



# Making Waves

## Inside this issue:

- Biomimetic Flapping Foil AUVs
- Welcome Sophomores
- SNAME goes to Disney World
- Spotlight on Alumni: Britton Ward, Naval Architect
- 13.018 Design Presentations

## Spotlight on...

Research	2
News	3
Alumni	5
Career Fair	6

## New OE Student Association: 13SEAs

I am pleased to announce the creation of the MIT Course 13 Student Engineering Association, also known as 13SEAs! 13SEAs is the Department's student-led organization dedicated to the students, faculty, and alumni of Ocean Engineering.

Our primary objective is to promote ocean technology, marine engineering, and naval architecture both within MIT and beyond. We bring together a number of professional societies to accomplish this goal, so that students are able to take advantage of the vast range of opportunities in the ocean community.

13SEAs is currently a student section, or member

of: the American Society of Naval Engineers, the International Shipping Club, the Marine and Oceanographic Technology Network, the Marine Technology Society, the Oceanic Engineering Society and the Society of Naval Architects and Marine Engineers. We hope that our connections with these organizations will continue to grow in the years to come.

Making Waves is just one way in which we are reaching out to those involved with MIT Ocean Engineering. Through this quarterly newsletter, we will keep you up to date on the goings-on in and outside the department. From innovative student research to pioneering faculty studies,

from enlightening lunch seminars to our annual job fair, from notable alumni to volunteering at local high schools – 13SEAs is setting new standards for student involvement and leadership; making waves as it were, in the ocean engineering community.

I invite you to become involved with 13SEAs. Suggest a new speaker for a luncheon or tell us about a company for the Ocean Technology Job Fair – two of the many ways you can help us form new partnerships within the department and the ocean community.

-Katherine Croff  
President, 13SEAs

## Letter from our department chair...

I am extremely proud to be asked to write this welcome letter for the inaugural issue of the XIII-Seas newsletter. A few students who wanted to share their love for the oceans and their desire to share their experiences in the Department with other students and alumni started this newsletter.

I think part of the excitement comes from the Department's ability to engage students in real projects whose objectives are to explore the mysteries of the ocean,

the study of nature and learning from millions of years of evolution, and participation in the design of complex structures such as ships and offshore structures. Some of our student projects are described elsewhere in this newsletter.

I would like to invite any students that are interested in ocean related projects to contact the faculty, our UROP Coordinator (Dr. Consi) and or the XIII-Seas leadership for additional information.

I look forward to continuation of this effort and broader student participation.

Regards,  
*Chrys Chryssostomidis*  
Department Chair MIT  
Ocean Engineering

Massachusetts Institute  
of Technology

Department of Ocean  
Engineering

<http://oe.mit.edu>

## Spotlight on Research: Biomimetic AUV's

**“We believe that we can adapt the form and function of biological swimmers, which have outstanding maneuvering capabilities, into real vehicles.”**

Dr. Franz Hover's research interests in biomimetics and autonomous underwater vehicles have come together in the *Biomimetic Flapping Foil Vehicle Project* at Sea Grant. Autonomous underwater vehicles (AUV's) are finding increasing utility in many areas of current study, including oceanographic survey, pipeline and cable survey and inspection, and mine countermeasures, to name a few.

The long-term goal of this project is to create AUV's specifically suited for operation in very close waters, and in high-energy environments such as the surf zone. The vehicles therefore need to be highly maneuverable, both in flight and also at zero speed (hover). “We believe that we can adapt the form and function of biological

swimmers, which have outstanding maneuvering capabilities, into real vehicles. This approach represents a departure from conventional vehicle designs employing control surfaces and propellers -- instead we will develop flapping and undulating wings to manipulate unsteady flows,” explained Dr. Hover.

The first two years of the project will focus on the construction and testing of a prototype vehicle, which is intended to provide enough layout flexibility that various configurations, actuators, sensors, and control strategies can be investigated. We also anticipate significant research programs in state-of-the-art sensing and actuation technologies, such as artificial muscles, optimization of designs using CFD analysis, and the

biological foundations of high maneuverability.

Dr. Hover received his undergraduate degree in Mechanical Engineering from Ohio Northern University and his Masters and Doctorate degrees in Mechanical Engineering here at MIT in the joint program with Woods Hole Oceanographic Institution. After graduating, Franz worked at Monterey Bay Aquarium Research Institute in California as a post-doc. Franz joined the department of Ocean Engineering several years ago and was promoted this summer to Principle Research Engineer. Franz recently taught 13.49 and helped out with the undergraduate design series, 13.017 and 13.018.

Franz and his wife, Susie, have two children, Henry (2.5 years) and Sylvia (6 months).

Conceptual drawing of AUV by Stephen Licht

## Fully funded UROP opportunity!

### UROP INFORMATION SESSION

Friday, December 14, 2001

OE Conference Room (5-314)

Refreshments will be served.

Announcing two fully funded UROPs available starting IAP 2002:

**WANTED:** 2 MIT students that are willing to develop the materials and equipment necessary to test propeller thrust in a high school setting (analog or digital or some combination) in a water tank with a variety of propeller properties.

You will be working with High School teacher Paul McGuinness, from the Cambridge Rindge and Latin School, near MIT. These UROPs are open to all undergraduate students.

**ALSO NEEDED:** students (could be the same ones as above) to work in class with students to assist in the design and building of ROV's. Work would include helping students decide what is the best way to meet the design requirements and specifications of the unit.

**IMPORTANT:** MIT students should not do the work for the high school students but should be able to make suggestions and perform appropriate demonstrations if necessary.

If you are available and willing, you will work with a small group of students after

school to meet the design requirements and specifications of an ROV design for a national competition, scheduled for the end of May 2002.

If you take on this UROP, you will attend the national MATE ROV competition at the Kennedy Space Center in Cape Canaveral, Florida.

The competition is hosted by the Link Symposium, a NOAA-NASA collaboration for ocean and space technology innovation.

Come to the information session if you would like to be involved!

## SNAME goes to Disney World

If you were wondering where 13SEAs members John Hootman, Karl McLetchie, and Katie Wasserman disappeared to for a few days near the end of October, they were attending the 109<sup>th</sup> Annual SNAME Meeting at Disney's Contemporary Resort in Orlando, FL.

The two-day long conference involved an International Marine Expo, featuring all segments of the maritime industry, technical paper presentations, and a student job fair, allowing students to look for internships and potential careers. Technical papers were presented in many areas concentrating on the shipping industry, several of interest to students were "Practical Hydrodynamic Optimization of a Trimaran," "Technological and Economic Implications of Mega-Container Carriers," and "World - Class Shipbuilders: Their Productivity Using

Lean-Manufacturing Principles."

Time was also spent enjoying some of Disney's offerings, as well as the hospitality of receptions sponsored by MIT, Webb Institute of Naval Architecture, and naval architecture and marine engineering firms: M. Rosenblatt & Son, Inc. and G.G. Sharp, Inc. Many other companies were represented at the conference as well, including General Dynamics, American Bureau of Shipping, Newport News Shipbuilding, and Maritime Research Institute Netherlands (MARIN).

Katie gained a "glimpse of the light at the end of the tunnel...a goal that I'm working towards instead of just working... [and] some understanding of the industry as it is today and where it needs to be in the future."

by John Hootman

Several students from our department won student paper awards that were presented at the conference. Dr. Richard Kimball won the 2001 Graduate Paper Honor Prize for his paper entitled "Experimental and Numerical Investigations on a Mixed Flow Waterjet."

Also, OE students from the class of 2001 collected the Undergraduate Paper Honor Prize for their paper entitled "Construction of the AUV Delphini" presented by Ann Marie Polsenberg, Jonah Elgart, Ian McCreery and Jan Meyer. Ann Marie was present at the SNAME meeting to represent the group.

The 2002 Annual Meeting will be held in Boston next September, and 13SEAs looks forward being a part of it. For more information on SNAME check out <http://www.sname.org> or the new 13SEAs website.

## STUDENT PAPER AWARDS

*Best Student Paper Award (First Prize) in Acoustical Oceanography June 2001 ASA meeting*  
Kyle Becker

*Best Student Paper Award (First Prize) in Underwater Acoustics, Fall 2000 ASA Meeting*  
Purnima Ratilal

*Best Student Paper Award (Third Prize) in Acoustical Oceanography, Fall 2000 ASA Meeting,*  
Joshua Wilson

*Winner of the 2001 SNAME Undergraduate Honor Prize for Student Paper, October 2001*  
Ann Marie Polsenberg,  
Jonah Elgart  
Ian McCreery  
Jan Meyer.

*Winner of the 2001 SNAME Graduate Honor Prize for Student Paper, October 2001*  
Richard Kimball

## Fellowships and Awards

- *SNAME Undergraduate Award*  
Jessica M. Donnelly
- *SNAME Graduate Award*  
John Hootman
- *Robert Bruce Wallace Prize*  
Karl-Magnus W. McLetchie
- *Knauss Sea Grant Fellowship*  
Katherine L. Croff
- *American Bureau of Shipping Scholarship*  
Timothy W. Glinatsis
- *MIT Presidential Fellowship*  
Steven Torok  
John Hootman  
Konstantinos Pelekanakis
- *NDSEG Fellowship*  
Anna P. M. Michel  
Benjamin S. H. Connell  
Jay E. Dryer  
Matthew R. Walter
- *LINK Fellowship*  
Anna P. M. Michel
- *Shell Fellowship*  
Corey Jaskolski
- *MIT Center for Environmental Initiatives/Laboratory for Energy and the Environment's Martin Fellowship*  
Timothy Presterio
- *MIT Entrepreneurship Center's Carroll. L. Wilson Award*  
Timothy Presterio

## Fellowship Due Dates

**January 2002**  
*DOD Fellowship*  
*Link Fellowship*

**February 2002**  
*ASNE Scholarship*  
*SNAME Scholarship*

**March 2002**  
*ISOPE Scholarship*

**April 2002**  
*MTS Scholarship*

### Looking for fellowship opportunities for graduate school?

Check out the 13SEAs website for a list of fellowships and deadlines

<http://web.mit.edu/sname/www/research/scholarships.html>



**SNAME STUDENT  
PAPER  
COMPETITION**

**ABSTRACTS DUE:**

15 JANUARY 2001

**PAPERS DUE:**

15 FEBRUARY 2001

**PRESENTATIONS:**

22 FEBRUARY 2001

**Awards:** Top papers are eligible for scholarships on local, regional, and national levels, and will be invited to compete in the national student paper contest.

**Topics:** All Ocean/Marine Engineering and related topics are welcome, including (but not limited to): Design, Acoustics, Hydrodynamics, Marine Robotics, Structures, Maritime Law, C.F.D., etc.

13.018 Design of  
Ocean Systems  
Student Presentation

"Tetragonos: A Jack  
and a Box"

12 December 2001

2:00pm, MIT Room 5-  
314

*Refreshments will be  
served*

**Ocean Technology Job Fair and New England  
SNAME Student Paper Competition**

**22 February 2002**

Massachusetts Institute of Technology  
Stratton Student Center: La Sala de Puerto Rico

11am-4pm: Job Fair and Company briefings  
TBD: Student Paper Presentations  
4pm: Keynote Speaker

CAPT Craig McLean, NOAA Office of Ocean Exploration

To register your company and for more information,  
please see

<http://web.mit.edu/sname/www>

or email

[oceantech@mit.edu](mailto:oceantech@mit.edu)

**New Scholarship!!**

**Offshore Research Scholarship**

Award: \$1500 and an expense paid trip to the  
Offshore Technology Conference in  
Houston, Texas, May 6-9, 2002

Requirements: 1-page executive summary and  
a 20-minute presentation of student research  
on topics including, but not limited to,  
offshore structures, hydrodynamics, CFD, and design.

**Executive Summaries Due: March 1, 2002**  
**Presentations: March 15, 2002**

For more information, please email [Croff@alum.mit.edu](mailto:Croff@alum.mit.edu)

*Sponsored by ExxonMobil Corporation*



## Spotlight on Alumni: Britton Ward, Naval Architect

*Each newsletter we would like to spotlight alumni from the OE department, to give students some insight into career opportunities for Ocean Engineers. Any alumni interested in offering career advice please contact the 13SEAs news group at [13seas-news@mit.edu](mailto:13seas-news@mit.edu).*

Our first spotlight is on Britton Ward, a graduate of the OE master's program in 1996. Originally from Perth Australia, Brit has been sailing and building small boats since he was very young. In 1987, the America's Cup race was held within sight of his house, sparking an interest that would steer his course into Naval Architecture.

Before attending MIT, Brit completed his undergraduate degree in 1995 at Naval Architecture at Webb Institute of Naval Architecture in New York. While at MIT, he

worked with Professor Jerome Milgram developing new bailing devices for sailboats in the 1996 Olympics in Atlanta.

After graduating from MIT Brit went to work for Farr Yacht Design, Ltd. based in Annapolis, MD, and is still working there today. He is now a Senior Naval Architect and has worked on designing sailboats that range from small 15-foot dinghies to 100+ foot high performance cruising boats.

Farr has designed a wide range of successful production boats for builders such as Carroll Marine and Beneteau, but their principal specialty is in the design of high performance race boats for a variety of races and venues, which have won an unprecedented 37 world championships over the last 20 years. Most notable has been their continued

involvement in America's Cup yacht design since 1987 and in designing successful boats for the Volvo Ocean Race (formerly Whitbread Race).

When asked what he most appreciated about his MIT experience, Brit explained, "[The] most useful knowledge I obtained from MIT clearly falls in an ability to appreciate the intricacies of both experimental and numerical hydrodynamic methods. As part of my job I deal extensively with both numerical simulations (liaising with CFD operators of panel methods/RANS codes etc) and experimental techniques involved in analyzing tow tank tests, wind tunnel results and full-scale test results.

"My experience at MIT has helped me interact with consultants in a more understanding way and has



provided me the knowledge necessary to draw valuable design lessons from these types of experiments with an understanding of the pros and cons of each method."

Britt is married to Jaye Falls (SMOE 1997), who is also a naval architect and consults for Oracle Racing. Britt and Jaye have a son Hunter, 9 months old.

For more information on Farr Yacht Design, Ltd. check out:

<http://www.farrdesign.com>

## New Student Section of MTS forms at MIT

This year a student chapter of the Marine Technology Society (MTS) is being founded at MIT. The mission of MTS is to:

- Disseminate marine science and technical knowledge
- Promote and support education for marine scientists, engineers and technicians
- Advance the development of tools and procedures required to explore, study and further the responsible and sustainable use of the oceans
- Provide services that create a broader understanding of the relevance of the marine sciences to other

technologies, arts and human affairs.

All student members will have all the benefits of MTS membership including:

- Interact and meet with other professionals within the context of highly specialized Technical Committees
- Continue education and training through numerous Society programs, such as tutorials, workshops and student mentoring
- Expand knowledge through presentations at national and local meetings
- Job referrals and visibility with prospective employers
- Receive reduced rates at

MTS sponsored events, notably the annual "Oceans" conference

- Student Scholarships
- Discounted prices for MTS publications
- National recognition through our Awards Programs

Justin Manley (XIII '96), Operations Manager of the MIT AUV lab, and Greg Beers, Principal Naval Architect at the Bristol Harbor Design Group, will serve as the MTS counselors for the MIT Chapter.

The Marine Technology Society is looking forward to the participation of MIT's 13SEAs students.



**For more information on MTS check out their website:**

<http://www.mtsociety.org>

13SEAs Newsletter

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*Making Waves is a quarterly publication of the 13SEAs written by students in the MIT Department of Ocean Engineering.*

**We're on the Web!**

Check us out at:

<http://web.mit.edu/sname/www/>

Submit your interesting news and notes to

[13SEAs-news@mit.edu](mailto:13SEAs-news@mit.edu)



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- Dr. David Burke, SNAME/ASNE
- Dr. A.D. Carmichael, SNAME/ASNE
- Justin Manley, MTS
- Dr. Alexandra Techet, MIT OE

Upcoming Events and Deadlines:

**December**

- 12<sup>th</sup> Last Day of Classes; 13.018 presentations
- 14<sup>th</sup> New UROP Info session
- 19<sup>th</sup> OE Holiday Party
- 17<sup>th</sup>-21<sup>st</sup> Exam Period
- 22<sup>nd</sup> Vacation Begins
- 28<sup>th</sup> Pre-Registration for Spring Term

**January**

- 7<sup>th</sup> IAP Begins
- 15<sup>th</sup> SNAME Paper Abstracts Due
- 22<sup>nd</sup>-25<sup>th</sup> Part I Written Exams
- 28<sup>th</sup>-31<sup>st</sup> Part I Oral Exams

**February**

- 1<sup>st</sup> IAP Ends
- 4<sup>th</sup> Registration Day
- 5<sup>th</sup> Classes Begin
- 15<sup>th</sup> SNAME Papers Due
- 18<sup>th</sup> Presidents Day
- 19<sup>th</sup> Monday Classes to be held
- 22<sup>nd</sup> Ocean Technology Job Fair SNAME Paper Presentations

**March**

- 1<sup>st</sup> ORS Executive Summaries Due
- 15<sup>th</sup> ORS Presentations
- 25<sup>th</sup>-29<sup>th</sup> Spring Vacation

