

26th IUGG General Assembly, June 22 – July 02, 2015

Joint Inter-Association Symposium

JG1 "Dynamics of the Cryosphere from Geometric and Gravimetric Observations"

Convenor: Mirko Scheinert (TU Dresden) (IAG)

Co-convenors: Pippa Whitehouse (University of Durham) (IACS)

Matt King (University of Tasmania) (IAG)

Erik Ivins (NASA/JPL) (IAG)

Session description:

The Cryosphere is undergoing huge changes, and multidisciplinary studies offer the best approach to understand its past, current and future state. Geodesy provides an array of observational tools that operate across a spectrum of spatial scales: from the enormous areal extent of the Antarctic and Greenland ice sheets down to flow features within individual glaciers. Satellite methods play key roles: radar and laser altimetry enable us to infer height changes of the ice surface, radar interferometry and feature tracking allow monitoring of glacial flux, while satellite gravimetry provides a direct measurement of ice-mass changes. Independently, GNSS observations of crustal deformation reflect the loading effects of past and present ice-mass changes and provide constraints to disentangle ice-mass effects from solid earth effects in satellite altimetry and gravimetry. Furthermore, ground-based and airborne methods provide important spatial and temporal densification and calibration/validation of satellite measurements.

In recent years, our understanding of glacier, ice cap and ice sheet behaviour has advanced through a variety of synergistic combinations of geodetic methods with geological, geophysical and glaciological observation techniques. In particular, modeling efforts that are validated by geodetic data improve our understanding of the mechanisms and processes driving ice dynamics. In addition, the modeling of glacial-isostatic adjustment is of central importance to making reliable estimates of ice-mass balance by satellite gravimetry, especially in Antarctica.

For this symposium, contributions are sought on all aspects of space-, air- and ground-based geodesy applied to Cryosphere studies, from individual glaciers to entire ice sheets. We particularly welcome the interdisciplinary use of a variety of observational techniques to understand the stability and evolution of the Cryosphere and test numerical models. We hope that this session will present a detailed but also comprehensive picture of the dynamic state of the Cryosphere, from ice sheets to individual glaciers.