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

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<td>Introduction</td>
<td>Andrew Fowler</td>
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<td>Tuesday, June 20</td>
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<td>Adrian Jenkins</td>
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<td>Subglacial Control of Ice Flow</td>
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<td>Processes at the Ice-Ocean Interface</td>
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<td>Friday, June 23</td>
<td>Basic Theory of Ice-Ocean Interaction</td>
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<td>Monday, June 26</td>
<td>Ocean Circulation beneath the Ice Shelves</td>
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<td>Tuesday, June 27</td>
<td>Ice-Ocean Interactions around Antarctica</td>
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<td>Wednesday, June 28</td>
<td>Testing the Ocean Trigger Hypothesis for Greenland’s Recent Glacier Retreat</td>
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<td>Thursday, June 29</td>
<td>Submarine Melting of Greenland’s Glaciers</td>
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<td>Friday, June 30</td>
<td>Formulating Appropriate Glacier/Ocean Exchanges in Greenland Ice Sheet and North Atlantic Ocean Models</td>
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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 Superieure  
*Cooling via Baroclinic Acoustic Streaming*

Earle Wilson, University of Washington  
*The Dynamics of Subglacial Plume Liftoff*

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

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!

The Fellows

Agostino Meroni  Earle Wilson  Eric Hester  Federico Fuentes

Jessica Kenigson  Madeleine Gamble Rosevar  Madeleine Youngs  Margaret Lindeman

Micheal Guillaum  Rober Fabier  Thomasina Ball
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 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.

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.

The GFD Program is funded by the National Science Foundation and the Office of Naval Research.

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.