

## ***Diabologic: The World of Space Craft***

by Frank Dolinar

I began writing this on September 16, 2008. The morning news carried a story about China's announced intent to send three astronauts into orbit and, while there, to perform that country's first space walk. Yes, I know that US astronauts performed the world's first space walk as part of the Gemini program in the 1960s, so why are China's efforts in 2008 are worth noting.

Simply, the club of spacefaring nations is growing and the US is just one player. Different nations will certainly have different goals for space exploration, exploitation, communication, energy generation, scientific research, and for gaining the military high ground.

Starting close to home, the United States has, for five decades, conducted the world's most public, non-military, space program. It has provided benefits galore, which are often used even by people who insist that the space program is a waste of money or a fake. We have computers and cell phones that most of us, today, could not live without; instant communication, weather satellites, and the very useful GPS system; the Hubble Space Telescope has looked outward to the very edge of our universe; new materials for everyday cookware to light and strong prosthetic materials; and very lucrative spin-offs. Currently, the US is developing a launch system to replace the aging Space Shuttle fleet.

Russia, whose Sputnik 1 satellite launched the world into space on October 4, 1957, has had an ongoing – if poorly funded – space program continuously since that first launch. These days, there's money to be had, fueled – literally – by Russia's lucrative oil exports. This increase in funding was accompanied by statement by then President Putin that "...without astronautics, Russia can not compete for one of the leading positions in the world's civilization, and will not be able to provide its defense at a necessary level." There are currently plans on the boards for new manned spacecraft, a new fleet of rockets with a range of capabilities, and a new launch site in the Russian far east, and a new attempt to land on the moon.

The European Union, represented by the European Space Agency (ESA), continues to pursue a reliable and versatile space program, launching all manner of commercial and scientific payloads from its facility in French Guiana, a few kilometers north of the equator in South America. For more information, see the ESA's website at <http://www.esa.int/esaCP/index.html>

China launched its first satellite in 1970 and by the end of 2003 had conducted 67 successful launches, from three different launch sites. Most of these were for communications, weather, remote sensing, navigation, or science. According to a report from Hong Kong's Mingpao Daily newspaper, China intends to create a space station in the short term by linking together four of its spaceships 三 and presumably using that structure as a hub for future orbital construction.

Not to be outdone, India is scheduled to launch its first mission to the moon late next month. The primary vehicle will be an orbiter with eleven different scientific payloads onboard to perform remote sensing and a rover to be landed on the moon to study the lunar surface.

The US, Russia, China, and India, all are looking forward to getting to the moon (again, in the case of the US). The US and Russia expect to do so directly. India and China expect to build their own space stations before heading out. I think this is a good idea for a number of reasons.

Elsewhere, Iran is building launch vehicles for a putative space program.

The Phillipines, whose first foray into space was to provide a communications satellite to link its over 7000 islands via satellite ground stations rather than expensive cables, is now looking toward getting astronauts into orbit – probably with the help of either China or India.

Finally, there is the young but growing private space program represented by SpaceX and Virgin Galactic. SpaceX now has launch facilities at Cape Canaveral for freight launches to the International Space Station and later to launch humans. Virgin Galactic continues its quest to provide private individuals with sub-orbital flights in the near term and orbital flights later.

In all, there's a lot of activity this year. It looks like it is only going to grow... rapidly.