PI TAU SIGMA ANNUAL CHAPTER REPORT
2014-2015
Stevens Phi Omicron

A. Initiations

Stevens Institute of Technology follows a broad based engineering curriculum with a common core for the first three semesters and students are not required to declare their engineering major before their fourth semester. In addition, nearly a quarter of all engineering students complete 3 to 4 semesters before declaring their major.

In order to ensure that all initiates graduate as Mechanical Engineering majors, the chapter has established a policy to initiate only juniors (5th and 6th semesters) and seniors (in their 7th semester). Students who have excellent academic record (top sixth or 16.7% and who have a GPA of 3.65 or "High Honors") and who are in good standing are reviewed and invited to become members of the Stevens Phi Omicron Chapter.

During AY 2014-15, Stevens conducted two initiation ceremonies. The fall initiation ceremony for the Academic year was conducted on December 2, 2014 and 7 new members were initiated. The spring initiation ceremony was conducted on May 5, 2015 and 4 new members were initiated. The following is a listing of the AY 2014-15 initiates.

Fall 2014 Initiates:

Easter Mary
Nyary, Miklos W
Salmins, Kirsten R.
Thomas, Richard A.
Giannini, Peter W.
Rishell, Tyler J.
Sertial, Stephen

Spring 2015 Initiates:

Batista, Desiree N.
Fontana, Anthony C.
Caetana, Fabio R.
Good, Holly E.

The chapter pays the dues for all the students who are initiated. In addition, the chapter also provides stoles at no cost to all graduating seniors, who are members of the chapter. Funds for all chapter activities and socials are provided by the Mechanical Engineering Department.

B. Chapter Activities

Goals for 2014-15

- Initiate Members from the Senior and Junior Class during 2014-15 academic year
- Participation in the Annual Pi Tau Sigma conference, out-reach activities, and co-sponsorship of student-faculty activities.
- Participation in the 2015 Research and Innovation Expo and Engineering Design Day Events (jointly held on April 29, 2015).

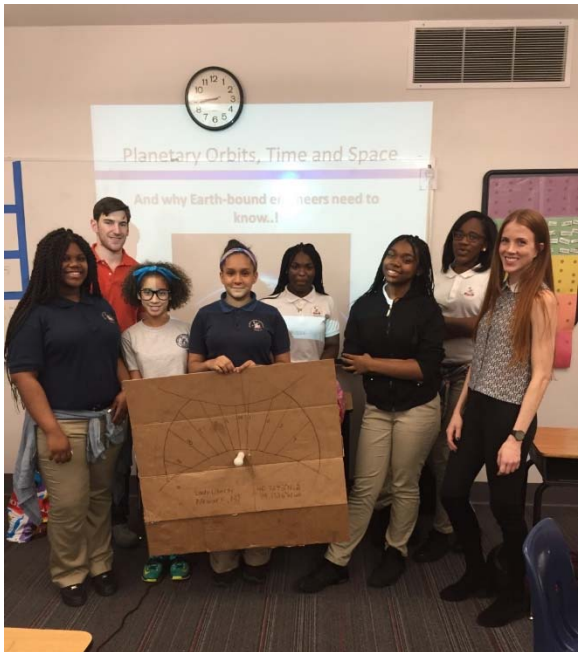
- Promotion of events associated with promoting Mechanical Engineering and involvement in the Stevens Innovation and Entrepreneurship activities.
- Participation in the ASME Region II student conference and in the design and oral presentation competitions.
- Participation in community and outreach activities.

All goals for AY 2014-15 were met and the following is a brief summary of chapter activities.

Activities

The special outreach program involving the organization of a STEM Club, which was started at the Lady Liberty Academy Charter School in Newark during spring 2014 was expanded and continued with two specific events. The first involved the Boys and Girls Club of Hoboken while the second Lady Liberty Charter School in Newark.

At The Boys and Girls Club of Hoboken the Pi Tau Sigma chapter volunteers taught two lessons, one on building bridges and one on boats. The students then designed and built their own bridge and boat with materials provided. These designs were tested using weights to see which team's design was the best.



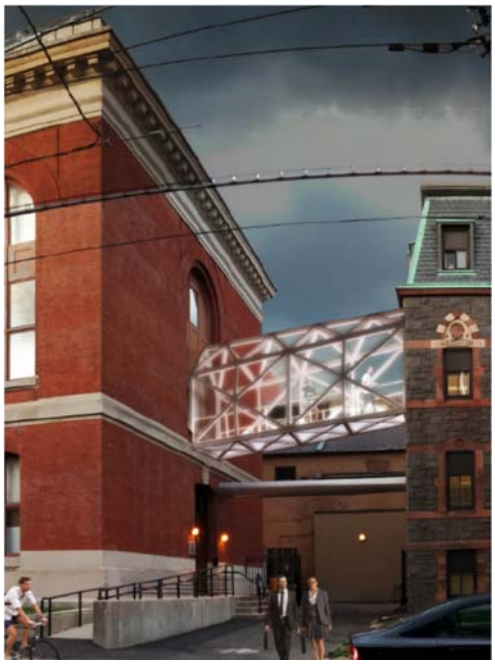
Drew Zahradka and Mary Easter with the STEM Club members displaying their sun dial at the Lady Liberty Academy Charter School, Newark, NJ

At Lady Liberty Charter School, the volunteers ran a 5-week program where we taught lessons on Engineering and the different types of disciplines, bridge building, the *analemma* of planets, a biomedical engineering lesson, and a rollercoaster lesson. The kids interacted with the Stevens students and activities were provided after the lesson to see how well they learned about that week's lecture.

They provided an overview of engineering, especially mechanical engineering disciplines and mentored the students in their project work. As part this effort, students were taught how to use SolidWorks™ (a graphics package). The project work required the student teams to design and fabricated mock-ups of a wooden-truss bridge, a boat, and the sun-dial. This was an enriching experience at the culmination of which the Stevens students were recognized for their dedication and service.

The Stevens Phi Omicron chapter again assisted the Mechanical Engineering Department with the open house for accepted students, which was hosted by Stevens on Sunday, April 18-19, 2015. In addition to volunteering their time for the various laboratory tours and for interactions with the students and parents several senior capstone design projects including the award-winning Exoskeleton system, Formula SAE car, the Regular and Advanced Class SAE Cargo planes, the Bipedal robot, Shell Eco-Marathon Car, the Lightweight Composite Bridge, among others.

Stevens celebrated the Research & Innovation accomplishments and the successful completion of the Engineering Capstone Design of its graduating class on April 29, 2015 with Innovation Expo — an all-day campus gathering of Students, Faculty and Business Community. The annual campus event, organized by the Office of Innovation & Entrepreneurship, has always been a showcase of the creativity and problem-solving capabilities of interdisciplinary student teams that reflect the university's academic approach to science, engineering, business and humanities. The Stevens Phi Omicron chapter assisted the Mechanical Engineering Department with the set up for the event and the distribution of ASME literature. Various capstone design projects were on display and they included the following from the Pi Tau Sigma members.



Rendition of a Lightweight Composite Bridge system connecting two campus buildings

- Advanced Lightweight Composite Bridge (Tatyana Fedorenko)
- Lower Body Exoskeleton System (Mary Easter, Michael Giglia)
- Lightweight Exoskeletal Upper Extremity Robotic System (Brandon Hartt, Garett Joyal)
- Design of PCM Heat Sink (Brian Juzefyk, Sara Savoia)
- Power plant for the watercraft: *Little Juliana* (Richard Thomas)
- Project Perseus: Design of War Games (Milton Kohlhepp)
- Shell Eco-Marathon 2015 (Christine Sidorski, Nathan Quay)
- Fuel Station for Hydrogen Powered Cars (Danielle DeFeo)
- Thermoelectric Cell Phone Charger (Gary Aramini)
- Design of a Launch System for Ultimate Sports (Matthew Defeligibus)
- Micro-Injection Molding System for Additive Manufacturing (Jonathan Lee)
- Exercise System for Dogs (Rushabh Doshi, Russell Simms, Louis Stengel, Matthew Coccia)
- Building Re-Design for Energy Efficiency (Angela LoPiccolo)
- Urban Farming Solutions (Jordyn Auge, Chloe Misthos)
- Student Unmanned Air System (Richard Gaugler, Jeffrey Miscione)
- Bipedal Walking Robot (Charles Romaniello)
- Structural Health Monitoring System Design (Clayton Brancato)
- Solar Decathlon 2015: Energy Efficient Solar House (Michael-Robert Lewis)
- Heat Recovery System for from Air-conditioners (Kirsten Salmins, Drew Zahradka)

The chapter again successfully organized and implemented an academic tutoring program for the mechanical engineering undergraduate students during the fall and the spring terms. The event covered all core engineering topics for the sophomore and junior class with a special review during the final exam period.

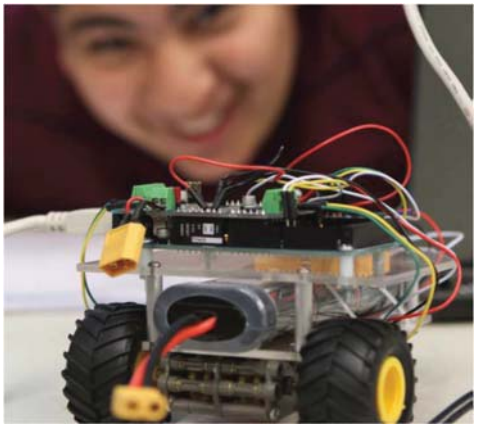
The Stevens Phi Omicron chapter has developed an Alumni Networking Database to track where alumni move to, work, or have previously worked, along with their contact information. This will be a living document that will continue for years to come.

Mr. Drew Zahradka (chapter president) represented Stevens at the centennial Pi Tau Sigma National conference at the University of Illinois, Urbana Champaign (February 20-22, 2015).

The chapter members also volunteered at all the student visit days for the Mechanical Engineering department, and participated in various Mechanical Engineering panels and gave feedback to the External Advisory Board.

In addition, as part of social outreach, several members of the chapter again participated in the collection of food and clothing for the needy and the Hoboken shelter during the holiday period.

A number of current Stevens Pi Tau Sigma chapter members are also elected members of the Alpha chapter of the Tau Beta Pi, the engineering honor society and several are current and past chapter officers. During AY 2014-15, Garett Joyal served as the chapter President, while Drew Zahradka was the Treasurer and Mary Michelle Easter served as the K-12 Outreach Program Chair. The chapter organized an extensive K-12 outreach program that included STEM education, student mentorship, and an engineering competition. Teams of 8th grade students from six local schools gathered weekly for two months to meet with Tau Beta Pi mentors for hour-long lecture sessions. Each lesson was supplemented by custom developed problem sets designed to reinforce understanding of the material, which included real engineering concepts presented at the high school and college levels with the goal to expose young students to engineering, so they are better prepared to take advantage of specialized technical high schools and colleges. The mentors developed and organized weekly lectures covering software engineering, robotics and automation, math for engineering, biomedical engineering and structural engineering to participating students. The activities are summarized as the lead news item entitled "K-12 Engineering Competition Hosted by New Jersey Alpha" by Mary Michelle Easter and Garrett T. Joyal in the *Bulletin of Tau Beta Pi* (February, 2015).



A student from The Academy I Middle School checks out the team's robot before the Live Robot Programming round

Sara Savoia was among a group of three Stevens students who spent one week during the winter holiday break in Long Khot, Thailand – a rural area where fresh water is scarce in conjunction with an Engineers without Borders-USA Stevens Chapter (EWB-SIT) project to survey the area and meet the residents. Preliminary project plans include replacing the broken watershed by using a catchment on a stream and running a pipe several kilometers to the main road, where it will connect to a community water system. Future projects include plans to develop a micro-hydro system that generates energy from the water.

The chapter's web page (www.stevens.edu/pts) has been updated.

Graduates

Aramini, Gary
Brancato, Clayton C.
Defeligibus, Matthew E.
Doshi, Rushabh
Fedorenko, Tatyana
Giglia, Michael A.
Joyal, Garrett T.
Kohlhepp, Milton S.
Lewis, Michael-Robert C.
Miscione, Jeffrey N.
Quay, Nathan D.
Salmins, Kirsten R.
Sidorski, Christine M.
Stengel, Louis R.
Zahradka, Drew

Auge, Jordyn N.
Coccia, Matthew G.
DeFeo, Danielle M.
Easter, Mary
Gaugler, Richard A., III
Hartt, Brandon J.
Juzefyk, Brian J.
Lee, Jonathan P.
LoPiccolo, Angela M.
Misthos, Chloe A.
Romaniello, Charles H., III
Savoia, Sara A.
Simms, Russell A.
Thomas, Richard A.

Awards & Recognition

Several of the Stevens Phi Omicron chapter members from the 2015 graduating class were recognized for their academic excellence and participation in various extra-curricular activities during the graduation.

- **Tatyana Fedorenko** was the 2015 valedictorian with a perfect 4.0 average and was the co-recipient of the *Lawrence C. F. Horle Memorial Award* which is presented to the senior who attained the highest grade point average during the entire undergraduate program at Stevens.
- **Tatyana Fedorenko** and **Mary Easter** were the co-recipients of the *Eugene Fezandie Award* for best overall performance by a graduating senior in Mechanical Engineering in the sequence of junior and senior year Mechanical Engineering courses.

The following chapter members of the graduating class were recognized for their academic excellence.

- **Gary Aramini** was the recipient of the *Fernando Sisto Award* for his outstanding performance in Turbomachinery and Aerospace.
- **Danielle M. DeFeo** was the recipient of the *Andrew Carnegie Machine Systems Award* for being an outstanding student in Machine Systems and Design.
- **Matthew E. Defeligibus** was the recipient of the *Robert H. Thurston Leadership Award* given to the *ASME* Student Chapter officer who has demonstrated high leadership skills.
- **Michael A. Giglia** received the *Robert Oakner Award* for demonstrating the innovative spirit, creativity, and resourcefulness during the course of his senior capstone design project.
- **Brandon J. Hart and Garret T. Joyal** were members of the design team that received the *Senior Design Project Award* for outstanding capstone design project in Mechanical Engineering for their project *Lightweight Exoskeletal Upper Extremity Robotic System*.
- **Garret T. Joyal** was also the recipient of the *Richard B. Cole Award* for demonstrating high academic performance, integrity and personal dedication.

- **Michael-Robert C. Lewis** received the *Arthur J. Grymes award* for demonstrating greatest interest and proficiency in fluid mechanics.
- **Nathan D. Quay** was the recipient of the *Elie Fonrose Award* for his promise of advancement in the field of aerospace engineering.
- **Kirsten R. Salmins** received the *Col. John Stevens Power and Energy Systems Award* for being the outstanding student of Power and Energy Systems.
- **Sara A. Savoia** received the *Kenneth J. Moser Award* in recognition of her outstanding performance in heat transfer.
- **Drew Zahradka** was the recipient of the *Richard S. Magee Excellence Award* for demonstrating both extracurricular involvement and leadership in departmental and campus activities.

The following chapter members of the graduating class were recognized for their co-curricular academic excellence.

- **Clayton C. Brancato** was among the recipients of the *Innovation & Entrepreneurship Project Plan Pitch Award* given annually for exemplification of innovation in design to the winners of the project pitch competition held during the Stevens Innovation Expo.
- **Tatyana Fedorenko** received the *Career Development Award—Personal Career Growth* for demonstrating a focused approach to professional development by identifying a career path and exploring careers relevant to academic studies and personal interests throughout her years at Stevens.
- **Sara A. Savoia** received the *Women's Leadership Award* given to a senior in good academic standing who has demonstrated an ability and desire to succeed upon graduation and who serve as outstanding role models to their peers and achieve extracurricular merit through involvement in campus activities.

The following members of the Stevens Pi Tau Sigma chapter graduating class of 2015: **Jordyn Auge, Danielle DeFeo, Rushabh Doshi, Mary Michelle Easter (Outreach Program Chair), Tatyana Fedorenko, Michael Giglia, Brandon Hartt, Garrett Joyal (President), Brian Juzefyk, Milton Kohlhepp, Michael-Robert Lewis, Angela LoPiccolo, Chloe Misthos, Charles Romaniello, Kirsten Salmins, Sara Savoia, Russell Simms, Louie Stengel, Richard Thomas, Drew Zahradka (Treasurer)** were also members of Tau Beta Pi, the Engineering Honor Society.

Danielle M. DeFeo, Matthew E. Defeligibus, Rushabh Doshi, Tatyana Fedorenko, Michael A. Giglia, Angela M. LoPiccolo, Sara A. Savoia, Mark A. Siembab, Louis R. Stengel, received both a Bachelors degree in Mechanical Engineering with High Honors as well as a Master of Engineering Degree.

At the state level, **Danielle M. DeFeo**, **Mary M. Easter** and **Sara A. Savoia** were selected from Stevens to receive the *NASA New Jersey Space Grant Fellowship* for their outstanding academic record. As part of this *state-wide* award they each participated in a research project of aerospace relevance and presented a research paper and poster at the state-wide *NASA New Jersey Space Grant* meeting (Rutgers University) to highlight their work.

Plans for 2015-2016

Our plans for the upcoming year consist of educational, social, and outreach activities. Among others, it will include, among others:

- Mentoring of freshmen and sophomores interested in pursuing mechanical engineering
- Enhancement of STEM club outreach activities to expose high school and middle school students, especially those from under-represented groups, to the excitement of mechanical and related engineering fields
- Participation in the Stevens Innovation and Entrepreneurship programs
- Sponsorship of engineering seminars, co-sponsorship and participation in professional society student chapter activities
- Promotion and publicizing of the Mechanical Engineering program activities within Stevens.

In addition, the chapter plans to distribute the stoles and recognize the graduating seniors during the annual banquet.

Chapter Officers

President:	Drew Zahradka
Vice President:	Sarah A. Savoia
Secretary-Treasurer:	Rushabh Doshi
President Elect:	Carly E. LaGrotta,
Vice President Elect:	Sarah C. Zahran
Secretary-Treasurer Elect:	Isaac Downey

The elections for the chapter officers were held on May 5, 2015 following the initiation ceremony. The current group of officers explained the responsibilities and chapter activities to the officers-elect who will govern during the 2015-16 academic year. The chapter responsibilities were transferred during the last week of the term.

Chapter Advisor: Siva Thangam, Professor, Department of Mechanical Engineering**,** Stevens Institute of Technology, Castle Point on Hudson, Hoboken, NJ 07030 **(**sthangam@stevens.edu)

Chapter Website: www.stevens.edu/pts

Reporter: Siva Thangam