**Aerie: A Modern, Open Source Approach to Mission Planning and Scheduling**

The use of mission planning and scheduling software appears throughout the design and operation of most, if not all, space missions. Usually, such software provides some modeling and simulation capability that allows planners to predict the integrated behavior of the spacecraft, ground, and environment and their effect on critical spacecraft resources including available energy, on-board data storage, and propellant consumption. Early in a project’s lifecycle, many of these simulations can be run to quantify resource impacts to support trade studies, verify requirements, allocate resources, and assess the robustness of the design to perturbations. As the mission moves into operations, these simulations are then used to verify and validate a given plan prior to executing it on-board.

Aerie is a newly developed, open source planning and scheduling framework intended to support a wide range of mission classes from small sats to flagships. At its core, Aerie is a discrete event activity planning simulator that runs and orchestrates models in order to simultaneously simulate plan effects on flight, ground, and operations systems. Mission models are built and tested using a Java-based modeling framework, which can then be loaded into the Aerie system for planners to use to assess the viability of the plans they develop. Planners can either manually create plans using the Aerie user interface, or automatically build up a plan using Aerie’s goal-based scheduling capability. Once a simulation has been performed on a plan, planners can check the validity of their plan through a javascript-based constraint checker. Aerie is web-based, multi-tenant, and cloud-native, which enables users to easily collaborate to build and assess plans.