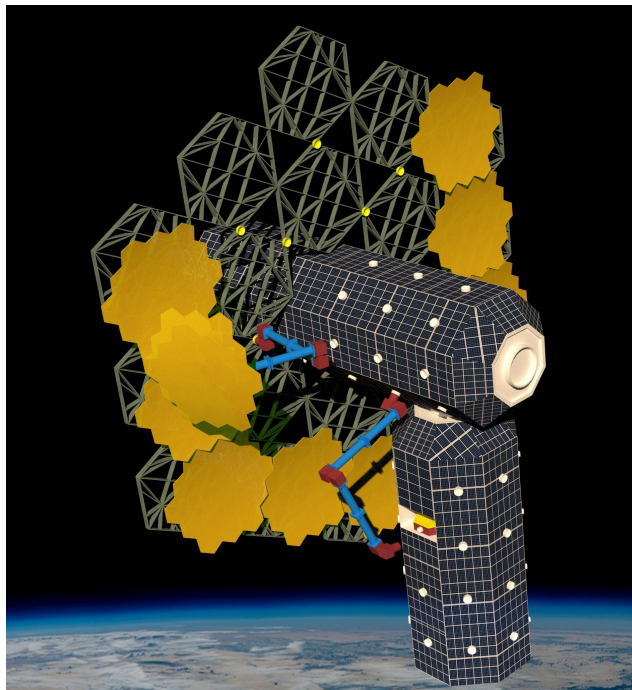


# Workshop Introduction: Robotic In-Situ Servicing, Assembly and Manufacturing

*Craig R. Carignan*  
*University of Maryland*

## Abstract

Robotic manufacturing, assembly, and servicing utilizing in-situ resources will enable the construction and maintenance of large-scale assets at significantly reduced cost. Examples include large, ground-based infrastructure (buildings, particle accelerators, solar farms), large in-space assemblies (space telescopes, commercial platforms, transportation hubs), and undersea structures (oil platforms, laboratories, habitats). Achieving in-situ fabrication using cooperative, mobile robots is also a major goal of several terrestrial and orbital construction projects. Major challenges include mobility, precise manipulation, localization/mapping, and adaptability to uncertainties in the environment. The capacity to process raw materials in remote environments is also key for on-orbit, lunar, and planetary applications. In general, large ground-based facilities built in inaccessible locales could benefit greatly from in-situ robotics for inspection and servicing, and likely would necessitate a multi-robot scalable solution.



University of Lincoln