



One-shot Outer Solar System Exploration with Adaptive Space Systems

**Nov 3-7, 2025
Overview Schedule**

**Monday, November 3, 2025
Broad 100 Lecture Hall - Caltech**

Short Course: One Shot to Glory: Designing Adaptive Missions to the Outer Solar System and Beyond

Time	Event	Speaker
8:15 - 8:45	Coffee and Refreshments	
8:45 - 8:50	Welcome and Logistics	Harriet Brettle
8:50 - 9:10	Introduction and Context	Team Leads
9:10 - 9:45	Unsolved Mysteries in the Solar System	Morgan Cable
9:45 - 10:20	Systems Engineering Challenges for Designing a One-Shot Mission	Alejandro Salado
10:20 - 10:50	Break	
10:50 - 11:25	Adaptive Robotics Technologies 1: Hardware	Maria Sakovsky
11:25 - 12:00	Adaptive Robotics Technologies 2: Intelligence	Yisong Yue
12:00 - 12:35	Adaptation and Plasticity in Nature	Shane Campbell-Staton
12:35 - 1:30	Short Course Ends: Informal Lunch is provided by the Beckman Institute West Patio	

**Invitation-Only Workshop Begins
Keck Center - Think Tank, Room 155**

1:30 - 1:45	Walk to Keck Center, pick up badge and welcome packet, find seat in the Think Tank	
1:45 - 2:30	Workshop Logistics and Introduction to KISS	Harriet Brettle
2:30 - 3:00	Participant Introductions	Harriet Brettle
3:00 - 3:15	Study vision: Exploration of unvisited worlds	Hiro Ono
3:15 - 3:45	Break	
3:45 - 4:30	Finalize study vision and workshop goals via plenary discussion	Team Leads
4:30 - 4:40	Lightning Talk Overview	Team Leads
4:40 - 5:30	Caltech Lab Tour: Soon-Jo's Lab + CAST	Soon-Jo Chung
5:30 - 6:00	Walk to dinner	All
6:00	Dinner at a local restaurant in Pasadena	

Tuesday, November 4, 2025 - Keck Center - Think Tank, Room 155

BRING GREEN CARD/PASSPORT

Time	Event	Speaker
8:00 - 8:30	Institute Opens - FREE THINK TIME	
8:30 - 9:00	Coffee and Refreshments at Keck Center	
9:00 - 9:15	Logistics and Team Lead Goals for the Day	Harriet Brettle and Team Leads
9:15 - 10:00	Talk: Stories and lessons from past missions - a briefing from JPL's Blue Sky study	Hiro Ono, Rich Rieber, Mitch Ingham, Mathieu Choukroun, Dani Selva
10:00 - 10:45	Lightning Talks (1) - Flight mission experiences - surprises, anomalies, and adaptation - Kris Zacny (Blue Ghost) - Lori Shiraishi (Sampling Systems) - Mathieu Choukroun (Philae) - John Day (Kepler) - Morgan/Mathieu (Europa Clipper) - David Murrow (Mars 98)	Selected participants
10:45 - 11:15	Break	
11:15 - 12:15	Plenary Discussion: Design principles for RSE 3.0: how can we <i>design</i> adaptability?	Dani Selva
12:15-12:30	Introduction to Breakout Groups and Topics	Harriet Brettle & Morgan Cable
12:30 - 2:00	Group Picture and Lunch at the Athenaeum	
2:00 - 3:30	Breakout Group 1: RSE 3.0 Mission Concept Development (tentatively): - Icy moon orbiter-lander-rover-subsurface - Flyby mission + probe - Interstellar/Oort cloud	Groups
3:30 - 4:00	Carpool to JPL	
4:00 - 5:30	JPL Tour	
5:30	OPTIONAL: No-Host Dinner in Pasadena	

Wednesday, November 5, 2025 - Keck Center - Think Tank, Room 155

8:00 - 8:30	Institute Opens - FREE THINK TIME	
8:30 - 9:00	Coffee and Refreshments at Keck Center	
9:00 - 9:10	Logistics and Team Lead Goals for the Day	Harriet Brettle and Team Leads
9:10 - 9:40	Report Outs from Breakout Groups (10 mins each)	Groups
9:40 - 10:00	Talk: emerging technologies for adaptability - a briefing from JPL's Blue Sky study	Hiro Ono, Rich Rieber, Mitch Ingham
10:00 - 10:30	Lightning Talks (2) - emerging technologies for adaptability - Mathieu Choukroun - Charity Phillips-Lander - Pascal Spino - Mitch Ingham - Maggie Hansen - Sorina Lupu	Selected participants
10:30 - 11:00	Break	
11:00 - 11:40	Group Pulse: "Taking Away" & "Want to Accomplish Yet"	
11:40 - 12:30	Plenary discussion - key technology gaps for RSE 3.0 / selection of breakouts	Plenary
12:30 - 2:00	Lunch at the Keck Center	
2:00 - 3:30	Breakout Group 2 - Design a research program for bridging the key missing capabilities (including funding considerations)	All
3:30 - 4:00	Break	
4:00 - 4:45	Report outs from breakout groups (15 mins each)	Groups
4:45 - 5:30	Writing Sprint following Breakout Session 2	Groups
5:30 - 7:30	POSTER SESSION and Informal dinner at the Keck Center (dinner starts at 6:30 pm)	

Thursday, November 6, 2025 - Keck Center - Think Tank, Room 155

8:00 - 8:30	Institute Opens - FREE THINK TIME	
8:30 - 9:00	Coffee and Refreshments at Keck Center	
9:00 - 9:15	Logistics and Team Lead Goals for the Day	Harriet Brettle and Team Leads
9:15 - 9:45	Special Talk: RSE 2.0 Systems Engineering for Space Missions	Rob Manning
9:45 - 10:15	Lightning talks (3) - New systems engineering approaches - Amanda Stockton - Alex Demagall - Marie Ethvignot - Andreas Hein - Dani Selva - Alejandro Salado	Selected participants
10:15 - 10:45	Break	
10:45 - 11:00	Breakout - goals and process	All
11:00 - 12:30	Breakout Groups (3) - RSE 3.0 Systems Engineering Approach - Science definition - Designing for dynamic requirements - conceptual design - Designing for dynamic requirements - V&V	All
12:30 - 2:00	Lunch on your own + homemade guacamole!	
2:00 - 2:30	Report outs from breakout groups (10 mins each)	Groups
2:30 - 2:45	Breakout - goal and process	All
2:45 - 3:30	Breakout (4) Part 1 - Refine mission concepts. Goal: CONOPS definition	
3:30 - 4:00	Break	
4:00 - 4:45	Breakout (4) Part 2 - Refine mission concepts. Goal: CONOPS definition	Groups
4:45 - 5:30	Path forward to 2nd workshop	All
5:30 - 6:00	Walk over to the Athenaeum	All
6:00	Closing Dinner at the Athenaeum	

Friday, November 7, 2025 - Keck Center - Think Tank, Room 155

Time	Event	Speaker
8:00 - 8:30	Institute Opens - FREE THINK TIME	
8:30 - 9:00	Coffee and Refreshments at Keck Center	
9:00 - 9:15	Logistics and Team Lead Goals for the Day	Harriet Brettle and Team Leads
9:15 - 10:00	Breakout Groups Report Out (15 min x 3)	All
10:00 - 10:30	Writing Sprint following Breakout Sessions 4	All
10:30 - 11:00	Break	
11:00 - 11:30	Writing Sprint following Breakout Sessions 3	
11:30 - 12:15	Open Discussion of Path Forward	All
12:15 - 12:30	Workshop Closeout	Harriet Brettle
12:30 - 1:30	Lunch at Keck Center	
1:30 - 5:00	Optional group collaboration/individual writing	All (optional)
5:00	Institute closes	