Asteroid Impact Over Russia: SDE Proposal Grips the World

by Benjamin Deniston

Feb. 17—In the Fall of 2011, it was leaked that Russian Deputy Prime Minister Dmitri Rogozin was proposing a joint U.S.-Russian effort to protect the planet from the threat of both nuclear missile strikes, and asteroid and comet impacts. By calling his proposal the Strategic Defense of Earth, Rogozin clearly reflected the Strategic Defense Initiative (SDI) program of Lyndon LaRouche, the late physicist Edward Teller, and President Ronald Reagan. LaRouche and his associates immediately responded in full support of an open technology-driver program for the defense of Earth in the spirit of the SDI.[1]

In contrast, President Barack Obama has continued his pursuit of a U.S./NATO strategic advantage over Russia and China, with the European ABM system and the "Pacific pivot," driving the world towards thermonuclear war.

In immediate response to the asteroid impact over Russia on Feb. 15, 2013, Rogozin reiterated his proposal for cooperation, saying that neither Russia nor the United States presently has the capability to defend the Earth from these threats, and there needs to be an international effort. He cited the key roles of Russia, the U.S., China, and Europe. Prime Minister Dmitri Medvedev has reportedly tasked Rogozin to put together a program for both detecting threatening objects in advance, and ensuring they don't hit the Earth.

The chairman of the Russian State Duma International Affairs Committee, Alexei Pushkov, called for an international effort to defend the Earth from asteroids, saying, "Instead of creating a (military) European space defense system, the United States should join us and China in creating the AADS—the Anti-Asteroid Defense System."

With each passing day more political and scientific officials are demanding action on this cosmic issue.

The world is buzzing with coverage of the meteorite impact, with the force of a thermonuclear warhead,[2] over an industrial region of the Ural Mountains in Russia on Feb. 15. But there is a fundamental question missing from most of the coverage.

Why did this meteorite explode over the Earth? The impact is not just a consequence of a cosmic event. Scientists, military officials, and even some politicians

1. LaRouchePAC and *EIR* have been unique in seriously covering this proposal. For example, see Benjamin Deniston,"As World War Threatens, Russia Proposes SDE," *EIR*, Nov. 25, 2011; Rachel Douglas, "Strategic Defense of Earth: Russia To Put SDE at Top of Agenda," *EIR*, May 4, 2012; Benjamin Deniston, "The Thermonuclear Option: Extinction or Existence," *EIR*, May 25, 2012; and the LaRouchePAC interview with Russian space agency (Roscosmos) chief Vladimir Popovkin, on May 27, 2012.

2. The official estimates released by NASA are that the object (which can be called either a tiny asteroid or a meteor) was 17 meters in diameter, weighed 10,000 tons, and released the same amount of energy as 500 kilotons of TNT, 30 times more powerful than the bomb dropped on Hiroshima during World War II, and about the same power as the larger of the thermonuclear warheads arming the U.S. standard Trident missiles.

have been warning about the danger of asteroid and comet impacts for decades, and the fact that this meteorite was able to blindside planet Earth is a consequence of the failure of the economic and strategic policies of the past three decades, as much as anything else. For example, if the SDI program, specifically as proposed by LaRouche (and supported by Teller and Reagan)[3] had been adopted, there is no doubt that the technological spinoffs would have enabled mankind to, at this point 30 years later, deal with threats like the meteorite that impacted Russia.

FIGURE 1
NASA Estimates of Near-Earth Asteroid Population by Size Range*

Size Range (Diameter in Meters)	Estimated Population	Number Discovered	Percentage
0-30	11.5 million	~1150	0.01%
30-100	500 thousand	~1950	0.40%
100-300	21 thousand	~2100	10.00%
300-1,000	4800	~2400	50.00%
1,000 and larger	904	~850	94.00%

*As presented by Lindley Johnson in May 2012.

While much of the media is now reacting to this impact from the standpoint of practical responses which fit within the current political-economic framework, the significance of this special delivery from the Solar System is that it expresses the failure of the current paradigm.

In response to the recent meteorite impact, LaRouche stressed that mankind has lost three decades of progress, and that is the issue that must be addressed. The current lack of the necessary means to defend Earth expresses the failure of the three combined Presidential terms of the two Bushes, and the even worse Presidency of Obama. At this point, the only way to develop the necessary capabilities to truly defend Earth is with a full-scale, international science-driver program. NASA must be unleashed on a scale not seen since Apollo, in a collaborative program with Russia, China, and other nations, to develop the technologies and space infrastructure needed to fundamentally increase mankind's capabilities in the Solar System. To get to the heart of the issue, the mission to develop an operational capability on Mars, along with the entire range of space-based infrastructure required to permanently expand civilization's capabilities in space, is the best possible way to ensure the defense of Earth.

The thermonuclear-sized explosion that hit Russia without warning, on the very same day that the asteroid 2012 DA14 made the closest pass to Earth ever witnessed for an asteroid of its size, has now put this imperative in clear focus.

The Challenges Posed on Feb. 15, 2013

Start with the undeniable and obvious lessons from these two events.

First, the impact in Russia came without warning, literally out of the blue. Part of the difficulty was that it was approaching the Earth from the direction of the Sun (coming out of the morning sky), which makes it harder to detect—but that is not the whole story. The particular size poses a unique challenge because of the difficulty of seeing objects that small over astronomical distances, and because of their great number. As of 2012, NASA estimates that there are over 11 million near-Earth asteroids less than 30 meters in diameter. Only about 1,150 have been found. That leaves 99.9% of these small objects yet to be discovered.

The object that struck Russia, at about 17 meters in diameter, expresses a very important physical boundary. Any smaller, and it would not have grabbed headlines around the world. A little bigger, and a large number of people would have been killed, and the city of Chelyabinsk could have been leveled. So this size provides an useful lower boundary for the size of near-Earth objects that need to be discovered and tracked (**Figure 1**).

While this impact grabbed the world's attention, the big event that day was supposed to be the flyby of asteroid 2012 DA14, which serves as a perfect example of the second aspect of the challenge. Being three times larger—about 40 meters across—DA14 would have delivered a much larger blast if it had struck the Earth. For reference, DA14's size is comparable to the asteroid or comet fragment which is believed to have struck the uninhabited Tunguska region of Siberia in 1908, leveling

3. It is important to emphasize that Reagan personally was fully committed to the LaRouche-Teller concept of the SDI, as an open technology-sharing program with the Soviet Union, based on developing "new physical principles" associated with laser and beam systems, and not part of an offensive program. Further documentation of this has been presented in recent declassifications. For example, see the book review by Jeffrey Steinberg, "President Reagan Was Fierce Opponent of Mutually Assured Destruction Doctrine," *EIR*, April 29, 2005.

trees over an area of 2,000 square kilometers. If this had hit over any major city, the result would have been more than broken windows and minor injuries; millions could easily have been killed in a matter of minutes.

DA14 was only discovered one year before it made its close pass. With present technologies, this would not have been enough time to deflect the asteroid if it had been on an impact trajectory.[4] If the warning time is significantly longer, preferably a decade at minimum, some experts believe it would be theoretically possible to stop asteroids of a certain size from impacting the Earth, although no concrete program has been implemented, and many experts stress that the technologies still need to be developed and tested.

Feb. 15, 2013 was about as close a warning as possible without causing a disaster. If the meteor over Russia had been a little larger, or if 2012 DA14 had a slightly different orbit, the consequences would have been tragic.

Flying Blind

An array of practical responses is now being discussed in response to this recent cosmic intervention. Some of these are already in the process of being developed, and others are longstanding proposals. Most of the individual systems provide important and even critical improvements, but alone or together, they do not meet the challenges defined by the events of Feb. 15. While these systems are important as aspects, nations must start from a comprehensive approach to the challenge.

Currently, NASA has not been given the mission to systematically find near-Earth asteroids of this size range. In the 1990s, Congress told NASA to find 90% of the large near-Earth objects (NEOs), measuring 1 kilometer and larger (which was completed recently). This led to a modest but successful series of dedicated observation systems, with the LINEAR and Catalina Sky Survey programs leading the way in finding these large asteroids. In the NASA Authorization Act of 2005, Congress ordered NASA to find 90% of the near-Earth asteroids, at sizes down to 140 meters, by 2020. Based on the current observation systems, and any others currently being funded or built, the authoritative National Research Council report "Defending Planet Earth" shows that the 2020 goal will not be met (see **Appendix 1** for analysis of the 140-meter target).

In addition to NASA, there are other institutions making efforts to find potentially threatening asteroids, and studies of how to possibly defend the Earth from an impact. These include the SpaceGuard alliance, the NEO Shield program, the United Nations Working Group on Near-Earth Objects, extensive amateur efforts, and more. However, to the best knowledge of this author, there is presently no national or international mission to systemically find the asteroids down to a size of 20 or 30 meters, and to develop the capability to ensure they don't impact the Earth.

At a NASA press briefing following the impact in Russia, a NASA/JPL (Jet Propulsion Lab) official was asked where the United States stands on finding and defending against objects of this size. He could only restate NASA's current mandate, "defending the Earth against tiny asteroids such as the one that passed over Siberia and impacted there is a challenging issue that is something that is not currently our goal."[5]

It must be emphasized that this is not the fault of NASA. Anyone claiming that this is NASA's fault is ignorant of the basics of how the U.S. government functions. NASA does what it is told to do, and does it well; but it has not been tasked to do this, nor has it been given the funding required to do what it has been asked to do. Because of this, other initiatives are being pursued to find the hundreds of thousands of neighboring asteroids which could pose a threat to the Earth.

Perhaps the best and most promising is the Sentinel Mission of the B612 Foundation. A non-profit started by a group of scientists, including former NASA astronauts Ed Lu and Rusty Schweickart, B612 is focused on defending the Earth from asteroids; they announced last year that they are attempting to raise private funding to launch an infrared space telescope to get a better reading of the asteroid population. The mission is to place the telescope closer to the Sun, in an orbit like that of Venus, where it will have a better view of the asteroids that can't be easily seen from the Earth because of the glare of the Sun.[6]

4. For analysis of warning time requirements, see the comprehensive report, "Defending Planet Earth, Near-Earth Object Surveys and Hazard Mitigation Strategies," by National Research Council's Committee to Review Near-Earth-Object Surveys and Hazard Mitigation Strategies, published in 2010.

5. See the Feb. 16 Space.com article by Mike Wall, "Russian Fireball Won't Be Last Surprise Asteroid Attack. "

6. An infrared space telescope in a Venus-like orbit has been recognized as a high priority for planetary defense for years. It was included in the recommendations provided by the NASA Ad-Hoc Task Force on Planetary Defense, which submitted their final report in 2010. No NASA funding has been provided for this project.

Scheduled to be launched in 2018 (if the $450 million private funding can be raised), the Sentinel Mission would take a huge step toward locating the population of near-Earth asteroids, but would still fall short of the challenge posed on Feb. 15. Over 500,000 new asteroids would be expected to be found by such a mission, including more than 50% of the near-Earth asteroids about 40 meters across (the size of 2012 DA14), according to B612's analysis. This would be a crucial component of a real Strategic Defense of Earth system, but it still would miss the other half of these 40-meter asteroids, and even more of the smaller ones, down to the size of the 17-meter object that exploded over Russia this past week. Although this is a very worthwhile effort, global security should not have to rely on philanthropists (see box).

Active Defense

Developing a map of the asteroid population is one aspect of the challenge, but we must also develop the capability to stop these space rocks from impacting the Earth. Most of the recent focus has been on how to deal with larger asteroids, and concern with scenarios involving very long warning times. As of the time of the impact in Russia, the challenge of stopping smaller objects with shorter warning times was not even on the agenda of the U.S. government.

The most that NASA has been able to do to address these threats, is to provide $5 million for the telescopes of the Asteroid Terrestrial-impact Last Alert System (ATLAS) project, which would be able to provide one week warning time before the impact of an asteroid the size of DA14 (less time for smaller objects; more time

Insane Priorities

Throughout his Presidency, Barack Obama has continued an offensive strategic policy against Russia and China. The development of the NATO ABM system in Europe and the "Pacific pivot" have forced military and strategic posturing not seen since the Cold War. At the height of these tensions, on Feb. 15, 2013, the Solar System delivered a message: Planet Earth will be wiped out if we continue in that direction; that is, if we don't destroy ourselves with thermonuclear warfare first.

A particular example of these inverted priorities is the refusal to share military data with civilian scientists. Longtime asteroid expert Clark Chapman, and former Apollo astronaut turned planetary defense expert Rusty Schweickart, have called for the data from military satellite systems to be released to the scientific community to aid science and the defense of Earth.

As reported in an article on Space.com ("Russian Meteor Fallout: Military Satellite Data Should Be Shared," by Leonard David, Feb. 18, 2013), Chapman wrote, "The satellites that monitor the skies around the world for missile launches also detect brilliant incoming meteoroids, including startling events much smaller than the Chelyabinsk bolide.... In the past, these data have been partly withheld from the scientific community. They should be released immediately, while scientists, emergency management officials, and others are trying to understand what has happened, where people might have been hurt, and where valuable meteorites might be found."

Schweickart stated, "There's no question that data sharing here is critical.... We need to learn as much as possible from these incidents, and without jeopardizing any legitimate national security consideration, what they have should openly be shared with the rest of us."

These assessments are corroborated in the 2010 National Research Council report, "Defending Planet Earth," in which it is stated, "U.S. Department of Defense satellites have detected and continue to detect high-altitude airburst events from NEOs [Near-Earth Objects] entering Earth's atmosphere. Such data are valuable to the NEO community for assessing NEO hazards." The report recommends that "data from NEO airburst events observed by the U.S. Department of Defense satellites should be made available to the scientific community to allow it to improve understanding of the NEO hazards to Earth."

A full-scale Strategic Defense of Earth program will only work if the most advanced technologies and science are shared and applied to the challenges facing all mankind in an international effort. This was a key feature of the SDI which Dr. Edward Teller and Lyndon LaRouche fought for.

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for larger ones), giving enough time for evacuation. Although this is an obvious part of a layered defense system, mankind deserves much better than this alone.

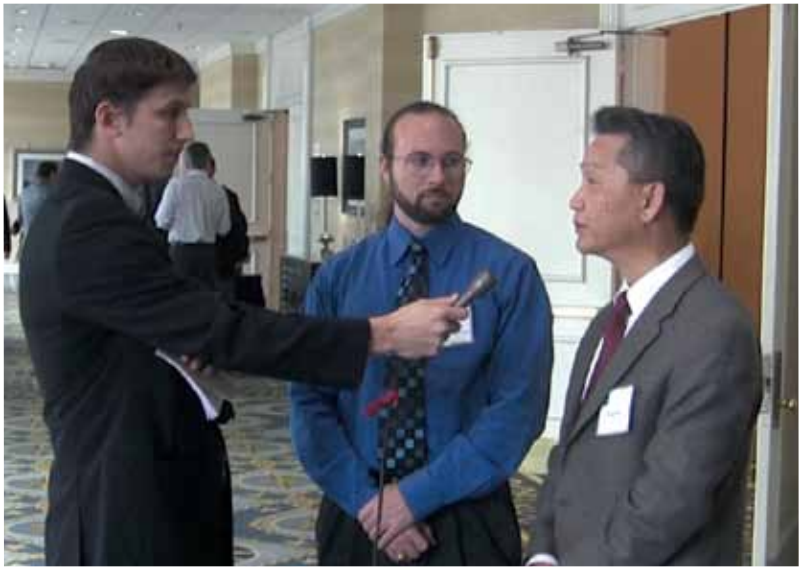
DA14 is a useful example. Discovered only one year before its extremely close flyby (beneath our communications satellites), if it had been on an impact course, there would not have been enough time to mount an effective defense. Most studies of asteroid deflection indicate that it would require many years, and ten years is often cited as a preferable minimal amount of warning time, since the deflection mission would need to be designed, built, launched, and actualized. While better observation systems will help to provide longer warning times, the ability to defend mankind from an asteroid of 25 or 30 meters across, coming in with a very short warning time, has been shown by the recent events to be critical.

The only active NASA-supported study attempting to address this, is being funded by a small grant provided by the NASA Innovative Advanced Concepts program. Prof. Bong Wie, the director of the Asteroid Deflection Research Center at Iowa State University (see box), has been provided funding for his team to study the challenges of intercepting small asteroids, when there is only few months to a few years of warning time. Because short warning time usually translates into very fast intercept speeds, and due to the small size of the target, there are still significant difficulties to be worked out (for example, trying to hit a 100-meter target traveling at 40,000 miles per hour). Obviously, the smaller the target and shorter the warning time, the more difficult the challenge becomes. This particular study, while important, does not address objects below about 40-50 meters, or extremely short warning times, such as weeks or a couple of months.

Bottom line, the United States government has no active program to stop impacts like the one that occurred in Russia, and only a tiny amount of funding going into a study that might be able to deal with objects of the size of 2012 DA14—that is, if they happen to be discovered with enough warning.

Another option that has resurfaced in response to the events of Feb. 15, is the potential use of directed-energy systems, such as lasers, to move or vaporize

Interview: Hypervelocity Asteroid Deflection



NASA, under its Innovative Advanced Concepts program, is providing a limited amount of funding to solve the challenges of intercepting small to medium-size asteroids at very high speeds, and when there is minimal warning time available. This research is being led by Bong Wie (Iowa State University) and Brent Barbee (NASA Goddard Space Flight Center), with their "Hypervelocity Asteroid Intercept Vehicle" concept, a two-part spacecraft, designed to operate at very high intercept speeds, utilizing a thermonuclear explosive device to break apart the threatening asteroid.

Wie and Barbee were interviewed by LaRouchePAC at the Fall 2012 NASA Innovative Advanced Concepts (NIAC) Symposium, Nov. 14-15, 2012, held in Hampton, Va. (See, *EIR* Nov. 30, 2012, or www.LaRouchePAC.com/node/24563 for the video.)

FIGURE 2

Planetary Defense Technology Is Decades Behind

	Propulsion Systems	Deflection/Destruction Options
Available in 1992	⅄ Chemical rockets	⅄ Nuclear explosives ⅄ Kinetic impact
Development by 2012	⅄ Nuclear rockets ⅄ Electric propulsion (solar and nuclear) ⅄ Mass drivers	⅄ Nuclear rockets as thrusters ⅄ Lasers ⅄ Hypervelocity penetrations ⅄ Brilliant darts
Development beyond 2012	⅄ Hypervelocity lunar launch ⅄ NEO defense in Earth orbit	⅄ DHe3 fusion driver ⅄ Anti-matter

In 1992, Edward Teller and other veterans of the SDI project participated in an international workshop at Los Alamos National Laboratory, on defending the Earth from near-Earth asteroids. One objective of that workshop was to assess what general categories of technologies were available at the time; what could be developed within the next two decades (by 2012); and what might be available later. Even though this assessment was a step down from the technological goals of the SDI, the baseline technologies employed today are barely beyond those of 1992, as seen in this representation of their table.

Source: Workshop Summary, "Assessment of Current and Future Technologies, Proceedings of the Near-Earth Object Interception Workshop," Los Alamos National Laboratory, N.M., Jan. 14-16, 1992, pp. 225-34. Published Febuary 1993; D.G. Rather, G.J. Canavan, J.C. Solem; Sandia National Labs, Albuquerque, N.M.

threatening objects.[7]

Serious studies of the applicability of lasers to defend the Earth go back decades. Dr. Claude Phipps, a 30-year veteran of Lawrence Livermore and Los Alamos laser work, presented a number of studies throughout the 1990s on the potentials for laser-deflection of asteroids and comets. More recently, a team working with UC Santa Barbara physicist Philip Lubin has presented its concept of the space-based Directed Energy Solar Targeting of Asteroids and Exploration (DE-STAR) system, which they claim could be used to vaporize threatening asteroids. However, this is still just a concept, and the designs are based on solar energy as the power source. Nuclear reactors inherently provide a much denser and greater power source, although their utilization in space has been long delayed.

The speed of laser systems could provide a significant advantage for dealing with the challenges of small asteroids with short warning times (**Figure 2**).

A Future-Based Response

Despite the flurry of press coverage about possible responses to the recent cosmic events, there are certain hard facts that must be recognized. First, as of this writing, there is no commitment from the U.S. government to systemically find the potentially threatening near-Earth objects, down to the size of either the one that exploded over the Ural Mountains in Russia, or DA14, which passed beneath our communications satellites the same day. Second, if we happen to get lucky and discover an asteroid a short time before it hits, there is no existing capability that would stop that impact from occurring.

What has been presented so far is only a brief overview of the specific challenges posed by the two events of Feb. 15. There are many other aspects to the challenge, some easier, others more difficult.

For example, the threat of long-period comets is usually completely left out of consideration, because they are less frequent, and pose challenges well beyond the capabilities of our current systems, requiring that we look very deep into the outer Solar System.

As LaRouche has stressed, the recent failure to defend the Earth is an expression of 30 years of lost time. The events of Feb. 15 demonstrate that mankind is running far behind the scientific and technological capabilities that we need to defend life on Earth. This will not be solved by taking proposals that were on the table yesterday, and trying to use the recent events as the excuse to get them through. Programs have to be enacted which make up

7. For example, a laser applied to the surface of an asteroid can vaporize the material over a small section, creating a thrust which can alter the asteroid's orbit over time.

for decades of lost time, making the focus on developing Mars as a Solar System outpost an absolute necessity.

The question is, whether three generations from today, people will look back and recognize this point as a time of change, as a great wake-up call for the inhabitants of our planet, when nations adopted a fundamental change in policy, and took up an international science-driver effort for the Strategic Defense of Earth as the new priority for mankind.

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APPENDIX I

Comparison of Different Options for Finding 90% of Near-Earth Objects 140 Meters Across and Larger

Project	Location	Years to discover 90% of 140 meter NEOs	Years to Build Project	Status
Catalina Sky survey	Arizona and Australia	Can't achieve 90%	Already operational	Already operational
Lincoln Near-Earth Asteroid Research	New Mexico	Can't achieve 90%	Already operational	Already operational
Discovery Channel Telescope	Arizona	Can't achieve 90%	?	Not fully funded
Panoramic Survey Telescope and Rapid Response System 1 (PS1)	Hawaii	Can't achieve 90%	1	Funded by Air Force
Panoramic Survey Telescope and Rapid Response System 4	Hawaii + other locations	Can't achieve 90%	5	Not fully funded
Large Synoptic Survey Telescope (LSST)	Chile	12-17 years	10	Under current funding full operations begin in 2022
Space-based infrared telescope	L1/L2	11	5	No funding
Space-based visible telescope	L1/L2	16	6	No funding
Space-based infrared telescope	Venus	7.5	5	B612 private initiative
Space-based visible telescope	Venus	7	5	No funding
Combined space-based infrared and PS1	Venus and Hawaii	5.5	5	No funding
Combined space-based infrared and LSST	Venus and Chile	3-4'	7	No funding

All information is taken from the 2010 National Research Council report, "Defending Planet Earth," the only exceptions being the updated information on the status of the Large Synoptic Survey Telescope (LSST), from the NRC'S website, and the 2012 announcement of the non-profit B612 Foundation, that it is raising funds to build and launch a space-based infrared telescope into a Venus-like orbit.