



ICESat-2: the next generation laser altimeter mission for polar research

Thomas Neumann, Thorsten Markus, Anthony Martino, and the ICESat-2 Science Definition Team
NASA Goddard Space Flight Center, Cryospheric Sciences Laboratory, Greenbelt, MD 20771, USA

NASA's Ice, Cloud, and land Elevation Satellite-2 (ICESat-2) mission objectives are to quantify polar ice sheet contributions to sea level change, quantify regional signatures of ice sheet changes to assess driving mechanisms, estimate sea ice thickness, and to enable measurements of global canopy height as a basis for estimating large-scale biomass. Its predecessor ICESat, which operated from 2003 to 2009, pioneered the use of laser altimeters in space to study the elevation of the Earth's surface and its changes. Among other contributions to the cryospheric sciences, ICESat proved adept at making centimeter-level elevation measurements over both ice sheets and sea ice. Since ICESat stopped collecting data in October 2009, the IceBridge and CryoSat-2 missions continue these important observations. The well-documented and ongoing dramatic and rapid changes in the Earth's ice cover have strengthened the need for sustained observations beyond what CryoSat-2 and IceBridge are expected to provide. Lessons learned from ICESat demonstrated the need for cross-track slope information over the ice sheets (realized through ICESat-2's multiple beams), a smaller footprint size, and gapless along-track data collection. These needs resulted in a different measurement concept for ICESat-2.

The presentation will provide a brief summary of the measurement concept, the status of hardware development (instrument Integration and Testing has started in May 2014), and progress on geophysical algorithm development.