

Asteroid Strike! Asteroid Mining! Will the Air Force Have a Role?

Lt Col Peter Garretson, USAF

In 2008 Doug Kaupa and I wrote an article for *Air and Space Power Journal* that laid out potential roles for the Department of Defense (DOD) and the Air Force regarding planetary defense.¹ We were not the first to do so. Rather, we followed a tradition of Airmen before us who did some of the most important thinking on the subject, including retired Air Force brigadier general Dr. Simon “Pete” Worden, retired Air Force colonel Dr. Lindley Johnson, Col Marty France, Col Rex Kiziah, and Dr. Jim Oberg.² In both *Spacecast 2020* and *Air Force 2025*, a visionary Air Force of two decades ago foresaw a future role and mission of protecting planet Earth.³ Furthermore, the last major project in my capacity as chief of Future Technology in the Air Force’s Strategic Planning Directorate was the only multiagency “war game” designed to determine how the US government might realistically attempt to deflect an impending asteroid strike.⁴ Participants included the National Security Council, Joint Staff, Office of the Secretary of Defense, National Aeronautics and Space Administration, Defense Threat Reduction Agency, Missile Defense Agency, Coast Guard, and Department of Homeland Security.

In 2010, as a strategist on the former chief of staff of the Air Force’s Strategic Studies Group, I laid out in an internal memorandum Air Force equities and potential organizational implications of the service’s role in planetary defense. I argued that, assuming the mission was highly consonant with our other war-fighting requirements (space situational awareness [SSA] and space control), it would offer the Air Force a deep-space mission which would create requirements advancing propulsion, proximity operations, and noncooperative capture. Moreover, the mission would give our service a visionary quality as a global force for good that would be inspiring, aid recruiting, and attract public support. I estimated that an initial operational capability against the more likely

and lower-end threats might cost the nation on the order of \$500 million to complete the survey using an SSA asset similar to a space-based space-surveillance infrared telescope in a Venus-like orbit, a budget for ready-to-launch reconnaissance probes (about \$150 million each), and interceptor busses capable of accepting multiple physics packages with adaptors for multiple launch vehicles (about \$250 million each). Not surprisingly, most people have little appetite for a subject they don't perceive as "real" war fighting and consider a "low-probability event." In fact, years before Kaupa and I began to promote planetary defense, the earlier cadre of Air Force Space Command advocates staffed a package to the Joint Requirements Oversight Council to establish a formal mission requirement. In accordance with the wisdom of the time, the council denied it. Let's repeat that: no requirement to protect planet Earth exists.

Perhaps the fact that the recent meteor strike in Russia and the close pass of an asteroid rose to presidential-level attention spurred some interest in and consideration for our "black swan" scenarios, risk assessments, and "horizon" forecasts. Top-down interest succeeds in bureaucracies whereas bottom-up suggestions fail. Perhaps some individuals will wake up after the meteor strike over Chelyabinsk, a major Russian military industrial town, which injured 1,100 people and cost \$33 million, damaging 4,000 buildings, blowing out cell-phone communications, and shattering a million feet of glass windows.⁵ A subject that once drew polite giggles as "Bruce Willis sci-fi" is no longer a laughing matter. Indeed, the meteor narrowly missed hitting both a Russian nuclear arsenal and a chemical weapons storage facility.⁶ Moreover, a senior Russian statesman, Vladimir Zhirinovskiy, publicly (and mistakenly) blamed the strike on the United States: "Those were not meteorites; it was Americans testing their new weapons."⁷ Such mistakes of intention could have the most serious of consequences. In his testimony to Congress, Brigadier General Worden, then the director of operations for US Strategic Command, speculated on the seriousness of

such an event during a crisis between nuclear powers such as India and Pakistan.⁸

It is time we took SSA for asteroids seriously. When our nation had a US Space Command, it commissioned a study called the Natural Impact Warning Clearinghouse, but the command was dissolved before implementation, and US Strategic Command does not appear to have picked up the study.⁹ Despite the fact that the *National Space Policy* tasks the DOD with SSA for homeland defense and space control, to date the department has not considered asteroids part of this mandate.¹⁰ In fact I was unable to convince the Air Force, Office of the Secretary of Defense, or US Strategic Command to defend their equities and argue for the mission when H.R. 6063, National Aeronautics and Space Administration Act of 2008, forced the director of the President's Office of Science and Technology Policy to assign a lead agency.¹¹

The problem is not going away. Regarding asteroid 2012 DA14's close pass, the Association of Space Explorers publicly stated that "we know there are 500,000 to 1 million asteroids the size of DA14 or larger. So far we have found fewer than 1% of that 'cosmic hailstorm' through which we sail in our yearly orbit around the Sun."¹² Furthermore, the association's presentation to the United Nations Committee on the Peaceful Uses of Outer Space noted that as new telescopes come online, in a little over a decade we likely will be tracking as many as 1 million near-earth objects, of which 10,000 may have some probability of striking Earth in the next 100 years, and that 50 to 100 will appear threatening enough to require active monitoring and/or deflection.¹³

More Airmen might seriously consider the requirements of an asteroid defense system, given our traditional respect for the Russian space program and the fact that the Russians have become increasingly vocal about the need to build such a system, have examined meaningful architectural designs, and have raised attention about such threats to a high level in their national security system.¹⁴ Further, we should

consider the geopolitical linkages. In April of last year, with no advance knowledge that within a year fire would rain down on their nuclear/chemical weapons town, Nikolai Patrushev, the Russian Security Council secretary, and Vitali Davydov, the deputy head of Roscosmos (Russian Federal Space Agency), stated that the subject their third international security conference in June would include, as one of its major subjects of discussion, the necessity of international cooperation for asteroid defense. Afterwards, Patrushev confirmed that the “space threat from asteroids” had been an important topic at the meeting and called for international cooperation on readiness and potential deflection measures.¹⁵ Such linkages involve our most serious trusts—nuclear devices. We should also note the explanation given to the Russians by the Chinese Foreign Ministry regarding China’s unwillingness to sign the comprehensive nuclear test ban treaty: “The door to peaceful nuclear explosions should not be closed, at least not now” because “mankind needs to keep developing ‘peaceful’ nuclear weapons in case a giant asteroid is discovered careering through space on a collision course with the earth.”¹⁶

I have also argued that Airmen should prepare themselves for a world in which billionaire-backed private companies like Planetary Resources Incorporated and Deep Space Industries can survey, access, move, and mine asteroids. In such a world, wealth in and from space amounts to more than just bits, and our economy moves outward into the inner solar system.¹⁷ Developing the requisite technology allows the Air Force to play a role similar to its function in aviation, whereby the service’s investment in jet engines and large aircraft catalyzed intercontinental air transport—35 percent of global trade by value now moves by air.¹⁸ By retiring the risk for deep-space transportation and noncooperative capture and deflection, we not only would advance Air Force and security equities under a banner of pursuing a global public good but also would lay the foundation for a revolution in space

transportation and wealth generation in which even the smallest metal asteroid is worth trillions of dollars.¹⁹

If we wish to become the visionaries who lead America toward becoming a true spacefaring and enduring nation that survives such existential threats as asteroids, then we must pursue not simply narrow military power but general spacefaring and its supporting industry, just as Rear Adm Alfred Thayer Mahan set us on the right course in naval power and as Brig Gen William “Billy” Mitchell did so in airpower. The Air Force is missing the boat (or spaceship). If the service truly wants to be America’s Space Force, it can’t shy away from this “growth industry” and what will likely become the most essential defense mission of a space force / space guard—planetary defense, the single mission that provides a deep-space requirement. To cede this requirement is to fall into the same precedent as the Army Air Corps, which conceived of airpower as nothing more than a supporting function for land power. A space force cannot just downward; it must look outward to the source not only of danger but also of wealth and opportunity.

Notes

¹ Lt Col Peter Garretson and Maj Douglas Kaupa, “Planetary Defense: Potential Mitigation Roles of the Department of Defense,” *Air and Space Power Journal* 22, no. 3 (Fall 2008): 34–41, <http://www.nss.org/resources/library/planetarydefense/2008-PlanetaryDefense-PotentialMitigationRolesOfTheDepartmentOfDefense.pdf>.

² See, for example, James Oberg, “Planetary Defense: Asteroid Deflection & the Future of Human Intervention in the Earth’s Biosphere” (presentation at the Futures Focus Day Symposium sponsored by the commander in chief, US Space Command, Colorado Springs, CO, 23 July 1998), <http://abob.libs.uga.edu/bobk/oberg.html>.

³ See “Preparing for Planetary Defense: Detection and Interception of Asteroids on Collision Course with Earth,” in *Spacecast 2020* (Maxwell AFB, AL: Air University, Air Education and Training Command, 1994), R-1 through R-33, <http://www.nss.org/resources/library/planetarydefense/1994-DetectionAndInterceptionOfAsteroidsOnCollisionCourseWithEarth.pdf>; and COL John

M. Urias et al., “Planetary Defense: Catastrophic Health Insurance for Planet Earth,” in Air University 2025 Support Office, *Air Force 2025* (Maxwell AFB, AL: Air University 2025 Support Office, 1996),

<http://www.nss.org/resources/library/planetarydefense/1996-PlanetaryDefense-CatstrophicHealthInsuranceForPlanetEarth-Urias.pdf>.

⁴ Peter Anthony Garretson and Lindley N. Johnson, “Results of Multi-Agency Deflection and Disaster Exercise” (presentation at the First IAA Planetary Defense Conference: Protecting Earth from Asteroids, Granada, Spain, 27–30 April 2009), http://www.cfr.org/content/thinktank/Planetary_Defense_Garretson_v11.pdf; and Headquarters Air Force, Directorate of Strategic Planning, *Natural Impact Hazard (Asteroid Strike) Interagency Deliberate Planning Exercise After Action Report* (Washington, DC: Headquarters Air Force, Directorate of Strategic Planning, December 2008), <http://www.nss.org/resources/library/planetarydefense/2008-NaturalImpactAfterActionReport.pdf>.

⁵ “Russian City Hit by Meteor: 1,200 People Hurt,” *ABC News*, 16 February 2013, <http://abcnews.go.com/GMA/video/russian-city-hit-meteor-1200-people-hurt-18518828>.

⁶ Hans M. Kristensen, “Meteors against Nukes,” *FAS Strategic Security Blog*, 17 February 2013, <http://www.fas.org/blog/ssp/2013/02/meteors-against-nukes.php>; and Associated Press, “About 1,100 Injured As Meteorite Hits Russia with Force of Atomic Bomb,” *Fox News*, 15 February 2013, <http://www.foxnews.com/science/2013/02/15/injuries-reported-after-meteorite-falls-in-russia-ural-mountains/>.

⁷ Michael Santo, “Russian Politician States Friday’s Meteor Explosion Really a ‘U.S. Weapons Test,’” *Examiner.com*, 16 February 2013, <http://www.examiner.com/article/russian-politician-states-friday-s-meteor-explosion-really-a-u-s-weapons-test>.

⁸ US Space Command, “Hearing Statement: ‘The Threat of Near-Earth Asteroids,’” Brig. Gen. Simon Worden, United States Strategic Command,” 3 October 2002, SpaceRef Interactive, <http://www.spaceref.com/news/viewsr.html?pid=6723>.

⁹ SSgt A. J. Bosker, “Near-Earth Objects Pose Threat, General Says,” *Space Daily*, 17 September 2002, <http://www.spacedaily.com/news/deepimpact-02s.html>.

¹⁰ President of the United States, *National Space Policy of the United States of America* (Washington, DC: White House, 28 June 2010), 7, 13, 14, http://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf.

¹¹ “H.R. 6063, National Aeronautics and Space Administration Act of 2008 (Enrolled As Agreed to or Passed by Both House and Senate),” National Space Society, 4 May 2009, <http://www.nss.org/resources/library/planetarydefense/HR6063.html>.

¹² “13 February 2013 Status Update,” Association of Space Explorers, <http://www.space-explorers.org/committees/NEO/neo.html>; and “Asteroid Discovery - 1980–2012 - UHDTV,” YouTube video, 3 min. 14 sec., 6 September 2012, <http://www.youtube.com/watch?v=xJsUDcSc6hE>.

¹³ Russell L. Schweickart, chairman, Association of Space Explorers Committee on Near-Earth Objects, “The Asteroid Impact Threat: Decisions Upcoming” (presentation at the 37th Committee on the Peaceful Uses of Outer Space Scientific Assembly, Montreal, Canada, 13–20 July 2008), [1], [2], <http://www.oosa.unvienna.org/pdf/nataact/neo/2008-aseE.pdf>.

¹⁴ V. V. Adushkin et al., “Conceptual, Technological and Legal Bases of Creation of the International Planetary Defense System,” n.d., accessed 8 July 2013, http://www.tsi.lv/space/SGS1020_221%20-%2005.07.10/Adushkin/IAA-RACT%20C2%20S3-03.pdf.

¹⁵ “Patrushev Speaks on International Planetary Defense Cooperation,” LaRouchePAC, 9 June 2013, <http://larouchepac.com/node/22979>.

¹⁶ Patrick E. Tyler, “Chinese Seek Atom Option to Fend Off Asteroids,” *New York Times*, 27 April 1996, <http://www.nytimes.com/1996/04/27/world/chinese-seek-atom-option-to-fend-off-asteroids.html>.

¹⁷ “Mining Asteroids: Planetary Resources,” YouTube video, 3 min., 15 sec., 24 April 2012, http://www.youtube.com/watch?v=V_5XXVblllw; and http://www.youtube.com/watch?v=pIY_fmVFDhM.

¹⁸ US Department of Transportation, Federal Aviation Administration, *The Economic Impact of Civil Aviation on the U.S. Economy* (Washington, DC: US Department of Transportation, Federal Aviation Administration, August 2011), http://www.faa.gov/air_traffic/publications/media/FAA_Economic_Impact_Rpt_2011.pdf.

¹⁹ “How Much Is an Asteroid Worth?,” *Kurzweil Accelerating Intelligence*, 15 February 2013, <http://www.kurzweilai.net/how-much-is-an-asteroid-worth>.