THE ORBIT

AUGUST 2013 the space architecture community newsletter

- SA Poll of the Month: answer this month's question here -

News and Announcement

[AIAA Space]: September 10-12: AIAA Space 2013 Conference & Exposition at San Diego Convention Centre, San Diego, California, USA.

[AIAA Space]: Detailed Program for SPACE 2013 is now available.

[IAC]: September 23-27: the 64th IAC at China National Convention Centre, Beijing, China.

[IAC]: Technical Program for IAC 2013 is now available**.**

Mailing list highlights:

the SATC mailing list archive is currently undergoing server restructuring and maintenance. As a consequence parts of the archive (including all discussion threads in recent months) are not currently accessible. Sorry for the inconvenience.

Event Summary: the 43nd ICES

The 43nd International Conference on Environmental Systems (ICES) convened in Vail, Colorado, USA, 14-18 July 2013. Theodore Hall chaired this year's Space Architecture sessions (ICES 502A/B). In total five papers were accepted and presented and the sessions were fairly well attended in overall. A more detailed report is available for download **here**.

Photos credits: Ted Hall / AIAA Facebook page (top middle & top right).

Poll of the Month

July 2013 Poll Results

Last month's poll results suggested that a majority of our community has no preference regarding the choice of power generation system for spacecraft or architecture design, or would simply choose one which is the most economical. Many commented on the fact that the choice of a particular power generation system is likely to be down to its compatibility with the specific mission requirement.

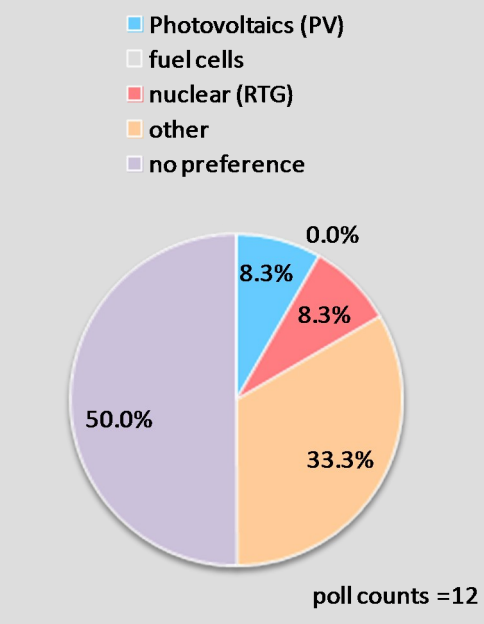
Photovoltaic (PV) is particularly effective when there is access to an ample level of sunlight and there is volume to accommodate its infrastructure—which make it the obvious choice for most orbital or deep space applications that are not too far from the Sun (beyond Mars). Planetary applications of PV however would require careful considerations of the day/night cycle and the infrastructure robustness against the elements (e.g. dust, wind, landing impact and deployment etc.).

Fuel cell could be useful as a backup/auxiliary power generation system but ultimately it requires another power source in order to perform its function.

RTGs that are currently available are very low power sources and would not be able to cope with human system power demands—however it is often considered more reliable and is one of the very few viable ways to power missions that have no access to decent level of sunlight (e.g. some polar regions on the Moon, or the outer solar systems.).

In addition to those comments mentioned above, **Solar Dynamic/Solar Thermal** and **Nuclear Fission** have also been mentioned as potential power generation options for spacecraft or architecture design.

If you would like to discuss or comment on this topic, you can start an email discussion thread here.



August 2013 Question:

There have been some renewed interests on the subject of extra-terrestrial mining in recent years. While the lime lights are currently focusing on the prospect of asteroid mining, discussions regarding water mining on the Moon and Mars have also gained much traction thanks to the recent scientific discoveries suggesting an apparent abundance of water presence on some region of the planetary bodies.

Many proposed extra-terrestrial mining strategies tend to feature heavily on automated mining technologies and that physical presence of human at the mining operations is generally considered as unnecessary. However, the status-quo of conventional mining operations on Earth shows a rather different picture, where majority of the mining operations worldwide still rely heavily on physical human presence to make on-the-spot judgement and interventions, and that automated mining technologies have yet to be adopted by the mainstream.

NASA's proposal on robotic asteroid capture mission
Image credit: NASA

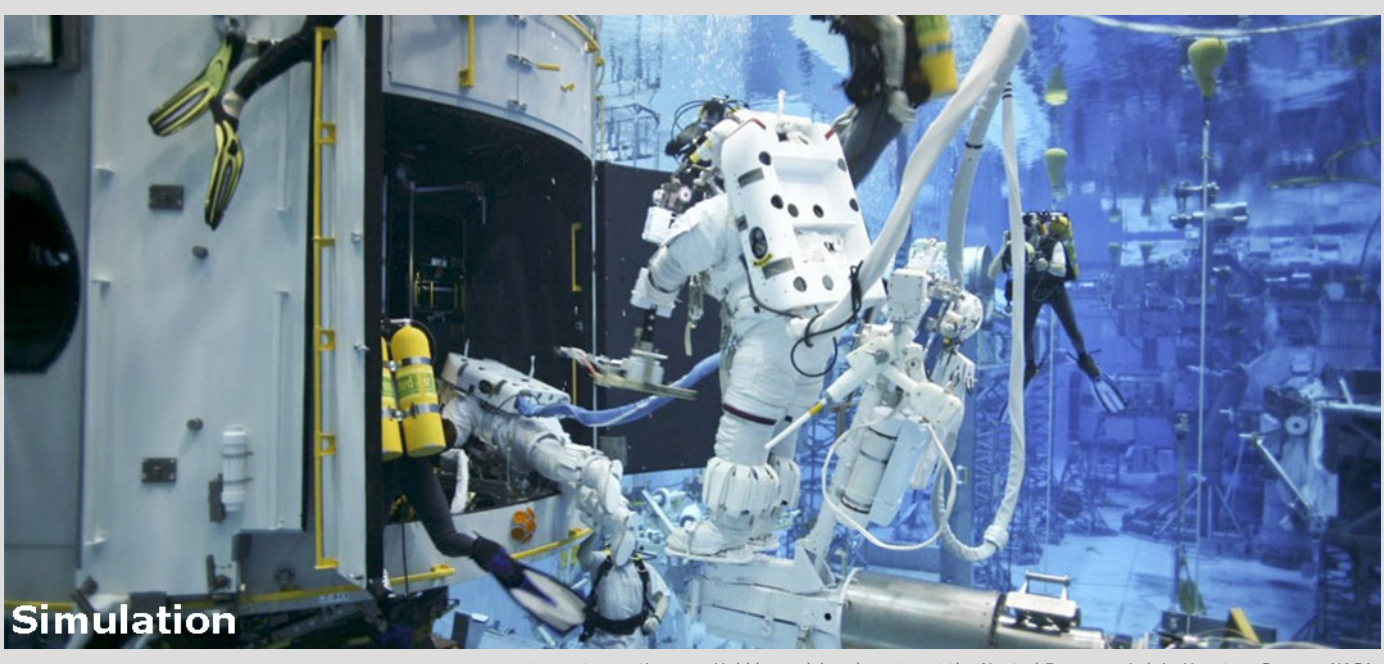
Do you think physical human presence is required for any extra-terrestrial mining operations?

- yes
- no

Please answer the poll question here.

You can also start an email discussion thread on this topic here.

Theme of the Month



astronauts practice on a Hubble model underwater at the Neutral Buoyancy Lab in Houston. Source: NASA

14 articles can be found within the spacearchitect.org publication archive by searching under the keyword: **"simulat*"**.

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Ferguson, Matthew; May, Chester B. (1970). Use of the Ben Franklin Submersible as a Space Station Simulator (NASA TM-X-66943).

Jørgensen, Jesper; Bannova, Olga (2006 September). Can We Test Design for Coming Interplanetary Expeditions in the Arctic? Arctic Research Stations as Test Bed for Simulations of Future Long-Term Space Environments (AIAA 2006-7343).

Mohanty, Susmita; Fairburn, Susan M.; Imhof, Barbara; Ransom, Stephen; Vogler, Andreas (2008 June). Survey of Past, Present and Planned Human Space Mission Simulators (SAE 2008-01-2020).

Mohanty, Susmita; Fairburn, Susan M.; Imhof, Barbara; Ransom, Stephen; Vogler, Andreas (2009). Human-Space-Mission Simulators. In A. S. Howe, B. Sherwood (Eds.), *Out of This World: The New Field of Space Architecture* (Chapter 25, p. 333-354).

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Nixon, David; Antonetti, Stefano; Clancy, Paul (2010 July). An Underground Isolation Laboratory for Human Space Mission Simulations (AIAA 2010-6047).

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Peldszus, Regina (2011 September). The Aouda.X Space Suit Simulator. In, Wired UK (September 2011, p. 30).

Simpson, William G.; Walker, Hill M. (1970 October). Space Environmental Work Simulator (US patent no. 3,534,485).