

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
Enabling the Future - Developing the Space Workforce (5)

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WORKFORCE FOR THE FUTURE DEVELOPMENT OF SPACE ACCESS VEHICLES

**Abstract**

The development of advanced vehicles that will travel to and from planetary surfaces with atmospheres requires the availability of experimental and computational capabilities that accomplish the research leading to new technologies and the development, test, and evaluation (RDTE) of new flight systems. The United States is at risk of not having the required RDTE workforce – qualified and in sufficient numbers – in place and ready to meet the future market’s commercial and defense needs.

Systemic challenges include uncertain Federal budgets that limit and interrupt government research and development, the projectized nature of new space access systems that drive boom/bust cycles, an aging aerospace workforce (compounded by a mid-age demographic gap), limited to declining investment in sustaining and advancing experimental and computational tools infrastructure, lack of standards for sharing (and leveraging) data, dramatically changing technologies, changing social norms, and potentially large increases in commercial market needs. Additionally, the aerospace workforce is historically weak in employing women and people of color – the industry is leaving a lot of talent on the table – improvement here should be one of the major contributors to addressing these challenges.

Flight systems have mission-based trajectories to and from space and designers must ensure risk is properly assessed across the entire trajectory. Thus, physics questions must be answered at each stage of flight, which requires a suite of experimental and computational tools. The RDTE workforce utilizing these tools include subject matter experts from the producers, interested in acquiring data and information on the product, and from the capabilities being utilized, interested in addressing the product customer’s needs (providing robust data collection techniques, data quality, timeliness – available when needed, efficient with cost management, and teaming on data analysis). This requires a range of skills – in addition to aerospace, other engineers, and software developers, a highly trained and certified craft and technician workforce is critical to future success.

This paper will present a human resources construct that addresses the system of needs for people – including, but more than just technical skills. The construct reviews the challenges for the operating environment, the organization, and the individual and will be applied to the needs of the RDTE workforce required to develop new and updated vehicles flying to and from space in planetary atmospheres. This is part of a larger AIAA effort to document challenges and associated best practices for the aerospace RDTE workforce.