



# Transforming Remotely Conducted Research using Education Ethnography & Rapidly Evolving Technologies

(Poster Monday Morning at AGU: ED11C – 3423)



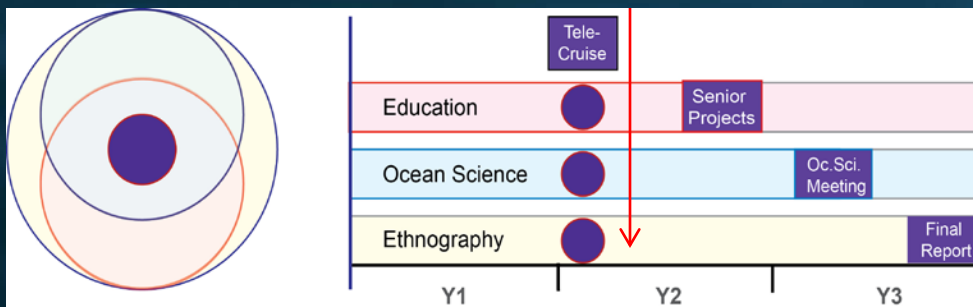
## What *WERE* We Thinking???



Goal: 2013 showed we *could* connect a UNOLS ship to shore via Telepresence. But *should* we? How can we use telepresence better, to facilitate active remote participation in research and undergraduate teaching.

Concept: A telepresence-enabled cruise nested within *Ocean Science* research that also forms a basis for research into *Educational* methods and *Ethnography*.

Motivation: Telepresence is not a “normal” way for working in the oceans and, on their own, oceanographers are not the best people to work out what the “new normal” should be. But ships keep shrinking so anything that can relieve demand for science berths is worth trying.





# Transforming Remotely Conducted Research The NSF-INSPIRE “TREET” Partnership



## Co-PIs:

Amy Pallant (Concord): Education

Katy Croff Bell (OET): Ocean-Telepresence

Sheila Jasanoff & Zara Mirmalek (HKS): Ethnography

Kanna Rajan: Robotics

## Mentors:

Steve Carey (URI): Geology

Cindy Van Dover (DUML): Biology

## Early Career Scientists:

Eric Mittlestaedt (U.Idaho)

Anna Michel (WHOI)

Scott Wankel (WHOI)

Masako Tominaga (Michigan State)

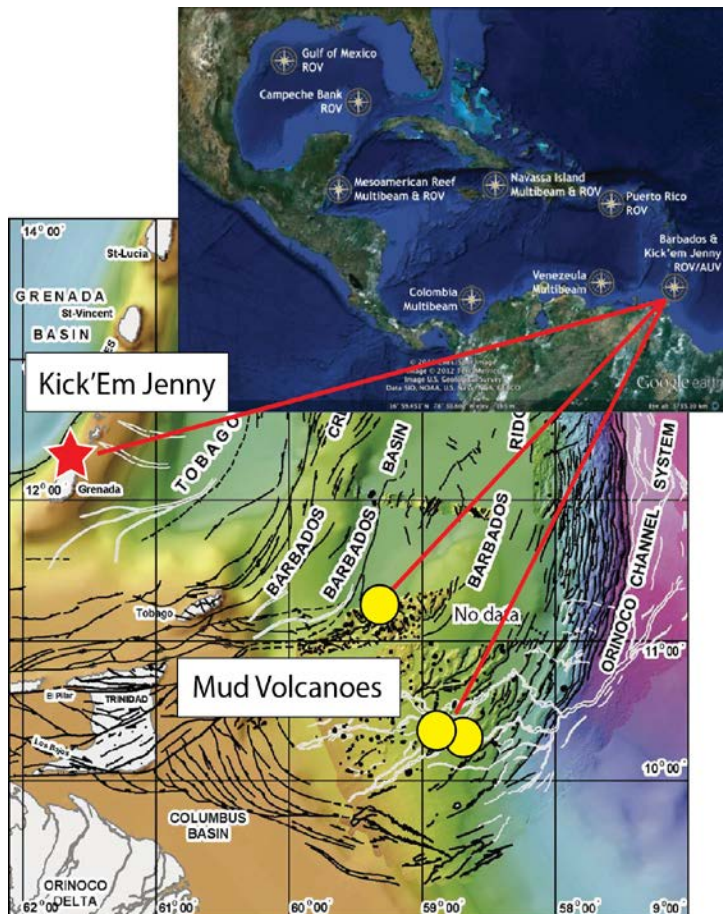
Chris Roman (URI)

Pete Girguis (Harvard)





# Transforming Remotely Conducted Research The Compelling Ocean Science Research Project



- Investigating the fate of  $\text{CH}_4$  and  $\text{CO}_2$  released to the oceans from *natural* examples of gas-rich seafloor fluid flow.
- Volcanic exhalations at Kick'Em Jenny submarine volcano (Steve Carey).
- Cold Seeps at the Barbados Mud Volcanoes (Cindy Van Dover).
- Multi-disciplinary investigations using methods in geophysics, imaging, and *in situ* biogeochemical sensing.
- Nobody to be allowed on the ship!!!



# Transforming Remotely Conducted Research Y1: Synchronous Winter Semester Seminar Series



## 13 Week Seminar Series: Mondays @ 6PM EDT

**ABOUT** **RESEARCH FOCUS** **WHO'S WHO** **SEMINARS**

**Seminar in Remote Deep Sea Research & Exploration**  
The spring 2018 seminar series is designed to introduce the project and provide undergraduate students with background they will need to undertake research during the second year of the project.

The seminar will provide:

- an overview of the program
- background on science and research pertinent to the sites to be studied
- an introduction to the technology and the topics/articles
- planning time for the research

The seminar will be held on **Monday nights at 6:30 p.m. EST.**

**Week 1: Jan 26-31**  
Chris Gorman (Co-PI), Amy Palant (Co-PI) and Zora Minnawa (Co-PI) introduce the program as a whole, overview of ethnography, education and evolving technologies.

**Week 2: Feb 2-7**  
Katy Craft Bell (Co-PI), Steve Carey and Cindy Lee Van Dover, provide overview of technology and scientific research opportunities.

**Week 3: Feb 10-14**  
Michigan State University (Mikaela Tombragos)

**Week 4: Feb 17-21**  
Harvard University (Peter Orvik)

**Week 5: Feb 24-28**  
University of Idaho (Eric Minnstaad)

**Week 6: Mar 3-7**  
University of Rhode Island (Chris Roman)

**Week 7: Mar 10-14**  
Woods Hole Oceanographic Institute early career scientists (Anna Michie and Gill Wilson)

**Week 8: Mar 17-21 Spring Break (No Zoom session)**

**Week 9: Mar 24-28**  
Feasibility discussion: Discuss your research ideas with scientists and other students. Get ideas about tools and techniques.

**Weeks 10-11: Mar 31 - Apr 11 (Presentations March 31 and April 7)**  
Student presentations of research goals.

**Week 12: Apr 14-18**  
Nothing opened a plan for the cruise  
Chris Gorman and Katy Craft Bell to present plan for the cruise that is feasible, equitable, get feedback from group.

**Week 13: TRCQ**  
Finalizing the plan (time to be determined)  
Chris Gorman will explain final plan for the cruise.

**Participants**  
Login to the seminar website for resources and discussion.  
[Go to Seminar Website](#)

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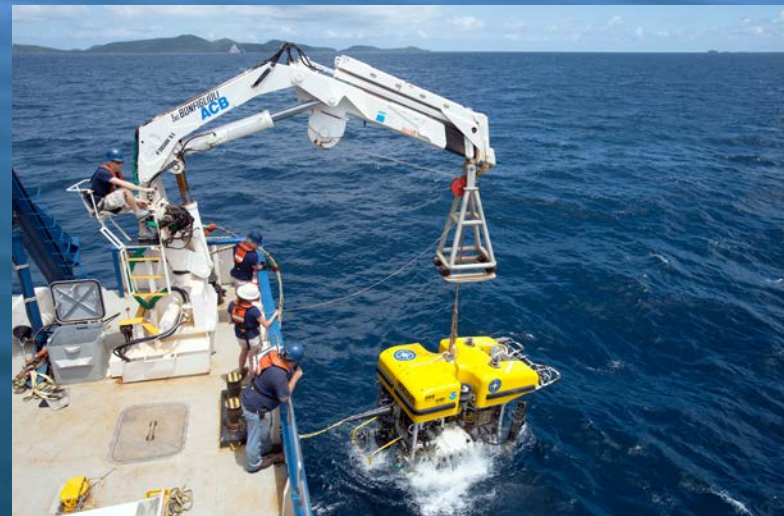
### Topics Covered:

Introduction to the Technology  
Lectures on the Mentors' Interests  
Presentation of Student Projects

Introduction to the Field Areas  
Lectures on the ECS PIs' Interests  
Detailed Pre-Cruise Planning



# Transforming Remotely Conducted Research Y2: The TREET Cruise At Sea



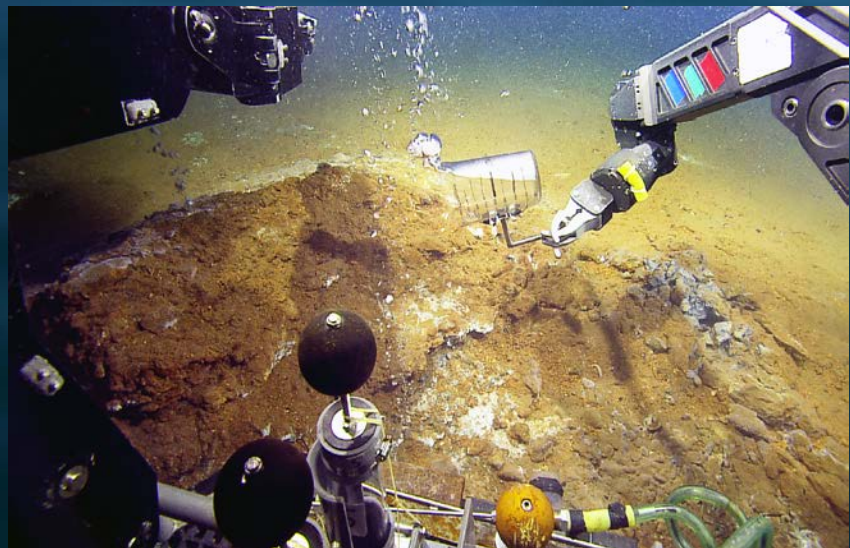


# Transforming Remotely Conducted Research Y2: The TREET Cruise On-Shore





# Transforming Remotely Conducted Research 3 Weeks, 17 Dives, All Project Data Collected





# Transforming Remotely Conducted Research Microbiology Sampling from 30,000ft



Inner Space center THE UNIVERSITY OF RHODE ISLAND Ocean exploration news, highlights, and more at [InnerSpaceCenter.org](http://InnerSpaceCenter.org) and [@InnerSpaceCenter](https://twitter.com/InnerSpaceCenter)

The Ocean Exploration Trust's E/V Nautilus LIVE VIA ISC

A screenshot of a live video feed from the E/V Nautilus. The top of the frame features a blue banner with logos for Inner Space Center and The University of Rhode Island, along with text providing website and social media information. The main video area shows a robotic arm with a yellow gripper sampling a dark, rocky seabed. The scene is illuminated by bright yellow lights, creating a high-contrast, warm-toned environment. In the foreground, various pieces of equipment, including a large grey cup and green hoses, are visible. The bottom of the frame has a blue banner with the text 'The Ocean Exploration Trust's E/V Nautilus' and a red button that says 'LIVE VIA ISC'.