

## **Ice Sheet Modeling based on ISSM**

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New modeling activity is initiated to predict the tipping point for the irreversible Antarctic melting and unstoppable sea level rise. The main goal of our group is to reduce uncertainties and enhance predictability of future sea level rise by improving the ice sheet model by intensifying our understanding on the ice sheet processes and dynamics based on field observations, especially focusing on the Thwaites glacier of the West Antarctic Ice Sheet. CHASE (Unit of Ice Sheet and Sea Level Changes) in KOPRI have established the field observation system participating in the international collaborative framework to study the Antarctica, while the field of ice sheet modeling is at the early stage of development considering the precedent studies and manpower in Korea. Under these circumstances, to build an advanced ice sheet modeling system, our strategy is to (i) adopt an existing ice sheet model based on the comprehensive analysis of world's leading ice sheet models, (ii) diagnose errors in the ice sheet modeling system via sensitivity experiments and paleoclimate simulations, (iii) improve the ice sheet modeling system in terms of numerics, physics and initial/boundary conditions based on field observations targeting the high resolution mapping, extension of data in terms of space/time and new physical mechanisms, (iv) conduct the future predictions/projections under multiple emission scenarios and (v) validate our results by utilizing the multi-model intercomparison facilitating assessment of uncertainty and provide the fidelity and probability of future predictions/projections. Throughout this research, we aim to assess the stability of ice sheets and ice shelves on the Thwaites glacier and produce more reliable projection of sea level rise induced by Antarctic melting under various scenarios.

# "Ice Sheet System Model" Sea-Level Science Workshop at a Glance

University of Hawaii, Sea Level Center, Honolulu, Hawaii, USA.

Building: [Pacific Room of the East West Center](#)

Sunday, June 10 <sup>th</sup>		
<b>Session 1: Welcome &amp; Ice Breaker</b>		
3:00-3:30 PM	Registration & Poster Hanging	All Participants
3:30-6:00 PM	Poster Presentation	All Participants
7PM	ICE BREAKER	
Monday, June 11 <sup>th</sup>		
8:00-8:30 AM	Coffee & Registration	All Participants
<b>Session 2: Introduction</b>		
8:30-8:45 AM	Welcome from ISSM Team & UH Sea-Level Center	Eric Larour
		Phil Thompson
8:45-9:00 AM	Views from NASA HQ (PO & ESI)	Gerald Bawden
9:00-9:15 AM	Views from NASA Sea-level Change Team	Ben Hamlington
9:15-10:15 AM	ISSM Introduction and Capabilities (What to expect from the workshop?)	Eric Larour
10:15-10:30 AM	<b>Coffee Break</b>	
10:30-11:00 AM	Invited Talk: <i>GPS and absolute gravity observations in Greenland</i>	Tonie van Dam
11:30-12:15 PM	Installation	Eric Larour
12:15-1:30 PM	<b>Lunch</b>	
<b>Session 3: Crustal Displacement</b>		
1:30-2:00 PM	3-D crustal deformation: Theory & methods	Surendra Adhikari
2:00-3:00 PM	A simple benchmark experiment (Wahr)	Surendra Adhikari & Lambert Caron
3:00-3:30 PM	<b>Coffee Break</b>	
3:30-4:30 PM	Global computation for GRACE loads	Adhikari & Caron
4:30-6:00 PM	Installation Clinic (optional)	ISSM Team
8PM	DINNER	
Tuesday, June 12 <sup>th</sup>		
8:00-8:30 AM	Room open for late registration	
8:30-9:00 AM	Invited Talk: Why we care about ice melt fingerprints? Historical & future implications	Phil Thompson
<b>Session 4: Anisotropic Mesh Refinement &amp; Sea-level Fingerprints</b>		
9:00-9:30 AM	Sea-level fingerprints: Theory & methods	Surendra Adhikari
9:30-10:30 AM	Coastline mesh refinement	Eric Larour
10:30-11:00 AM	<b>Coffee Break</b>	
11:00-12:15 PM	A simple benchmark experiment (Farrell)	Adhikari & Caron
12:15 -1:30 PM	<b>Lunch / Installation Clinic (Optional)</b>	
<b>Session 5: Sea-level Fingerprints and Gradients</b>		
1:30-2:45 PM	Sea-level fingerprints for GRACE loads	Adhikari & Caron
2:45-3:15 PM	<b>Coffee Break</b>	
3:15-4:30 PM	Sea-level gradients and coastal applications	Eric Larour
4:30 -5 PM	Adjourn	