

Partnership in Space Activities

Michael D. Griffin

Administrator

National Aeronautics and Space Administration

International Astronautical Congress

3 October 2006

Thank you for inviting me to the 57th annual gathering of the IAC. This Congress is just about as old as I am, so obviously the people dedicated to putting this meeting together are in the space business for the long haul. I am honored to join my fellow travelers from the world's spacefaring nations in this session for "late breaking news." But I really think that you know most of our late breaking news, and so I've decided to focus more upon what I hope you'll decide is "perspective".

I spent last week in Beijing and Shanghai, touring various facilities and meeting some excellent scientists and engineers. It was my first visit to China, and I will again take a moment to thank my hosts for their warm hospitality on that visit. It is important for the fraternity of spacefaring nations to discuss openly the issues that we each face. I look forward to more such dialogue with China's National Space

Agency, and to continuing the dialogue with the heads of other agencies here at the IAC. Thus, my remarks today will be on the subject of “partnership” as we apply it to our endeavors in space.

Space exploration, whether human or robotic, is still the grandest and most technically challenging expression of human imagination of which I can conceive. Thus, I believe it to be in our best interests in this unique human endeavor to work together on occasion, to ask each other as different countries and different cultures how we should go about solving the unique problems of this unique endeavor. The physics is the same for us all; the rocket equation does not change when expressed in a textbook of a different language. But I have found that while the problems and the physical constraints are the same for all, the vagaries of human creativity and ingenuity can yield many different solutions. So, it really is to our mutual benefit to understand how each of us develops the art and science of spaceflight. We all have much to learn. We can learn best by doing some things together.

I have often said, but it bears repeating before this audience: I have no doubt that humans will continue to explore space, going to the

Moon and Mars and far beyond. Thus, the question of “whether” this will happen is not an interesting one to me; I know that it will. The interesting questions center around topics like “when”, and “who”, and “what”, and “why”. When will humans next return to the Moon, or venture to Mars, or first explore the near-Earth asteroids? Who will first do each of these things, and many even bolder things beyond them? What languages will they speak, and what values will they hold? Why will they go; what gains will they expect to return to their parent societies?

Such questions can be considered jingoistic if taken out of context, but that is not my intent at all. My intent in raising them is to ask how each of our cultures regards its role in exploring the space frontier. The American culture retains even now a certain frontier mindset, based on our history. We in America are the descendants of pioneers from Spain, Portugal, Holland, Great Britain, France, Germany, and many, many other countries who emigrated over many generations to settle in what became the United States. But the British were the boldest and most persistent of these early groups, and so the primary language of the

United States came to be English. Canadians speak both English and French, while elsewhere in the Americas both Spanish and Portuguese are spoken. Now, these various languages not only convey the thoughts of their speakers in different ways, they also encourage and allow different thoughts. Language is, in part, a window into and a map of the culture of its users. And so, looking into the future of space exploration, I sometimes wonder what languages the explorers and eventual settlers of the Moon and Mars will speak? Will my language be passed down over the generations to future lunar colonies? Or will another, bolder or more persistent culture surpass our efforts and put their own stamp on the predominant lunar society of the far future?

Further, the laws of the United States, which represent the values of our people, are fundamentally based on English common law, Roman law and the Justinian code, yet have evolved to take into account modern philosophies and practicalities. Especially noteworthy is our core belief in the possession by individuals of certain inalienable rights, including the right to own property. All of the countries represented here at the IAC are governed by the rule of law, but each of us have variations in

our legal codes which reflect the values of our unique cultures. So, looking into the future of space exploration and space settlement, what values and laws will govern those explorers and settlers?

These and others are fundamental questions which I will not attempt to answer here, because in the end I am not qualified to do so. I have never pretended to be either a linguist or a lawyer; I am merely an engineer. However, I consider such topics to be quite fascinating, and I hope that the community of spacefaring nations will carefully consider their import in the future. While we may disagree on certain points and priorities, it is important that we try to understand, and respect, each other's views. This is an essential ingredient of any successful partnership.

It is no secret, and should be no surprise, that the United States has played, and seeks to play, a leadership role among the community of spacefaring nations. But we cannot simply presume such a role; it can only be earned. We must first be respected as a good partner before we can be regarded, by you, the community of spacefaring nations, as a good leader. We at NASA have not always been the most reliable of

international partners, and it has been one of my most important goals to improve that record. All who are here know that I have said on many occasions that the partnership behind the International Space Station provides its highest and longest lasting value, a value which we in the United States highly respect, as we work with our partners toward the completion of this enterprise.

For many and various reasons, partnerships in space exploration have enormous benefits, but they are not easy to consummate. History demonstrates that countries and cultures will always have issues which divide and set them apart. We compete in the global marketplace of ideas, influence, and intellectual property, as well as in the more visible marketplace of economic goods and services. It should be no surprise that there are sometimes disputes surrounding one or more of these issues.

Competitiveness is healthy and useful for people, organizations, and even nations, but the competitive spirit must be leavened with a healthy dose of collaboration, lest it be carried past the point of utility and into harm. So, while competing, we need also to be mindful of

opportunities to work together, to create alliances for the common good of mankind. I believe that space exploration and scientific discovery are examples of endeavors which offer a distinctly unifying force for that common good.

However, each of our countries also has unique national security concerns. Having spent a good portion of my career working for the U.S. Department of Defense, I am not ignorant of the military applications of space technologies, nor of the need to regulate the proliferation of certain capabilities, and missile technologies are prominent among these. The United States is firmly committed to ensuring that certain key technologies, which we possess and some others do not, not be used against us or our allies. That priority is higher for us than partnership in various space endeavors, and this fact must be understood and carefully considered by the parties involved in any putative collaboration. I recognize the bluntness of this assertion, but I believe that each of us, as spacefaring nations, must respect each other's national priorities, and must speak openly and honestly with each other if there are differences which hamper our ability to collaborate.

Further, each of our countries has only so much money to expend on space endeavors, and this also limits our ability to partner on various projects. Even with an annual budget of \$16.8 B, NASA cannot afford everything that our own numerous constituencies would like us to do in exploration, science, and aeronautics research. That budget constitutes only 0.6% of the overall budget for our U.S. government, but in the wake of Hurricane Katrina, the greatest natural disaster in the history of the United States, and the expense of the Global War on Terrorism, I still consider myself to be very lucky that our nation's leaders provide that much to NASA. But still, we must carefully choose those endeavors to which we commit with our fellow spacefaring nations. Much as we would wish otherwise, we cannot do everything we would like to do. In this context of limited resources, it is clear that partnerships work best when all partners have "skin in the game", each contributing resources toward a common goal that is greater than that which could be easily afforded by any single partner. We believe that such relationships work best when conducted on a "no exchange of funds" basis. I must admit that this view is not universally shared. On

many occasions since assuming my role as Administrator I have been asked about opportunities for “partnership”, when what is really being sought is American investment in the aerospace industries of other nations. I must be clear on this; “partnership” for us is not a synonym for “helping NASA to spend its money”.

The United States’ *Vision for Space Exploration* honors our past commitments with the International Space Station partnership, and calls on your interest and support in embarking upon new ventures. Last month, we re-started assembly of the ISS, after a hiatus of over three years due to the loss of Space Shuttle *Columbia*. Onboard the Space Station today, American Michael Lopez-Alegria (who was born in Spain but grew up in California), Russian Mikhail Tyurin, and German Thomas Reiter, are part of the greatest construction project in the history of humankind, rivaling the pyramids of Egypt, the Suez and Panama Canals, or the Great Wall of China. Who would have imagined after World War II, my own father’s generation, that such a team could be working and living in space today?

Two weeks ago, I welcomed home the crew of Space Shuttle *Atlantis*, which included Canadian astronaut Steve MacLean. Last week, Russian cosmonaut Pavel Vinogradov, American astronaut Jeff Williams, and Iranian-born spaceflight participant Anousheh Ansari returned home to Earth on Soyuz, landing in Kazakhstan. In December, I look forward to the next Shuttle assembly mission to the Space Station, with Swedish astronaut Christer Fuglesang. Even at a cursory look at human spaceflight activities over just this past month shows that space exploration is a truly international endeavor, and a broader look shows just how true this has been, for a long time.

The Shuttle program has, in 25 years of operation through STS-115, flown 708 astronaut-seats. (By that I mean that most individuals have flown more than once.) Eighty-three of these flight opportunities, or about 12% of the total, have gone to 58 individual International astronauts from 14 countries. I don't know the statistics for Soyuz, but I do know that our Russian partners have flown a substantial number of non-Russian cosmonauts, going back for decades. This goes beyond the mere exchange of money or favors or other considerations. The largest

spacefaring nations have quite simply made it a point to make human spaceflight a significant international activity.

But that's not all. Last month, American engineers and scientists met in India to review progress in executing data-sharing agreements and delivering two instruments for India's *Chandrayaan* lunar mission. Since NASA cannot afford to do everything, and since so many missions are planned for the Moon over the next few years, including China's Chang'E mission, lunar science data should be openly shared among the science community, just as we do with other planetary science data.

Also last month, the Japanese Space Agency successfully launched the SOLAR-B satellite, a joint JAXA-NASA-UK-Europe heliophysics mission to study the sun's magnetic fields. Not only is NASA interested in the sun's effects on terrestrial telecommunications and power grids and potential impacts to the International Space Station, we'll soon need timely and accurate warnings of impending solar storms for our astronauts in cislunar space. Later on, we'll need this same information on treks to Mars and near-Earth asteroids.

Later this month, I'll be sitting down with the NASA management team to go over the flight data from the past three Shuttle missions to see if a servicing mission to the *Hubble Space Telescope* to extend the life and capabilities of this Great Observatory can be performed safely.

People from all over the world are awed and inspired by *Hubble* pictures that reveal the secrets of our universe, and from the first, *Hubble* has had an international complexion. After that mission is completed, the European Space Agency will launch the U.S.-built *James Webb Space Telescope* aboard an Ariane V. We're also collaborating with the German Aerospace Center on the SOFIA airborne observatory, and along with NASA's Kepler mission, ESA's Gaia mission will survey our galaxy for extra-solar planets.

Next month, NASA Deputy Administrator Shana Dale will meet with her counterparts in Washington at an AAS/AIAA seminar to define better our purposes in going to the Moon, and to discuss what we'll do when we get there. This meeting is a follow-up to a highly successful NASA-hosted workshop last April. Since then, we have met regularly

with other international space agencies to define a global strategy for space exploration.

One aspect of this discussion is the need to set certain engineering technical standards to ensure compatibility and interoperability in our exploration architecture. Analogous to my previous comments about spoken languages for future space explorers, it is important that the engineering standards for NASA's architecture be specified with the international metric, or SI, standard as the base unit of measure, with English units only by exception when it makes sense for NASA to do so. Thus, we hope for a high degree of compatibility of interfaces and standards, as space-faring nations explore the Moon, Mars, and near-Earth asteroids together.

So, before I open up the dialogue to your questions, let me share with you the awe that veteran American astronaut Shannon Lucid conveyed to me last week as we toured China. Her parents were American missionaries in the city of Shanghai, and Shannon was born there during World War II. Her family was interned in a concentration camp for the first year of her life, after which she and her parents were

released as part of a personnel exchange. They returned to China after World War II, and she attended kindergarten there. She has many memories from that time. She was amazed last week by the transformation of the city of Shanghai from what she remembered from the 1940s. Such changes are never objectively surprising, yet when we are confronted with them, as individuals we are indeed always surprised.

Cities change, people change, nations change. Some nations that were American allies during World War II are not as close to us today, and some nations that were enemies in that era are now among our closest partners. Many have asked why I visited China last week on behalf of my country, when that nation is today not among those most closely linked to us. But China is a powerful and important nation, home to the oldest civilization we have in the world. The United States is newer and younger, but is also a powerful and great nation. There is no possible purpose to be served by creating or advocating adversarial relations between the United States and China, or indeed between ourselves and any other nation. There have been sea changes in relationships between the United States and Germany and Japan, our

adversaries in World War II, and between the United States and Russia, our competitors during the Apollo era of the 1960s. There can be more such changes, and there will. The best possible goals for those who manage our nations' space agencies are to find ways to narrow the differences between us, so that the changes are good ones. We need to look toward those things we have in common, precisely *because* there are already an ample number of things to divide us. Perhaps this is not "breaking news" so much as it is a new perspective on the news.

Thank you. I'd be happy to take your questions.