differential in the theoretical yield-to-force ratio is 2,000 times (Holsapple/Dearborn).

- Margins of Error required for designing tactical aspects of asteroid interdiction missions: Probability Ellipse, Technological Failure, Target Mass.

- Suitable Launch-Window availability and interception/transit probability analysis.

*(b) Identification of research opportunities for international collaboration on technologies and techniques for NEO deflection.*

- Increased (modern/post Cold War treaty) yield efficiency and Space Capable operation of thermonuclear explosive devices in space: develop a Nuclear NEO Mine.

*(c) Development and adoption of a set of reference missions addressing a variety of potential NEO impact scenarios and deflection and disruption possibilities.*

- Confirm the effectiveness of Nukes empirically. At least 3 missions: test for complete vaporization. exploding and deflecting asteroids through ablation. Even the opponents of Nukes cede the necessity for Nukes after 200 meters and as a 'last resort' if the Detection-To-Impact Window is small: a Plan B. Despite any reservation for their use, what we look for in a Plan B is a high degree of certainty it will work.

Since at its lowest theoretical effectiveness Nukes can be seen to be at least 10,000 times more effective than any of the Second Best Alternatives, consider that one Atlas V can convey a 5 ton 25 Mt yield thermonuclear device to heliocentric orbit. Such a system should afford complete vaporization of anything up to a 75 meter asteroid requiring execution only days before impact; safely explode up to a 500 m threat as close as 18 months before impact; and given 10 years before impact, with a 10 times margin of error easily deflect up to a 1,250 m threat. However, with a 10,000 m threat it would require 500 such nuclear payloaded Atlas Vs to save the planet from asteroid impact... and Mankind from its Extinction by NEO.

Let the diplomats at the UN chew on that... Smart money would bet on their grasping at any straw that affords them a high degree of dissociative denial. After all, they are expert at believing their own lies. It's part of the job description.

*(d) Development of decision and event timelines for a variety of potential Earth impactors and trajectories identified for mitigation campaign analysis;*

Although 'event timelines' will always be event specific in detail there are minimal categorical assumptions we will have to live with in any Detection-To-Impact Window.

From the back end, as things stand:

- A) Displacement Window: 10 years (working number for deflection), 18 months (intentional explosion), 10 days (vaporization).
- B) Execution of Force Window: 10 days (multiple Nukes or KI)
- C) Transit Window: 3 to 5 years (subject to target orbital elements)
- D) Launch Window Window: 3 to 5 years (random chance probability subject to target orbital elements, Murphy's Law and weather permitting: Good Luck)
- E) Construction Window: 5 years (select, develop, design, build, test, train payload/launch vehicle/team)
- F) Political Window: 5 to 10 years (educating decision makers, Policy/Agency/Funding and likely a CYA precursor characterization mission.)

From a Risk Management (pessimistic) perspective that would be 35 years... for one rocket. Add a couple years for each rocket after that. And at some point start adding launch facilities as well.

Time and Chance can never be taken to be on our side here. Only rational pessimistic foresight leading to far more Preparation, Training and Vigilance than we are currently considering will dramatically reduce both the strategic and tactical challenges we will face on the day NEO PuckerTime comes.

*(e) Evaluation of technical maturity and consequences of deflection techniques;*

Since Nukes, in terms of payload mass to Work/DV, in an ablation approach can be seen to be theoretically at least 10,000 times more effective than any of the Second Best Alternatives; Can be used to either decelerate or accelerate an asteroid; Can be employed in standoff or surface or subsurface approach; Can be applied incrementally over time or at once; Can be delivered in either a high velocity flyby or slowly dropped from a rendezvous in co-orbit: Can also be employed to vaporize or explode an asteroid as needed; Would be the only alternative for asteroids over 200 meters or loosely bound rubble piles of any dimension... what more could we possibly want in a tool to deflect asteroids? One Tactic fits all size threats! It's like what Oppenheimer should really have had in mind when he invented the things. 'Behold, I have become Oppenheimer, Saver of Words'...

However, the thousands of thermonuclear devices presently stored around the world were only designed to be launched only into the upper atmosphere to fall harmfully back to Earth. As is, they are *devices*, they may not tolerate being launched to heliocentric orbital velocities or capable of operating as advertised outside Earth's Magnetosphere, at -240C, in hard vacuum, at Zero G for what may be 4 or 5 years...

SMPAG needs to recommend research and development of Space Capable Nuclear NEO Mines. Which may include the potential for making them Earth Friendly: incapable of detonation on or near Earth.

In the shadow of the threat of Extinction by Asteroid Impact what really needs to mature here is Mankind's love of Nukes. And that can begin with SMPAG. You need to stop treating Nukes like they were the Devil's own tools. You are engineers of technology. How can you allow the irrational fear of high energy systems dictate reasoning based in physics? How can you allow weakness based Politically Correct ideology influence your math? Nukes are not Evil. Nukes don't kill people. People kill people. And asteroids. Asteroids kill people. Plan A: Use Nukes to kill Asteroids! Win/Win.

*(f) Recommendations to the appropriate decision-makers, in collaboration with IAWN, on criteria and thresholds for action*

It needs to be understood by decision makers that with most foreseeable worst-case scenarios wherein the asteroid is either large or the Detection-to-Impact Window is small, or both, to hold any reasonable expectation of success 'action' (as much as possible) must be taken before we see it coming... Now! Such action would include Politics: Policy Determination, Agency Delegation and Funding, training; tactical selection and development; mission design, construction and even predeployment to some strategically advantageous position in heliocentric orbit. If our strategy here does not include a response to the worst-case scenarios, then the question here should be at what point do we abandon managing this risk and choose to take it, gamble, and leave our fate to an expectation of continued good luck... Hope.

Otherwise, the notion of a 'threshold for action' will always be event specific with to many variables to try and determine any formulaic certainty before the fact. As things stand, these considerations will include:

- Size of the Detection-To-Impact Window
- Size of the Asteroid
- Composition, cohesion and structure of the Asteroid
- Orbital Elements of the Asteroid: Launch Window and Mission Transit time
- Tactic available for response: Nukes or No Nukes
- Effectiveness of Nukes
- Degree of readiness: Preparation/Training/Predeployment
- Precursor Characterization mission results
- Political Will: Policy/Agency/Funding effectiveness decisions post detection.

*(g) Recommendation of a minimum acceptable Earth-miss distance and/or other criteria for deflection targeting;*

One meter would work... at least for large asteroids. But for the smaller potential Window Buster bolides: keep them out of the atmosphere, say LEO. However, realistically, anyone charged with the responsibility for defending the planet is going to want to cram as much Nuke as it can into all the rockets it can commandeer and Alpha Strike the rock. After all, there is no such thing as

deflecting it to much... The notion of 'a minimum acceptable Earth-miss distance' is strategically irrelevant and only interesting on paper to academics as Rocket Surgery.

This question does beg a determination for how much Margin of Error we should plan to build into our response mission in order to afford a reasonable expectation of success... even if it is only one meter.

*(h) Recommendation of operational responsibilities for a mitigation campaign;*

Ideally, as a security issue, the strategic C3 responsibilities would be best delegated to the world's military agencies that already have an evolved culture and mindset for going in harm's way, responding to dire threats, discretionary authority for the disposition of Nukes and already represent half the world's space capabilities. The world's dedicated space agencies, given their experience in heliocentric orbit and manned space flight would endeavor to evolve and develop a more tactical role responsible for the execution, logistical, maintenance and eventually, the manned elements of our Planetary Defense capabilities.

*(i) Preparation to coordinate with the relevant actors involved in the implementation of the threat response;*

At this point, SMPAG will likely seen by Decision Makers and any 'relevant actors involved' as just another impotent UN diplomatic gesture. Lip service. No teeth. At best, no more than bringing a knife to a gunfight.

To fix this, at any cost, by any means necessary: Be the smartest guys in the room. Be the first to tell truth to power. Remind them that failure is not an option... And before the fact endeavor to make sure that '*the relevant actors involved in the implementation of the threat response*' are well informed and wise enough to do what works. Do not leave the quality and capability of the 'relevant actors' up to just Chance and the vagaries of Politics. Then, they will not even think of leaving home to Save the World without you.

Of course with the current strategy of waiting before we see it coming before we prepare a response, SMPAG will have to develop and maintain itself to actually be the smartest and actually know the truth and actually see what all the paths to failure look like and how to actually scare 'the relevant actors involved' enough to desperately want to become informed and wise... forever. Of course this would also require somehow qualifying and approving the Member States' delegates to SMPAG... then take them to school. A rigorous and comprehensive Masters course in Planetary Defense. A delegate to SMPAG should be a very high paying full time job... a career objective. Only the best and the brightest need apply. This is, after all, about defending the planet and the survival of our species.

However, if you can get the powers-that-be to build and deploy a Planetary Defense in response to the worst case scenario *before* they see it coming, then all they will ever have to do is just point and shoot. KISS. Once you do that you can declare victory and go home.

Or you can take the path of least resistance and just suck up to the Decision Makers and 'relevant actors involved' by telling them all the cheap and easy/Don't Worry Be Happy optimistic things they want to hear. And when the Smoke and Mirrors and Good Luck sophistry fit only for public consumption fails, and we are about to see our civilization and culture and half the world's population exterminated by some 5,000 meter asteroid, they can cover their political ass and point to the international collection of fools at SMPAG as their expert scape goat...

*(j) Identification of any potential legal issues (e.g. liabilities) that may arise in undertaking NEO mitigation actions or selecting any likely mitigation option;*

It should be illegal that the Executive Officer of any nation on the planet disregard or fail to appropriately respond to the threat of asteroid impact. Dereliction of Duty. A Failure of Fiduciary... and make it a Capital Offense.

Otherwise, the notion of using Nukes in space is a treaty issue. Technically not a legal issue. No penalties or punishments attach. And treaties can be abrogated simply by breaking them the consequence being allowing the other parties to do the same.

In the event of a failure to respond or a flawed response wherein either result in harm to a sovereign state, since the effect can always be seen to be the product of insufficient funding, the fault and liability shall fall back to the sponsoring member states: ideally, everyone. And as in most disaster and emergency situations dedicated first responders should be saved and held harmless from any specific liability. In that it is already a convention for the nations of the Earth to render assistance and facilitate recovery to each other in the event of natural or man made disasters it should not be conceptually difficult to codify by treaty such response in this specific case.

And since this issue seems to be logically heading for an international mutual Planetary Defense Treaty fold in an ad hoc exception for Nukes, disaster relief and protection for first responders.

*(k) Communication of its activities to the international community;*

Complete transparency. Real time and recorded online video and posted English transcripts of all meetings. And complete reciprocity. Easy e.access to our nation's delegates and all officers of SMPAG. Real email addresses! not those double damned email utility forms.

*(l) Provision of a yearly briefing to the Committee on the Peaceful Uses of Outer Space on the status of its activities.*

Screw COPUOS. They can send someone to the meetings and write their own report. Or follow it online. Unless of course they are going to come up with some funding...

UN/COPUOS just put the band together. Thank you. We needed that. But unless they are going to help finance writing the songs and building the show they can buy the CD like everyone else. Did they even offer a woodshed for you to practice in? Diplomats! All gall no geterdone.

*(m) Given the limitations of our current state of science and technology, recommend the level of predetection preparation required to address this threat in its worst responsible case manifestation .*

The recommendations of COPUOS presented here seem to all be based on the assumption that the next asteroid on its way to strike Earth will be small and that the Detection-To-Impact Window will be large. A product of an optimistic and critically flawed risk assessment. Given that it is the role of SMPAG to shape and inform a global strategy for responding to this threat, this responsibility should include a recommendation for ex ante preparations and standing deployments in response to this threat in the event that the next asteroid on its way to strike Earth is not small and/or the Detection-To-Impact Window is not large... and our expectations of Good Luck are proven wrong.

(n) Recommend a level of training, experience and expertise for the 'relevant actors' to develop and maintain in their dedicated Planetary Defense personnel.

This can only be effectively achieved by practice. We should be deflecting an asteroid every 5 to 10 years. Longer than that and personnel moves up and out to different jobs.

(o) Recommend that criterion for IAWN in terms of what constitutes early detection, as an integral element of our response should be determined by and subordinate to SMPAG.

Surveillance not Survey. The Stargazer battle cry of 'Find them early, Find them early, Find them early' sounds good... to them. But the Rocketboys, who are ultimately going to be responsible for doing the heavy lifting and actually doing the Work of moving these cosmic mountains, are concerned about the Stargazers Finding them early *enough!* It's bad enough that they are only tasked with finding only 90% but then 90% of an estimate... their estimate. After all, all that is required for one asteroid impact is one asteroid. Then, once they find them they track them only long enough to determine their current orbital elements then move on to find another one. As if these rocks never bump into each other or become perturbed in close keyhole passages and change their orbits. And why only NEOs? Is there any reason that the next asteroid on its way to strike Earth can not come directly from the Main Asteroid Belt?

Deflection must dictate the criterion for Detection. The other way around will only work as a matter of Good Luck. The Stargazers are limited only by Funding whereas the Rocketboys are limited by Time and Physics... and Funding. But when NEOPucker Time comes, no amount of money will buy us more Time or new Laws of Physics.

In short, if we are going to detect all the asteroid impact threats to Earth we are going to have to watch all the asteroids in the Solar System all the time... forever.

(p) To address the suggestions of COPUOS, SMPAG will need to be a collection of engineers of both technology and method.

As such, No Gods or Odds allowed. Abandon all Optimism, Hope and expectations of Good Luck. Using the laws of Physics in a Deterministic Universe it is your job to stack the deck, fix the race, load the dice... game the system. Cheat. Tempered only by value and capability Leave Nothing To Chance. Anything less would be gambling. We The Species can do that for free and without your help... and the only question then would be "Do you feel lucky...?"

(q) SMPAG shall establish a budget and mandate an annual contribution for the general operation of SMPAG to be charged to the Member States pro rata their respective GDP.

Much of the preliminary research, educational and organizational activities will need to be able to be done by SMPAG in advance of submissions and solicitations for funding any ad hoc projects. You would think that an organization charged with the responsibility for Saving the World would at least have an office and a couple of full time employees. Otherwise the principal activity for the delegates to SMPAG will be panhandling money from their government.

(z) Since "*The primary purpose of the SMPAG is to prepare for an international response to a NEO threat through the exchange of information, development of options for collaborative research and mission opportunities, and to conduct NEO threat mitigation planning activities.*"

Then in the direction of enabling these ambitions and as a first rational step and strategic recommendation by SMPAG for developing an effective response to the threat of asteroid

impact:

You don't get what you don't pay for... If SMPAG is to ever actually *do* anything well it must be well funded. Their first and key-stone recommendation in the direction of preparation to respond to this threat needs to be that now, before we see the next one coming, at least the Space Capable nations involved in SMPAG must independently adopt and codify a National Policy to *endeavor to deflect these objects as they present themselves to be impending Earth impact threats*. This much can not be left to be a tacit understanding.

Such a policy would inherently compel the formal delegation of a National Planetary Defense Agency to become trained, expert and ultimately responsible for executing this policy. Then, and only then, through these responsible national agencies, can funding sufficient for actually preparing to respond to this threat be solicited and appropriated. (Which would include the funding necessary for achieving the stated and implied objectives of SMPAG.) Then, with NATO as a model, these individual national agencies can come together around a codified universal 'Human' Policy to form an international agency of agencies... a practical extension of SMPAG on steroids and with sharp pointy teeth, so to speak.

A more top-down alternative approach could take the form of a UN sponsored treaty, principally addressing the space capable nations, establishing and codifying a basic 'Human' Policy and expression of Global Political Will to defend the planet from this threat. Such a treaty should necessarily oblige signatories to both delegate a dedicated responsible National Planetary Defense Agency and (like NATO) appropriate an annual percentage of their national GDP (0.1%) through this agency to cooperatively develop and maintain an effective global response to this perpetual threat.

Whether you want to have pizza for dinner or want deflect The Next Large Asteroid on its way to strike Earth, first a Decision is made to do so. Second, some Agent is tasked with the responsibility for executing the decision. Third, Money is committed in order to conduct and implement the decision's execution. This is just 'Doing things 101'.

Further, at the other end of the spectrum, in the absence of a collection of national codified policies compelling the creation of dedicated National Planetary Defense Agencies enabled by suitable levels of funding, there will be no response-able recipient to find any practical value in any of the recommendations, guidance and advice produced by SMPAG. And the work products of SMPAG will end up being just another collection of grossly underfunded academic reports and result in nothing more than the appearance of actually doing something relevant in response to this threat. You may as well just post your findings on-line under the caption of "To Whom This Should Concern".

I understand that you and your fellows want to drill down into designing new technology and developing space missions and engineering method, but unfortunately, Politics first.

Note: In the 2008 Space Act the US Congress mandated the delegation of a responsible federal agency to deal with this threat and the President signed it into law. By mid 2009 the ASE had submitted its proposal for the notions of IAWN, MPOG and MAOG to UN-COPUOS for consideration in the General Assembly. It is possible, if not likely, that given the nature and disposition of this administration the ASE/UN initiative served to deflect any momentum and blunt any political will to take the lead and codify a national policy and formally delegate a responsible agency until after the UN considerations were completed. Perhaps any political issues would be resolved or revealed or just hoping this buck would be passed... That was 5 years ago. After failing to comply with this law by the 2010 deadline this administration reiterated the

mandate in the 2010 Space Act with a new 2012 deadline. However, failing to meet that deadline or doing anything to date, this administration has now failed to comply with its own law...

As such, we should consider that the US is likely primed to respond to a general recommendation from the UN/SMPAG for an expedited policy determination and agency delegation - and a reminder for the US government to do what it had already decided needed to be done 6 years ago. With such a commitment the rest of the nations of the world will quickly follow suit. And the money will flow. Some tone of urgency would be warranted. After all the next large asteroid on its way to strike Earth is closing at a million miles a day... and we are not prepared. Tic Toc.

A Million Miles A Day,

R. Dale Brownfield

Gaiashield Group:

[<http://Gaiashield.Com>](http://Gaiashield.Com)

Agency Delegation:

[<http://Gaiashield.Com/NEOHearing>](http://Gaiashield.Com/NEOHearing)

[<http://DearPOTUS.Com>](http://DearPOTUS.Com)

< PD Counter Arguments

A Guide to Counter Arguments, Logics and Truths Against Building a Hope Based Planetary Defense.

Definitions:

Random

Rational

Strategic

Tactical

Hope Based Planetary Defense

Givens:

Billion Years

We Don't Know

One Asteroid

- Policy/Agency

- Random

- Probability:

Strategic Relevance

Conflation

Risk Reduction

Averaged Relative Frequency

- Preparation/Training/Vigilance

- Nukes:

Fear Based Political Correctness

Holsapple vs Dearborn

Basket of Tactics

- Science vs Strategy

- Optimism Bias:

Hope

Fear of Fear

Best Case Assumptions

Appeals to Random Chance With an Expectation of Good Luck

- Early Detection
- Extemporaneous Response
- Asteroid/Asteroid/Comet Impact/Keyhole Perturbation
- Neo NEO
- Last Neo
- No More Extinction Level NEOs to be discovered... Safe now.

< NEOShiva

As "Training material for the Asteroid Grand Challenge" NEOShiva would be a tool designed and intended not for training the sheep but rather a tool for training the shepherds... although the sheep would get a kick out of it too. But designed first for training the senior personnel and decision 'makers' in our National Planetary Defense Agency... in case ever get one.

As a strategic war game it would present the OPFOR as a possible impending asteroid impact in a randomly generated Red Flag/Blue Flag scenario where imaginable variables involved in responding to this threat will be exercised: determined and resolved by a modified cast of the dice (virtual). All stages and relevant elements of a Detection-to-Impact Window ranging from Politics to a Displacement Window would be exercised. And at any point what we may want to do to save the world can fail... and the asteroid can win. After all, the objective of a strategic war game is to test our standing capabilities and preparedness and reveal and demonstrate vulnerabilities in responding to a foreseeable threat.

Look at this as a game where the asteroid and computer program is the Red Flag First Person Shooter behaving at random and the Blue Flag as the rest of the players behaving strategically... as targets. If this is seen as a game then sooner-or-later it will be a true "Ender's Game".

Master Strategist

Expert Risk Manager

Professional Decision Maker

A consequence of nearly 50 years as a serial entrepreneur building and operating over a dozen businesses. A list of specific tactical skills would be to long to go in to here...

Gaiashield Group: Founder <<http://Gaiashield.Com>>

War Zone GTS: Founder <<http://War-Zone.Com>>

Dear POTUS <DearPOTUS.Com>

Cinema III Theaters: Founder

Primary Power Corp: Founder

Brownfield Wood Products: Founder

Union 76 Truck Stop: Operator

Exit Farm: Co-Founder

West Labs: Co-Founder

Sippin' Lizzard Coffee House: Co-Founder

\*Probably not the kind of 'Maker' you are looking for, however there are two things that prompted me to make this application.

Second: Access to the back end hacker skill sets that would be needed to develop this idea in an electronic/video format. I can see and develop the idea old school as a US MilSpec war game or even RPG. But the only video game I've ever even played was Asteroids... for an hour... on Atari.... when it was new. So hook me up with a qualified community space/group... thingie. Any development funding generated can go to the hackers. I'm comfortable working pro bono up front and on spec/if come.

But First: You're sponsored by DARPA and may be a conduit to get this tool To Whom This Should Concern... da/nyet?

< 10 Things

Ten Things the NEO Experts Have Neglected To Tell Us

Existential Threat:

- 1) All asteroid impact events are random, without any recursive pattern, both in their occasion and magnitude... which includes the prospect of our extinction.
- 2) The perturbation of an asteroid's orbit due to asteroid/asteroid and asteroid/comet collisions as well as close (Keyhole) gravitational passages with small and large planetary objects is a common, if not constant randomly occurring condition.
- 3) No matter how complete, the random survey of an estimated asteroid population will always leave the possibility for one undiscovered asteroid.
- 4) New Near Earth-orbit Objects can be generated from stable Main Belt populations at any time and can be on a near-term Earth impact trajectory.
- 5) The notion of an actual asteroid impact frequency is false. Consequentially,

Strategic Risk:

- 6) The best and only responsible definition of the threat would be The Next Large Asteroid on its way to strike Earth.
- 7) Agency Delegation is the first and most important next step to responding this threat.
- 8) Detection-to-Impact Window.
- 9) The Strategic Relevance of of information: what is essential to the conduct of implementing a response, often effectively discounts or discards what is only academic information.
- 10) Whatever we decide to do in response to the threat of asteroid impact we will have to do Forever. The Existential Threat will never go away or become diminished.

Tactical Risks:

Mission mass is the principal determinate to both mission cost and effectiveness.  
Launch Windows

Technology Failure  
Probability Ellipse  
Target Mass  
Nukes Rule!  
LP Comets

< 2010 Space Act

SEC. 808. <<NOTE: 42 USC 18387.>> NEAR-EARTH OBJECT SURVEY AND POLICY WITH RESPECT TO THREATS POSED.

(a) Policy Reaffirmation.--Congress reaffirms the policy set forth in section 102(g) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2451(g)) relating to surveying near-Earth asteroids and comets.

(b) Implementation.--The <<NOTE: Deadline.>> Director of the OSTP shall implement, before September 30, 2012, a policy for notifying Federal agencies and relevant emergency response institutions of an impending near-Earth object threat if near-term public safety is at risk, and assign a Federal agency or agencies to be responsible for protecting the United States and working with the international community on such threats.

< HR 2687

**H.R.2687: National Aeronautics and Space Administration Authorization Act of 2013 (Introduced in House - IH)**

## **SEC. 322. NEAR-EARTH OBJECTS.**

(a) Findings- Congress makes the following findings:

(1) Near-Earth objects pose a serious and credible threat to humankind, as many scientists believe that a major asteroid or comet was responsible for the mass extinction of the majority of the Earth's species, including the dinosaurs, nearly 65,000,000 years ago.

(2) Similar objects have struck the Earth or passed through the Earth's atmosphere several times in the Earth's history and pose a similar threat in the future.

(3) Several such near-Earth objects have only been discovered within days of the objects' closest approach to Earth, and recent discoveries of such large objects indicate that many large near-Earth objects remain to be discovered.

(4) The efforts taken to date by the Administration for detecting and characterizing the hazards of near-Earth objects must continue to fully determine the threat posed by such objects to cause widespread destruction and loss of life.

(b) Definition- For purposes of this section, the term 'near-Earth object' means an asteroid or comet with a perihelion distance of less than 1.3 Astronomical Units from the Sun.

(c) Near-Earth Object Survey- The Administrator shall continue to discover, track, catalogue, and characterize the physical characteristics of near-Earth objects equal to or greater than 140 meters in diameter in order to assess the threat of such near-Earth objects to the Earth, pursuant to the George E. Brown, Jr. Near-Earth Object Survey Act (42 U.S.C. 16691). It shall be the goal of the Survey program to achieve 90 percent completion of its near-Earth object catalogue (based on statistically predicted populations of near-Earth objects) by 2020.

(d) Warning and Mitigation of Potential Hazards of Near-Earth Objects- Congress reaffirms the policy set forth in section 20102(g) of title 51, United States Code (relating to detecting, tracking, cataloguing, and characterizing asteroids and comets).

(e) Program Report- The Administrator shall transmit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate, not later than 1 year after the date of enactment of this Act, an initial report that provides--

- (1) recommendations for carrying out the Survey program and an associated proposed budget;
- (2) analysis of possible options that the Administration could employ to divert an object on a likely collision course with Earth; and
- (3) a description of the status of efforts to coordinate and cooperate with other countries to discover hazardous asteroids and comets, plan a mitigation strategy, and implement that strategy in the event of the discovery of an object on a likely collision course with Earth.

(f) Annual Reports- The Administrator shall annually transmit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report that provides--

- (1) a summary of all activities carried out pursuant to subsection (c) since the date of enactment of this Act; and
- (2) a summary of expenditures for all activities carried out pursuant to subsection (c) since the date of enactment of this Act.