

Antarctic Undersea ROV
McMurdo Station, Antarctica
October 23, 2007





Welcome to Wimba!



Arctic Research Consortium of the United States

Raise your hand to ask a question

List of all participants

Return to the Lobby or Exit

Slides will be shown here

'Chat' with one person or the entire group

Connecting to server...
You have connected successfully!
You have entered the lobby.
You have entered 'Arctic Research Consortium of the United States (ARCUS)'.
Your media format is Third-party Conference Call.

Yes No [Hand Icon]

Name	✓	X	Hand
Helen_Wiggins			

Exit Lobby - Help



What is PolarTREC?

PolarTREC is a professional development experience in which K-12 teachers are paired with researchers in authentic polar research experiences.

In the next three years over 40 teachers from around the United States will join scientists in the Arctic and Antarctica in celebration of the International Polar Year!

www.polartrec.com



International Polar Year (IPY) **2007-2009**

The International Polar Year (2007-2009) is an exciting scientific campaign focusing on the world's polar regions!

IPY is a time for discovery, science, learning, and awareness about the polar regions with activities for youth, scientists, and the public.

www.ipy.org

An underwater photograph showing a diver in the center, illuminated by a bright light source below. The water is dark blue, and there are some rocky structures in the foreground. The overall scene is dimly lit, with the primary light source being a bright, circular glow from below.

Science Under Ice

Project SCINI in Antarctica

Overview of Presentation

- Introductions
- Variety of Science in Antarctica
- Logistics of Science in Antarctica
- SCUBA Diving in Antarctica
- Stacy's Research
- SCINI Update
- Questions?

Meet the SCINI Team



Stacy Kim

- Benthic ecologist
- Moss Landing Marine Labs, CA
- 11 deployments to Antarctica



Bob Zook

- Chief Gizmologist
- Engineer
- Diver
- 14 seasons in Antarctica



Bryan Newbold

- MIT Undergrad Physics major
- Software engineer
- Joystick master



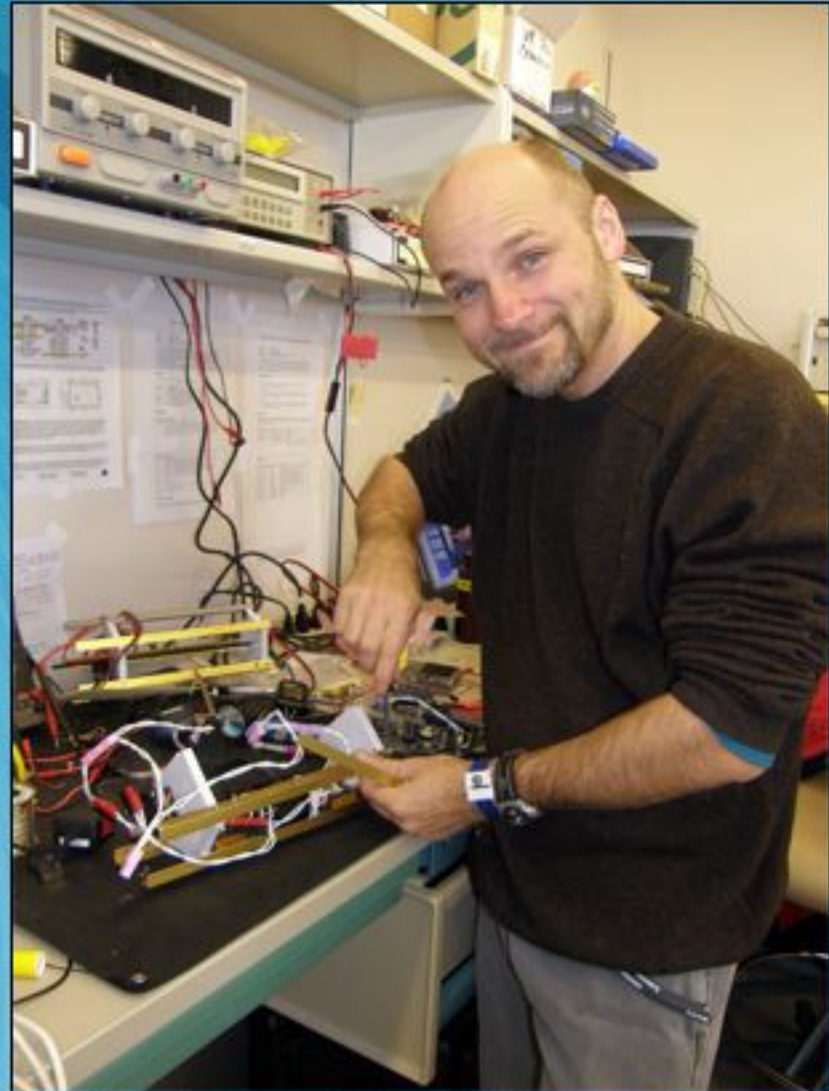
Nicholas Huerta



- CSU Monterey Bay undergrad
- Machinist
- Diver
- Snowboarder

Marcus Kolb

- VideoRay
owner
designer
engineer
- Diver
- SuperDad



Mindy Bell

- PolarTREC Teacher
- Science teacher
- SCINI helper



Why Antarctica?

Coldest, windiest, highest, driest continent



Variety of Science

- 6 PolarTRECs
- 3 Seal groups
- Penguin Ranch
- ANDRILL
- Antarctic Fish
- And many more!



Surveying conditions of the West Antarctic ice Sheet



- What is under 3485 m of ice?
- How does it move?

Measuring change in the ozone layer at the South Pole



- What contaminants are in the air at the South Pole?
- How are they changing over time?

Monitoring automatic weather stations across Antarctica

- A network of meteorological observatories is scattered across the Antarctic continent
- Data is transmitted in real time via satellite



Capital expenditure, lactation energetics and the importance of foraging to Weddell seals and their pups.
Smithsonian National Zoological Park



OR

How fat are female Weddell seals?

How do they get so fat?

How does that fat get transferred to their pups?

Container Ship, McMurdo Station



Aircraft

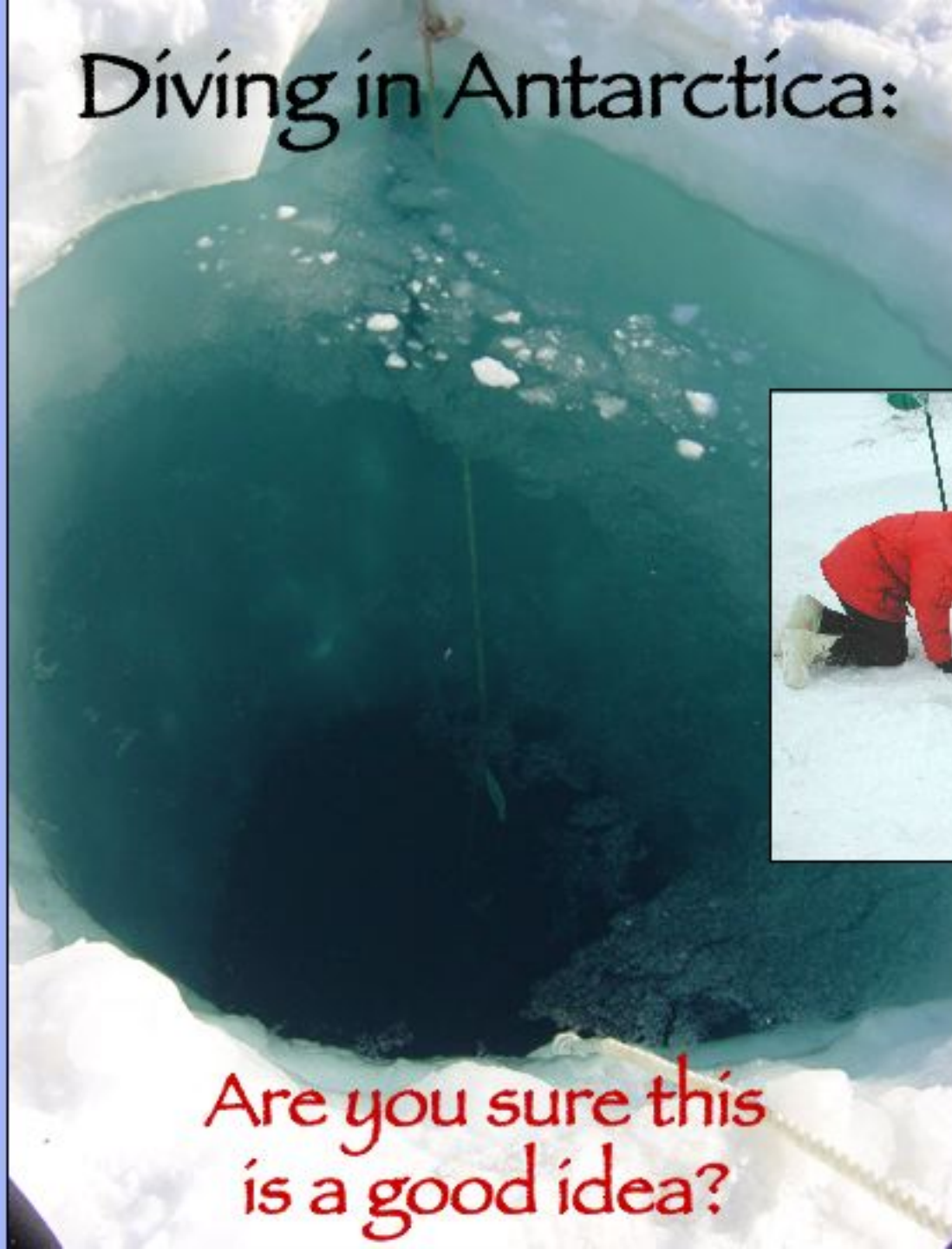
- Limited cargo
- Very \$\$\$



Field Camps



Diving in Antártica:



Are you sure this
is a good idea?

Diving in a tidal crack



Research questions

- What lives here, especially in deeper waters?
New species are still being discovered!
- How do humans impact this environment?
- How do communities change over time - with and without human impacts?

The Lost Experiments



- Begun in the early 1960s by Dr. Paul Dayton from Scripps.
- Experiments located at depths up to 60 m.
- Experiments were not completed because diving safety limits of 40 m were later established.

Revisiting old sites

- Searching
- No time limit



Photo by Paul Dayton

Human Impacts



- Dump site - hydrocarbons, metals, PCBs

Human Impacts

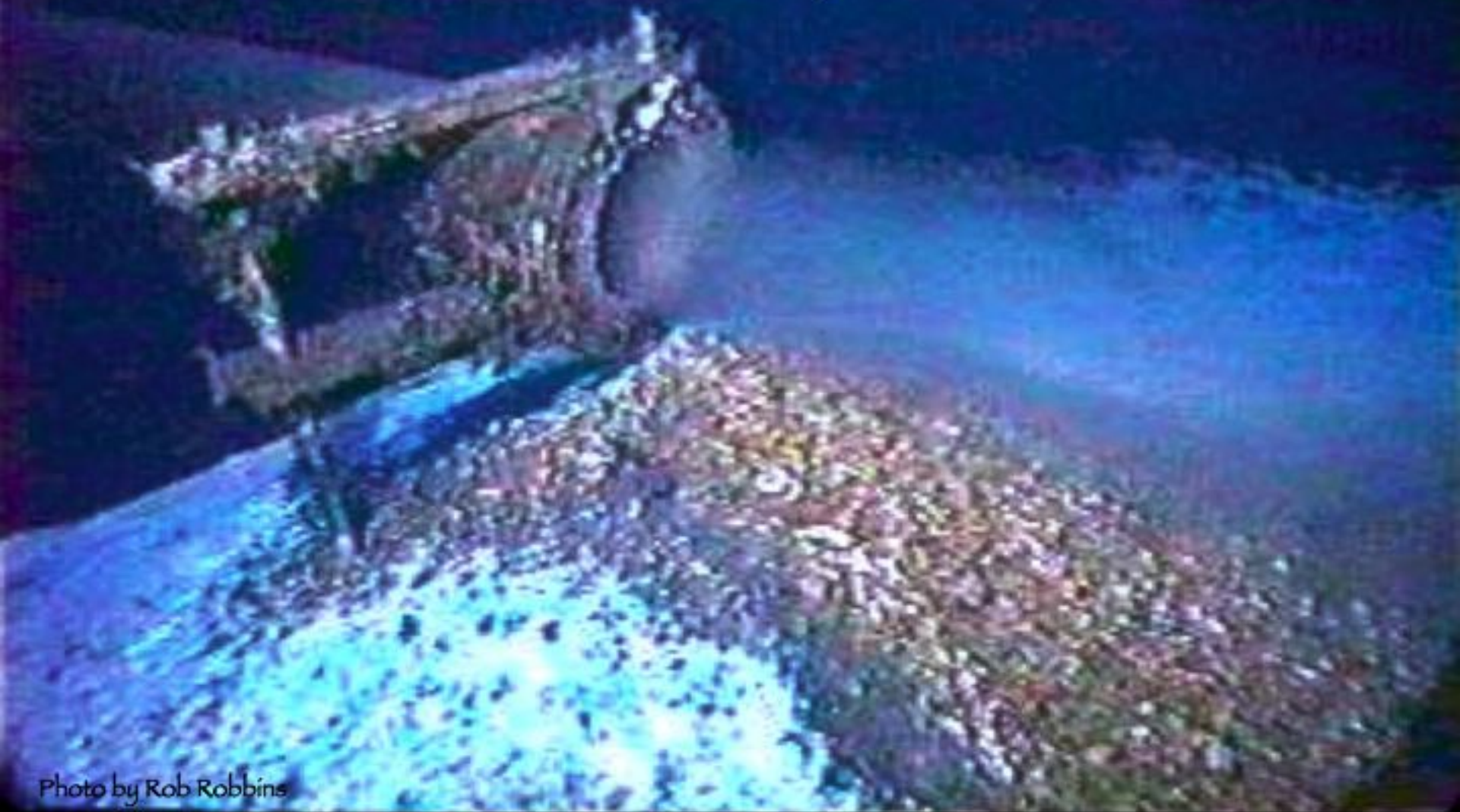


Photo by Rob Robbins

- Sewer outfall - treatment plant

The Need for SCINI



Existing technology limits access to new sites

Photo by Jesse Huff Christensen



Proof of Concept

- ROSCam
(Remotely Operated
Submersible
Camera)
- Deployment and
recovery testing
- Flight characteristics
- Total cost: \$300

SCINI

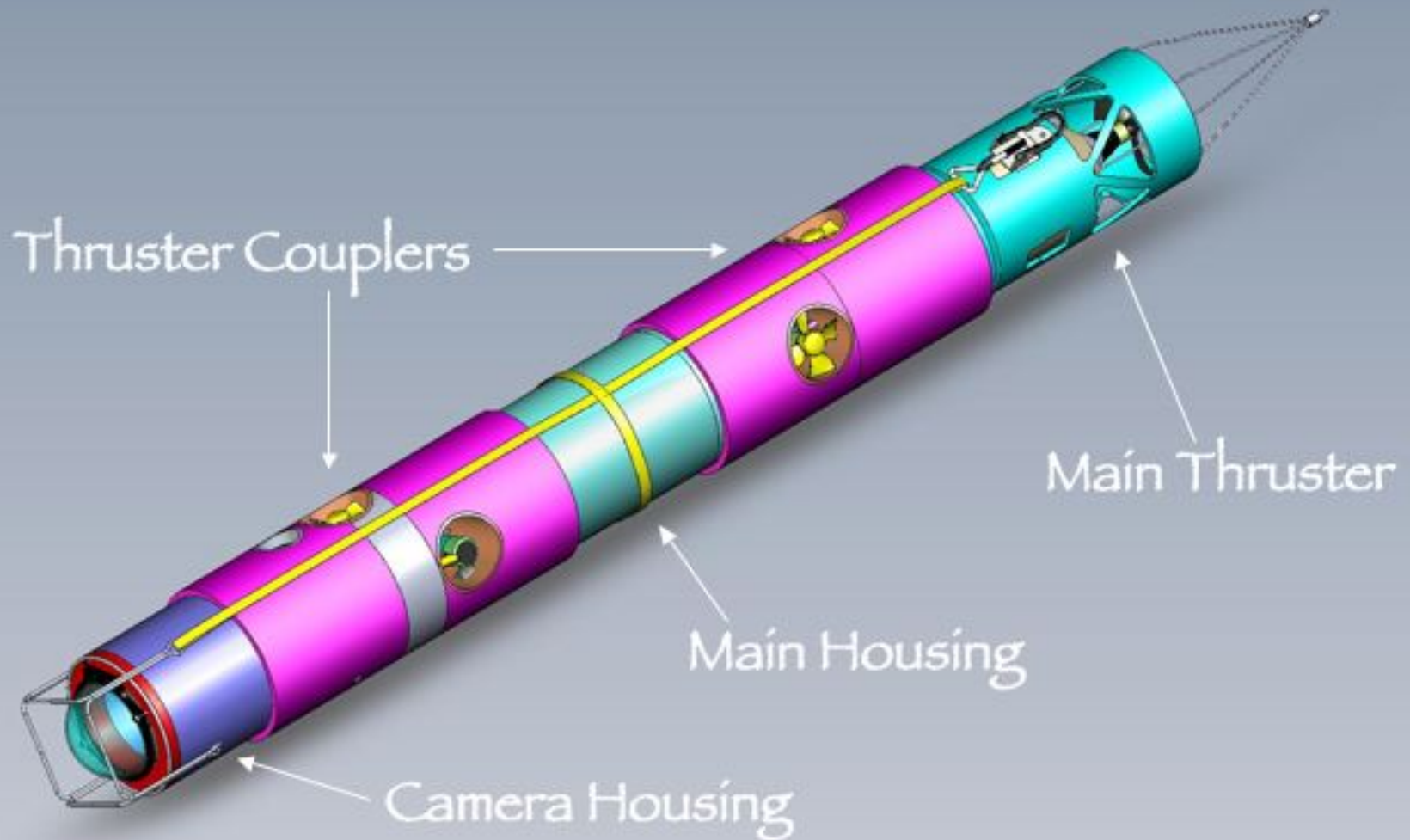


Submersible Capable of under
Ice Navigation and Imaging

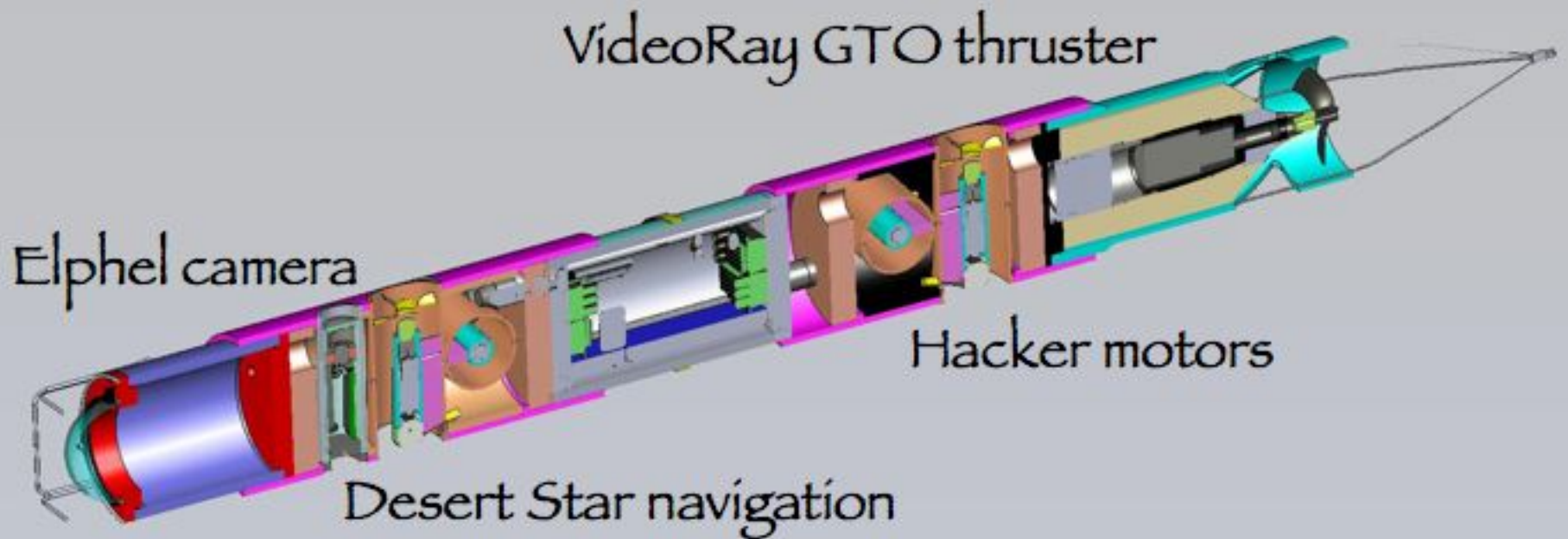


SCINI

SCINI External Anatomy



SCINI Internal Anatomy



How SCINI can be used

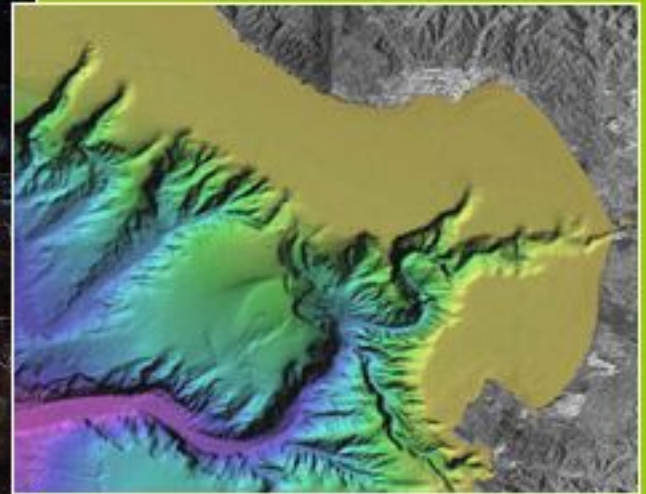


- Easy to survey many locations

- Find pristine control sites for experiments



SCINI Goals



- To locate new research sites and assess their suitability with minimal logistic costs.
- To reach depths below SCUBA diving limits.
- To create initial maps of seafloor areas.

Other Potential Uses



- Observing penguins
- Checking the drill string
- Going under the permanent ice shelf

SCINI Update-First tank dive!



First Under the Ice Dive!



Join our adventure at
www.polartrec.com!





Thank You!