Crossing the Chasm ... Space Edition

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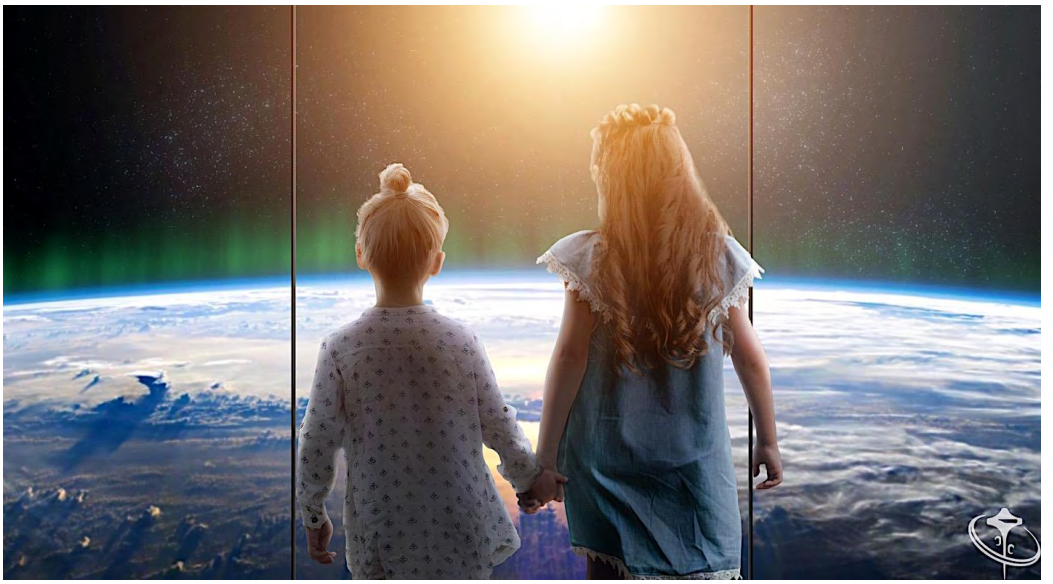

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Abstract

We face a "race" to the stars that requires a joint public-private sector entity designed to fund and support space development and infrastructure, similar to the building of the Erie Canal, the Transcontinental Railroad, and supporting our air, sea, and road highways serving the public. But now, our focus is on space.

Balancing the needs of industry, taxpayers, workers, and our children requires the U.S. to deploy a full range of financial, policy, and/or educational tools. This is best accomplished through creating a single entity with the mandate, authority, and reach to effect change at the speed of innovation. The best way to achieve this is by forming a Space Public-private Advanced Commercialization Enterprise (SPACE) Corporation.

Keywords: Space Public-private Advanced Commercialization Enterprise (SPACE) Corporation, Space Corp, private and public sector, economy, investment, policy, space access, space sustainability, space support

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Cruzando el abismo… Edición espacial

Resumen

Nos enfrentamos a una "carrera" hacia las estrellas que requiere una entidad conjunta del sector público y privado diseñada para financiar y respaldar el desarrollo y la infraestructura espaciales, similar a la construcción del Canal Erie, el Ferrocarril Transcontinental, y respaldar nuestro aire, mar y carretera. carreteras al servicio del público. Pero ahora, nuestro enfoque está en el espacio.

Para equilibrar las necesidades de la industria, los contribuyentes, los trabajadores y nuestros hijos, EE. UU. Debe implementar una gama completa de herramientas financieras, políticas y educativas. Esto se logra mejor mediante la creación de una entidad única con el mandato, la autoridad y el alcance para efectuar cambios a la velocidad de la innovación. La mejor manera de lograrlo es formando una Corporación de Empresa de Comercialización Avanzada Pública-Privada Espacial (SPACE).

Palabras clave: Space Public-private Advanced Commercialization Enterprise (SPACE) Corporation, Space Corp, sector público y privado, economía, inversión, políticas, acceso al espacio, sostenibilidad espacial, apoyo espacial

跨越分歧（太空版）

摘要

我们面临一场通往星球的"竞赛"，这场竞赛需要由公共-私人部门共同组成的实体，用于出资和支持太空发展和基础设施，类似于建设伊利运河、横贯大陆铁路，和支持为公众服务的航空航海设施以及高速公路。不过现在，我们的重点是太空。

在产业、纳税者、工人、后代的需求之间寻求平衡，需要美国实行一整套金融、政策和/或教育工具。完成此举的最佳方法则是建立一个拥有授权、权力、和以创新的速度完成变革的影响力的单一实体，即建立一个太空公共-私人先进商业化企业（SPACE）集团。

关键词：太空公共-私人先进商业化企业（SPACE）集团，太空集团，私人和公共部门，经济，投资，政策，空间接入，空间可持续发展，空间支持

Introduction

Staying at home, waiting to run out of resources, or to be wiped out by the next disaster is not America's style. We demand better alternatives to meeting our energy needs than carpeting our purple mountains with solar cells, blackening the sky with wind generators, or clogging our air with pollution.

Interestingly, our genetic makeup somehow prevents humankind from shying away from embarking on a great adventure, or flatly refusing to engage in a challenge that may seem impossible at first glance. We push boundaries—whether these boundaries exist on land, sea, air, or ... in space. What greater challenge is there than to build homes in a lifeless vacuum? What greater adventure is there than exploring a limitless frontier? For Americans, this is who we are, and what we do.

What is SPACE Corp?

At Foundation for the Future (F4F), we have a single goal: to make space boring. The routine and ubiquitous kind of boring. We continually work to enable innovation in the realm of space development, specifically creating secure, sustainable, and reliable space infrastructure. Our mission is to serve as the bridge between civil space and federal government policy—from technology developments in space transportation to the education of the next generation of space workforce. We aim to foster a diverse and collaborative ecosystem made up of companies, innovators, and leaders who are building the future of America's space exploration initiatives and strategies.

Unlocking America's next economic frontier can be reached only by laying the foundation now for America's next century in space. Only by stoking the flames of limitless innovation, inclusion, and radical transparency can we disrupt the status quo. That disruption is needed if we are to cross the market-based chasm between the plans and ambitions of current space entrepreneurs, and the rest of America.

This sort of disruption should not be approached lightly. Indeed, the best solution is one that builds upon the bi-partisan space policy that was initiated during the Kennedy-Johnson presidencies in direct response to Sputnik, Soviet-manned space travels, and our directive to be the first on the Moon with Apollo. We face a similar "race" to the stars that requires a joint public-private sector entity designed to fund and support space development and infrastructure, similar to the building of the Erie Canal, the Transcontinental Railroad, and supporting our air, sea, and road highways serving the public. But now, our focus is on space.

Balancing the needs of industry, taxpayers, workers, and our children requires the U.S. to deploy a full range of financial, policy, and/or educational tools. This is best accomplished through creating a single entity with the mandate, authority, and reach to effect change at the speed of innovation. The best way to achieve this is by forming a Space Public-private Advanced Commercialization Enterprise (SPACE) Corporation.

What Would SPACE Corp Do?

The SPACE Corporation would be created by Congress and incorporated as a for-profit entity rather than an agency under the U.S. government. Building on the model of the 1960s Commercial Satellite Corporation (COMSAT), our proposal calls for the SPACE Corp to issue space infrastructure bonds, space development loans, and the ability to buy and sell shares of stock. Additionally, the SPACE Corp would use other financial instruments such as microloans, research grants, and educational programs in cooperation and coordination with existing science and space government research institutions.

All of these tools and partnerships would focus on supporting projects that ensure easy access to space and that are capable of supporting homes and businesses—and most importantly, to increase economic opportunity for all Americans. It would be necessary for SPACE Corp's projects to fall into one of these three categories:

- *Space Access:* This refers to getting *to, from*, and *through* space. By investing in partnerships and projects that reduce the costs of sending people, machines, and materials, SPACE Corp will lower the barriers to entry for space entrepreneurs.

- *Space Sustainability*: This refers to technologies required to live, work, and survive off-world. The goal is an ability for Americans to show up in space and be able to focus on building and running their lives or businesses, rather than fighting to simply survive.

- *Space Support*: This refers to tools, technologies, and capabilities which directly benefit the rest of us, while enabling a space economy. Whether this includes advanced material foundries around the country or space-based solar power, investments to support space-related activities such as these will offer immediate benefits to Americans at home.

Why Now?

One barrier standing in the way of SPACE Corp becoming a reality is the transportation infrastructure needed to launch more humans into space—and more often. Expanding access to space is essential to achieve a more equitable future for space exploration, as well as a sustainable ecosystem supporting humans living safely in space.

From improving economic opportunities, to uniting a divided country, to ensuring a free and fair world, space infrastructure is a boring solution to our most pressing problems.

United States history has evidenced that by lowering barriers to invest in major infrastructure improvements following economic downturns, the economy provides room for hundreds of thousands of new jobs. An investment in the future of space, for example, supports diverse industries such

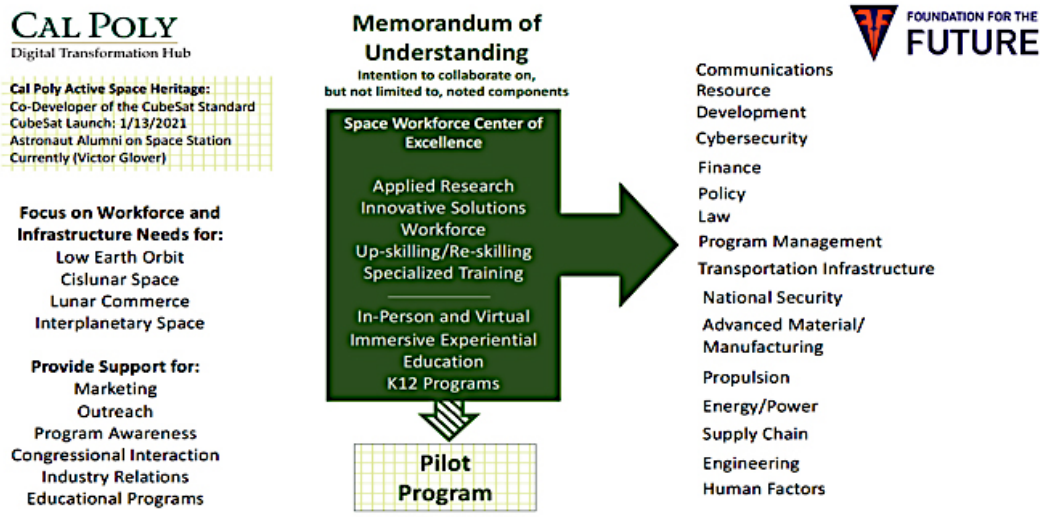

Figure 1. Collaboration components between Cal Poly and Foundation for the Future

as advanced materials manufacturing, green energy, and shipping and logistics.

Outer space holds virtually limitless amounts of energy and raw materials—from Helium-3 fuel on the Moon for clean fusion reactors, to heavy metals and volatile gases from the asteroids—which can be harvested for use on Earth and in space. Quality of life can be improved directly by using these resources and indirectly by moving hazardous and polluting industries and/or their waste products from planet Earth.

Technology developed for use in space possess the potential for direct use on Earth. In fields such as medicine, future construction, as shown throughout NASA's history and its NASA Technology Transfer program, will allow for private corporations and investors to license NASA-developed technology for commercial distribution and consumption. A renewed investment in space infrastructure will also require new facilities, workforces, and supply chains nationwide.

Security

There also exists a looming fear that the U.S. will fall behind countries such as China, India, or even the European Union (EU) in the 21st-century's rapidly-accelerating space race. To ensure this does not occur, the government needs a new leader supporting collaboration between the government-backed efforts of NASA and Space Force and the civilian business sector.

China's planting of the flag on the Moon late last year should have had the same impetus of Russia's launch of the satellite Sputnik, or the orbital flight of Russian Astronaut Uri Gagarin, which propelled America's manned Apollo Missions to the moon during the latter half of the 20th century.

For the past decade, Russia and China have each sought supremacy in

space, but now as China has surpassed Russia in space-based spending and launches, cooperation between the two is taking shape. Russia has signaled its desire to reduce partnership with the U.S. while increasing its cooperation with China.

Maintaining U.S. space security requires investment, not only in military capacity, but in the infrastructure needed to support the engine of U.S. success around the world as well as American innovators and the economy they build.

Unity

America is a nation founded on the frontier. From our first settlers to landing on the moon, we are a nation that has sought out each new frontier and molded it in our image. It was those frontiers that captured the imagination of dreamers, agitators and troublemakers alike. Space is the ultimate, boundless frontier. No society has ever gone wrong betting on the frontier. Nations are invigorated spiritually, and prosper economically, by challenging and finding new uses for new frontiers. Over many decades, however, the benefits gained from this exploration came at a cost from the exploitation of vulnerable populations.

For example, in the 18th century we conquered the North American land. Riding wagons and horses, we expanded from the east to the west. Building off of slave labor, our economy developed.

In the 19th century, we conquered the world's oceans. Our trading ships visited every port on the planet, therefore enabling new exports. This success was supported through child labor, other exploited populations, and a domineering patriarchy.

In the 20th century, America took to the skies. Our planes won two world wars, resupplied starving cities, and ultimately made travel to anywhere accessible to the masses. This was possible because our planes also carried soldiers, bombs, and nuclear weapons.

Now, in the 21st century, space is open to us. And, for the first time in our country's history, we can explore, develop, and prosper using our own labor. We can access the riches of the solar system without exploiting others. We can expand our communities without jeopardizing the Earth we call home. That is to say ... we can finally, truly, experience the self-sufficient, non-controversial America that we once envisioned when we were children.

What Got Us *Here* Won't Get Us *There*

A renewed investment in space infrastructure, financing, and development will take a combined partnership between the public and private sectors—something the U.S. has shown to do effectively, from the COMSAT Act in 1962. Although controversial at the time, the COMSAT Act triggered the development of technology which enabled President Kennedy to communicate to Apollo astronauts Neil Armstrong and Edwin Aldrin on the surface of the moon. Five years and

a new president later, President Lyndon B. Johnson reported to Congress,

> "The Communications Satellite Act of 1962 [has] brought mankind to the threshold of a full-time global communications service to which all nations of the world may have equal access."
>
> *President Lyndon B. Johnson's March 17, 1967 Report to Congress*

The COMSAT Act continues to serve as a positive contributor to the public-private space sectors, as evidenced by the success of recent SpaceX launches.

Creating a new public-private partnership in the form of SPACE Corp, a federally chartered enterprise would serve a vital role in planning, financing, and the administration of basic infrastructure to, from, and through space. This corporation would accomplish its primary goals while offering key support to other branches and agencies within the U.S. government, while simultaneously remaining revenue-positive to the U.S. Treasury.

Our proposal is not unique, but rather a combination of the best and most researched ideas from across the intellectual spectrum. Its strength lies in its focus on outcomes, and the idea that when united, we are capable of wild, ambitious, and "what-was-thought-to-be-impossible" dreams. But maybe most importantly, it reminds us that the impossible never stays that way for long.

Tim Chrisman *is the founder and executive director of Foundation for The Future (f4f.space), author of Humanity in Space, a look at the future of the second century of human spaceflight, and former CIA intelligence officer and retired Army Special Operations officer. Foundation for The Future is focused on unleashing America's potential through the creation of smart space infrastructure.*