

## GFD Newsletter 2013

### Faculty of Walsh College



The 2013 GFD Photograph.

about long tanks, small slopes and smaller particles. Janet Fields and Jeanne Fleming made sure that the administrative side of the program ran with admirable efficiency. We continue to be indebted to W.H.O.I. Education, who once more provided a perfect atmosphere.

### Schedule of Principal Lectures

Monday, June 17: *Introduction to gravity currents*

Tuesday, June 18: *Scaling laws*

Wednesday, June 19: *Hydraulic theories*

Thursday, June 20: *Shallow water theory*

Friday, June 21: *Two-layer bores and non-Boussinesq gravity currents*

Monday, June 24: *Stratified Environments*

Tuesday, June 25: *Continuously stratified environment*

Wednesday, June 26: *Rotating currents*

Thursday, June 27: *Currents with mass loss*

Friday, June 28: *Gravity currents on slopes and in turbulent environments*

### The Structure of the Summer

The 2013 Geophysical Fluid Dynamics Summer Study Program started on June 17th and the topic this year was *Buoyancy-Driven Flows*. Professor Paul Linden of the University of Cambridge was the principal lecturer. He ably introduced the topic from simple beginnings to sophisticated models and observations, guiding the audience in the cottage and on the porch through fundamental theory and applications. A number of topics from the lectures resurfaced in the fellows' projects.

Claudia Cenedese, Eric Chassignet and Stefan Llewellyn Smith were co-directors for the summer. The summer was marked by a large number of long-term staff numbers, as well as many visitors who gave talks on a large variety of topics. The large number of long-term staff members ensured that the fellows never lacked for guidance, and the seminar series was filled by a steady stream of visitors, talking about topics as diverse as how to model hagfish slime and the science and art of sculpturing fluids.

As usual, laboratory experiments were facilitated by able support from Anders Jensen, who had to worry



Our Principal Lecturer: Paul Linden

## Fellows' Reports

- Yuki Yasuda, University of Tokyo  
*Response of thermohaline circulation to changes in precipitation*
- Kate Snow, Australian National University  
*Particle driven flow down an incline into a linear stratification*
- Daniel Lecoanet, University of California, Berkeley  
*Nonlinear optimal perturbations*
- Tobias Bishoff, California Institute of Technology  
*Energy stability and transport efficiency in forced stratified shear flows*
- Catherine Jones, Scripps Institution of Oceanography  
*Investigation of lock release gravity currents in an upslope valley*
- Varvara Zemskova, University of North Carolina  
*Modelling the evolution of an iron-rich layer in a double diffusive regime*
- Karin Van Der Wiel, University of East Anglia  
*On the collision of sea breeze gravity currents*
- Gregory Wagner, University of California, San Diego  
*Granular flow in a rotating drum*
- Ton van den Bremer, Oxford University  
*The Stokes drift of internal gravity wave groups*



Sunset over the bay



Fingering intrusion in Kate's laboratory experiment



Karin and Greg's experiments



The team and the coach after the first victory

## Softball Report

The GFD Dynamos benefited from the presence of some former baseball players. A slow start was succeeded by some exciting games. Charlie provided his usual encouragement for the first three weeks, while Rich Kerswell, Greg Chini, Keith Julian, Rick Katz, Andy Thompson, Alban Sauret and others featured in compelling cameos. The fellows melded into a strong unit and under George's coaching delivered strong performances to register two victories (and a walkover). The staff contributed too, with Basile's batting providing some big hits, Pascale starring at second base, George Hagstrom filling the crucial shortstop position and the Directors combining to provide some steady pitching. The end of summer game opposing fellows and staff was surprisingly one-sided, with the staff winning decisively, helped by a strong turnout. The fellows all provided memorable plays. Greg's big left-handed hitting was impressive to behold, even if it didn't always translate into home runs; Varvara and Karin patrolled the infield; Kate's tidy fielding at first base was impressive, aided by George's cap with a feather in it; Ton and Toby were sure contributors in the outfield; Yuki combined accurate fielding at third base with strong batting; Catherine's contributions as catcher grew in importance; and Daniel overcame a broken toe to provide some testing pitching.



Gravity currents colliding in Karin's experiment



Tobias Bischoff



Catherine Jones



Daniel Lecoanet



Kate Snow



Ton van den Bremer



Karin van der Wiel



Gregory Wagner



Yuki Yasuda



Varvara Zemskova

*The fellows*

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## 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*  
 Steve Childress *New York University*  
 Charles Doering *University of Michigan*  
 Glenn Flierl *M. I. T.*  
 Pascale Garaud *U.C. Santa Cruz*  
 Karl Helfrich *W. H. O. I.*  
 Lou Howard *M. I. T. and Duke University*  
 Joseph B. Keller *Stanford University*  
 Norman Lebovitz *University of Chicago*  
 Stefan Llewellyn Smith *U. C. San Diego*  
 Willem Malkus *M. I. T.*  
 Philip Morrison *University of Texas at Austin*  
 Joseph Pedlosky *W.H.O.I.*  
 Michael Proctor *University of Texas at Austin*  
 Antonello Provenzale *ISAC-CNR, Torino*  
 Edward Spiegel *Columbia University*  
 Jean-Luc Thiffeault *University of Wisconsin*  
 George Veronis *Yale University*  
 John Wettlaufer *University of Oxford*  
 Jack Whitehead *W. H. O. I.*  
 William Young *Scripps Institution of Oceanography*

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## The GFD Website

The lectures notes and reports are available online at [gfd.whoi.edu](http://gfd.whoi.edu). The GFD website also contains:

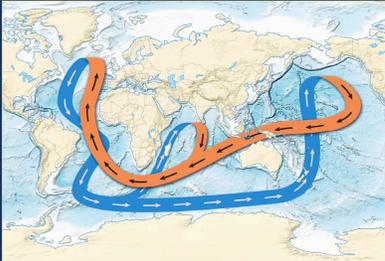
- lecture and seminar schedules
- electronic versions of proceedings and newsletters
- lists of alumni and visitors
- application materials
- picture galleries of life at GFD
- useful information and links.

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## The Sears Public Lecture

In 2013, the Sears Public Lecture was delivered by Professor Susan Lozier, of Duke University on the topic of “Overturning in the North Atlantic: new observations, new views, lingering questions”. Susan showed how modern observational techniques now allow the time-variability of the Gulf Stream and the North Atlantic circulation to be monitored, revealing trends and changes hitherto undetected. Redfield was crowded, and the audience enjoyed refreshments together after the lecture.

*Overturning in the North Atlantic:  
new observations, new views,  
lingering questions*



*Professor Susan Lozier*  
Duke University



Sears Public Lecture

Geophysical Fluid Dynamics Program

August 8, 5:00 pm

Redfield Auditorium, W.H.O.I.  
Reception to follow

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## 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 [sgls@ucsd.edu](mailto:sgls@ucsd.edu), [echassignet@fsu.edu](mailto:echassignet@fsu.edu) or [ccenedese@whoi.edu](mailto:ccenedese@whoi.edu).

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