

# ECCO Project Meeting 2018

The University of Texas at Austin  
Institute for Computational Engineering and Sciences (ICES)  
201 E. 24th Street  
Austin, TX 78712

Peter O'Donnell Building  
(southeast corner of 24th St. and Speedway Blvd.)

<https://goo.gl/maps/fK1M2WD3uAo>

POB 6.304 (6th floor seminar room)

Monday, October 29 (8am)  
to Wednesday, October 31 (12:30pm)

## Please Note:

- Parking on campus is limited and expensive (\$18/day); we advise you to walk or take an Uber or Lyft to and from the meetings.
- Directional signs will be posted on the main (2nd) floor entrance and on the 6th floor. Take the double elevators by the 24th Street (north) entrance to the 6th floor and turn right. The meeting room is on the far side of the spiral staircase, on your right.
- We will arrange for WebEx remote access. Connection links will change daily and will be emailed separately to people having requested remote participation. This will require uploading all presentations on the PC/Laptop that serves as WebEx screen. Please prepare to upload your talk ahead of your session.
- Information on how to connect to the WIFI is in the back of your name badge.

## Contacts:

Patrick Heimbach, [heimbach@ices.utexas.edu](mailto:heimbach@ices.utexas.edu), 617-642-3481 (cell)

Sue Rodriguez (admin), [suerod@ices.utexas.edu](mailto:suerod@ices.utexas.edu), 512-232-2262

## **MONDAY, OCTOBER 29 --- AM**

### **Session 1: Production efforts (ECCO, SOSE, ASTE,...) - CHAIR: D. Menemenlis**

08:00 BREAKFAST

08:30 Patrick Heimbach: Welcome & Logistics

08:45 Nadya Vinogradova-Shiffer: A view from Washington D.C.

09:00 Ichiro Fukumori: ECCO Production - overview & goals

09:15 Ou Wang: Status of ECCO v4r3 extension

09:30 Ou Wang: Status of ECCO v4r3 extension (cont'd)

09:45 Matt Mazloff: SIO regional state estimation activities

10:00 Matt Mazloff: SIO regional state estimation activities (cont'd)

10:15 - 10:45: --- COFFEE BREAK ---

### **Session 2: Production efforts (cont'd) & science with ECCO (1) - CHAIR: I. Fukumori**

10:45 An Nguyen: The Arctic Subpolar North Atlantic State Estimate (ASTE)

11:00 Arash Bigdeli: What drives the sea ice volume in the Arctic marginal ice zones? An adjoint sensitivity study

11:15 Hong Zhang: Updates on the ECCO-v5 LLC270 1992-2017 solution

11:30 Dan Jones (remote): Adjoint sensitivity experiments in the Labrador Sea and Southern Ocean

11:45 Helen Pillar: Impacts of Atmospheric Reanalysis Uncertainty on Atlantic Overturning Estimates at 25°N

12:00 Tim Smith: Atmospheric origins of variability in the South Atlantic

12:15 - 12:30 Discussion

12:30 - 1:30 --- LUNCH --- (lunch will be catered)

## **MONDAY, OCTOBER 29 --- PM**

### **Session 3: Science with ECCO (2) - CHAIR: I. Fenty**

1:30 Ryan Abernathey: A linearized heat budget for the world ocean based on ECCO

1:45 Paola Cessi: The global overturning circulation according to ECCO4

2:00 Xinfeng Liang: The subtle difference between vertical and diapycnal diffusivities

2:15 David Trossman: Adjoint sensitivities to ocean mixing parameter assimilation

2:30 Chao Liu: Vertical Redistribution of Ocean Salt Content in ECCO v4

2:45 Maike Sonnewald: K-Means and vorticity budget

3:00 - 3:30 --- COFFEE BREAK ---

### **Session 4: Model & tool development - CHAIR: M. Mazloff**

3:30 Jean-Michel Campin: MITgcm model development

3:45 Jean-Michel Campin: MITgcm model development (cont'd)

4:00 Chris Hill: The Earth Machine

4:15 Chris Hill: NASA's plans for scientific data and computing

4:30 Paul Hovland: Compressing Checkpoints in MITgcm Adjoint Computations

4:45 Gael Forget (remote): Moving forward, fast with Julia

5:00 - 5:30: Discussion

### **6:00pm: Reception at the UT Austin Visual Arts Center, 2nd FLOOR**

ART Building, 120 San Jacinto Blvd, Austin, TX 78712

<https://goo.gl/maps/j1BqHFDsn7v>

(buffet dinner and refreshments)

In conjunction with the exhibition: "Exploring the Arctic Ocean":

<https://sites.utexas.edu/utvac/exploring-the-arctic-ocean/>

## **TUESDAY, OCTOBER 30 --- AM**

### **Session 5: SWOT - CHAIR: R. Ponte**

08:00 BREAKFAST

08:30 Lee-Lueng Fu: The Status of the SWOT Mission Development

08:45 Zhijin Li: A Data Assimilation System and Observing System Simulation Experiments for the SWOT Ocean CalVal

09:00 Jimbo Wang: LLC4320 and SWOT

09:15 Matt Mazloff: SIO activities in preparation for SWOT and the next generation observing system

09:30 Matt Mazloff: Why do regional models produce frequency spectra steeper than llc4320 and observations?

09:45 Brian Arbic (remote): Validation of internal tides in several global ocean models

10:00 DISCUSSION: Mathematical formulation of the barotropic tidal forcing used in llc4320

10:15 - 10:45 --- COFFEE BREAK ---

### **Session 6: Science with ECCO - A. Nguyen**

10:45 Hector Torres Gutierrez: Air-sea interactions driven by submesoscale ocean motions and winds

11:00 Rui Ponte: Accounting for gravitational attraction and loading effects on altimeter data and state estimates

11:15 Xiaohui Liu and Christopher L. P. Wolfe: Sensitivities of Gulf Stream latitude in ECCOv4

11:30 Maike Sonnewald: Diffusivities as barriers to mixing

11:45 Chris Piecuch: A Variety of Wind Effects on Eastern Equatorial Pacific Decadal Sea-Surface Height Variability

12:00 - 12:30 DISCUSSION

12:30 - 1:30 --- LUNCH --- (lunch will be catered)

## **TUESDAY, OCTOBER 30 --- PM**

### **Session 7: Subpolar & polar regions - CHAIR: H. Pillar**

1:30 Ian Fenty: Using ECCO to Identify an ocean role in the thickening and advance of marine-terminating glaciers in central west Greenland

1:45 Michael Wood: Ocean-induced undercutting triggers glacier retreat in northwest Greenland

2:00 Yoshihiro Nakayama (remote or to be presented by Dimitris): Modeling Ice shelf-ocean interaction in the Amundsen and Bellingshausen Seas

2:15 Ichiro Fukumori: Causal mechanisms of sea level and ocean heat content changes over the Antarctic continental shelf analyzed with ECCO V4

2:30 Florian Geyer: Moving towards assimilation of acoustic tomography data: using a regional ocean model with ECCO boundary conditions to model acoustic tomography arrivals in Fram Strait

2:45 DISCUSSION: Sea ice assimilation, including use of upcoming InSAR high spatial and temporal resolution ice motion observations in future ECCO products (Nguyen and Menemenlis)

3:00 - 3:30 --- COFFEE BREAK ---

### **Session 8: Ocean biogeochemistry & ecology - CHAIR: D. Trossman**

3:30 Galen McKinley: Mechanisms of forced variability in air-sea carbon fluxes

3:45 Raphael Dussin: First Results on the Atlantic/Arctic State Estimate coupled with biogeochemistry

4:00 Gael Forget: CBIOMES: upcoming model-data products and goals

4:15 Tom Van der Stocken: Global-scale ocean dispersal and connectivity in mangroves

4:30 Peter Cornillon: Characteristics of spatial scales in model and satellite-derived SST fields between 10 to 100 kms

4:45 - 5:15 DISCUSSION

### **6:30pm: Joint no-host dinner outing:**

**The Austin Beer Garden Brewing Co. - ABGB (<https://theabgb.com/>)**

1305 West Oltorf St. (at South Lamar Blvd.), 512-298-2242.

The "lower garden area" is reserved for our group in Patrick Heimbach's name.

## **WEDNESDAY, OCTOBER 31 --- AM**

### **Session 9: Emerging activities - CHAIR: C. Piecuch**

08:00 BREAKFAST

08:30 Ryan Abernathey: A PANGEO tutorial

08:45 Ryan Abernathey: A PANGEO tutorial (cont'd)

09:00 Heimbach/Fenty/Huang: NASA ACCESS

09:15 Francis Condi: Assessment of ECMWF and NCEP Forcing Fields for GRACE-FO  
Atmosphere-Ocean De-aliasing

09:30 Nora Loose: Comprehensive Observing System Design within the ECCO framework

09:45 Liz Logan: Greenland and Antarctica: Regional and Ice Sheet-wide Volume  
Sensitivities to Boundary and Initial Conditions

10:00 Andy Aschwanden: Making Greenland green again

10:15 - 10:45 --- COFFEE BREAK ---

### **Session 10: The future - CHAIR: I Fukumori**

10:45 Heimbach: 2019 Events: ECCO Summer School 2019, 20-year symposium, ...

11:00 Udi Strobach: Development of GEOS-MITgcm coupled atmosphere-ice-ocean model

11:15 Dustin Carroll: Using an ocean biogeochemistry model (ECCO-Darwin) to quantify the  
physical and biological contributions to air-sea carbon flux during El Nino-Southern  
Oscillation events

11:30 DISCUSSION: ECCO in 2021 and beyond

**12:30 ADJOURN**