

GFD Newsletter 2017

Faculty of Walsh College



The 2017 GFD Photograph.

Summer Highlights

The 2017 GFD Program theme was *Ice-Ocean Interactions*. Three principal lecturers, Andrew Fowler (University of Oxford), Adrian Jenkins (British Antarctic Survey) and Fiamma Straneo (WHOI/Scripps Institution of Oceanography) were our expert guides for the first two weeks. Their captivating lectures covered topics ranging from the theoretical underpinnings of ice sheet dynamics, to models and observations of ice-ocean interactions and high-latitude ocean circulation, to the role of the cryosphere in climate change. These icy topics did not end after the first two weeks. Several of the Fellows' projects related to ice-ocean dynamics and thermodynamics, and many visitors gave talks on these themes.

Claudia Cenedese and Mary-Louise Timmermans were co-directors, and the steady-stream of visitors, plus large number of long-term staff members around for the summer, ensured that the fellows never lacked for guidance. The second annual GFD awards night was a notable highlight with Prof. Grae Worster sweeping the best dressed category for the second year in a row. On serious note, Andrew Wells (Oxford) was awarded

the GFD Distinguished Scholar Award.

As usual, laboratory experiments were facilitated by able support from Anders Jensen who had the challenge of making icebergs of different shapes and sizes. Once again, Julie Hildebrandt and Janet Fields kept the whole program running smoothly with efficient administration in all aspects. We continue to be indebted to WHOI Education, and are grateful for the opportunity to share scientific ideas on the porch at Walsh, the picnic tables on the lawn, and in the bustle of Woods Hole village.

Schedule of Principal Lectures

Monday, June 19: *Introduction*

Andrew Fowler:

Tuesday, June 20: *Ice Dynamics*

Wednesday, June 21: *Subglacial Control of Ice Flow*

Thursday, June 22: *Processes at the Ice-Ocean Interface*

Adrian Jenkins:

Friday, June 23: *Basic Theory of Ice-Ocean Interaction*

Monday, June 26: *Ocean Circulation beneath the Ice Shelves*

Tuesday, June 27: *Ice-Ocean Interactions around Antarctica*

Fiamma Straneo:

Wednesday, June 28: *Testing the Ocean Trigger Hypothesis for Greenland's Recent Glacier Retreat*

Thursday, June 29: *Submarine Melting of Greenland's Glaciers*

Friday, June 30: *Formulating Appropriate Glacier/Ocean Exchanges in Greenland Ice Sheet and North Atlantic Ocean Models*



Principal Lecturers: Andrew Fowler (left), Adrian Jenkins (center) and Fiamma Straneo (right)



Staff vs Fellows Final Game

Fellows' Projects & Presentations

Robert Fajber, University of Toronto
Seeing Ocean Through Sea Ice: Simple Theory for Submesoscale Ice-Ocean Interactions in the Marginal Ice Zone

Margaret Lindeman, Scripps
A Supercool Mechanism for Secondary Sea Ice Growth

Madeleine Youngs, MIT
Energy Fluxes in Mixed Barotropic-Baroclinic Instability: Up-gradient or Down-gradient?

Federico Fuentes, University of Texas-Austin
Global Stability of Two-dimensional Plane Couette Flow Beyond the Energy Stability Limit

Thomasina Ball, University of Cambridge
Understanding Cylindrical Dinosaur Footprints

Jessica Kenigson, University of Colorado-Boulder
A Simple Adiabatic Model for Vertical Variation of Halocline Slope in the Beaufort Gyre

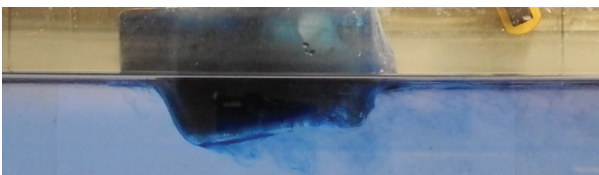
Eric Hester, University of Sydney
Slim or Stout: Which Iceberg Lasts Longer?

Agostino Meroni, University of Milan-Bicocca
Do Icebergs Know That the Earth Spins?

Guillaume Michel, Ecole Normale Supérieure
Cooling via Baroclinic Acoustic Streaming

Earle Wilson, University of Washington
The Dynamics of Subglacial Plume Liff-off

Madelaine Gamble Rosevear, University of Tasmania
Turbid Tales: Where Do Sub-glacial Sediments Go?



Eric's Iceberg melting in a background flow

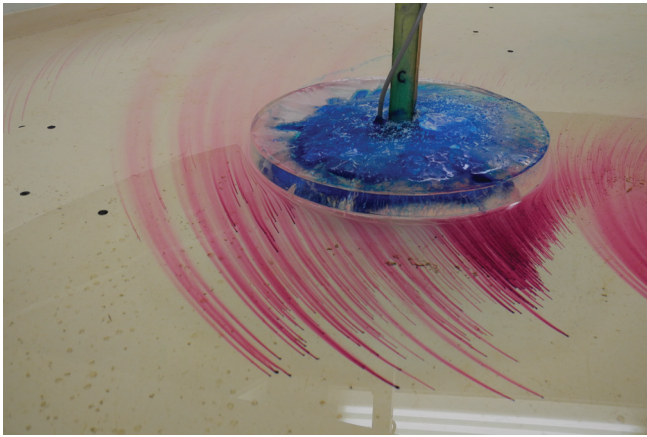
Softball Report

The softball season provided the usual bonding experience between fellows and staff, with an opportunity to unwind in the sun. The Dynamos claimed two victories in the regular season; one hard fought and the other technical. Despite a mid season injury crisis and an experiment with Deputy and Associate Deputy coaches, the season provided many highlights. Our inexperienced team grew throughout the season, combining home runs, stunning reaction catches, and some audacious running. Thus the final Staff vs Fellows game was approached with much anticipation, and did not disappoint. After a late Fellows rally, the Directors called time on a 13-13 tie, and a moral victory for the Fellows.



Solar Eclipse

A significant highlight of the summer was the solar eclipse on August 21, which reached around 65% totality from the porch. Since the first summer of GFD (1959), only two other eclipses have been visible – on July 20, 1963 and July 10, 1972. Eclipse viewing provided a breathtaking distraction during the week of the Fellows' talks.



Agostino's iceberg in a rotating tank investigating the effect of Taylor columns on melting



The Fellows still smiling, only week 2!



Agostino Meroni



Earle Wilson



Eric Hester



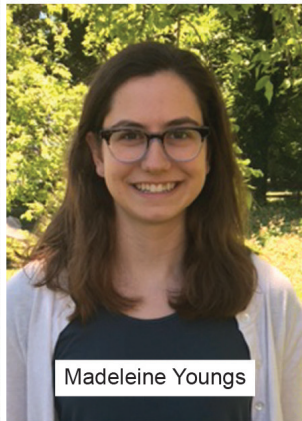
Federico Fuentes



Jessica Kenigson



Madeleine Gamble
Rosevear



Madeleine Youngs



Margaret Lindeman



Micheal Guillaum



Rober Fabier



Thomasina Ball

The Fellows

The GFD Faculty

The GFD Faculty handles the scientific and administrative duties of the school. This group is made up of members of the scientific community, across several disciplines, united by their interest in GFD. These are the faces to be seen at GFD over future summers, and their research interests help to define the scientific direction and flavor of the Program.

Neil Balmforth *University of British Columbia*
 Oliver Buhler *New York University*
 Colm-cille Caulfield *University of Cambridge*
 Claudia Cenedese *W. H. O. I.*
 Eric Chassignet *Florida State University*
 Gregory Chini *University of New Hampshire*
 Charles Doering *University of Michigan*
 Glenn Flierl *M. I. T.*
 Pascale Garaud *U.C. Santa Cruz*
 Karl Helfrich *W. H. O. I.*
 Miranda Holmes-Cerfon *New York University*
 Rich Kerswell *University of Cambridge*
 Norman Lebovitz *University of Chicago*
 Stefan Llewellyn Smith *U. C. San Diego*
 Philip Morrison *University of Texas at Austin*
 Joseph Pedlosky *W.H.O.I.*
 Antonello Provenzale *ISAC-CNR, Torino*
 Tiffany A. Shaw *University of Chicago*
 Edward Spiegel *Columbia University*
 Bruce Sutherland *University of Alberta*
 Jean-Luc Thiffeault *University of Wisconsin*
 Mary-Louise Timmermans *Yale University*
 George Veronis *Yale University*
 John Wettlaufer *University of Oxford*
 Jack Whitehead *W. H. O. I.*

The GFD Website

The lectures notes and reports are available online at gfd.whoi.edu. The GFD website also contains:

- lecture and seminar schedules
- electronic versions of proceedings and newsletters
- lists of alumni and visitors
- application materials
- picture galleries of life at GFD
- useful information and links.

The Sears Public Lecture

The 2017 Sears Public Lecture was given by Professor Richard Alley (Pennsylvania State University) on *Ice Sheets and Sea Level Rise*. For the conclusion of his exceptional presentation Professor Alley played guitar and sang a lively tune about climate change. His talk drew a big crowd of GFD folks and Woods Hole locals who kept the conversation going at the reception afterwards.

2017 Sears Public Lecture
 Geophysical Fluid Dynamics Program
 Wednesday, July 26th 5:00 p.m.
 Redfield Auditorium - WHOI
 Reception to follow

Richard B. Alley
 Evan Pugh Professor
 Pennsylvania State University

**How High Will the Tide Be?
 Ice Sheets and Sea-level Rise**

Sea level is rising as warming melts ice and expands ocean water. Under strong warming, sea-level rise is usually expected to accelerate but remain less than 3 feet by the end of the century. However, ice-sheet collapse might give us several times as much rise. New discoveries about how the great ice sheets flow and break are shining a clearer light on the uncertain future of our coasts.

Contributions

The GFD program has established an endowment fund to help support the program in the future and for a specially funded position intended to help finance the extended visit of a key participant, such as the summer's Principal Lecturer. The fund is administered by WHOI, under the guidance of George Veronis. If you would like to contribute, please send your check (made payable to WHOI) to

Woods Hole Oceanographic Institution
 GFD Fund, MS 40
 Woods Hole, MA 02543

Donations can also be made by credit card by calling the Development office at 508-289-4895.

Please send comments or suggestions about this newsletter or the GFD Program to mary-louise.timmermans@yale.edu or ccenedese@whoi.edu.

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