



Re-establishing NASA's Leadership

As President-Elect Obama takes office, NASA stands positioned to benefit from the change and enthusiasm brought by his new Administration. Five years out from the announcement of a new vision for America's Space Exploration program, important lessons about what NASA should be doing and how it can best meet those goals are available, and must be learned. So long a source of national pride and inspiration as well as cutting edge research, NASA is now losing its position of world leadership. Thankfully, the ingenuity and the talent necessary to reassert America's pre-eminence are still hardwired into the fabric of this nation. NASA and its peer agencies can be in a position to efficiently tap into it and direct it.

Engage the Private Community

For too long, aerospace contractors have lacked the appropriate incentive to innovate. Internal research and development budgets have been low; the punishment for failure to deliver to specification and budget has been light or absent; and a culture of risk avoidance has kept major breakthroughs out of reach. Recently, a new type of commercial aerospace industry has emerged; one that seeks to access large sources of private revenue—and which therefore must make strategic business decisions that lead to rapid and impressive innovation.

To allow NASA to accomplish its lofty goals while simultaneously stimulating the American economy, NASA must continue to engage this new commercial space community. This new commercial space industry should be viewed not as a competitor, but as a critical partner. Therefore, trailblazing commercial programs such as COTS, Centennial Challenges, and the now-defunct Mercury Fund should be renewed, expanded, and emulated throughout NASA's mission directorates.

Use Risk as a Tool

The NASA of the 1960s was able to accomplish incredible things in large part because they had no established experts to turn to for advice. NASA's engineers and managers were literally writing their own textbooks. On the way to accomplishing these great things, they understood that failures would occur—and that each such failure contained lessons that would advance the state of the art.

While the culture of "Failure is Not an Option" certainly is a worthy goal, an innovation agency that avoids all risks cannot succeed in its goals. To achieve breakthrough innovations, NASA and all of its partners must relearn how to use risk as a tool, and must discover and define methods whereby each program is willing to tolerate an acceptable amount of well-managed risks to hasten ultimate success.

Attract and Retain the Best Workers

Apollo-era NASA also benefited from being object of the nation's fascination—and thus the logical workplace of choice for America's best and brightest. Today, NASA must compete for those individuals with companies working in BioTech,

Revolution Through Competition.

5510 Lincoln Blvd. • Suite 100 • Playa Vista, CA 90094

T: 310.741.4880 • F: 310.741.4974

www.googlelunarprize.org



GreenTech, NanoTech, and other exciting technical fields. Additionally, NASA's ability to call on talent from the aerospace contractors has been limited by a series of mergers and acquisitions that have left only a few major players—meaning that every potential contractor who might help prepare NASA for a major program likely also has a financial stake in who eventually wins that contract. Finally, export control laws and other regulations have limited NASA's abilities to take in non-citizen workers, regardless of talent—even when those workers have been trained in America's universities and colleges.

NASA needs to once again become an attractive place to work—not only compared to other government agencies, but compared to all other high technology industries. To do so, NASA needs to find new and better ways to inspire and engage potential future employees. To facilitate this, NASA should create and promote pipeline programs such as internships, co-ops, and leadership training programs specifically aimed at the best and brightest students, and NASA must be aware that those students have other attractive options. Additionally, the Agency needs tools to properly identify and reward the most talented employees already working in the agency.

Help America Benefit from the Global Space Community

In addition to being the source of multiple challenges to NASA's technical preeminence, the global space community also has the potential to be both a critical partner to NASA and a key customer to American industry. Recently, though, ITAR and other regulations have effectively isolated a NASA from the global community, creating a market for specifically non-American "ITAR-free" space technologies. With every year that this situation persists, the global space community grows farther and farther from the USA, and the ability of domestic space industries both civil and commercial to take advantage of this growing community continues to diminish.

NASA should work to help the USA reenter the global space community, both by deliberately engaging international partners and by championing a reform of export control regulations. Such efforts can help NASA meet its objectives more efficiently and can help grow the American economy—and need not pose any practical threat to national security.

Take the Lead Where Only NASA Can

Impressive private efforts like SpaceShipOne, SpaceX's Falcon I, and Armadillo Aerospace's prize winning Lunar Landers could not have happened without access to data from governmental programs like the X-15 or DC-X. Indeed, throughout history, government efforts have been critical to blaze trails where private industry cannot—but the best results are achieved when the government efforts then refocus on the next impossible task, allowing private industry to follow in governmental footsteps and achieve incremental improvements in capability and efficiency.

NASA should once again turn its attention to those missions and those challenges that it is uniquely capable of completing. When a task becomes repetitive and common—such as the conduct of parabolic flight campaigns or the resupply of ISS—NASA should look to pass that responsibilities off to private industry, freeing NASA's attention once more to look beyond the horizon.

Revolution Through Competition.

5510 Lincoln Blvd. • Suite 100 • Playa Vista, CA 90094

T: 310.741.4880 • F: 310.741.4974

www.googlelunarxprize.org



Leverage Incentive Prizes

Incentive prizes have a lengthy track record of enabling radical breakthroughs for very low costs. Governments have long been the beneficiaries of the work done to win incentive prizes, from the Longitude Prize of the 1700s to the contemporary Northrop Grumman Lunar Lander Challenge and DARPA Grand Challenges. Additionally, NASA and its peer agencies can benefit even from prizes offered by external bodies, by becoming customers of the products and services that emerge from the prize competitors.

NASA should proactively seek to benefit from incentive prizes, both by offering prizes of its own and by seeking to actively engage in commerce with the teams who compete for and win prizes offered by others. To do so, NASA should supplement the prize purse funds available to Centennial Challenges, and should allow for the creation of larger value prizes such as competitions for suborbital point-to-point spaceflight, asteroid detection, end beamed power launching systems. Additionally, NASA should begin identifying both areas of need and contractual mechanisms needed to benefit from private companies participating in prizes such as the Google Lunar X PRIZE. Finally, NASA should seek out ways to benefit from and strengthen existing prizes such as the Google Lunar X PRIZE by funding related educational programs, prize purses, or other associated programs.

Inspire the Nation, and the World

In the Apollo era, NASA benefited from a positive feedback loop wherein public attention and support drove NASA success, which in turn amplified public support. Recently, though, NASA has struggled to command the attention of the public except in the case of failures and disasters, when such attention can even be counterproductive. This need not be the case, though—NASA's missions and accomplishments are still exciting and worthy. To re-establish this feedback loop is not merely a matter of better public relations; instead, it is a matter of increasing and demonstrating relevancy, and of genuinely inspiring and galvanizing the public.

In all of its activities, NASA should be aware of the needs of its “customer”—the American public. Through the improvement of key tools such as NASA TV—and through the increased implementation of recent online activities such as Twittering spacecraft—NASA must better convey the importance and the significance of its missions to the public. Key to this improvement is the identification and promotion of key milestones and metrics, so that the public may better judge NASA's progress against its stated objectives and plans.

Revolution Through Competition.

5510 Lincoln Blvd. • Suite 100 • Playa Vista, CA 90094

T: 310.741.4880 • F: 310.741.4974

www.googlelunarxprize.org