

## SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)

Enabling The Future – Developing the Project Management and the Technical Space Workforce (3)

Author: Prof. Mariel Borowitz

Georgia Institute of Technology, United States, marielborowitz@gmail.com

Mr. Micah Walter-Range

Space Foundation, United States, mwalterrange@spacefoundation.org

## ANALYSIS OF GLOBAL SPACE WORKFORCE AND EDUCATION

**Abstract**

The activities and infrastructure that comprise the global space economy rely on a workforce of hundreds of thousands of professionals around the world. Although the U.S. workforce decreased slightly in 2009, the available data demonstrate that over the long term, space employment levels have remained consistent and there has been real salary growth. Other leading space actors, such as Europe and Japan, have also maintained their space workforce through periods of relative economic strength and weakness.

The high-paying jobs available to space workers require highly developed skills and education. For example, at NASA, almost all of the individuals hired in 2010 held a bachelor's degree or higher. A robust space workforce requires an adequate supply of science and engineering university graduates. Education trends around the world show that some countries, such as China, are greatly increasing the number of these graduates.

This paper presents the Space Foundation's findings from The Space Report 2011, describing figures and trends with regard to global space employment and global space education. In addition to these facts and figures, this paper attempts to explain some of the drivers of changes within the global workforce, including those caused by NASA's recent policy transitions. A snapshot of the demand for highly educated individuals is presented based on detailed data about the educational attainment of NASA's current and past space workforce, as well as reports on commercial hiring practices. This is compared with global data on the number of space-related undergraduate and graduate degrees attained in various regions and particular spacefaring nations. The paper ends by discussing the limits of currently available space workforce and education metrics, and suggesting ways that trends in these areas could be better tracked and understood in the future.