

Triton Fun Company

Science Newsletter

December 2009

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New concepts: NASA's plans for future human space flights

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Special points of interest:

Future space flight..

Triton Fun stuff

Superfluous questions

2009 has been a banner year for NASA's human space flight program. There have been 5 nearly flawless Space Shuttle missions, with few of the technical issues that normally delay shuttle launches. There was the spectacular repair mission to the Hubble Space Telescope, as well as missions to the International Space Station; ISS now has full power and a full crew complement of 6 (a virtual crowd; this is an improvement (population jump) from 3 astronauts who had to do everything themselves). This has been perhaps one of the Shuttle programs' most productive years. And it might also be the last full calendar year of operations for the Shuttle program.

The Shuttle Program is due to stand down in September 2010. The reason for the retirement of the Shuttle is to make budgetary room for *Project Constellation*, which has been designed to replace the shuttles crew transport duties and also as an exploration vehicle for a return to the Lunar surface and perhaps even Martian excursions. Constellation as proposed includes the *Orion crew capsule*, the *Ares I* crew launch vehicle, the *Ares V* cargo launch vehicle and the *Altair Lunar lander* as primary components.

However, most new and technically challenging programs are prone to design issues, schedule slips and budget overruns and Constellation and particularly ARES I, have so far been no exception. Myriad technical challenges with Ares I have cropped up, from thrust oscillation issues, to issues with the Orion crew escape system, to Ares I-X test flight anomalies, among others. These issues have not gone unnoticed in Washington D.C.

Earlier this year, President Obama called on the Augustine Commission to review all current NASA human spaceflight plans and budgetary scenarios. The Commission strongly endorsed extension of the ISS to beyond the currently planned retirement date of 2015, perhaps out to 2020. The current plan calls for the ISS to be de-orbited in 2015, making a big splash into the ocean; Or NASA would withdraw and turn the station over completely to the Russians, Europeans and the other international partners. The Commission also strongly endorsed a budget increase of \$3 billion annually for NASA, saying anything less will prohibit NASA from doing anything of substance beyond low Earth orbit.

Most of the options outlined by



Shuttle on its way

to another adventure in space

the Commission do not include Ares I due to timing and lack of funding necessary to complete Ares I prior to the decommissioning of ISS. Ares I budgeting requires the transfer of the current shuttle and ISS operations budget. However, the most optimistic scenario for Ares I is an operational capability in 2015, by which time either the ISS would have splashed in the ocean or NASA would no longer have access to it. Thus Ares I would have nowhere to go, since lunar missions would not be possible without Ares V. Other analyses suggest that Ares I might not be operational until 2017 or later, creating at least a 5 to 7 year gap after shuttle retirement.

In place of Ares I, the Commission proposed options for increased investment in

continued, pg 2 —>

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Future Space Flights: *continued*
 Photos/Info: NASA/PWR

commercially available crewed transportation to and from low earth orbit (LEO). There are also various options for a large heavy lift vehicle, including the SDHLV: *Shuttle Derived Heavy Lift Vehicle*, which bears a strong resemblance to an earlier concept called Shuttle C and also, the proposed *Jupiter series* of vehicles which was developed in secret by NASA rebels: (http://www.popularmechanics.com/science/air_space/4295233.html) while Ares I development trudged along.

Extending the Shuttle Program to 2015 would alleviate the problem of having a gap in domestic U.S. launch capability to low earth orbit. Once the Shuttle Program stands down, there will be no means for NASA crews to reach ISS except by the Russian Soyuz spacecraft. Extension to 2015 could provide multiple benefits: The extra 5 years of operation would allow NASA time to complete the Ares I vehicle and development of commercial crew transportation options. It would also keep in place the highly skilled NASA and contractor work force that will be needed for any future human space flight activities. Extension to 2015 also preserves U.S. capability for launching U.S. citizens into low earth orbit without the uncertainty inherent in the ever changing political situation between the United States and Russia.

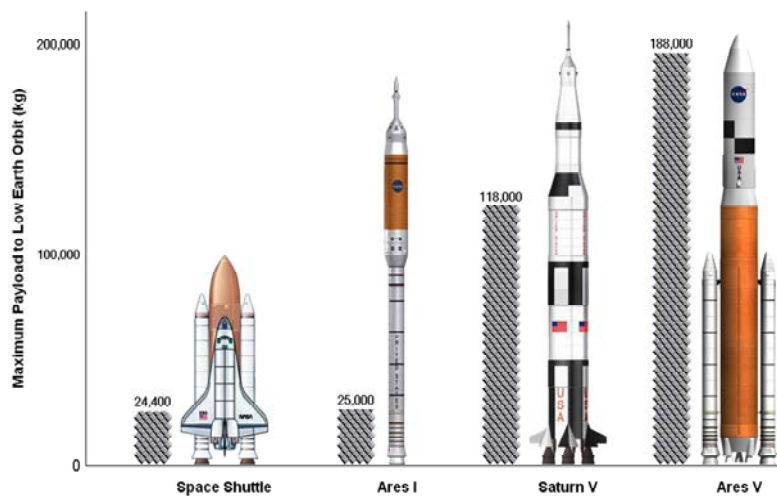
A big problem with this is that production of the shuttles large external tank (ET) takes ~ 2 years. NASA currently has enough tanks to launch the 5 missions scheduled for 2010. A 6th tank will be available for the "Launch on Need" (LON) rescue mission for the last scheduled flight, STS-133. That tank could be used to launch a potential 6th mission, STS-135. (This mission would deliver a multi-purpose logistics module to the ISS.)

Beyond that, there are two other partially completed tanks that could be ready for flight within nine months of the orders being placed for those reserve tanks. Beyond that, additional tanks are at least 2 years away, requiring the restarting of manufacturing from scratch. Thus, the Shuttle Program is rapidly approaching the point of no return given the putative 2015 extension date and the fact that new tanks will take at least 2 years to fabricate.

Therefore, there are many factors to be taken into account in NASA's future.



Atlantis (STS-129) landing at KSC



Comparison of Ares I/V with the Space Shuttle and Saturn V

However, the Constellation Program and Ares I are not without their staunch supporters in the U.S. Congress. The question is, will consensus be reached between supporters of the space shuttle extension and the supporters of the building of Constellation in time to save the Space Shuttle Program and the uniquely skilled NASA work force? Only time will tell. #

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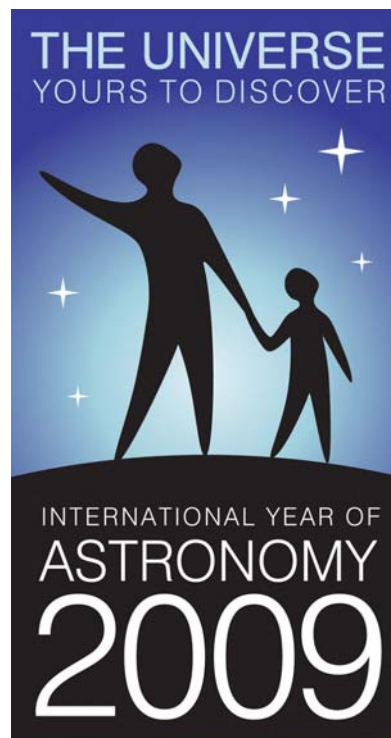
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2009 has been declared the "International Year of Astronomy". Events and activities to further the excitement of astronomy are being sponsored by IYA committees in over 100 countries. The logo for the IYA2009 is shown below. For more info on upcoming IYA2009 events, go to: <http://www.astronomy2009.org>

Triton Fun is an authorized distributor of T-shirts, sweatshirts and long-sleeve tees sporting this logo. Part of the proceeds from the sale of these shirts will go to support astronomy clubs and astronomy activities connected with IYA2009 in California.

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Superfluous Questions:

- 1) Astronomers detected a huge 55000 lightyear-long object, called a Lyman- α blob in space; what is its name?
a) Kibo b) Himiko c) Kanji d) Arigato
- 2) On what day of the year is St. Swithun's Day ?
a) August 15 b) June 15 c) May 15 d) July 15
- 3) In the TV show *Star Trek* (original series), Kirk meets his early love on Shore Leave. Her name was *what*?
a) Ruth b) Helen c) Janice d) Sue
- 4) What is the name of the highest mountain on Venus?
a) Maxwell Montes b) Olympus Mons c) Boosaule Montes d) Huygens Mons

→ ANSWERS in next months issue of the Science Newsletter ! ←---

** ANSWERS to November's Superfluous Questions: 1. b) Chastity Claire 2. b) cheese 3. a) JKCS041 4. d) Atacama