

Cryogenic Thermal Design Challenges and Status of NASA's James Webb Space Telescope

Keith Parrish¹, John Pohner², Stuart Glazer¹,
Shaun Thomson¹, and Robert Mackey³

(Email: Keith.A.Parrish@nasa.gov)

¹NASA Goddard Space Flight Center, Greenbelt, Maryland

²Northrop Grumman Space and Technology

³Lockheed Martin Missiles and Space

NASA's James Webb Space Telescope (JWST), scheduled to launch in 2011, will include a multi-module science instrument package with near-infrared detectors passively cooled to below 40 Kelvin. Instrumentation will also include a mid-infrared camera with detectors cooled to less than 7 Kelvin via a solid Hydrogen dewar. These complex cooling configurations, combined with a large deployed and actively controlled six meter telescope passively cooled to below 50 Kelvin, serve to make JWST one of the most unique and thermally challenging missions flown to date. This presentation describes JWST's current status and baselined thermal/cryogenic systems design. The extreme thermal challenges facing JWST are described and accompanied by a discussion of the JWST thermal modeling approach, development activities, and verification plans.