

## SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)

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

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## DEVELOPING THE NEXT GENERATION OF SPACE TECHNICAL LEADERS

**Abstract**

The increasing complexity of modern systems and enterprises demands a new generation of technical leaders who can see and solve problems from multiple perspectives. Complex technical decision making, ubiquitous software, massive net-centricity, asynchronous clock speeds for the evolution of different technology and application elements, increasing legacy (systems and organizations), dissonant regulatory standards, decentralized governance, expanding applications and stakeholder expectations, global supply chains, and increased concerns about cyber and cyber-physical security are contributors to this complexity.

The traditional career progression of technical leaders begins with domain specialists who grow to become systems engineers, lead designers/architects, or team leads. However, very little formal training exists to prepare technical leaders to reach the top level of leading complex technical organizations in roles such as Chief Engineer, Chief Architect, or Chief Technical Officer. The need for space technical leaders is becoming increasingly important as space systems become more complex, the Apollo and Shuttle era workforce retires, and programs are cut or reduced due to tight budgets, resulting in fewer opportunities for hands-on experiences.

To meet this need, Stevens Institute of Technology, with its 140-year legacy of innovation in engineering and business entrepreneurship, has developed a new Technical Leadership Program. The program results from two years of collaboration with senior technical leaders from industry and government in the U.S. and globally, and guidance from on-going research sponsored by the U.S. Department of Defense's Systems Engineering Research University Affiliated Research Center (SER-UARC), which Stevens leads. These engagements have explored characteristics of top technical leaders, common pitfalls and points of failure for technical leaders, skills needed at various career points, and how to leverage education and knowledge transfer to develop competencies of technical leaders.

The Technical Leadership Program is architected into three phases (lenses) – Systems, Business, and Enterprise – that align with a technical leader's career growth within an organization and enable an increasingly broader aperture for problem solving and situational awareness. Communications, mentoring, ethics and technical integrity are emphasis themes that cut across all three lenses. Projects and coursework are presented in a dynamic experiential learning environment ranging from case studies to simulation and are directly tied to participants' current and future job challenges.

This paper will explore the research behind the Stevens Institute of Technology Technical Leadership Program, present details on the learning framework, and share initial observations from the inaugural class of master's students scheduled to begin in June 2011 in Washington DC.