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Message from the Chair

I hope you will enjoy this new edition of the *Nautilus*, which reports some of our accomplishments in Naval Architecture and Marine Engineering during 2014-2015. In this issue we highlight our valuable relationship with our friends and colleagues working with and in the U.S. Navy.

NAME has had a strong relationship with the Navy since our founding in the 1880’s, and many of our alumni have gone on the serve in the active duty Navy and as civilian Naval Engineers.

We were fortunate to welcome back to campus the current, and three former Chief Naval Architects for the U. S. Navy: Mr. Robert Keane (MSE ’68), Mr. Edward Comstock (BSNAM ’70/ MSE ’74), Mr. Howard Fireman (BSNAM ’79/MSE ’85), and Ms. Robin White (BSNAM ’82). It was quite a homecoming! All four alumni spent time with our students and faculty, and they participated in a panel session to discussing their career path since leaving NAME and current career opportunities in naval engineering. I invite you to read more in our feature article.

Our students and faculty continue to work with the Navy on interesting research and development challenges. Many of our students go on to find careers at NAVSEA. In this issue of the *Nautilus*, we highlight the accomplishments of Assistant Prof. David Singer (BSNAM ’95/MEng ’97/Ph.D. 2003), a recipient of the 2012 Solberg Award from the American Society of Naval Engineers. We also profile some of our students who are recipients of fellowships from the Department of Defense, including the prestigious Science, Mathematics and Research for Transformation (SMART) and National Defense Science and Engineering Graduate (NDSEG) Fellowships.

NAME undergraduate students continue to travel far and wide to enhance their knowledge and gain new experiences as budding naval architects and marine engineers. Thanks to all of you who have sponsored and hosted our students during site visits and internships. We highlight a particularly interesting senior design project that resulted from one summer internship: a re-design of the Research Platform FLIP.

I would like to thank all of our alumni who continue to be a strong source of support for our students and faculty, and I would like to thank all of you who have continued to play a part in the success of our department. As you read about what we have been up to, we invite you to let us know about your accomplishments and future plans. As always, we welcome your visits back to campus in Ann Arbor. Please stop in and see us.

Thanks you for taking the time to read about our past year, and Go Blue!

Steve Ceccio  
NAME Department Chair
From the Chair

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Chief Naval Architects of the U.S. Navy
Meet the Chief Naval Architects

ROBERT KEANE

Bob Keane jokingly refers to himself and his fellow Chief Naval Architects as the oracles that possess the knowledge and history of modern ship building, and with over 45 years of ship building design experience under his belt, it’s an apt comparison.

“I had to be courageous at times,” Bob explained when asked about the rigors of the position. “There are battles that you have to fight even though you’re pretty sure you’re gonna lose them. You still have to fight those battles.”

He talked about how the concept of the Design Manager that started in the 1970’s and placed a single person in charge of the entire design process. “The Naval Architect was the first systems engineer,” he said.

Ship design managers are the most senior people in the technical organization for NAVSEA and the career path that leads them there is varied. From a background in hydrodynamics to structures or even preliminary stage design, this role of reserved for the most experienced people. “They truly are the best of the best,” He said.

“There are battles that you have to fight even though you’re pretty sure you’re gonna lose them. You still have to fight those battles.”

He was careful however, to point out that though he may have been in charge, the people around him were invaluable to the process. “We didn’t do all the work.” He explained. “We were just writing the music and orchestrating the band.”

It was 1901; the dawning of the 20th century, Clark Gable had just been born; a Michigan school teacher survived a trip over Niagara Falls in a barrel, and the United States Navy was undergoing a major effort to modernize and grow its fleet and to that end, decided to create a new division of shipbuilding. The idea was to set up a group that would specialize in ship design and construction composed of both naval officers and civilian technical specialists. They called the head of this group the Chief Naval Architect of the United States Navy (C.N.A.).

Though the position has evolved with the changing nature of warfare, it has existed in one form or another since its original inception. Today it is widely recognized that the C.N.A. is the single-most technical authority in the United States Navy.

Since 1985, the distinction of the title of Chief Naval Architect has been held by 4 subsequent graduates of the Department of Naval Architecture and Marine Engineering from the University of Michigan. They are respectively; Robert Keane MSE ’68, Edward N. Comstock BSNAM ’70/MSE ’70, Howard Fireman BSNAM ’79/MSE ’85 and, the recipient of this year’s Michigan Engineering Alumni Award for Naval Architecture and Marine Engineering, Robin P. White BSNAM ’82.

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EDWARD COMSTOCK

Ed Comstock went to work for the Navy straight out of graduate school. His stance was that he’d stay for 2-3 years to see how it all worked and then, he’d be gone. Thirty-one years later, he finally left the Navy.

His credo was simple. “Computers don’t design ships. People design ships.”

When he discussed the role of the Chief Naval Architect, he often talked about the importance of understanding the breadth of the technical scope of the job, but he never lost sight that at the heart of successful ship building, are people. Organizational development, personnel management and work processes were all fundamental keys to his success. “You gotta have the right people in the right place at the right time,” He explained. “If you do that right, you’ve got the 80% solution.”

He spoke with particular fondness about the satisfaction that comes from watching young people come into the field and being able to help develop their skills and knowledge and guide their career advancement. “They get to be in the center of everything that’s going on technically in their field,” he said. “It’s a great job, it really is.”

“Computers don’t design ships. People design ships.”

HOWARD FIREMAN

Howard Fireman spent seven years as Chief Naval Architect for the U.S. Navy.

He mentioned once being pulled out of a weekend shower for a phone call from a Navy Admiral. “When the top brass really want to know something, they come to us. People really relied on us.” The position was demanding and he noted that, “There were times I felt like I barely slept, but we had to do the right thing. The navy, the sailors, they relied on us to make the right calls and to take it on the chin if you have to.”

Of his time at the university, he said, “This place, Michigan, this department taught me how to think and how to get prepared.”

“When the top brass really want to know something, they come to us.”

ROBIN WHITE

Robin White currently holds the title of Chief Naval Architect and has been working for NAVSEA since the late 1980’s. During her time there, she was a key technical advisor on alternatives for bringing home the USS Cole after an attack, recovering the USS Lamoure County after severe damage, and floating the USS Cape St. George from a buckled drydock.

Robin talked about the evolution of the position from just early-stage design and acquisition to ship design managers also having an in-service ship role. Although she doesn’t make every minor decision, any decision with significant impact on design comes through her. “When a big crisis occurs, I’m very much involved in making that ship well again,” she said.

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“You get the basis here.” She said about her time at Michigan. “That basis allows you to continue to learn as you move forward in your career.” Something all of the Chief Naval Architects agree on is the necessity of effective communication skills to become a successful leader. Luckily, as Robin pointed out, it doesn’t have to be inherent. “Communication,” she said, “both written and oral, being able to articulate things, can be learned just like any other skill. It just takes practice.”

Photos on page 7: Past and present Chief Naval Architects of the US Navy celebrate Homecoming Weekend and participate in the 2014 Chief Naval Architects Symposium.
Though the weather was brisk, the welcome was warm. This fall, the department of Naval Architecture and Marine Engineering proudly welcomed home all four of our Chief Naval Architect Alumni for a Homecoming weekend symposium that engaged faculty, students and alumni. Featuring panel discussions with our esteemed guests, students were able to pick the brains of those who have orchestrated the largest and most complex systems that human beings operate; ships. An afternoon session allowed faculty to present their cutting-edge Navy research to many eager ears. That evening an awards banquet honoring this year’s Alumni Merit Award winner, Robin White, was hosted by the college and on Homecoming Saturday, a football game was won. Most of all, however, we were able to recognize the tremendous achievements and contributions of four of our own.

Ed Comstock, however was happy to direct the attention away from himself to tell the story of a recent major competition for the work on a system that his company was able to secure, displacing the 40 year incumbent, through the work of, you guessed it, a Michigan naval architect.
Meet the Professor

David Singer

Growing up in Baltimore, David Singer did not know he wanted to be a naval architect. “I would see the big ships along the docks, but I never thought I would help create them.” As an undergraduate, Dave was attracted to both the engineering and business school at UM. During David’s freshman year he was introduced to Raymond A. Yagle and discovered NAME. “Within the first five minutes of my meeting with Professor Yagle I knew that I wanted to be a naval architect.”

Upon completion of the Ph.D., Dave was offered his dream job at NAVSEA, but his personal circumstances made it difficult for him to relocate from Ann Arbor. However, Dave stayed involved with the department and the Navy and, when Prof. Thomas Lamb retired; Dave was able to come back to naval engineering full time as an instructor and researcher. He began by redesigning NAME’s graduate ship production course to better match graduate level operations management courses that would be offered in an Industrial and Operations Engineering program. “Ship production and operations have been an important aspect of NAME’s research and curriculum since the time of Prof.’s Benford, Bunch, and Lamb,” explains Dave. “I take this legacy very seriously.”

Since his arrival, Dave has been a champion for the continual development and focus of ship production within the department. For example, when the new UM American Lightweight Materials Manufacturing Innovation Institute (ALMMII) was under development, the department had an opportunity to extend its ship production presence with the recruitment of Professor Pingsha Dong. Dave passionately advocated for pursuing Professor Dong so that, between the two of them, our students would receive the best ship production education in the country, if not the world. “I am fortunate to have the opportunity to work with Professor Dong to shape ship production research and education for the future.”

One area of his research that has directly impacted the naval design community is Set-Based Design (SBD). SBD is a design methodology that helps large teams execute complex product development. Naval ship design is an extremely complex problem. David and his PhD students examine the implications of the design process, design methods that enable functional large-scale design teams, and strive to bring activities (such as distributed systems design) that are historically completed late in the design process into the early stage design. “My team’s...
research is focused on one basic concept—how can the design of complex Naval combatants be improved?"

The virtues of SBD are that designs can converge more rapidly than traditional design techniques due to its ability to handle limited information and late stage design changes. "It is fairly well known that the Navy has had difficulty using classic point-based spiral design methods to produce optimal, converged designs. While the ships that are eventually produced are the best in the world, the result of the difficulties has been large growth in non-recurring engineering, schedule slippage and performance loss."

Recently, the values of SBD have been clearly demonstrated during the design and development of the U.S. Navy’s Ship-to-Shore Connector (SSC) program. The SSC is a proposed replacement for the LCAC (Landing Craft Air Cushion). The SSC program was the first time SBD was employed in a Navy design acquisition program. The success of SBD is evident in several key facts. Firstly, the preliminary design was completed within a compressed schedule that would make a traditional point-based approach impossible. Second, the final preliminary design activities were less than 10% over the original budget, with no increase in estimated procurement costs. Lastly, none of the traditional design margins were used. The success of the activity was realized when, on July 6, 2012, the U.S. Navy awarded Textron Systems a fixed-priced incentive-fee contract for the detail design and construction of a Ship-to-Shore Connector test and training craft.

Dave’s current SBD research is focused on understanding the relationships between key functions and design parameters at multiple stages of the design as well as the implications associated with making the decision to converge certain areas of the design space. A design space mapping method and a longest path problem formulated as a Markov Decision Process is used to understand design convergence as the design process progresses. The combination of these two approaches can enable the central decision-maker to understand how a decision to narrow the design space impacts the relationships between design variables and key functions such as performance metrics.

David’s SBD research has garnered him several impressive awards including a 2007 Office of Naval Research Young Investigator Award and the 2012 Solberg Award by the American Society of Naval Engineers. The Solberg was awarded to Dave “for his path-breaking research in ship design and his contributions to the future of naval engineering.” The selection committee also noted that, “The recapitalization of our fleet through the implementation of Set Based Design in the coming decades will be reliant on the innovative work of Dr. Singer. Until its use in the preliminary design of the Ship-to-Shore Connector, Set Based Design was an unproven academic model in naval ship design. Dr. Singer’s research efforts in this area validated and led to the first successful deployment of the model. Set Based Design has been institutionalized within the manuals for the Navy’s Ship Design Manager and Ship Integration Manager.” Dave’s contributions as a teacher, mentor, and researcher were also recently recognized by the Society of Naval Architects and Marine Engineers with his election as a society Fellow. Moreover, he was honored with SNAME’s 2014 Distinguished Service Award.

Dave’s influence as an educator and mentor continues to grow not only through his research efforts, but also through training and placement of his students. To date, seven out of Dave’s nine Ph.D. students Dave have graduated to work within the naval enterprise. Three of his Ph.D. students now work as engineers at U.S. Naval Surface Warfare Center Carderock Division (NSWCCD). Mr. Jason Strickland joined Dave’s research group in the fall of 2011. Prior to returning to full time studies, Jason was a civilian engineer with the US Navy. His last position was as the Senior Ship Design Manager for the T-AKE Class. Jason was recruited by Dave to pursue his Ph.D., and he is currently on schedule to finish his degree this academic year. “In hindsight the blind faith and belief that David demonstrated in my capability to complete a Ph.D. at the University of Michigan was unwarranted”, Jason remarked. “However, I am grateful for his unwavering support. He has been more than an advisor. He has fulfilled the roles of teacher, cheerleader, critic, and most importantly a friend. It is clear that he wants his students to obtain their personal best.”

USN’s Ship to Shore Connector hovercraft is the first Navy vessel to be designed using Professor Singer’s Set-Based Design method.
MANY OF NAME’S STUDENTS compete for and receive fellowships to help aid their research and start them on the pathway to successful careers. Two such exceptionally prestigious fellowships offered by the Department of Defense National Defense Science and Engineering Graduate (NDSEG) and Science, Mathematics & Research for Transformation (SMART) Fellowship programs. Both are important in the support of our research and design efforts. Many NDSEG and SMART students eventually go on to establish their careers in the Navy. We are proud to introduce a few of our Department of Defense funded NDSEG/SMART students.

First Year undergraduate student, Collin Helm is just starting his time in the program and is looking forward to his internship this summer at the Army Corps of Engineers Marine Design Center. “I applied for the program due to a combination of financial need and interest in military research. I’m very excited for all the travel and learning opportunities in my job with the Army Corps of Engineers, and I’m looking forward to living in Philadelphia. As a young naval architect, there are a variety of ways for me to learn from my coworkers and become a better engineer in the process during both my internship and my time there as a professional. The chance to get my degree funded and go straight into the workforce is the opportunity of a lifetime, and I plan to make the most of it.”

“...”The SMART fellowship was a great opportunity because it allowed me to pursue research I was passionate about directly related to the field I’ll be entering,” says graduating Ph.D student, Dylan Temple. After graduation he’ll be relocating to the Naval Surface Warfare Center (NAVSEA) Carderock Division in Bethesda, Maryland where he’s always been offered a position to continue his research in model and full scale testing of naval vessels.

Jonathan Holbert is another graduating senior and SMART Fellow. He explains that, “My educational and professional career has benefitted greatly by being a SMART Scholarship Program participant. Not only has the scholarship alleviated the worries of paying for college, but it has also provided me with valuable work experiences. This past summer I interned with my sponsoring facility, the Naval Surface Warfare Center, Carderock Division. As a part of this internship, I conducted small model tow tank testing at the United States Naval Academy. I look forward to joining Carderock full time this summer after graduation and starting what I hope to be a fruitful career as a naval architect.”

Morgan Parker graduated with his Ph.D.'s last summer and began his career with Naval Surface Warfare Center, Carderock Division almost immediately. He was introduced to the SMART program by Professor Vlahopoulos during his senior year, was accepted with sponsorship from the Naval Surface Warfare Center Carderock Division. Professor Singer became his adviser, and suddenly his vague idea of graduate school quickly transformed into a solid plan for two MSEs and a Ph.D. That plan would become reality. Looking back on his time in the SMART program, Morgan says, “The major benefits were research flexibility, a generous stipend, and guaranteed employment without the need for a job search. These benefits, overlaid with opportunities provided by the Naval Engineering Education Center, enabled me to get the most out of my graduate school experience.”

Like, Parker, 2014 Ph.D. graduate Doug Rigterink was hired directly upon graduation at the Carderock Warfare Center. He interned at Carderock before entering Graduate school and the experience solidified his desire to work there after finishing his degree. “Looking over the options for getting hired I came across the SMART scholarship which guaranteed me a position at Carderock once my degree was complete, which is great because it meant I didn’t have to go through a trials and tribulations of a job search right as I was completing my dissertation. Beyond that, the SMART program offered an avenue of funding independent of my advisor’s grants which meant I could focus on what I wanted to research, instead of working on my own research as well as a project “to pay the bills.”

Colin Shields is one of our NDSEG Fellows who was first introduced to Naval Architecture and Marine Engineering through his freshman year ENG 100 course. Now six years later, he is in the second year of his Ph.D. program and still thoroughly enjoys learning about all things nautical and staying active in the NAME professional community. Colin is currently developing his thesis topic on complexity theory and vessel arrangement with his advisor, David Singer. “Support from the NDSEG fellowship has given me the opportunity to explore a range of academic disciplines and focus on learning from, and working, with a great group of students and faculty from around the world.”
**Ken Brower:**

We are incredibly grateful for the gift of design files from alumnus Ken Brower, class of ’65, from his long career in naval architecture as a feasibility designer who specialized in Comparative Naval Architecture. Mr. Brower operated independently as President of Spectrum Associates and therefore had the unique opportunity to transfer his data to the department for the sole use of the students. The data and drawings in these files have helped our students determine layouts, estimate weights, and determine ship system requirements for their senior capstone design projects. Having student access to real-world data to support these tasks is invaluable. Students designing military, coast guard, ice-capable, and other complex vessel types have been using this resource for the past five years. We look forward to Ken’s next donation this spring which will further expand our collection. Of his decision to donate his files to the department, Mr Brower says, “I loved Ann Arbor and the U of M! Hopefully, the data and studies I accumulated during my career will benefit future generations of Michigan Naval Architects. Hail to the Victors Valiant. Go blue!”

**Senior Conner Goodrum discusses icebreaking hullforms from the Brower collection with his senior capstone design project teammates. Conner’s group is designing an emergency response vessel capable of responding to oil spills in arctic and sub-arctic regions.**

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**Ed Comstock:**

Ed Comstock (MSE ’74), has been awarded the ASNE Harold E. Saunders Award for his use of managerial and technical expertise in a variety of key leadership positions which helped transform the Navy of today into a force for the future with new and advanced war-fighting capabilities necessary to counter projected and emergent asymmetric threats. The award, presented annually since 1977, which honors an individual whose reputation in naval engineering spans a long career of notable achievement and influence. The nominee must have demonstrated productivity, growth, and outstanding accomplishment in engineering over the years, with ultimate wide recognition by peers as a leader in the field, and of such prestige as to merit the acclaim of the naval engineering community. Widely recognized as an international expert in ship design, naval architecture, and ship hydrodynamics, Mr. Comstock has been instrumental in sustaining the Nation’s capabilities to design cost-effective warships and has brought great credit to the naval engineering profession. The profound character and influence of Mr. Comstock’s collective contributions prove him to be truly deserving of the Society’s 2014 Harold E. Saunders Medal Award. Read more about Mr. Comstock in the feature article on page 4.

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**Department Stats**

**UNDERGRADUATE**

107

- Total US Citizen/Permanent Resident – 90
  - Male 65
  - Female 12
- Total International – 17
  - Male 14
  - Female 3

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**MASTERS Students**

- 63
  - Male 52
  - Female 11

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**DOCTORAL Students**

- 39
  - Male 34
  - Female 5

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**TOTAL**

102
FLIP II: Student Design Project makes waves

Student, Vittorio Bichucher never expected his summer internship experience would lead to the inspiration for his senior design class project, a visit onto the nautical marvel R/P FLIP (Floating Instrument Platform), and national recognition by SNAME (Society of Naval Engineers) and ASNE (American Society of Naval Engineers); but that’s just what it did.

Bichucher first became acquainted with the original FLIP while interning with Glosten Associates, a naval architecture firm that was involved in the original construction of the platform. The Research Platform FLIP is a 355 foot long non-propelled manned spar buoy designed as a stable research platform for oceanographic research. Being non-propelled, FLIP is towed to its operating area in the horizontal position and through ballast changes is “flipped” to the vertical position to become a stable spar buoy with a draft of 300 feet. [1] The world-renowned vessel is owned by the Office of Naval Research (ONR) and operated by the Marine Physical Laboratory at Scripps Institution of Oceanography, UC San Diego.

Student Design/Senior Capstone Project WINS Ship Design Competition
“I knew that’s what I wanted to do for my research, for my senior design class, because it was just something so unique,” explained Bichucher. It wasn’t difficult to pique the interest of his fellow classmates, Philip Cenzer, Jonathan Holbert, Harleigh Seyffert, and Michael Sypmiewski and they soon assembled to form the official FLIP II team.

The first step was to talk to the FLIP program manager, Captain William Gaines, in an effort to obtain specifications and ask questions. Gaines, however, impressed with the student’s passion for the project, invited them to visit the platform.

“I suggested that it would be beneficial if a couple of the members of the group could travel to San Diego to view and photograph FLIP,” said Gaines.

That wasn’t an offer the students were going to turn down. After receiving travel support from the department, all five members were able to fly to San Diego and even lodge on-board FLIP for a weekend.

“It’s incredible that they let us come,” said Seyffert. “I don’t think anyone has ever done this before or a project like this. I think for us it has been really, really edifying.”

During their visit, the students were able to tour the entire platform, surveying and exploring and even getting into the ballast tanks to observe the interior design.

The team was able to utilize the knowledge Bichucher gained during his internship and from the experience they gained during their visit to formulate a re-design to the original FLIP model.
Where the original FLIP did not have propulsion capabilities, FLIP II would be entirely self-propelled therefore not requiring the assistance of a tug to pull it to its destination, as the original had.

The group presented their design to the Naval Architecture and Marine Engineering Advisory Board last April. Their design won the Ackles Award, which is presented to the best senior design project of the year.

Soon after they entered the project in the Dr. James A. Lisnyk Student Ship Design Competition through the Society of Naval Engineers. The Lisnyk Student Ship Design Competition challenges groups of young people to design theoretical but practical cutting-edge vessels. Open to the world’s colleges and universities supporting maritime careers, the program has fostered teamwork and learning through competition.[2] The team’s design took first place in the competition.

Professor Matt Collette who teaches the NA 475 senior design class says, “I am very proud of the accomplishments of this team. Designing a vessel with two distinct operating configurations would be quite a challenge for experienced naval architects; the fact that this group of talented students was able to do so in a design course, and win the prestigious Lisnyk award with the resulting design, is a great achievement. Throughout the entire semester, this group displayed outstanding initiative, creativity, and spatial synthesis ability and I feel this award is a great recognition of their hard work.”

So what’s left to accomplish for this self-proclaimed ‘motley crew’? According to Seyffert, “If I could go out one day when FLIP actually flips, that would be incredible.”

Captions (clockwise from upper left): FLIP II students are shown interior ballast tanks of FLIP; FLIP II Team proudly displays their Lisnyk Awards; View of the FLIP Bow taken from the tanks; FLIP II students question officer in charge, Tom Golfinos, about the original FLIP vessel.

It’s never too early to start the process of landing an internship. According to Undergraduate Staff Advisor Warren Noone:

- Have your resume ready in the fall so you can apply to internships as early as possible.
- Keep abreast of events where you can meet potential sponsors, such as those hosted by the Quarterdeck Honorary Society. Presentations focus on individual companies, industry trends and internship and employment opportunities.
- Don’t be afraid to follow up with a potential internship sponsor.
- Apply for multiple internships. These positions can be very competitive, and limiting yourself in the application phase can result in not getting an offer at all. Having multiple offers to choose from is a much better situation.
- Keep an open mind, and apply to opportunities and companies outside of what you would consider your primary interest.
- Use the internship as a way to define your career goals.

Sponsoring interns can serve a company in many ways, according to Undergraduate Staff Advisor Warren Noone. “Internships allow a company to see what kind of potential employee a school is producing and can serve as an extended job interview. Companies have the opportunity to see how a prospective hire performs in different areas of a company, with relatively low risk.”

If your company is interested in sponsoring one or more interns, Noone has the following recommendations:

- Come visit the Department. The Quarterdeck Honorary Society hosts sponsor visits and arranges company presentations beginning in mid-September through the end of the academic year.
- Consider attending one of the College of Engineering’s career fairs, held the last week of September and January every year. For more information, visit the Engineering Career Resource Center website at www.career.engin.umich.edu/studalums/career-fairs.
- Contact the NAME Undergraduate Office at (734) 764-6471. “We are always looking for opportunities for our students, no matter the time of year,” said Noone. The office works with sponsors to advertise internships and other positions and can assist with developing and distributing job postings. The Undergraduate Office also helps sponsors collect student resumes - and screen applicants and can follow up with students on the sponsor’s behalf.

Ready to be a sponsor or have other questions?
Contact Noone at nooner@umich.edu.
Greetings from Quarterdeck!

For the year of 2014, I had the distinct honor of serving as the Commodore of the University of Michigan’s Quarterdeck Honorary Society alongside my fellow officers. It is exciting to see where the new Commodore, Rob Emmitt, and board of officers will take the Quarterdeck Society, and how they will service the students in the Naval Architecture and Marine Engineering (NAME) Department!

The mission of the Quarterdeck Society is to provide students with opportunities for professional development through attending conferences and corporate presentations and participating in industry related trips. These events help students grow professionally, learn about new developments within the marine industry, and build and maintain relationships with their peers and accomplished professionals.

This past year, we sent students to the Great Lakes Great Rivers SNAME section meetings that were held in Chicago, Cleveland, and right here in Ann Arbor. Among the topics discussed were LNG as an alternative fuel source, an offshore wind energy project in development in Lake Erie and how to keep up with new MARPOL regulations.

In December of 2013 and October of 2014, students braved the cold and witnessed the launching of two naval vessels at Marinette Marine Corporation in Wisconsin — the USS Milwaukee and the USS Detroit. Having attended the launching of the USS Milwaukee, I can personally say that it was truly a remarkable sight to see.

The primary highlight of the year for our students is the SNAME Maritime Convention (SMC) which was held in Houston, Texas this past October where approximately 32 students from the NAME department were in attendance. At the meeting, students participated in a design competition, attend technical presentations, spoke with industry leaders regarding topics about the marine industry, graduate school, and professional growth, and some students even presented their own technical papers. Finally, students had the opportunity to network with industry professionals at the conference banquet as well as the Michigan Alumni Banquet. It was also exiting for students to see Professor Armin Troesch receive the Rosenblatt-Michigan award and listen to his acceptance and thoughts afterwards.

During spring break, students were able to escape the cold and fly down to Pascagoula, Mississippi to visit Huntington Ingalls Shipbuilding. There, the students learned about
the shipbuilding process. While just beginning in 2012, the program has greatly expanded over the past couple of years. Not only were students able to tour both Ingalls’ shipyard and their engineering division, they were able to visit Ship Architects and VT Halter Marine as well. Having previously attended the trip, I can personally say that it was an amazing experience being able to see what we, as students, hope to design become a reality.

Giving back to the community is another important mission of the Quarterdeck Society. In the winter of 2014, Quarterdeck hosted a booth at the University of Michigan’s Kid’s Fair. There, students from the NAME department had elementary students build a boat out of a sheet of aluminum foil and see how many pennies it could hold until it sank. Additionally, this winter, Quarterdeck is continuing its participation in the Detroit Area Pre-College Engineering Program (DAPCEP). During this program, Quarterdeck hosts several middle school students from the Detroit area and teaches them the fundamentals of naval architecture. The participating students also receive tours of the Marine Hydrodynamics Laboratory and participate in a design-build-test project.

The Quarterdeck society also plans interactive social events for our students to decompress from school and have some fun. This past year, students were able to enjoy the warm (while limited) weather with their peers at a day in the park. Students were also able to show their spirit by competing in a couple of games of whirleyball!

At the annual NAME spring banquet, Quarterdeck presented Dale Miller of Interlake Steamship Company with the Honorary Commodore Award for his continued support of the students in the department. He has helped organized several trips for students to ride and tour different vessels of the Interlake fleet and observe the everyday operations conducted on board the vessels.

The Quarterdeck Society would like to thank and acknowledge the generous alumni of the NAME department and others who continue to support the professional and academic pursuit of our students. Without their help, the Quarterdeck Society would not be able to provide all of the experiences and opportunities previously mentioned. We thank them for their continued involvement and always, forever Go Blue!

Many Thanks,

Renee Wiwel
Commodore of the Quarterdeck Society 2014-2015
Zack Bayoff, currently a senior in the Naval Architecture and Marine Engineering program at the University of Michigan, is also completing an international minor for engineers in the French language. He hopes to use his international knowledge to open up new opportunities and potentially land a career overseas.

It was his experience participating in the annual NAME Spring Break trip to Ingalls Shipbuilding solidified his desire to work in a smaller shipyard to learn more about the ship construction process. To that end, last summer Zack decided to pursue an internship at Kadey Krogen Yachts in Stuart, Florida.

Kadey Krogen Yachts is a small yacht company with offices in Annapolis, Seattle, and Stuart that designs and sells their own semi-custom yachts. As an intern, Zack’s primary area of focus was the production of the necessary shipyard drawings for vessel construction; including electrical, machinery, mold lay-ups and lines drawings.

When clients requested specific customization, a drawing would have to be modified to reflect the necessary specifications. “I would make the drawing changes, using AutoCAD,” says Zack, “and have them verified by the chief naval architect and vice president of operations. Once they were approved, they would be sent to the shipyard in Taiwan.”

He was also exposed to 3D modeling. He explains, “Clients would often want to visualize what a change to the saloon or galley of the yacht would look like, perhaps wanting a different type of wood or a different furniture layout. Using Rhino3D and Flamingo NXT, I was able to create realistic 3D renderings of the interior and exterior spaces of the yacht. I would be able to then show these drawings to potential clients for a more realistic idea of what their yacht would look like.”

As part of his internship experience, he was also able to go aboard two different yacht models which helped him to visually clarify where compartments were, what specific rooms looked like, and gave an overall sense of the style of the company’s crafts. He was able to use his structures knowledge to perform stiffener calculations, and determine the mold lay-ups based on stress and inertia requirements.

For other potential NAME undergrads looking to gain internship experience, Zack says, “It would be a great idea to talk to older students about their internship experience first. A big part of the internship process requires an individual effort. Don’t sit around waiting for an internship to come along; you have to go for it!”
Eric Helder IS CURRENTLY A SENIOR WHO CAME TO THE UNIVERSITY OF MICHIGAN SPECIFICALLY FOR ITS NAVAL ARCHITECTURE AND MARINE ENGINEERING PROGRAM. He grew up in Holland, near the shores of Lake Michigan where he quickly gained an interest in maritime history and the freighters plying the Great Lakes. He decided early on that he wanted to work with ships for a living and already has plans on completing his Master's degree in NAME. Though he's is not sure exactly where he would like to work after graduation, he's excited to experience all the marine industry has to offer.

This past summer, he was an intern at Bay Engineering, Inc. in Sturgeon Bay, WI. Bay Engineering is a full-service Naval Architecture and Marine Engineer owned by NAME alumni and David W. Taylor medal recipient, Joe Fischer ('59). He happened upon this internship at a Great Lakes, Great Rivers section meeting when an employee of Bay Engineering inquired about potential inters.

"I was excited and honored to work for a company that had designed so many of the ships I saw on the lake growing up," said Eric.

He had the distinct pleasure of assisting on the deadweight survey for the St. Mary's Challenger, a bulk cement carrier that was converted into an articulate tug/barge combination, even getting to crawl into the ballast tanks to measure residual water and mud. Prior to her conversion, she was the oldest operating ship on the Great Lakes (launched in 1906). He also assisted in the inclining experiment of the Bradshaw McKee, the tug for the Challenger. In the office, he was tasked with several projects, including weight estimating, writing reports for ABS and USCG approval, crane analysis for a tug, assisting in the docking plan for a barge, and composition of loading spreadsheets for vessels. The engineering fundamentals taught in his NAME class were invaluable to his on-the-job work and learning experience.

"I enjoyed listening to the countless stories from Joe and working closely with the Ron Olander, who was the Director of Engineering and is a veteran in the field," says Helder. "Outside of work, I got to sightsee gorgeous Door County, paddle board, do some wine/beer tasting, and of course, consume copious amounts of Wisconsin cheese curds."

Eric encourages any incoming students to get excited about the field of Naval Architecture and Marine Engineering. "It is an incredibly diverse and fascinating industry where everyone still seems to know everyone else, and where industry professionals and experiences are easily accessible to students." Though he was nervous about finding his first internship, he advises other first-timers that they needn't worry.
“Students from the University of Michigan are highly regarded and well-taught, and with many prominent alumni in the field, internships can be rather easy to obtain. Companies value having students just as much as students value the internship experience.”

Lastly, he would like to encourage students to take full advantage of everything internships have to offer. “Classrooms can’t teach everything and internships are invaluable and incredibly fun learning experiences.”

Eric Helder

Summer Learning
Students Bring Their NAME Education to Life With Internships

NAVAL ARCHITECTURE AND MARINE ENGINEERING WAS NOT ALWAYS THE FIRST CHOICE OF MAJOR FOR Lauren Cromer.

She struggled throughout her freshman and into her sophomore year to decide on a major within engineering. “When I finally did choose NAME, it was the opportunities that I was given at various internships, and the strong guidance and encouragement of the department, that sold me and I’ve never looked back!”

This past summer Lauren was an intern at Ship Architects Inc., in Daphne, AL. Daily duties varied depending on the workload of the major projects, but she often spent time updating ABS drawings for the MSC Navy Supply repair project. This process included trips to the shipyard, navigating the length and compartments of the Supply, and noting any changes completed during repair. She then would redline each existing drawing and submit it back to ABS for approval. This exposed her to the importance of ABS rules, and the intricacy of the design and build process.

In addition to the drawings, Lauren was exposed to various sets of calculations such as lift, mooring, and launch for multiple types of marine craft. These projects often did not take place in the United States and therefore required Lauren to communicate across time and language barriers to obtain the information she required. Her supervisors were extremely helpful and really allowed Lauren to see how the class material she had been exposed to applied to the design and build processes. Much of her time was spent searching for information and completing research in textbooks, much like at school. “This was very valuable experience and encouraged me while back at school to concentrate not only on the individual aspects of my classwork, but the big picture and how the material in classes applies to the real world.”

The biggest piece of advice Lauren would offer to future interns would be to take risks. “I’ve interned in Washington and Alabama, both far away from my home state. This allowed me to learn more about the culture and nature of Naval Architecture than I would have had I stayed more local. The opportunities are out there, seize them and try not to think twice.”
**UNDERGRADUATE Scholarships 2014-2015**

**AMERICAN BUREAU OF SHIPPING SCHOLARSHIP**
Taylor Allen
Mark Bauerle
Zachary Bayoff
Sarah Blackwell
Kevin Bowe
Elizabeth Callison
Benjamin Clemens
James Coller
Jonmarcos Diaz
Fan Dong
Samuel Edwards
Robert Emmitt
Nicholas English
Sean Fabian
James Garay
Conner Goodrum
Eric Helder
Collin Helm
Clay Kane
Robert Kent
Teri LaForest
Reed Lillie
Liam McCollum
Jie Mei
Bradley Olson
Colin Palmer
Peter Romero
Matthew Schirmann
Lin Shan
Adam Spahn
James Spain
Mengze Wang
Wenzhe Xu
Jibin Yuan
Xinyi Zeng

**BARTON BALLOU COOK, JR. SCHOLARSHIP**
Jonmarcos Diaz

**CHARLES E. DART FELLOWSHIP**
Shiqing Jin

**CLASS OF 1931E SCHOLARSHIP**
Allison Ward

**COLLEGE OF ENGINEERING SCHOLARSHIP**
Sarah Blackwell
Elizabeth Brown
Jonmarcos Diaz

**DAVID ASPLAND SCHOLARSHIP**
Michele Hill

**DELPHI FIRST ROBOTICS SCHOLARSHIP**
James Coller

**GRADUATE Scholarships 2014-2015**

**AMERICAN BUREAU OF SHIPPING FELLOWSHIP**
(SGUS Department Graduate Fellowship)
Kevin Bowe
Lin Shan

**BOYKIN SCHOLARSHIP AND CHARLES E. DART FELLOWSHIP**
(SGUS Department Graduate Fellowship)
Shiqing Jin

**CARLTON E. & FRANCES E. TRIPP MEMORIAL SCHOLARSHIP**
(SGUS Department Graduate Fellowship)
Tyler Groll

**COLLEGE OF ENGINEERING MASTER’S FELLOWSHIP**
Dorian Brefort
Brandon Harrison
Dan Kowalsshyn
Sara Laffin

**DEANS NAMED FELLOWSHIP**
Hao Wang

**FRANK C. & IRVING PAHLOW SCHOLARSHIP**
(1st Term PhD NA&ME Department Graduate Fellowship)
Michael Sypniewski

**GEORGE L. WEST, JR. MEMORIAL SCHOLARSHIP AND RICHARD B. COUCH ENDOWED SCHOLARSHIP**
(SGUS Department Graduate Fellowship)
Fudi Wang

**HENRY CARTER ADAMS II MEMORIAL SCHOLARSHIP**
(1st Term PhD NA&ME Department Graduate Fellowship)
John Lietz

**Nautilus / Winter 2015**

**SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS SCHOLARSHIP**
Jonmarcos Diaz
Benjamin Nagle
Mark Parra-Shostrand
Matthew Springstead
Renee Wivel

**SPECIAL ENGINEERING SCHOLARSHIP**
Robert Emmitt
Collin Helm
Allison Ward

**WALTER G. MITCHELL MEMORIAL SCHOLARSHIP**
Peter Romero

**WILLIAM H. BRAY ENDOWED SCHOLARSHIP**
Taylor Allen

**Winter 2014**
**DOCTOR OF PHILOSOPHY**
Joshua Knight
Bill Rosemurgy
Andrew Dale Wiggins
Bingbin Yu
Jiandao Zhu

**Summer 2014**
**DOCTOR OF PHILOSOPHY**
David Patrick Hodapp
Morgan Clinton Parker
Douglas Tait Rigterink
Shang Sun

**Fall 2014**
**DOCTOR OF PHILOSOPHY**
Zhenzhong Jia

**Winter 2014**
**MASTER OF SCIENCE**
Alexander Ediger
Rory Kennedy
Zachary Moscicki

**Summer 2014**
**MASTER OF SCIENCE**
Kenneth Au
Valerie Anne Barthelemy
Diane Marie Blankers
Jason James Bundoff
Gokhan Ceylan
Eun Jung Chae
Christopher Greenough
Brock Hashimoto
Dillon Patrick Helfers
Weiran Jiang
Thomas Kai
David Komer
Kevin Schaefer Lounds
Qian Ma
Thomas Olsen
Shaurya Veer Singh
Andrew Stankovich
Alexander Andrew Szust
Eileen Marie Tausch
Alessandra Twomey
Stephanie Waller
John Walsh
Chi Yan

**Fall 2014**
**MASTER OF SCIENCE**
Xuan Ai
Shiyang Chen
Matt Graham
Ruize Hu
Yu Mao
Jason Strickland
Matthew Weibel
Xiwei Xia
Pingsha Dong named International Institute of Welding Fellow
Professor Dong was named a 2015 International Institute of Welding Fellow. Each year, every member country nominates three candidates to IIW for consideration as a fellow who has to demonstrate significant contributions to the science and technology of welding and joining. It is one of most prestigious awards given in welding/joining field in the world. This year, only four have been selected over all candidates nominated by their home countries.

LIDAR Best Paper IEEE

“Mitigation of Hydrodynamic Resistance”
NAME Professors, Marc Perlin and Steve Ceccio have released a new book about the methods to reduce hydrodynamic drag. This text presents the state of the art in friction drag/resistance reduction technologies for BODIES and crafts operating in liquids at and beneath the free surface. It is useful for professionals with backgrounds in advanced fluid dynamics as well as by academics teaching introductory graduate courses in this area. Active control of resistance will include a discussion of friction reduction, for example through the injection of gas that can form air layers and polymers that initially reside adjacent to the hull, including the use of partial and super cavities. The book discusses passive resistance control achieved through changes in the overall hull shape and appendages, including the application of lifting bodies, bulbous bows, and stern flaps. It also addresses passive reduction of skin friction through the application of hull coatings and other elements of hull husbandry.

Congratulations to Matthew Johnson-Roberson for his NSF Career Award!
Professor Johnson-Roberson has received a NSF Career Award for his project “Real-Time 3D Reconstruction and Manipulation for Underwater Intervention – A Career Development Plan”

Department Chair Steve Ceccio was awarded the 2014 Freeman Scholar Award by the American Society of Mechanical Engineers. This award is given to a person of significant expertise in fluid engineering. As the award winner, Professor Ceccio was invited to present his paper, “Skin Friction Drag Reduction in External Flows” at the A.S.M.E. Fluids Engineering Meeting in Chicago.
Professor Armin Troesch was selected by SNAME to be the ABET program evaluator for the ABET accreditation visit of the Virginia Tech AERO/Ocean Engineering department in Oct. 2103. ABET is a federation of more than twenty-four professional societies whose purpose is the evaluation and accreditation of engineering education programs. He also received the 2014 Rosenblatt-Michigan Award at the 2014 Michigan Alumni Banquet.

Professor Pingsha Dong and Assistant Professor Matthew Collette are supporting the University’s technical leadership roles in LIFT (Lightweight Innovations for Tomorrow — http://lift.technology/). On January 15th, LIFT opened a 100,000 square foot research facility in a former factory in Detroit’s Corktown neighborhood. Professor Dong and Collette are helping develop innovative research programs to lead to reduced weight for a number of transportation vehicle types including ships. LIFT is a public-private partnership bringing together government, leading academic and research institutions and leading transportation-sector manufacturing and engineering firms to transition advanced lightweighting technologies from research labs to production. LIFT is engaged in technical research as well as workforce development and training. LIFT is part of the federal government’s National Network for Manufacturing Innovation.

Professor Young introduced a new course, NA599: Lifting Surfaces and Propulsors (4 credits), for the Winter, 2015 semester. This course begins with introduction of the various types of lifting surfaces and propulsors, follow by model-scale testing of ship resistance, propeller performance, and hull-propulsor interactions, as well as determination of full-scale response based on model-scale test data. Next, we review the various types of available propulsion systems, and discuss the pros and cons of each type of propulsion systems. The fundamentals of viscous flow, laminar and turbulent boundary layer, flow separation, cavitation, and ventilation will be reviewed. The focus will be on potential flow based analysis and design of 2-D and 3-D lifting surfaces (e.g. hydrofoils, wings, rudders, and planing surfaces) and propellers, including the optimization of the sectional geometry and the use of blade pitch, skew, rake, and duct to improve performance, delay/control cavitation, minimize unsteady forces, and ensure structural integrity. This course will end with discussions about the advantages and disadvantages of mechanical, hybrid, and all-electric powering platforms, and their impact on the total ship architecture and propulsion system. In summary, this course is designed to expose students to the theory and technologies for the selection, analysis, design, optimization, and testing of lifting surfaces and propulsors.

Professor Marc Perlin is again the HaiTian Scholar (SeaSky Scholar) at Dalian University of Technology (DUT), Dalian, China. His collaboration there with the State Key Laboratory of Coastal and Offshore Engineering now spans eight years and numerous archival manuscripts. As part of the cooperation, a contingent from DUT with whom Professor Perlin has interacted, which includes the Dean of the Faculty of Infrastructure Engineering, Dean Guohai Dong, two other professors and two Ph.D. students, will be visiting our department in August 2015. During this past year, Professor Xiaozhou Ma, who will accompany Professor Dong, was a Visiting Scholar at UM and worked closely with Professor Perlin.
Stay social with Naval Architecture and Marine Engineering!

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