

# Aerospace Seminar



**Robotist - Structural Mechanics and Concepts Branch  
NASA Langley Research Center**

## An Approach to Robotic In-Space Assembly

**Monday, September 18, 2017 | DLC | 4:00 P.M.**

Autonomous in-space assembly will be a breakthrough technology for future mission capabilities. It would reduce mission complexity, enable aggregation from multiple launches, enable a common architecture for upgrades and servicing, drive down costs, and support more ambitious missions. Example missions and technologies include large space telescopes, orbital and surface habitats, aeroshells, and megawatt-class solar arrays. Challenges to overcome prior to making autonomous in-space assembly a reality include: reasoning in an uncertain environment, collaborative manipulation, task allocation, detecting unexpected events, and making repairs.

Dr. Komendera will describe an assembly method incorporating a team of robots including dexterous manipulators and long reach manipulators, using state estimation, error detection, and correction. This talk will discuss the results of three assembly trials featuring the assembly and deployment of solar arrays and trusses, and preview ongoing research.

Dr. Komendera is robotics researcher at NASA Langley Research Center. He earned his MS ('12) and PhD ('14) in Computer Science from the University of Colorado. His interests include addressing the challenges preventing in-space assembly from being practical, with an emphasis on state estimation and techniques to identify and overcome errors in the assembly process. He is the PI for a Langley IRAD project investigating assembly of solar arrays by a team of robots, and is the Assembly Lead for the joint NASA/Orbital ATK project "Commercial Infrastructure for Robotic Assembly and Servicing."



Smead Aerospace

SITY OF COLORADO

LDER