



THE GEORGE WASHINGTON UNIVERSITY

THE ELLIOTT SCHOOL
OF INTERNATIONAL AFFAIRS

SPACE POLICY INSTITUTE

SPRING 2014 NEWSLETTER

“Science and Commerce in Space: Balancing Public and Private Sector Interests”

On March 27, 2014, the Space Policy Institute and the Universities Space Research Association partnered to host a symposium discussing how the scientific community can take advantage of emerging private sector capabilities and insure the best science returns in the face of limited resources. Panelists from industry, government and academia discussed the pros and cons of private versus public sector work as they relate to their respective goals. USRA is a non-profit research organization governed by 105 universities that work in space-related research and technology. Speakers included Dr. Ellen Stofan, NASA chief scientist, Richard DalBello, White House Office of Science and Technology Policy, Vic Leonard of DigitalGlobe, Peter Marquez of Planetary Resources, and Debra Facktor Lepore, from Ball Aerospace.

Humans to Mars Summit

The Space Policy Institute cooperated with ExploreMars, Inc to host this multi-day event covering April 22-24, 2014, that attracted over 630 attendees and an offsite audience of well over 100,000. Speakers included NASA Administrator, Charles Bolden, and Apollo Astronaut, Buzz Aldrin. This was a comprehensive conference designed to address the major technical, scientific, and policy-related challenges that need to be overcome to send humans to Mars. It was a cross-disciplinary effort with the involvement of key players from NASA, industry, the science community, and non-government organizations.

The 64th Annual IAC in Beijing

During September 2013, Dr. Scott Pace, Dr. John Logsdon, Dr. Pascale Ehrenfreund, and Dr. Henry Hertzfeld attended the 64th International Astronautical Congress (IAC) in Beijing, China. SPI professors gave presentations on international cooperation in space science and human space exploration and policy changes affecting human spaceflight. Faculty participated in workshops at Beihang University of Astronautics and Aeronautics and gave presentations at the Beijing Institute of Technology's Institute for Air and Space Law. On the occasion of the IAC meeting in Beijing, SPI and the Institute for Air and Space Law at the Beijing Institute of Technology signed a joint statement that encouraged joint educational and research efforts in space law and policy. Dr. Hertzfeld gave space law presentations as a visiting professor to the Law Schools at the Beijing Institute of Technology and the Beihang Institute of Technology, and the Xi'an University Law School.

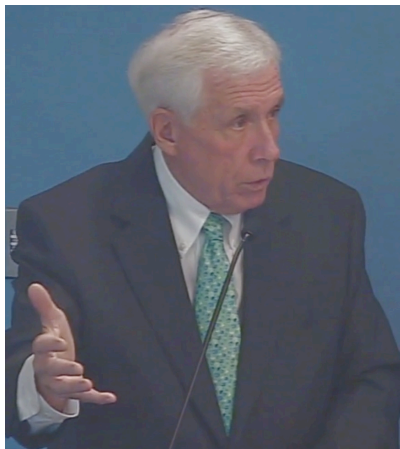
The Space Policy Institute Hosts Distinguished Speakers

The Space Policy Institute welcomed a number of notable experts who spoke to students and members of the local space policy community. General William L. Shelton, Commander of Air Force Space Command, spoke to students and professionals on January 7th. His lecture, “Space and Cyberspace: Enduring Missions in a Changing World,” described what the Air Force Space Command does for the nation, and how the command works with others to achieve its missions in space and cyberspace. A video of the

talk is accessible on the Elliott School website.



On April 28, 2014, the Space Policy Institute hosted a luncheon with Rep. Frank Wolf (R-VA) as speaker. The lunch brought together prominent members of academia, government, industry, as well as students. Rep. Wolf chairs the House Appropriations Subcommittee for NASA and has been a critic of space cooperation with China as well as a human rights advocate. A video of the talk is available on the SPI website.



George Washington University space policy students heard from several guest speakers in their classes, including Mike

Griffin, former NASA Administrator; Richard Buenneke, Senior Adviser for Space Policy at the State Department; Chris Shank, Policy Director for the House Science, Space, and Technology Committee; Chirag Parikh, Director of Space Policy at the National Security Council; and Charles Bolden, NASA Administrator (pictured below).



Planetary Society Board Meeting

On April 24-25, SPI hosted the annual meeting of the Board of Directors of the Planetary Society. Board members in attendance included Bill Nye and Neil DeGrasse Tyson.

SPI - SWF Reception for US - Japan Comprehensive Dialogue on Space

On May 8, 2014, the Space Policy, in conjunction with Secure World Foundation, hosted a reception in honor of the 2nd meeting of the Japan-U.S. comprehensive dialogue on space. Members of both delegations were present, along with members of industry and academia.

SPI Students

Over the spring, the SPI's nine Masters students secured jobs and internships in a variety of areas, including NASA, Arianespace, consulting firms, and the Pentagon. Mia Brown be interning at the UN Office of Disarmament Affairs in Vienna, Austria this summer.

The George Washington Space Society organized several events for SPI students and alumni this term, including a TDRS-L launch viewing at Florida's Kennedy Space Center. Students participated in and helped organize several conferences this term. Mia Brown helped organize the ST Global conference held in DC on April 4-5, 2014. Mia Brown, Tom Chinick and Jordan Sotudeh volunteered for the 30th Space Symposium in Colorado Springs, CO, from May 19-22, 2014. Jordan Sotudeh also volunteered for the May 19 Cyber 1.4 Conference and was a delegate at the New Generation Space Leaders Conference. Tom Chinick, Antonina Gromyko, Joel Sloten and Jordan Sotudeh provided research for the upcoming *Space Security Index*, and will be presenting their findings to the Space Security Working Group at McGill on May 28, 2014. Raphael Perrino's submission to AIAA's Space 2014 conference was accepted, and he will be presenting his paper in San Diego August 4-7, 2014.



Katrina Laygo did an independent study project in the Philippines on the use of space for maritime domain awareness. The photo above shows a meeting with Philippine Navy officers.

Alexander Burg, Katrina Laygo and Samantha Marquart were awarded the 2014-2015 Future Space Leaders Foundation grants, taking three out of five

possible awards. This will allow them to attend the International Astronautical Federation Conference in Toronto, Canada in October 2014.

SPI Affiliated Faculty News

Professor Henry Hertzfeld is currently leading a study for the Department of Defense's Office of Manufacturing and Industrial Base Policy on the commercial remote sensing industrial base. The study was requested to provide options for government action in light of reduced spending for commercial remote sensing imagery and consolidation of firms in response to changes in government demand.



Dr. Hertzfeld testified on to the House Committee on Science, Space and Technology on February 4, 2014 regarding proposed updates to the Commercial Space Launch Act. He also spoke before the Council on Foreign Relations on April 8, 2014 on Near-Earth Asteroids.

With Dr. Pace as a co-author, he published a November 2013 article in *Science* on "International Cooperation to Protect Human Heritage on the Lunar Surface." Dr. Hertzfeld also authored a chapter on "Dynamics of Space Exploration Activities and Outlook" for an International Astronautical Federation

book on *Legal Issues of Planetary Protection and Stewardship*.

Professor Zoe Szajnfarder's research group (SzajnLab) has had another busy spring semester, working to understand how innovation happens in the space sector, and how the process can be improved. Her group received new grants from NASA – to study the interaction of Open Innovation methods and System Complexity – and the University of Huntsville – to work with the UAH Space Systems Engineering Consortium on systems engineering education. More activities can be found here:

<http://www.seas.gwu.edu/~zszejnf>

Professor Pascale Ehrenfreund is part of a team that will be sending an experiment to the International Space Station (ISS) on July 24, 2014. Since the beginning of 2014 she has been engaged in the preparation of samples that will be exposed on the EXPOSE-R2 facility on the ISS for two years. She is also involved in preparation for the Rosetta Comet Rendezvous mission that will land on a comet in November 2014. Dr. Ehrenfreund is currently serving on the National Research Council Committee on Human Spaceflight and on National Research Council Committee CAPS (Committee on Astrobiology and Planetary Science).

In January Dr. Ehrenfreund attended the Heads of Space Agency Summit on Exploration in Washington DC; in February she participated to the “Science and Challenges of Lunar Sample Return” Workshop at ESTEC in The Netherlands, and in March at the IAF/IAA/COSPAR spring meeting in Paris, France. At the Human to Mars Summit 2014 in Washington DC she participated in the Panel: “Space Exploration at George Washington University” and “What are the critical Mars measurements (atmospheric

and surface) needed to reduce the risks of a human landing?” This spring, Dr. Ehrenfreund published several peer-reviewed papers in *Acta Astronautica*, *Astrobiology* and *Environmental Microbiology*. In March she was featured in the GWU Magazine: <https://magazine.gwu.edu/plenty-space-no-room-error>

Professor Emeritus John M. Logsdon focused his efforts during early 2014 on completing the manuscript for his new book “After Apollo? Richard Nixon and the American Space Program.” Palgrave MacMillan will publish in early 2015. Dr. Logsdon appeared on a March 19 panel hosted by Neil DeGrasse Tyson at the American Museum of Natural History's annual “Asimov Debate.” The debate topic was “selling space.”

Professor Peter Hays has led GW efforts in delivering research for the upcoming *Space Security Index*, which will be presented at McGill University, at the annual Space Security Working Group in May 2014. He participated in the Office of the Secretary of Defense/Office of Net Assessment Space Futures Wargame, May 6-8, 2014.

Professor Kris Lehnhardt has been continuing his efforts to improve the understanding of human health issues in spaceflight. In addition to teaching his course “Introduction to Human Health in Space;” Dr. Lehnhardt moderated a Biomedical Challenges panel at the recent Humans to Mars Summit. Dr. Lehnhardt will represent GWU at the annual Aerospace Medical Association (AsMA) conference, where he will be presenting on medical support for analog missions and aerospace medicine education. His research continues to focus on exercise countermeasures in microgravity and the risks of decompression illness.

Professor Michael Keidar is the Director of the Micropropulsion and Nanotechnology Laboratory in the Department of Mechanical and Aerospace Engineering. His research interests are in advanced spacecraft propulsion, particularly for small satellites such as “cubesats.” In March, his graduate students made presentations at a regional meeting of the Universities Space Research Association and in April at a national cubesat workshop at California Polytechnic State University, San Luis Obispo.



News from the Director

SPI Hosts Visiting Scholars

The Space Policy Institute continued to host international scholars to study and conduct their own research. This spring, the Institute hosted Bleddyn Bowen, from the Aberystwyth University in Wales, Yonggang Fan from the Chinese Academy of Sciences, Tomokoazu Ueta and Takehito Morishima, from the Japanese Ministry of Education, Science and Technology, and Sport (MEXT).

Mr. Bowen's work looked at strategic theory and US-Chinese space warfare capabilities through a “Clausewitzian” lens. He is currently organizing a space strategy conference in his home institution. Dr. Fan is studying the policy issues surrounding commercial uses of China's Navigation Satellite System, *BeiDou*.

Mr. Ueta analyzed examined the policy decisions shaping Japan's decision to build a new launch vehicle, the H-III. He presented his findings at the local JAXA office (see photo below). Mr. Morishima has taken on Mr. Ueta's role at SPI, and he is currently looking at ways to enhance international cooperation and innovation in space.



This has been another busy year with numerous public engagements and other duties. In June 2013, I served on the US delegation at UN meetings of the Committee on the Peaceful Uses of Outer Space in Vienna, Austria. Meeting topics included measures to improve the sustainability of space activities. I attended the International Astronautical Federation Conference in Beijing, China in September. My paper dealt with policy innovations in human space flight. I was a member of the Department of Commerce's Federal Advisory Committee on Commercial Remote Sensing. A White House review of remote sensing policy is expected to occur this year.

As was the case last year, I have been studying space cooperation with Japan. I made presentations at a Europe-Japan-U.S. space security conference in Tokyo in October 2013, and at a University of Tokyo conference in February 2014.

I was invited to give congressional testimony to the House in February 2014 on the potential value of a human fly-by mission to Mars in 2021. I was also invited to give testimony to the Senate Defense

Appropriations Committee in March 2014 on National Security Space Launches and potential new entrants. (See photo below)



GPS policy and regulatory issues continue to be a major part of my work. I was part of a government-industry team that negotiated an agreement with the Air Force on the placement of space laser reflected on new generation GPS satellites. The team received a special recognition award in February 2014 from the Institute of Navigation.

The international environment for international space cooperation continues to be complex, particularly with respect to Russia and China. The coming year will likely see major space policy developments. The faculty and graduate students of the Space Policy Institute hope to make constructive contributions to the on-going debates.

Space Policy Institute in the News

In the past several months you may have heard members from the Space Policy Institute in the media. The Institute was cited extensively as an expert source in television, radio, and print media. SPI professors were seen on television, like C-SPAN, Voice of America and the Discovery Channel; heard on radio, such as NPR in DC, KCRW in LA, The Space Show, TBS in S. Korea, the Diane Rhem

Show; read in magazines/periodicals like *New Scientist*, *Science*, *GW Today*, *Fast Company*, *Physics Today*, *Foreign Policy*, *CQ Roll Call*, *Aerospace America*, *IEEE Spectrum*, *Forbes*, *Quartz*, *National Geographic*, *Quest*, *Florida Today*, *Space News*, *New York Times*, *Popular Mechanics*, *Washington Post*, *Wall Street Journal*, *Associated Press*, *Houston Chronicle*, *Der Spiegel*, *Le Pointe*, *Guardian*, *Moscow Times*, *BBC*, *Xinhua News Agency*, and *Global Times*.

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