

Telepresence Technology and Applications on UNOLS Ships

Dwight F. Coleman

Director, URI-GSO Inner Space Center



THE
UNIVERSITY
OF RHODE ISLAND
GRADUATE SCHOOL
OF OCEANOGRAPHY





NOAA Ship *Okeanos Explorer*



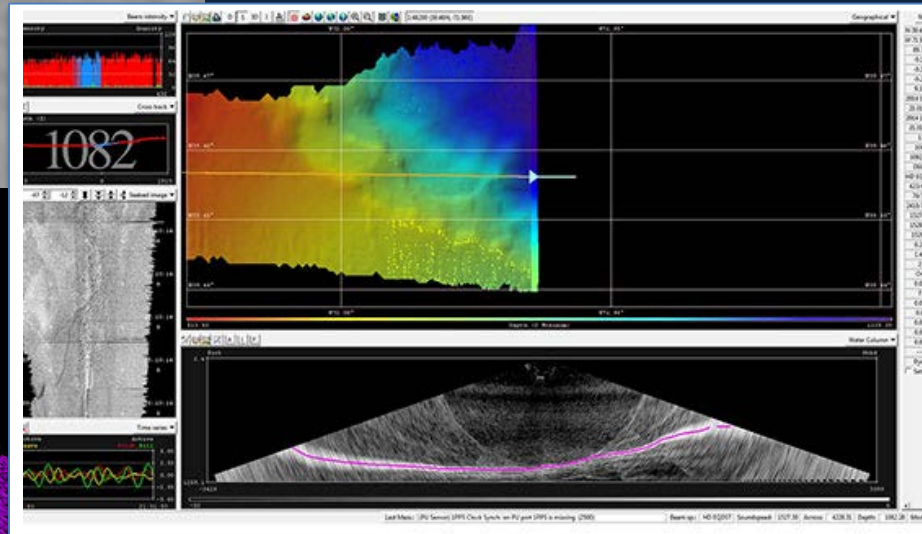
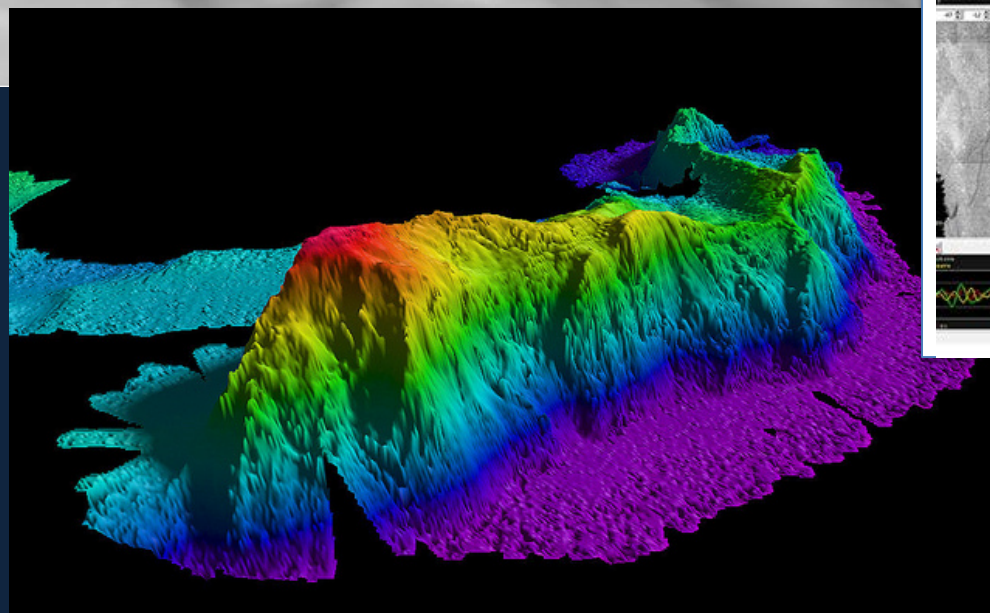
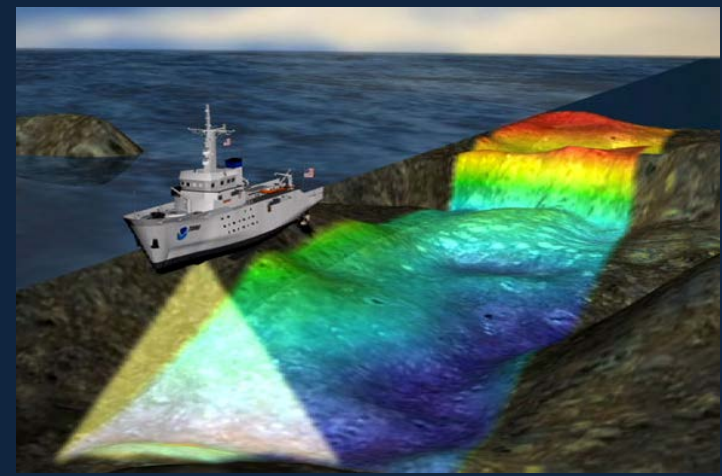
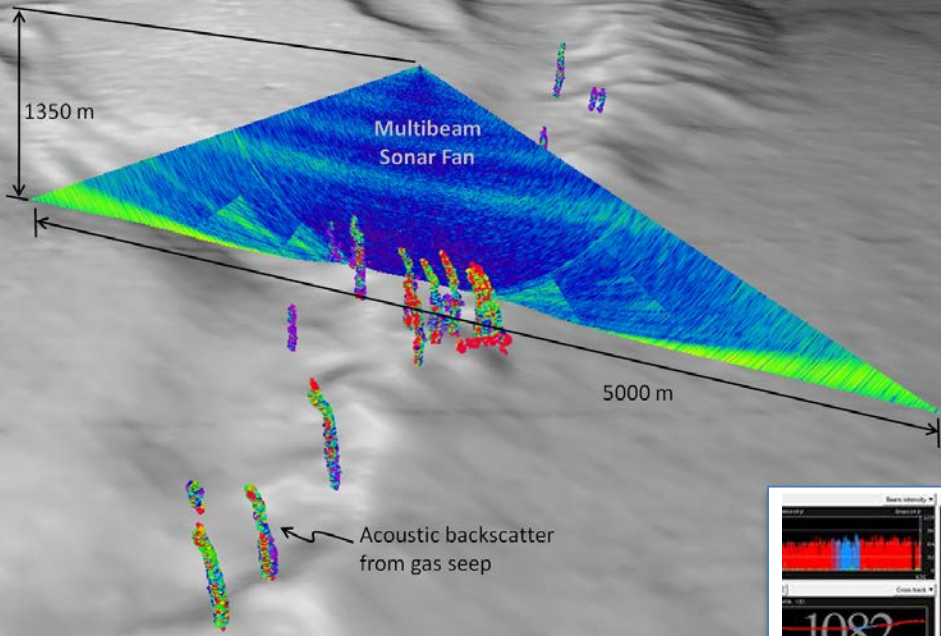
E/V *Nautilus*



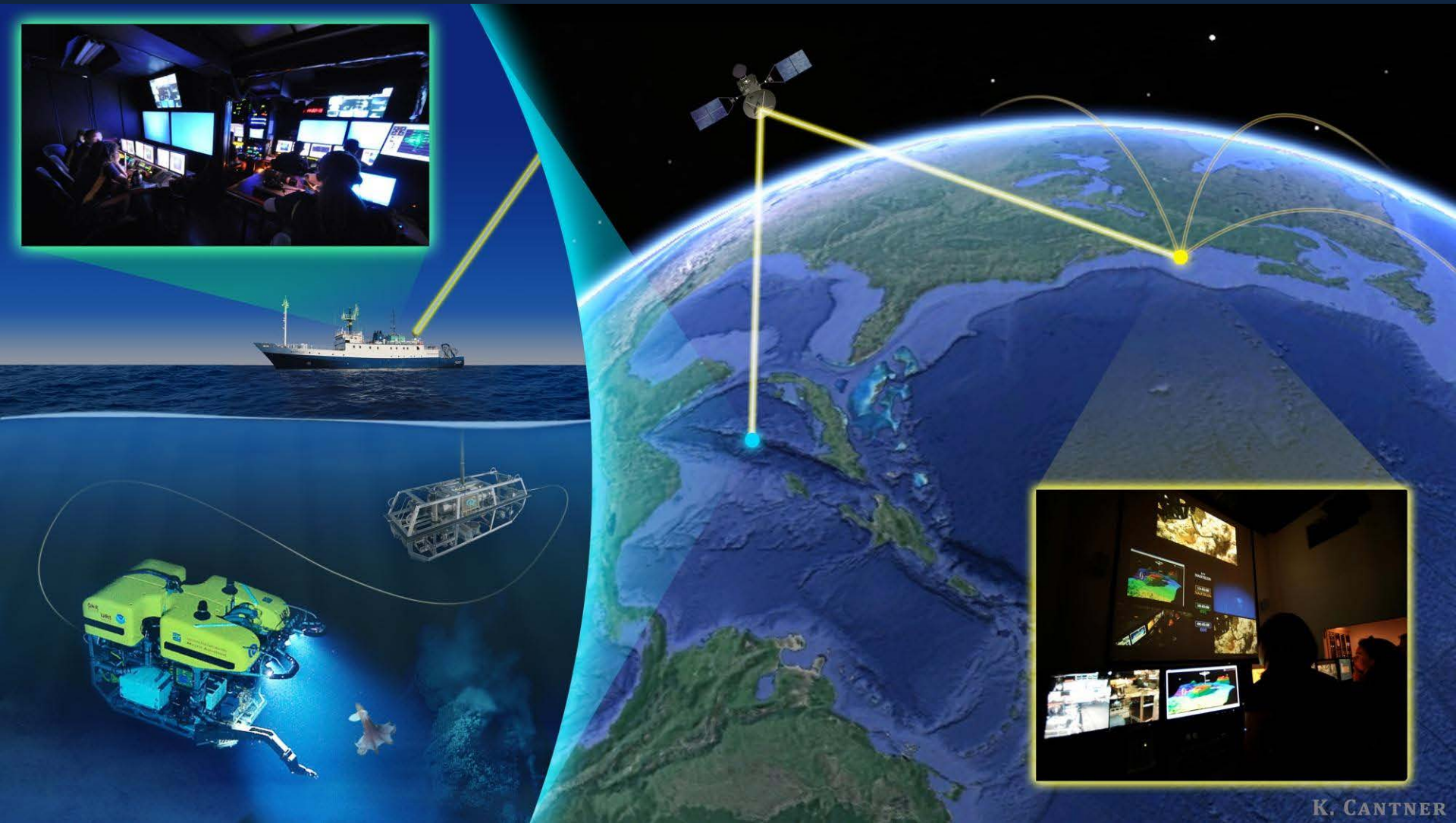
ROV *Deep Discoverer*



ROV *Hercules*



Kongsberg EM-302
Multibeam Sonar



K. CANTNER

Ship-to-Shore Telepresence



THE
UNIVERSITY
OF RHODE ISLAND
GRADUATE SCHOOL
OF OCEANOGRAPHY



Mission
Control



Internet2





Production Control and Studio

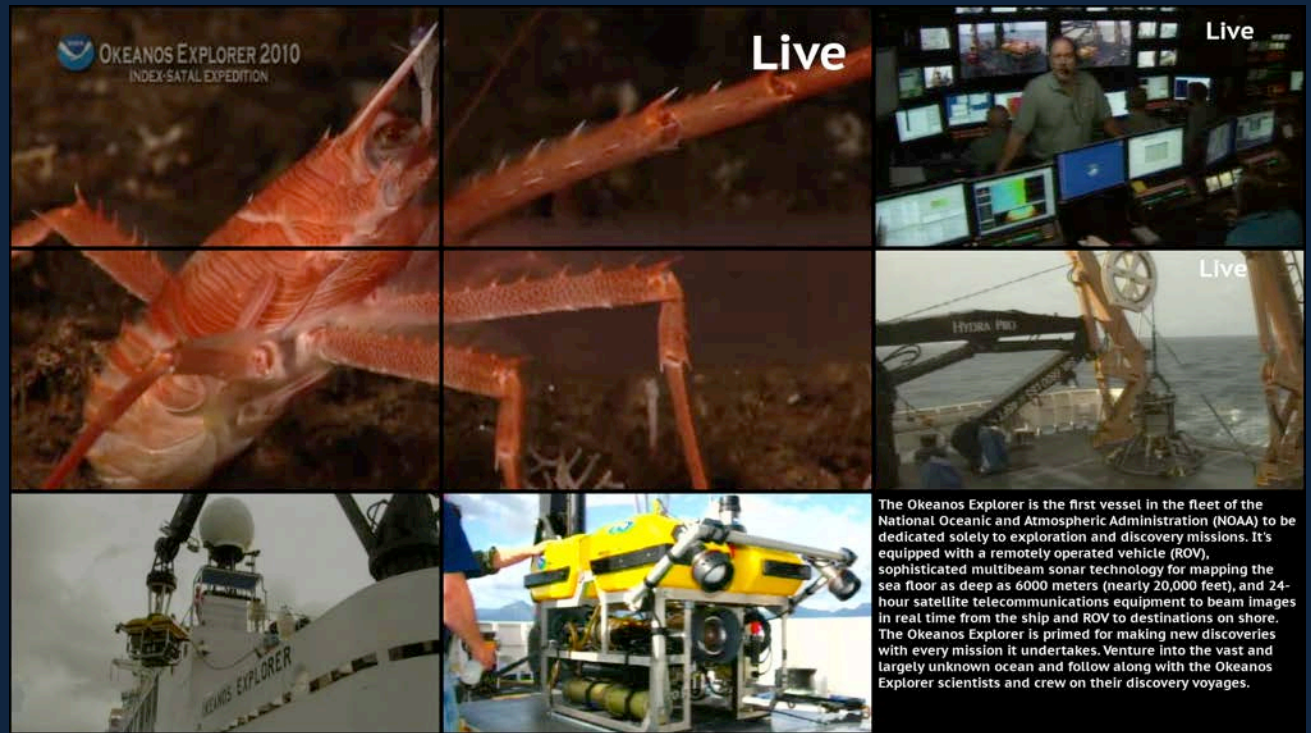
Shipboard Facilities for Hosting Interactions



NAUTILUS LIVE

Explore the ocean LIVE with Dr. Robert Ballard and the Corps of Exploration

Live Interactive Education and Outreach to Museums and Aquariums



Live Video Streaming to Public Web Sites

Inner Space center

What's happening now at the Inner Space Center?

E/V Nautilus is linked up LIVE to the Inner Space Center! Watch the live feeds now! Catch what you missed on Exploration Now!

Select a featured video below:



Live Stream



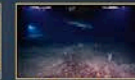
What's an ROV?



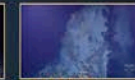
About the ISC



Deep Sea Communities



Lost City 2005



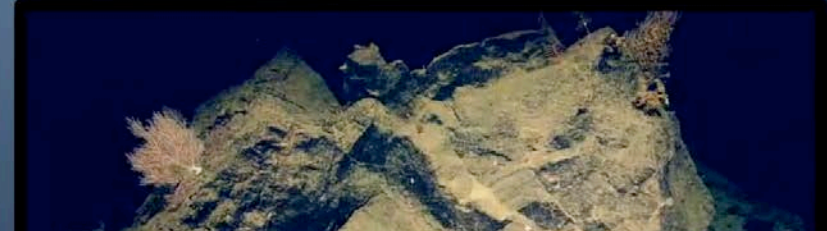
NOAA Mid-Cayman Rise Highlights



Nautilus NA017 Highlights

See more awesome clips in our video galleries!

The Inner Space Center, located at the University of Rhode Island's Graduate School of Oceanography, utilizes telepresence technologies to bring oceanographic exploration to the world in real time. Please



U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Ocean Explorer NOAA

OKEAN Explorer

OCEAN EXPLORER | EXPEDITIONS | EDUCATION | ABOUT

NOAA Ship Okeanos Explorer, "America's Ship for Ocean Exploration"

Featured Expedition: [Gulf of Mexico 2012 Expedition](#)



- [Okeanos Explorer](#)
- [Education](#)
- [Explorations](#)
- [Slideshows](#)
- [Video Playlist](#)
- [Okeanos Explorer Digital Atlas](#)

Featured Content

Watch video clips from the *Okeanos Explorer* Gulf of Mexico 2012 Expedition. See how scientists used the tandem remotely operated vehicles (ROV's), *Little Hercules* and *Seirios*, to explore deep-sea habitats and marine life in the northern Gulf of Mexico.



STAY CONNECTED

NAUTILUS LIVE

Explore the ocean LIVE with Dr. Robert Ballard and his Corps of Explorers aboard E/V Nautilus

NATIONAL GEOGRAPHIC SEA RESEARCH FOUNDATION

THE MISSION | THE HIGHLIGHTS | THE TECH | THE TEAM | THE LATEST | FOR EDUCATORS | FOR KIDS

SHIP STATUS: **Offseason** 02:34 AM WED MAY 01

CURRENT STATUS: Want to sail on Nautilus? Go here to find out how: <http://www.oceanexplorationtrust.org/opportunities> 4 months 2 weeks ago

EVENT LOG: **Data log offline**

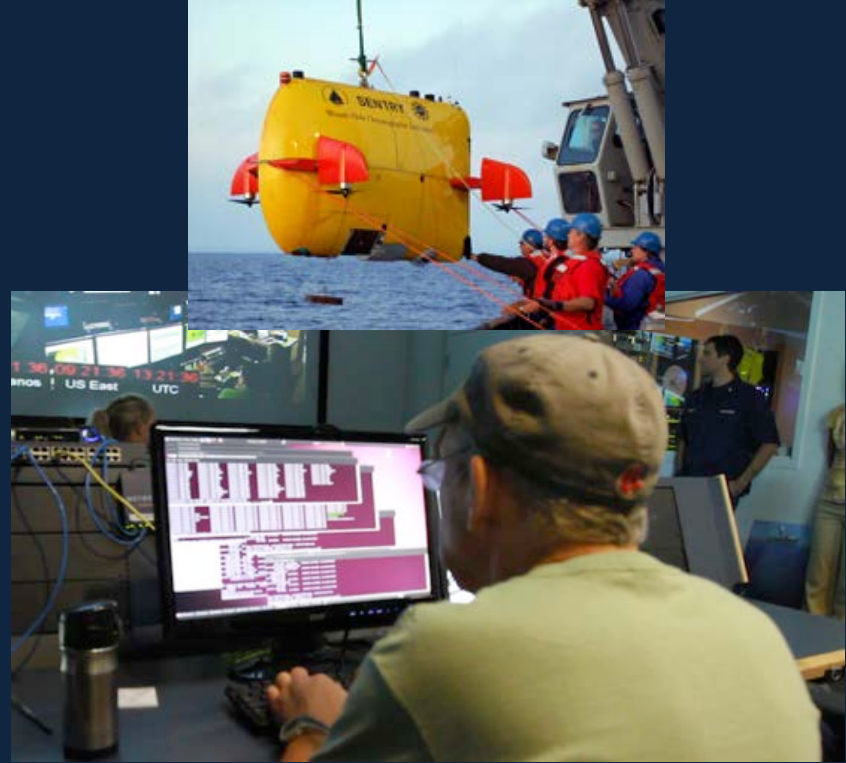
HIGHLIGHTS

- 2012 Nautilus Biology Summary 7 months 4 weeks ago
- Knidos O Shipwreck - Dive Highlights 8 months 3 days ago
- Knidos P Shipwreck - Dive Highlight 8 months 3 days ago

E/V Nautilus SHIP OF EXPLORATION

ROV Hercules UNMANNED SUBMERSIBLE

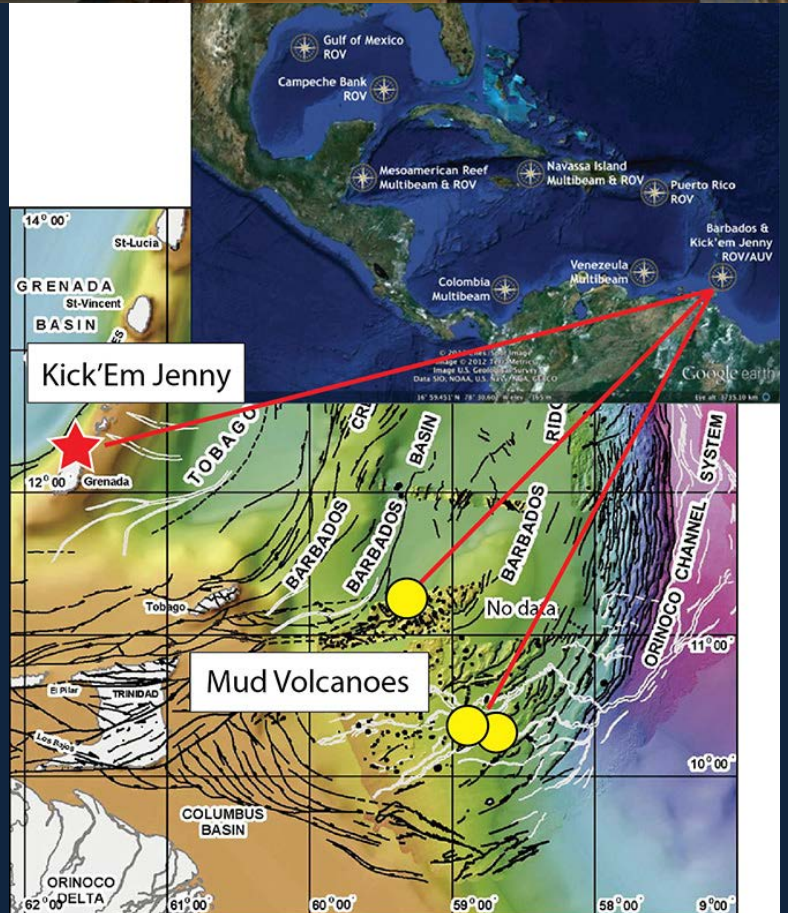
ROV Argus UNMANNED SUBMERSIBLE



ISC Mission Control
Sentry AUV Support

ologies

Zara Mirmalek



National Deep Submergence Facility







GATU 7 4

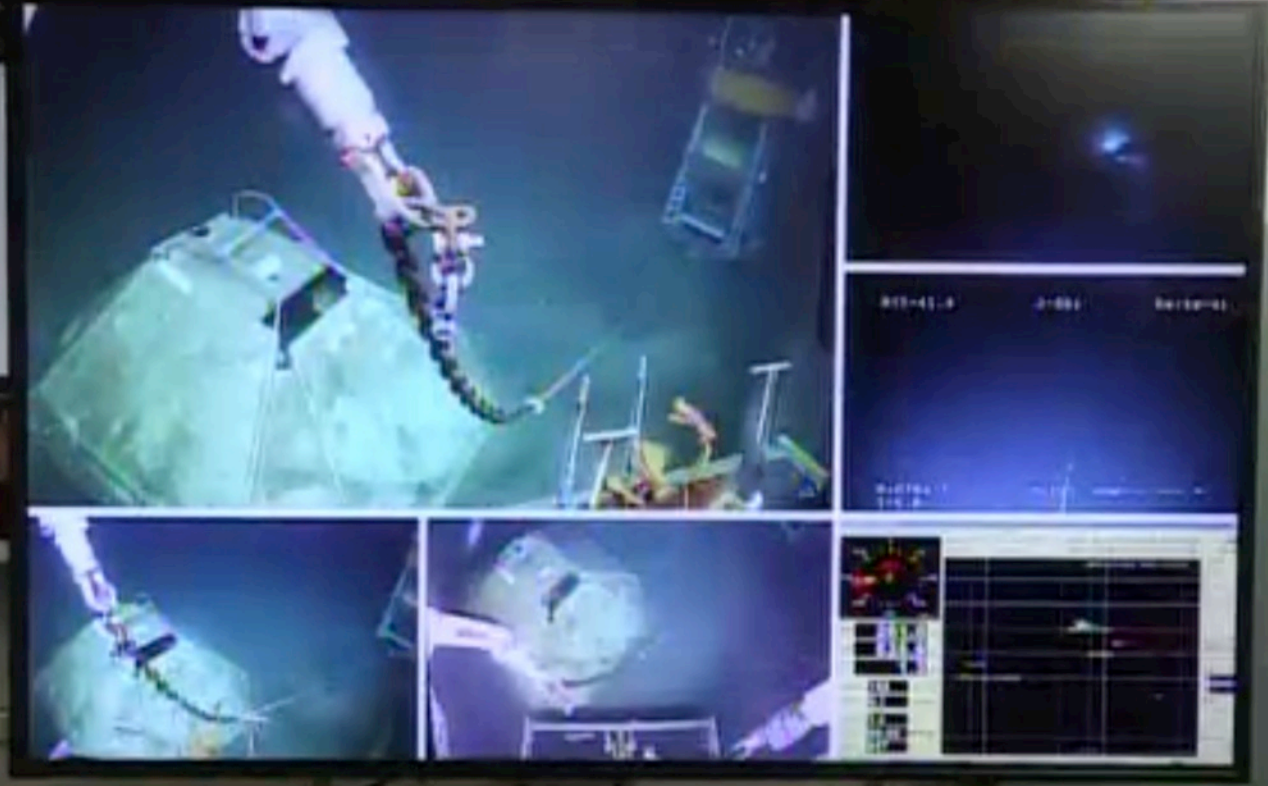


TARE	WEIGHT	4185 LBS
MAX	GROSS WEIGHT	36060 LBS
TOP	LOAD ONLY	



Mobile Telepresence Unit (MTU)

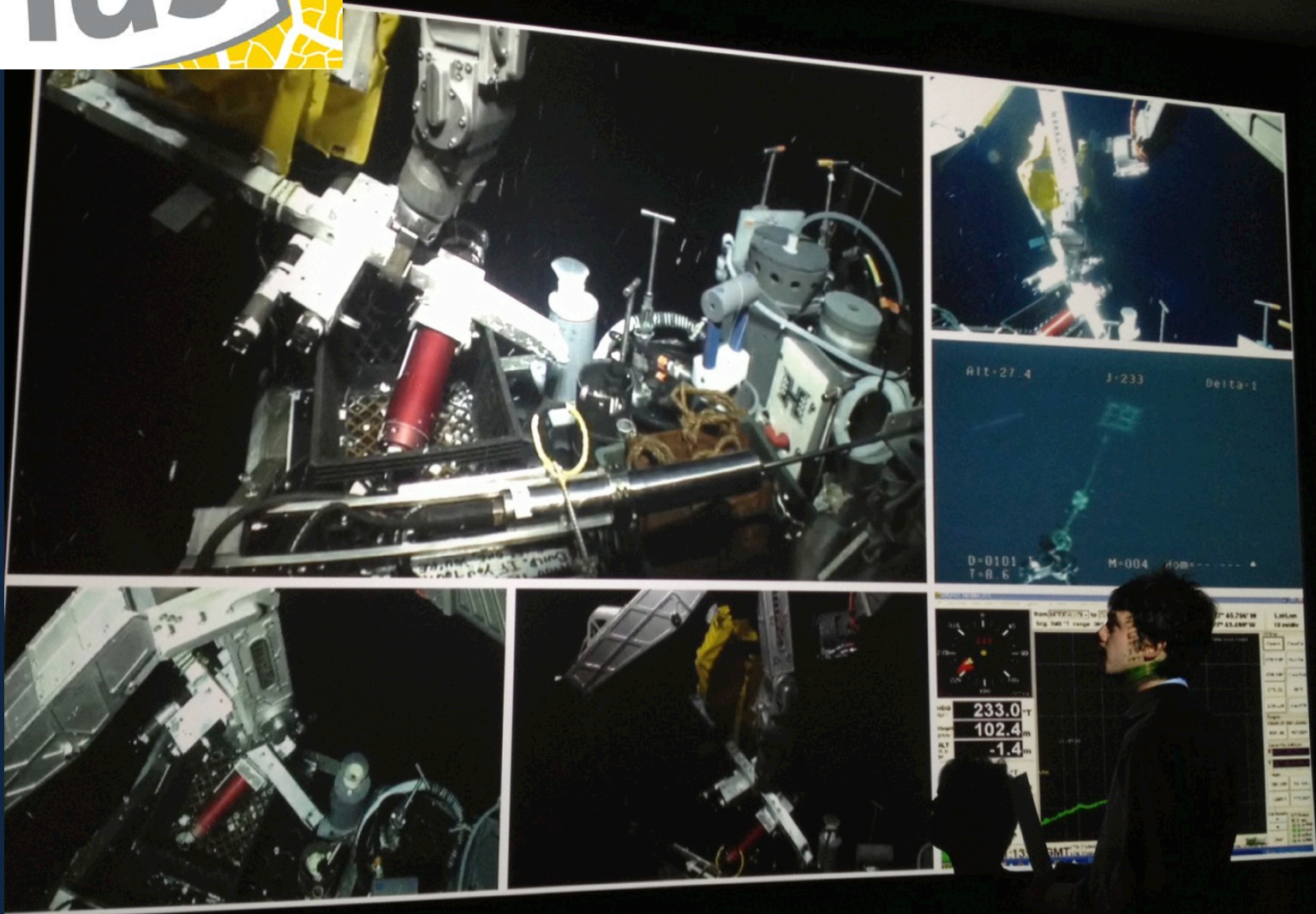






Smithsonian
National Museum of Natural History

Q?rius





ATLANTIS LIVE

Explore the ocean LIVE with scientists and engineers aboard R/V Atlantis

WATCH LIVE

THE MISSION

THE HIGHLIGHTS

THE TECH

THE TEAM

THE LATEST



Home

THE HIGHLIGHTS

Octopus's Garden in a CORK
from [Lisa Strong](#) **PLUS**

01:45

LIKE
LATER
SHARE

HD vimeo

A video player showing an octopus in a CORK. The octopus is white with purple tentacles. The CORK is a metal structure with various pipes and equipment. The video player includes a play button, a progress bar, and a time display of 01:45. There are also social media icons for Like, Later, and Share, and a Vimeo logo.

Meet the Team



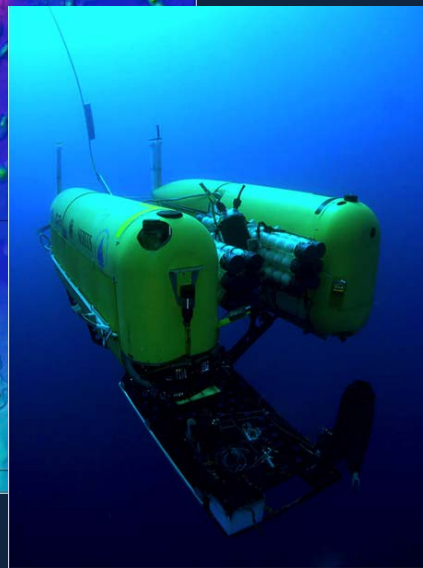
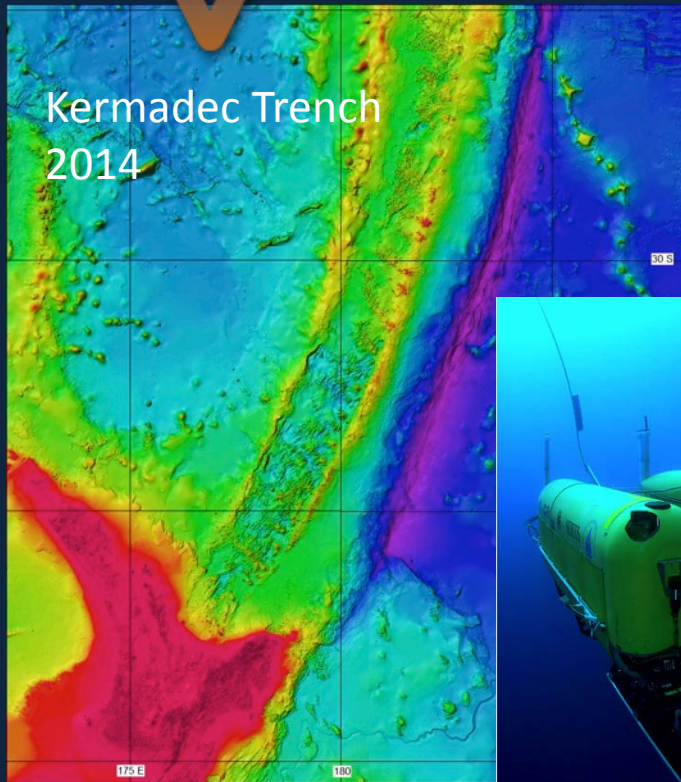
Chelsea Catania
researcher

Jason Dive Highlight - Octopus's Garden

It is not uncommon for an octopus to take up residence in or around a CORK. This footage taken by a Jason camera at the bottom of the ocean shows the resident octopus at CORK 1362B.

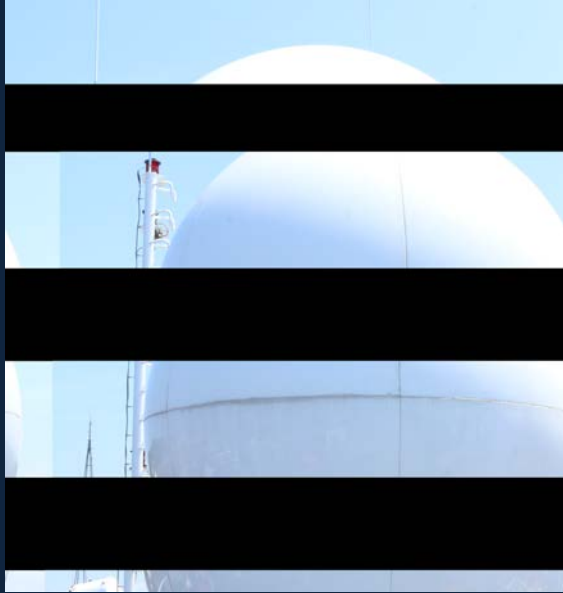
HADES

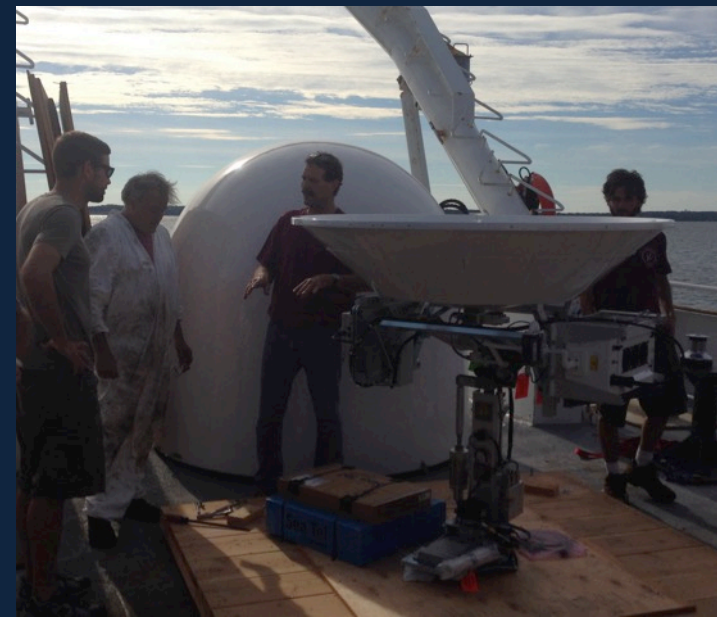
HADal Ecosystem Studies



DeepSeaVideo.com







A Telepresence System for the R/V Endeavor



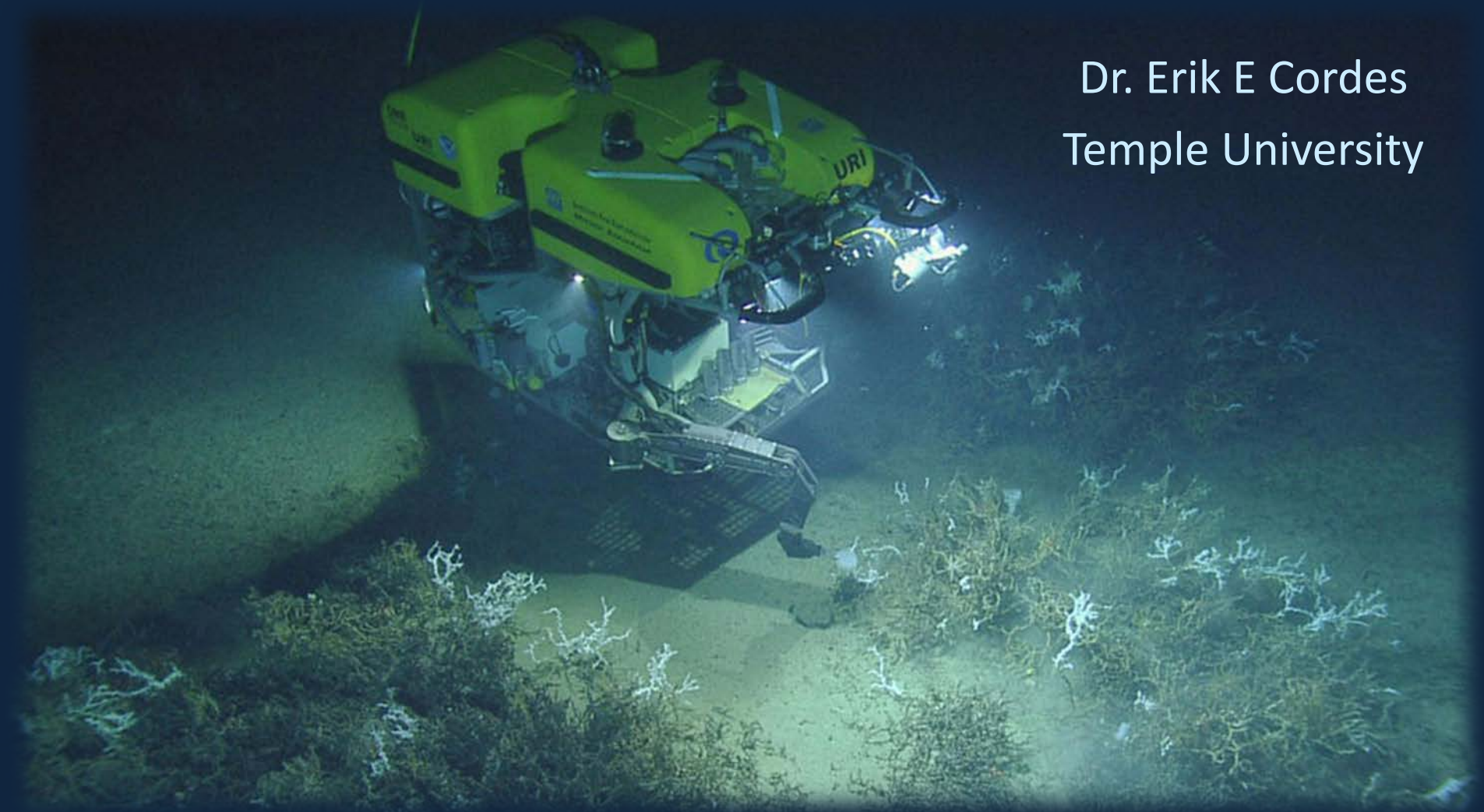
R/V Neil Armstrong and R/V Sally Ride



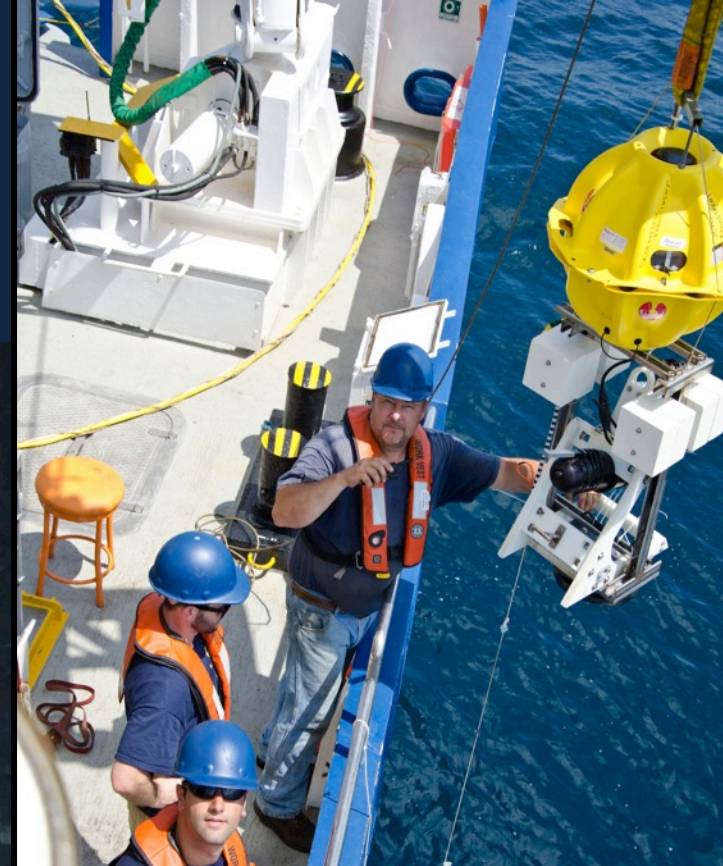
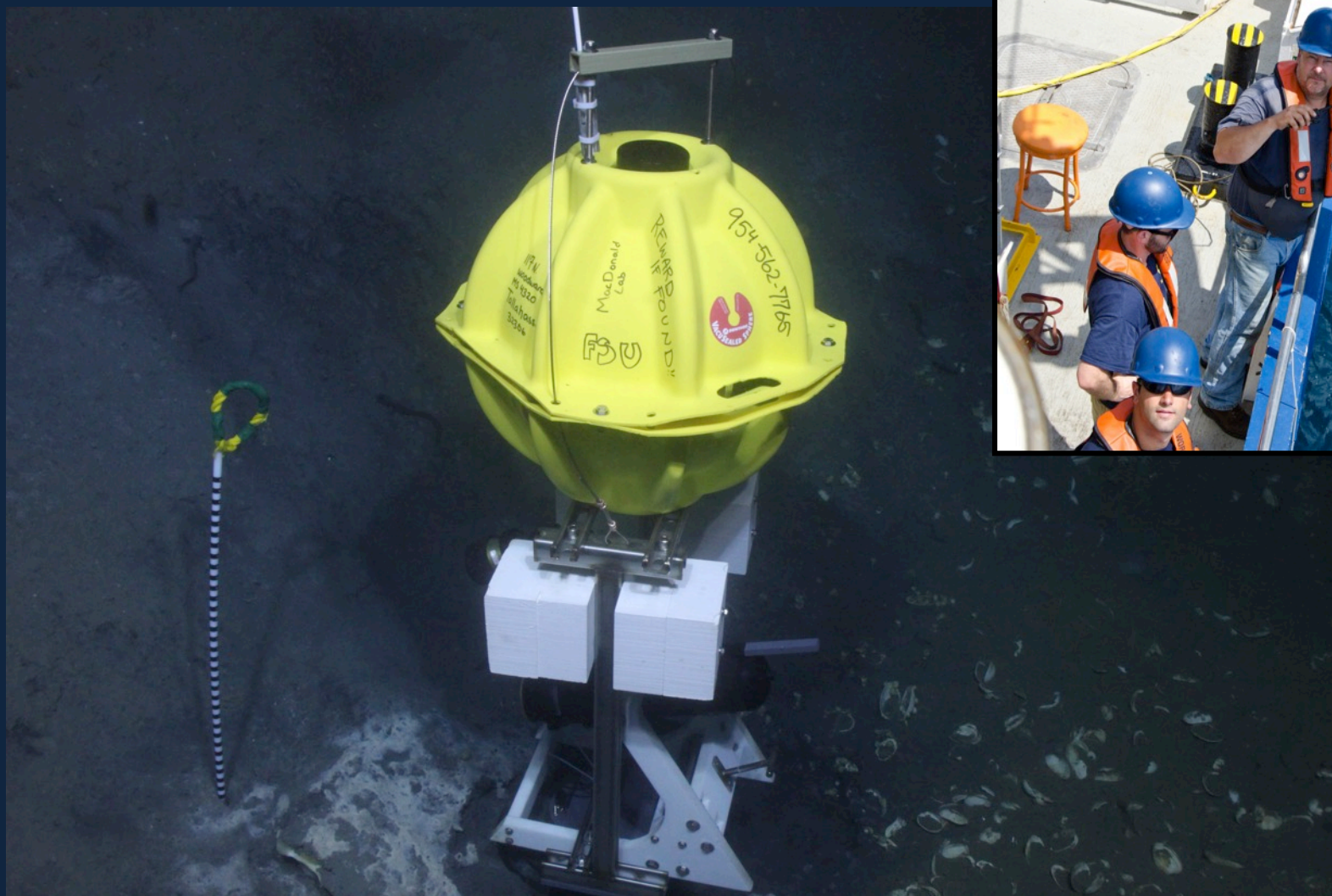
Future RCRV(s)

Telepresence-enabled science and outreach

Dr. Erik E Cordes
Temple University



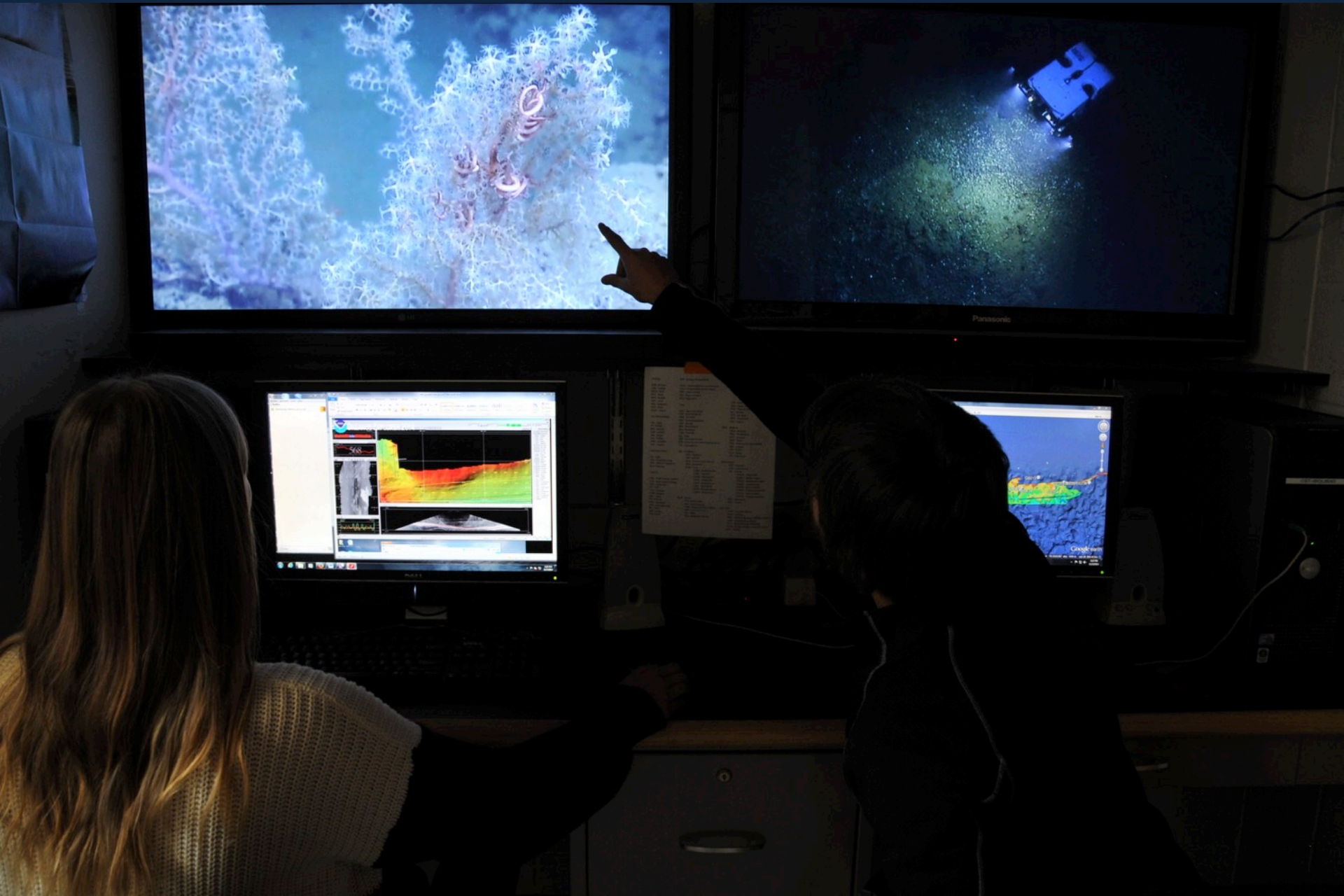
Bringing others onto the cruise



At-sea collaborations



Telecommuting



Live interactions beyond the van



Challenges

- Infrastructure & personnel
- Too many cooks
- Distractions





EXPLORING THE MARIANA TRENCH

NOVEMBER 2014



