

# SCS Keynote Speaker



**TITLE: Model-Based Space Exploration**

**AUTHOR:** Stephen D. Wall, Jet Propulsion Laboratory

**ABSTRACT:**

Question: How do you test something that hasn't been built, yet has to work in an environment you can't reach (or even come close to), and sometimes can't even be put together or operated until it's too late to fix anything? Answer: model-based design!! Even before the days of what we now call "model-based" design, this was an issue at JPL. Some novel methods were used to address it, but with integrated models we can be much better prepared for the increasing challenges that space exploration and its very hostile environments bring. We will discuss some of the early and current embodiments of models, simulations and formal methods in our engineering design processes as NASA heads toward finding out what's "out there".

**SHORT BIO:**

Stephen D. Wall is the Integrated Modeling and Simulation Manager at Jet Propulsion Laboratory and an instructor in engineering and management for Caltech's Center for Technology and Management Education. His research centers on the use of integrated model-based simulations to explore mission tradespaces in the aerospace design process. He has held design, systems, analysis and management positions on many NASA programs, including Viking, Magellan, Shuttle Radar Laboratory, and Cassini. Steve was one of the originators of JPL's conceptual-phase collaborative design team known as "Team X" in the late 1990's, going on to create and led JPL's Center of Excellence for Space Mission Architecture and Design. He introduced the concept of model-based design to JPL in the early 2000's and later led a similar program for the National Reconnaissance Office. From 2007 to 2010 he served as a member of the U.S. Air Force Science Advisory Board, and in 2013 he helped to develop a scenario-based, failure-tolerant design process for DARPA's F6 program. He currently leads the development of architectural design simulators for NASA's Human Exploration and Operations Mission Directorate.

Steve holds a BS in physics from N.C. State University and an MS in Optical Engineering from University of Rochester (NY). He has been awarded NASA's Exceptional Service Medal, Exceptional Achievement Medal, and 12 NASA Group Achievement Awards.