Project Status and Plans - 2004

- Development of syntactic floatation material.
- Initial design of housings underway.
- Developed a plan for the analysis, design and testing of the micro fiber payout system with SPAWAR. Examining potential candidate microfibers in detail.
- Developing conceptual plan for power storage batteries
- Developing specifications for sensors (e.g. sonar) and identifying potential vendors
- Form oversight committee
- Optical analysis and initial design specification of LED based lighting.
- Generating detailed Project Plan with milestones.
- Conceptual outline of the vehicle control software underway
- Developing initial specifications for electric manipulator

HROV Project Plans

2005

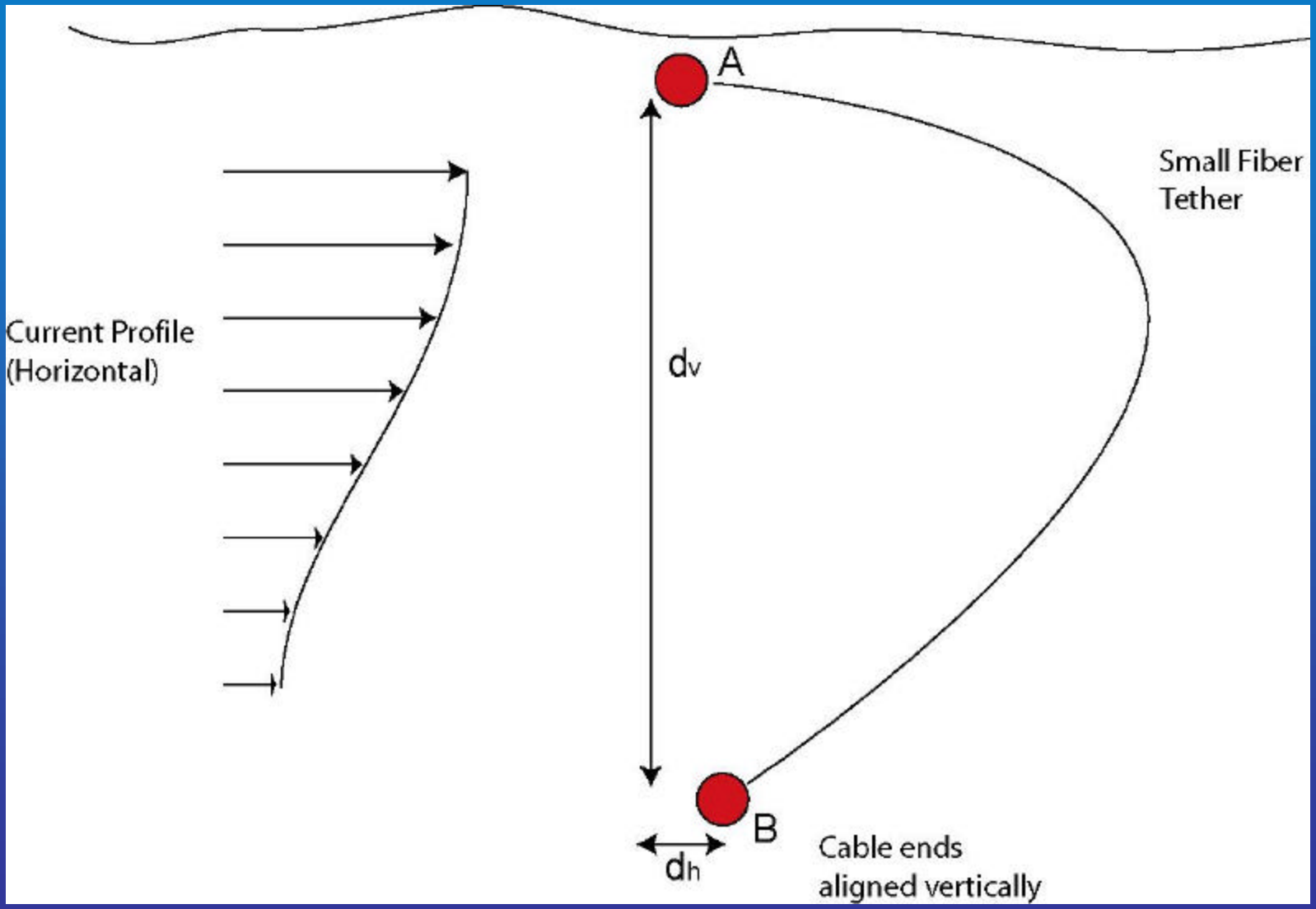
- Complete final testing on syntactic floatation material
- Complete proof pressure testing and cyclic testing of 10-inch ceramic floatation spheres and main electronics housings.
- Initial testing of microfiber payout canisters.
- Prototyping of battery assemblies.
- Monitor/received purchased components.
- Fabrication and operational testing of LED lighting assemblies.
- Development/testing of the control system using the JHU test bed

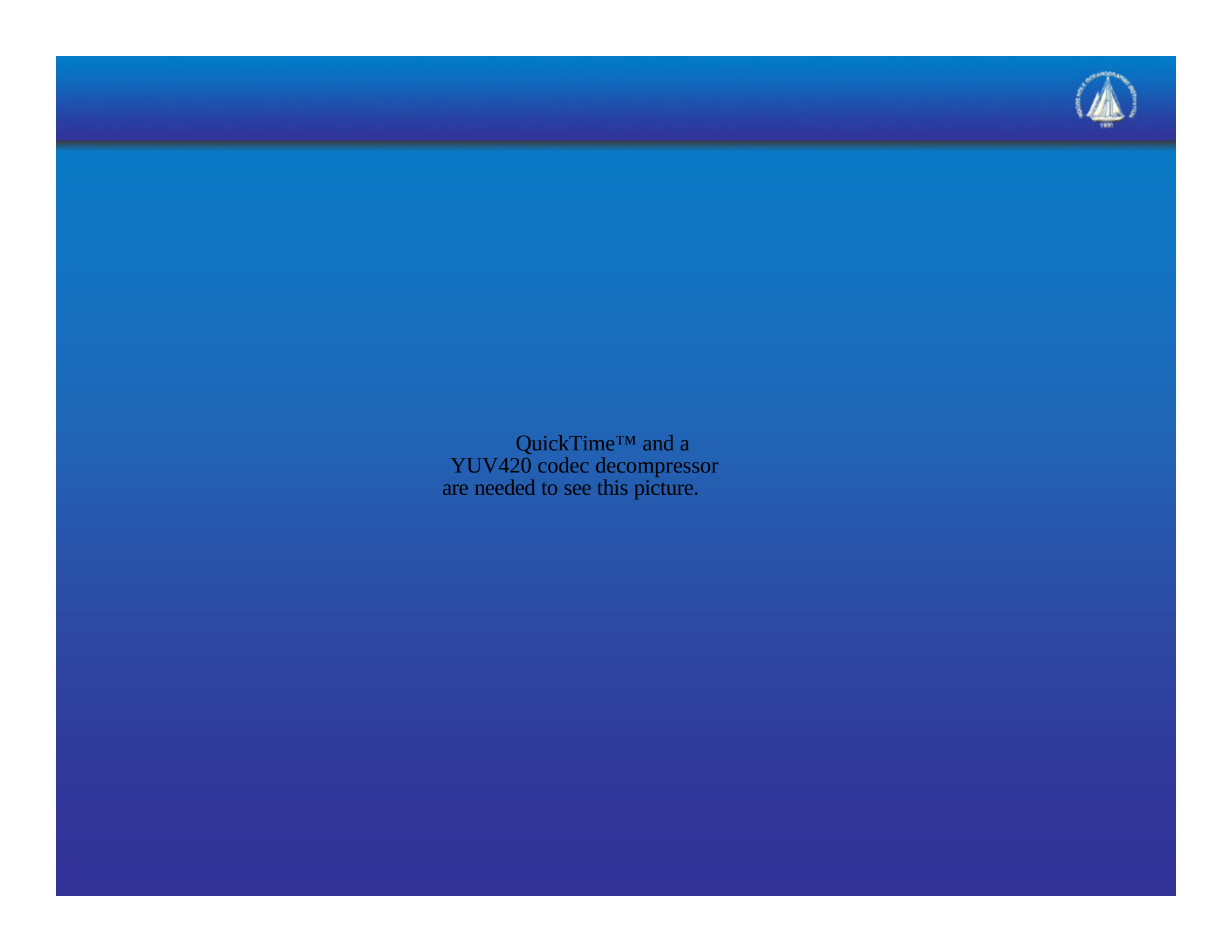
Light Fiber Approach

- Design
  - Fiber choice
    - Armored Micro-Cable (FOMC)
    - Bare Corning Fiber (LEAF)
  - Fiber deployment configuration
- Analysis
  - Determine feasibility
  - Current models
  - Case studies: locations, configurations, and operations
  - In-house design and operations capability
- Test
  - Elevator? ALVIN?

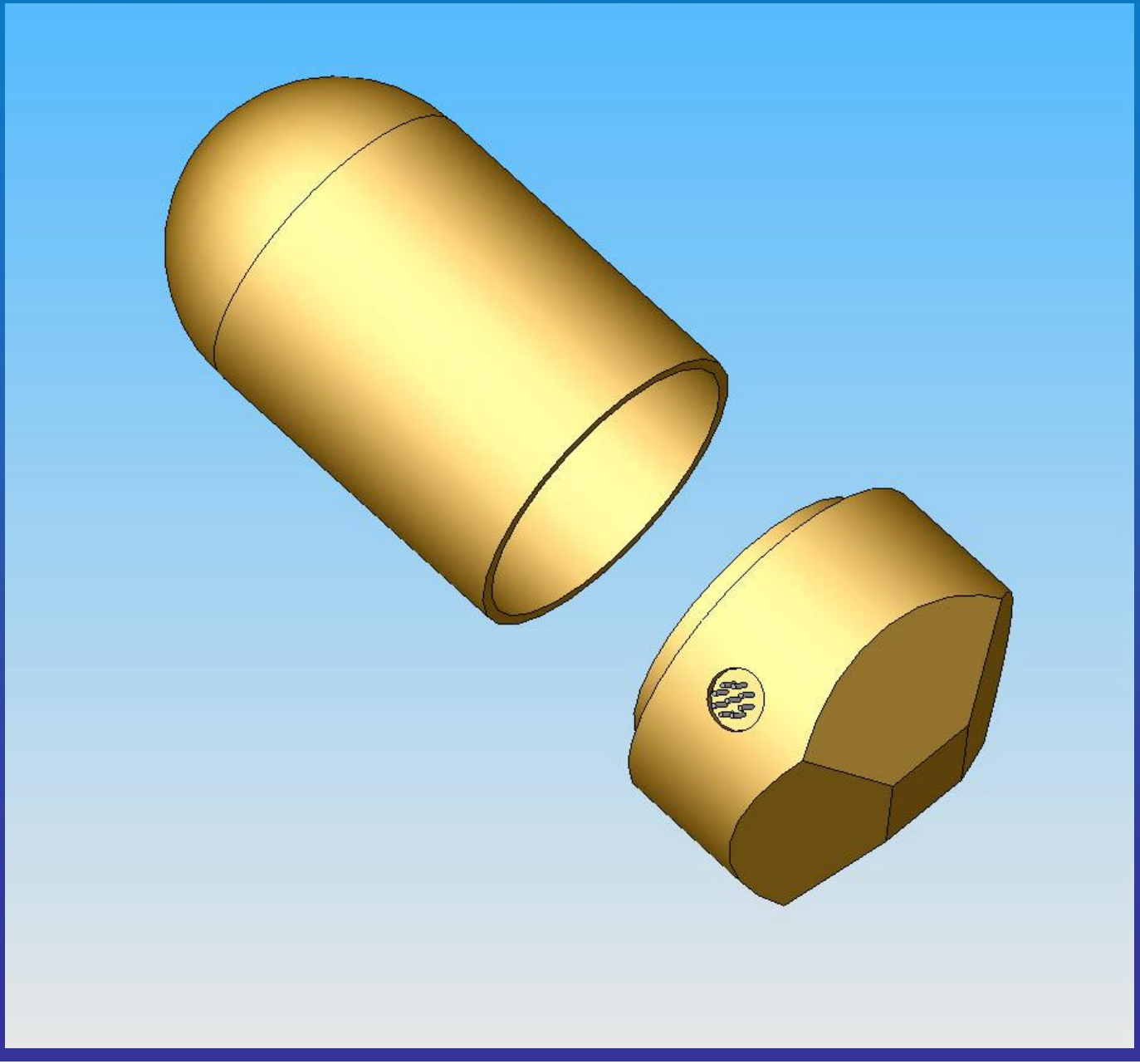
Fiber Types

	FOMC	Bare LEAF Fiber
Diameter (mm)	0.8	0.25
SG (fresh water)	1.74	1.36
Weight of 11 Km in water (kg)	4.2300	0.1730
Working Strength (N)	133	8
Breaking Strength (N)	400	108
Relative Survivability on Seafloor	medium	poor

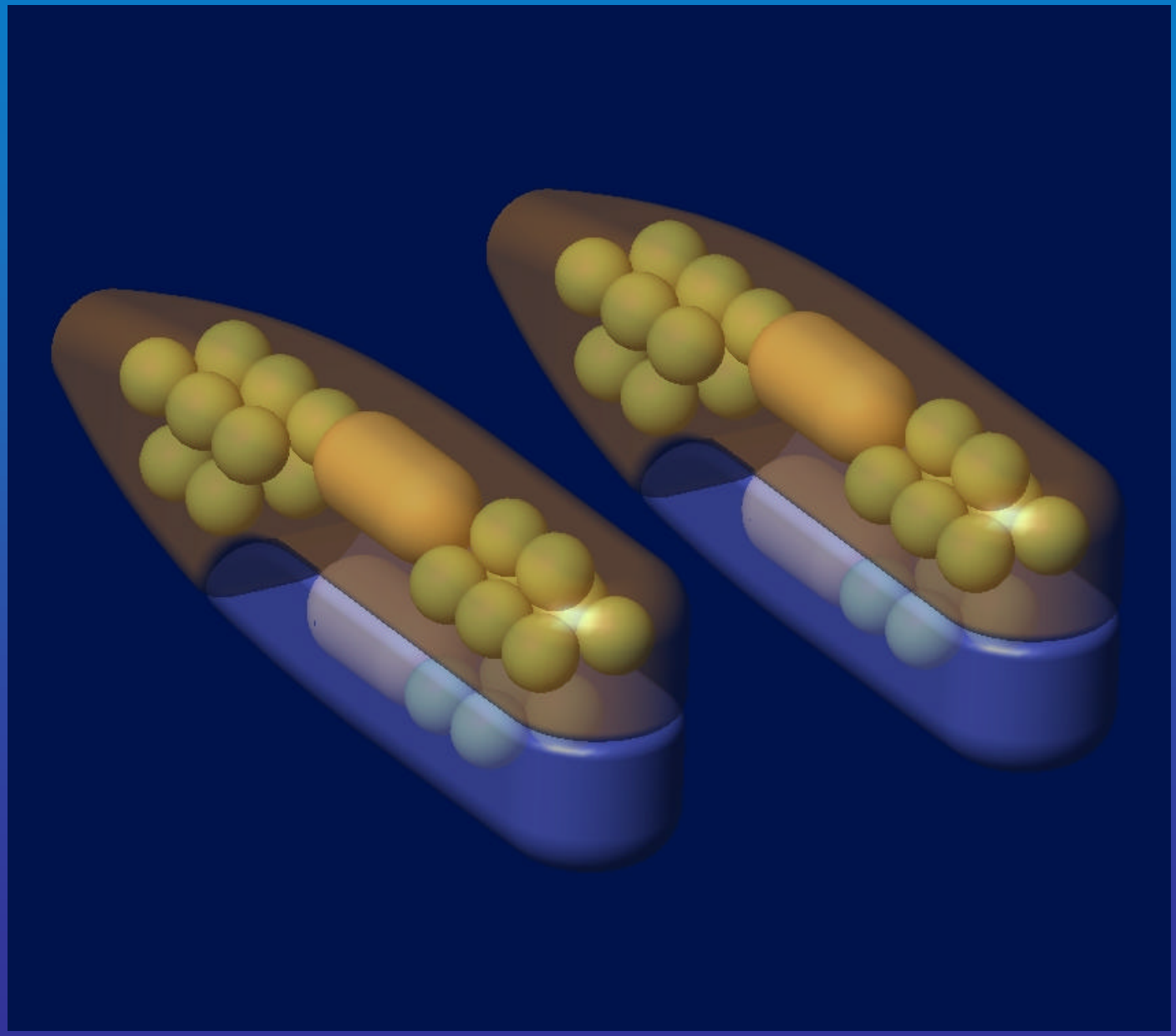

A
Small Fiber
Tether
Current Profile
(Horizontal)
dv
B
dh
Cable ends
aligned vertically


QuickTime™ and a
YUV420 codec decompressor
are needed to see this picture.

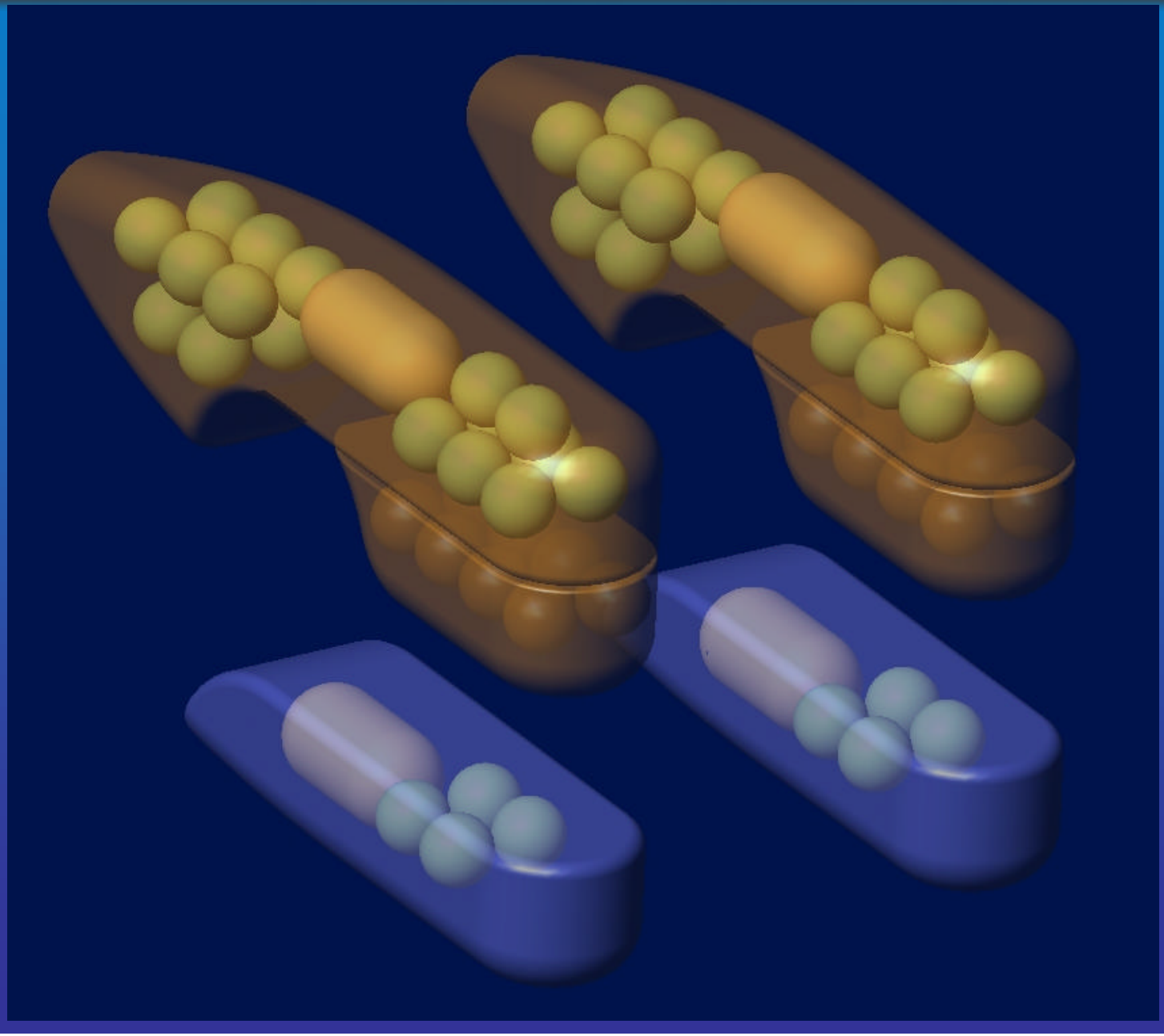
Auxiliary Ceramic Housing



AUV MODE



HROV Mode



HROV lighting requirements

- Strobe capability for low duty cycle
- Low power consumption
- Pressure tolerant
- Uniform illumination field

Available Lamp choices

- Halogen (incandescent)
- Xenon strobe (gas discharge)
- High power LED

Xenon Strobe

- 150 to 250 Lumens per Watt
- Very fast turn on
- 1 ATM operation
- Broad spectrum
- Mature technology

Halogen Lamp

- ~11 to 14 Lumens per Watt
- Very slow turn on
- 1 ATM operation
- Broad spectrum
- Mature technology

LED lamp

- 20-30 Lumens per Watt
- Very fast turn on
- Ambient pressure operation
- Continuous operation
- Narrow spectrum (500nm for high altitude)
- Infant technology (100 Lum/Watt)

LED lighting system features

- *Ability to create a spatially flat illumination field to match the camera field of view*
- *Discreet color for best transmission through water*
- *Color correction for chromatic attenuation*
- *Ability to strobe*
- *High electrical to optical conversion efficiency*
- *Pressure tolerant design*

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HROV Advisory Committee

- Melanie Holland (Arizona Steve Univ.)
- Lawrence Lawver (University of Texas)
- Chuck Fisher (Penn. State Univ.)
- Deb Kelley (University of Washington)
- Keir Becker (University of Miami)