

Glacial Isostatic Adjustment, Ice Sheets, and Sea-level Change – Observations, Analysis, and Modelling

Conveners: Thomas James, Natalya Gomez, Matt King, Shawn Marshall, Glenn Milne, and Pippa Whitehouse

Date and Venue: Sept. 24-26, 2019, Canadian Museum of Nature, Ottawa, Canada

Sponsors: Solid Earth Response and influence on Cryosphere Evolution (SERCE) Scientific Research Program of the Scientific Committee on Antarctic Research (SCAR), Polar Knowledge Canada (POLAR), and the Canadian Museum of Nature.

Workshop Description:

Glacial Isostatic Adjustment (GIA) is the response of the solid Earth to past and present-day changes to glaciers and ice sheets. It generates crustal displacements, sea-level changes, and changes to the Earth's gravitational field. Recent developments in GIA modelling include increased consideration of lateral variations in Earth structure (i.e. three-dimensional Earth models) and coupled ice-sheet/Earth modelling. Complementing these recent developments are ongoing investigations into paleo ice sheet extent, Earth structure, and paleo sea-level investigations. Geodetic measurements of crustal motion and gravitational change include the GIA viscoelastic response to past changes, as well as the Earth's elastic response to present-day ice mass changes.

The outstanding source of uncertainty in projecting future global sea-level rise is the dynamical behavior of marine-based portions of the Antarctic ice sheet. These ice sheets, grounded below present-day sea-level on bedrock that slopes down towards the interior, may be subject to a Marine Ice Sheet Instability (MISI) featuring a positive feedback cycle of thinning and grounding line retreat. Where glaciers and ice sheets are undergoing rapid change, the solid Earth response, which is comprised of both an elastic response to present-day change and viscoelastic response to past ice mass change, can affect the bedrock elevation relative to local sea-level and affect glacier flow dynamics, including grounding line migration, and thus affect global sea levels. The structure and rheology of the interior of the Earth determines the rapidity of the Earth's response and the strength of the potential interaction between vertical crustal displacement and ice sheet dynamics.

This workshop invites contributions discussing observations, analyses, and modelling of ice sheet dynamics, the ensuing solid-Earth response, the resulting global and local (relative) sea-level changes, and the interactions and feedbacks between these components of the coupled Earth system. Contributions related to both polar regions are welcomed. The workshop will emphasize recent developments in GIA and ice sheet modelling:

- coupled ice-sheet/GIA models to explore interactions, including those that may accelerate or impede rapid delivery of ice to the oceans
- GIA modelling with complex Earth models that may incorporate lateral heterogeneity (i.e., three-dimensional Earth models) and non-linear rheologies.

We also seek contributions on:

- Observations constraining ice sheet history and refinements or syntheses of paleo-sea-level histories
- Glacial isostatic adjustment modeling to explain aspects of the paleo record (ice-sheet extent, sea-level history) and present-day measured crustal motion and gravitational changes
- Geophysical and geodetic constraints on Earth structure and mantle rheology beneath present-day and ancient ice sheets
- Ice sheet and glacier measurements and modelling of past, present, and future extent and volume.

Accommodation, Registration and Abstract Submission

Accommodation: A block of rooms have been reserved at the Best Western Victoria Park Suites, two short blocks from the Museum of Nature at a rate of \$189 per night (plus taxes).

Address: 377 O'Connor St, Ottawa, ON K2P 2M2

Phone: 1-613-567-7275; 1-800-780-7234 (Canada and US only)

Indicate the reservation is for the “GIA Workshop” in order to get the quoted rate.

Web Site: [Best Western Plus Ottawa Downtown Suites](#) (the web site does not recognize the GIA workshop rates)

Registration. Registration is free, but we need to know your name and contact information. Please register here:

[GIA Workshop Registration](#)

Please use this google form to register for the GIA workshop

FILL OUT FORM

Registration will be first come, first served, and will end when we reach capacity, or on April 30, 2019.

Abstract Submission. Submit your abstract here:

[GIA Workshop Abstract Submission](#)

FILL OUT FORM

Attendees may submit more than one abstract. The preference is for oral presentations, but limited poster space will be available. Notification of acceptance of abstracts will be provided by email after abstract submission is closed on April 30.