

October 2007

Space Race 2

Today, a new space race has begun, but this time with far more competitors

Recently, there has been plenty of talk and ink devoted to the 50th anniversary of Sputnik. That amazing event launched the Space Age and will forever be a dividing line in human history. It also led to a Space Race that put the first man on the Moon. Today, a new space race has begun, but this time with far more competitors and it seems the tortoises may pass the hare. In fact, this second space race is a new "inconvenient truth" for Americans to understand and address if they choose not to lose. Whoever decides to enter this race, the events unfolding in space are highly likely to result in significantly increased expenditures for space activities, which we at Near Earth strongly encourage. Here, for example, are a few recent headlines and news quotes to demonstrate the state of play:

- "China celebrated the launch of its first lunar satellite, Chang'e One, yesterday as it followed Japan and India in a new space race to put the first Asian man on the moon." (The Scotsman, October 25, 2007)
- Seven nations, including India, the US, China, Japan, Germany, Britain and Italy, are planning to launch lunar missions in the near future, according to delegates at the 58th Astronautical Congress. (Source: Hindustan Times)
- India will develop its own technology to launch an astronaut into space rather than rely on outside support, the head of the country's space agency said. India's space program suffered in the past from sanctions imposed by the West, barring access to space material and technology transfers, after the country tested nuclear weapons in 1974 and in 1998. "We have learned the hard way that we should have indigenous capability," said ISRO's chairman. "Only then will anyone respect you." (Source: SpaceDaily.com)
- "In America, contrary to our self-image, we are no longer leaders but simply players," said Neil DeGrasse Tyson, the director of the Hayden Planetarium. "We've moved backward just by standing still." The numbers of new scientists in Asian countries are eclipsing those in the United States. According to the National Academy of Sciences, in 2004, around 500,000 engineers graduated in China, 200,000 in India and only 70,000 in the U.S.
- Experts warn that US-Russian post-Cold War space cooperation could crumble as Moscow recovers its economic and diplomatic strength, while tensions grow over Washington's missile defense plans in Eastern Europe.
- "The Chinese People's Liberation Army and Space Warfare," a report released Oct. 17 by the American Enterprise Institute, concludes that China is preparing for war in space and considers the United States a likely adversary. "They're very serious about



SPECIALISTS IN SATELLITE, MEDIA AND TELECOM INVESTMENT BANKING

developing means to attack targets in the atmosphere and on the Earth's surface from space," said Larry Wortzel, the report's author.

It should be acknowledged by all that this new space race does not necessarily have to be an adversarial one among sworn enemies, but can instead be a mix of friendly competition and even cooperation.

It should be acknowledged by all that this new space race does not necessarily have to be an adversarial one among sworn enemies, but can instead be a mix of friendly competition and even cooperation. After all, the amounts of money required to truly compete as a space faring nation are truly astronomical. Below are some indicative thoughts from the international community and the U.S.:

- "The biggest ethical question before the space-faring nations is whether mankind is looking at 'habitation or colonization' of Moon and Mars. The construction and occupation of bases should be fundamentally treated as habitations rather than colonies in the conventional sense," said the deputy director of ISRO.
- The U.S.'s International Traffic in Arms Regulations (ITAR) is a major hurdle in the growth of new space industry actors in the global market, said speakers from emerging space nations at the 58th International Astronautical Congress. The speakers were unanimous that both cooperation and healthy competition were necessary to ensure growth of the space industry, especially among emerging nations and new players. (Source: India PRwire)
- Michael Griffin reiterated that NASA "will be open to the idea of cooperating with India in human space flights. We hope that when we return to the moon, it will be done with our space station partners and others may be India." (Source: The Hindu)

But some how we think the stakes are just too high for friendly cooperation to rule the day and, if the International Space Station is such an example, perhaps it is not even desirable. No, friendly competition, perhaps from blocks of nations, is the best of the more likely outcomes to which we can aspire. So let's take a quick look at the three realms of space activities.

Most nations now understand the critical importance of the truly high ground of space as well as the need to protect space assets ever more critical to the global economy.

Military/Intelligence: We think most nations now understand the critical importance of the truly high ground of space as well as the need to protect space assets ever more critical to the global economy. At present, the U.S. and its allies have a lead in the military space race and appear to be trying very hard to maintain that lead. Unless there is a major change of U.S., EU and NATO strategy, we would expect to see continued and even increased expenditures (e.g. comms-on-the-move) to maintain this lead. Luckily for the aerospace/defense contractors of these nations, Russia, China, India and others have no intention of ceding the high frontier to the West and are ramping up their own activities and investments.

Commercial: On the commercial front, the U.S. seems to have temporarily checked its massive market share loss to Europe and



SPECIALISTS IN SATELLITE, MEDIA AND TELECOM INVESTMENT BANKING

elsewhere brought on largely by the ITAR related export issues of the last decade or so. According to an October Futron report, the U.S. manufactured 12 of the 19 commercial satellites launched year to date (63.2%) thanks to (i) continued technology leadership (those military R&D dollars do filter down), (ii) a weakening dollar, and (iii) capital markets more friendly to satellite financing. Of course a much smaller percentage of these U.S. made satellites were actually launched on U.S. launch vehicles. While satellite technologies have advanced remarkably since Sputnik, a rocket is largely still a rocket and sufficient quality can sometimes be achieved with much lower production costs.

When you add the four European manufactured satellites launched year to date, the total goes to 16 of 19 (84.2%), mostly launched on European or Russian launch vehicles. The real question is what happens in a few years when India and China ramp up their production. We suspect it will become very difficult for U.S. and European manufacturers to stay competitive on the more commodity-like satellite applications such as bent-pipe fixed satellite services or on launch services in general without meaningful government subsidies. Even Russia might find future price points hard to reach. Here are some examples of emerging competition:

- China Great Wall Industry Group, the marketing arm for China's space industry, said customers from Africa and Latin America are looking to China to build, launch and operate satellites. "We are cheaper compared to Europe's Arianespace," said Hua Chongzi, Great Wall's vice-president. China has launched 33 foreign satellites since 1980.
- India and China are wooing nations in Europe, Asia and Latin America to build and launch satellites aboard their homegrown rockets, as they aim for a larger share of the market. India is offering its Polar Satellite Launch Vehicle at nearly 75% of the price charged by companies such as International Launch Services (ILS), which offers Russian Proton rockets. (Source: Wall Street Journal)

The U.S. should clearly not feel so smug about its current "hyperpower" status and dominance of space.

Civil. Civil space may not directly affect a nation's security or its citizens' bank accounts, at least not in the near term, but accomplishments in space do say a lot about a country's will to lead and its position among nations. It's as much about national psychology and self esteem as it is about money and markets. For China, India and Japan it is about who will lead Asia, and perhaps the world, in technology and manufacturing in the 21st century. Ultimately, it is a question of which country will join, or replace, the U.S. as a super power. The U.S. should clearly not feel so smug about its current "hyperpower" status and dominance of space. Recall that at one point the New World was split between Spain and Portugal because of their advanced ships and superior navigation skills, yet England starting much later eventually caught up, producing more and

better ships and many would argue surpassing the first movers in colonization. History is replete with such examples.

According to the same Futron report cited above, only 21 of 59 non-commercial satellites launched year to date (35.6%) have been manufactured in the U.S. This percentage grows to only 45.8% when European manufactured satellites are included. When it comes to non-commercial space, the west already has lots of competition. Here is a summary of what several major space faring nations are saying about their near term ambitions in space:

- **China.** Just launched first lunar orbiter. Plans a space lab by 2010, a lunar rover by 2012, a lunar sample return mission by 2017 and a manned lunar base by 2020 done independently.
- **Japan.** Recently launched Kaguya, its first lunar orbiter, beating both China and India. Plans landing a robot on the moon's surface in 2012, followed by one in 2018 that will seek to return successfully to Earth. For human exploration and colonization of the Moon they expect international collaboration modeled on the international space station.
- **Russia.** The Federal Space Program for 2006-2015 stipulates the construction of a reusable "Clipper" spacecraft jointly with European partners, and two carrier rockets for manned spaceflight, the Angara and the Soyuz-2. Soyuz-2 is already operational. Mock-up models of Angara boosters will be exhibited at the Dubai AirShow Nov. 11, 2007.
- **U.S. (NASA).** The United States has pledged to colonize the Moon by 2020 and send astronauts to Mars by 2037. However, Michael Griffin has publicly stated that we may very well not be the first to return to the Moon.

The US Senate recently passed an appropriations bill that gives NASA \$18.5 billion

That the U.S. will meet these bold initiatives on its stated schedule is widely doubted. The US Senate recently passed an appropriations bill that gives NASA \$18.5 billion, thanks in part to an amendment the Senate approved earlier this month that adds \$1 billion to the agency's budget. The Senate version of the bill must be reconciled with the House version, which lacks the extra \$1 billion, and also faces a threatened veto from the president. Many believe that to really achieve these bold initiatives will require substantially higher civil space budgets not just an extra billion dollars here and there or a truly surprising level of contribution from private enterprise and space entrepreneurs.

Others, including many scientists, are outwardly opposed to a more aggressive and manned space program sighting the huge diversion of scarce budget dollars from other "more worthy" scientific endeavors. There is also a growing argument that intelligent robots and satellites employing tele-presence are a cheaper and less fragile way of exploring space and can do more than an adequate job. Yet some experts, such as



SPECIALISTS IN SATELLITE, MEDIA AND TELECOM INVESTMENT BANKING

In the end, we suspect (or at least hope), many participants from both the West and the East will find the “Right Stuff” and compete on a friendly basis for space.

Steve Squyres, an astronomy professor at Cornell University and principal investigator of the Mars Exploration Rover Mission, claim that “We are many decades from robots that can match humans, even in the lab, and laboratory robotics is about 20 years ahead of space robotics.”

So who is right? Will the U.S., perhaps with its European, Indian and/or Japanese allies (maybe even Russia), pick up the gauntlet thrown down by China or will the collective will devolve into budgetary battles and bureaucratic foot shuffling? In the end, we suspect (or at least hope), many participants from both the West and the East will find the “Right Stuff” and compete on a friendly basis for space. For those that choose to sit this race out, at least they can console themselves that it will be someone else’s citizens who will one day complain at every available opportunity “If we could put a man on the Moon, why can’t we _____ (fill in the blank).”

By Hoyt Davidson
Near Earth LLC

With special thanks to Edward Ellegood of FLORIDA SPACErePORT for many of the news quotes cited above.