SOUTH CAROLINA DELTA TAU

EXECUTIVE SUMMARY OF ACTIVITIES, 2015-2016

The South Carolina Delta Tau Chapter of Pi Tau Sigma (PTS-DT) was an active, vibrant organization in 2015-2016, thanks to the quality and commitment of our past members and new initiates. Activities of PTS-DT during the year are described in the following paragraphs.

First, the identification of potential PTS-DT members for Fall, 2015 and Spring, 2016 was completed. After completing the requirements for initiation, which includes attendance requirements for the seminar series and demonstrated service to the community and/or university, a total of twenty-two undergraduates were initiated into PTS-DT during the year, with one of the fall initiates (Chau Tran) now serving as Vice President for 2016-2017.

Secondly, near the end of the spring semester, our PTS-DT members met and selected their officers for 2016-2017. The process was improved during this round of elections by asking for nominations prior to the meeting and then adding new nominations from the floor. The elected officers demonstrated the diversity of the active members, with two women and three men selected to lead PTS-DT in the coming year.

Thirdly, an activity that almost every PTS-DT member really enjoys, the annual selection by our members of Mechanical Engineering's best young educator, best senior educator and best service provider, was finalized. The awards provided by PTS-DT are broadly acknowledged by the departmental faculty to be a worthwhile and valued honor. Sadly, the individual selected for best senior educator, Prof. Curtis Rhodes, unexpectedly passed away just before the announcement.

Fourthly, our PTS-DT members and initiates provided much-needed service to a broad range of organizations throughout the year. In particular, PTS-DT has taken the lead in assisting the Department of Mechanical Engineering every spring during Engineering Week. During the week-long activities, our members and initiates (a) set up and man the well-attended "bottle rocket launch" event and (b) one member actually designed, built and then manned a special booth entitled "What is a Lever?" A total of nearly 1,000 K-12 students attended these events, making it one of the most successful in recent years. In addition, many of our members offered service to the community at large, including activities with organizations such as Habitat for Humanity, Pets Inc. and the Gorman Home.

Fifthly, by far the most well attended and effective educational activity for our members, our **PTS-DT Bi-weekly Seminar Series** was held on a regular schedule during both the fall and spring semesters. A total of 13 government, industry engineers and engineering managers gave presentations that focused on what it is like to be an engineer in their field and what is necessary to be successful as an engineer.

Finally, with assistance from the Department of Mechanical Engineering and funds raised by PTS-DT members during the year, our society was able to send two of our PTS-DT members, including the President, Ian Adkins, and senior, Josh Porter, to the annual national meeting of Pi Tau Sigma held in February, 2016 in Los Angeles, California. Both attendees thoroughly

enjoyed the experience and brought back a series of recommendations for our society to consider in the future.

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PI TAU SIGMA ANNUAL CHAPTER REPORT, 2015-2016

South Carolina Delta Tau Chapter

A. Initiation of New Members

Under the current policy for initiation into the South Carolina Pi Tau Sigma Delta Tau Chapter (PTS-DT) is to identify (a) undergraduates who have completed their 2nd semester and are in the top 25% for GPA and (b) undergraduates who have completed their 3rd semester and are in the top 33% for GPA. The President of Pi Tau Sigma distributes a congratulatory letter to all nominees, which included details regarding the initiation process, the initiation fee, and date for induction as well as attire requirements. In addition to the academic achievements needed for initiation, new and existing members are expected to uphold and demonstrate dedication to the local community through service and activities.

Fall Induction of New Members

The inductions were led by the President, Vice-President, and Secretary. Individuals inducted into PTS-DT during the fall semester were as follows:

- Peyton Brumfield
- Rylan Burdette
- Jessica Coppin
- Myles Deluca
- Jon Fang
- Hunter Goman
- Brad Long
- Ilana Lu
- Carlo Mutuc
- Jared O'Quinn
- Jacob Smith
- Jake Snider
- Mark Stungurys
- Michael Tally
- Gwendolyn Thomas
- Chau Tran
- Samual Lupton

Spring Induction of New Members

As was the case in the Fall semester, The inductions were led by the President, Vice-President, and Secretary. Those inducted during the spring semester of 2016 were:

- William Eisele
- Adam Kirby
- Alexis Lewis
- Anthony Nguyen
- Ronak Patel

PTS-DT recognizes the hard work and dedication that it took for each of the pledges to become inductees in the society.

B. Student Leadership Elections

As the 2015-2016 school year began, the returning leadership from the previous year's elections took on their roles and responsibilities. The elected positions and individuals include the following:

- Ian Adkins, President
- Robert Holmes, Vice-President
- Ilana Lu, Secretary
- Chau Tran, Treasurer
- Jessica Coppin, Webmaster

At the close of the spring semester, elections to determine leadership for the following school year of 2016-2017 were held. Those elected to positions include:

- Ilana Lu, President
- Chau Tran, Vice-President
- Matthew Testa, Secretary
- Derrick Mak, Treasurer
- Dylan Madisetti, Webmaster

The responsibilities of the President include organizing events, speakers, and identifying as well as recruiting initiates. The Vice-President is tasked to compile a list of speakers for the bi-weekly seminar series. The Secretary generally documents the activities of the chapter and writes the annual report. The duties of the Treasurer include managing and recording member dues as well as arranging for refreshments for meetings and events. The position of Webmaster is to manage the chapter's online presence and update information so that the public and past members can stay informed.

C. Annual Faculty/Staff Awards

Awards were chosen by members at the close of the 2016 Spring semester, and as the tradition of this chapter continues, there are three major categories for faculty awards:

- Senior Professor of the Year
- Outstanding Young Educator
- Outstanding Service Provider.

For the first time, the voting was administered electronically with excellent participation and consensus. It was determined that the Outstanding Service Provider was awarded to Bill Bradley, who assists many of the students with machining and technical support for their research and senior design projects. The Outstanding Young Educator award was given to Dr. Ramy Harik. The Senior Professor of the Year was awarded to the much respected Dr. Curtis Rhodes, who had a distinguished career as well as an extensive history here at USC. Unfortunately, shortly after completing spring semester, Professor Rhodes passed away suddenly from an aortic aneurysm before he could be given the award by the President of Pi Tau Sigma Delta Tau.

D. PTS-DT Bi-weekly Seminar Series

The most developed of the chapter's activities is that of the bi-weekly seminar series that was first introduced and expanded into a full year activity in 2012. This unique seminar series that PTS-DT provides its members was continued robustly again this year, with positive reception and attendance. Refreshments are served to members as well as the guest speakers. A responsibility of the Vice President of the society is to organize a laudable list of speakers throughout the semester, many of which are graduates of the University of South Carolina and Pi Tau Sigma. Most notably during this year of 2015-2016, the society was privileged to host two of the three founding members of the Delta Tau chapter. Their attendance and advice was invaluable, as they have enjoyed successful careers since their graduation from the University of South Carolina.

Ken Holt (Holt Consulting Company)

Mr. Holt outlined in general what a consulting company does and how engineering graduates contribute in an engineering consulting company. Issues such as having a sufficiently broad background to tackle a range of problems (e.g., a malfunctioning gas furnace that caused major problems may require an engineer to know something about electronic switches, compressibility of gases, stress analysis of pipes and thermal analysis of a component that normally does not experience high temperatures). There was also a brief discussion of the Professional Engineering designation and how this is utilized in consulting.

Ms. Aileen Harlow discussing engineering in Michelin Corp.

Aileen Harlow (Michelin)

Ms. Harlow discussed employment opportunities at Michelin and the types of positions available that are related to mechanical engineering.

Ms. Phillips at PTS-DT seminar

Monica Phillips (Savannah River Nuclear Solutions)

Ms. Phillips outlined the various components within the Savannah River Complex. Noting that SRC has the Savannah River Site (we later found out that Mr. Oliver Barnes a founder of PTS-DT had worked his entire life in SRS) which deals with the oversight of the now closed nuclear reactors used to make fissionable materials during the Cold War. It also has the Savannah River National Laboratory, which is an Environmental Laboratory in DOE that was founded in early 2000s to expand its research and development activities related to the management of the nuclear wastes stored there. It also has a non-classified presence outside the SRNL and SRS facilities where visiting faculty, students and new employees can stay and work until clearance issues are resolved. Ms. Phillips also described the types of opportunities available at these locations, which are located near Aiken, SC.

Cameron Hochrein (Swagelok)

Mr. Hochrein discussed how the products made by Swagelok set themselves apart from others in the field, as well as about his personal journey in life that resulted in his employment at Swagelok.

Mr. Cameron Hochrein speaking to PTS-DT about Swagelok Incorporated

Tom Morris (International Paper)

Mr. Tom Morris at USC giving his presentation

Mr. Morris gave one of the most insightful lectures of the year. Discussing his long career (over 30 years) at International Paper, he talked about the changes that occur during an engineering career. Starting as a junior engineering hire, he was asked to work within one of their massive processing and manufacturing facilities. Learning new things each day, he progressed to senior engineer, front-line manager, group manager and eventually to a

position that is similar to senior fellow in technical fields, with broad responsibility to assist when difficult problems arise that are not readily understood or solved. As he wove his way through his career, he brought up key issues that each of our members will face. These included

- Timeliness in your attendance and in your responses
- Ability to work with other people to resolve problems
- How to communicate results in the most effective way
- Willingness to learn new things and take on new responsibilities for the organization.

The twenty five attendees were both attentive and also asked several questions at the end of the lecture.

Ronald Bee during presentation to PTS-DT attendees.

Ronald Bee (Husqvarna)

Speaking about systems and efficiency, Mr. Bee illustrated challenges faced by the industry using real-world examples familiar to the local Husqvarna manufacturing plant. Mr. Bee emphasized the need for employees to have a strong commitment to their projects. He cited a case where the employees independently (on their own) developed new manufacturing approaches that significantly improved overall productivity, saving many jobs by keeping his plant competitive.

Katherine Horn (Milliken)

Katherine Horn presenting during seminar series

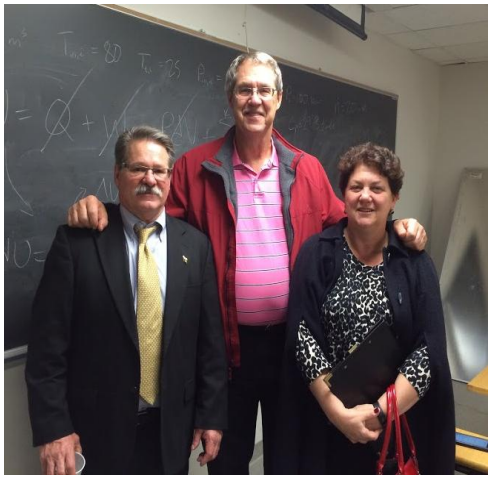
Similar to Mr. Bee in the previous lecture, Ms. Horn discussed the culture of Milliken and the types of positions available for graduate within their organization. Of particular interest was the observation that Milliken employs a wide range of engineers for their organization, including material scientists as well as mechanical and chemical engineers. In such an organization, new employees must be able to effectively communicate with and work with others.

Eileen Miller (Boeing, Charleston)

A returning speaker, Ms. Miller is not only a graduate of USC but also of the chapter here. Her advice to students regarding thinking about their career paths and graduate school was well-received. Ms. Miller discussed her personal experiences, emphasizing that, once you are hired, it is your performance that matters and

Eileen Miller giving her lecture to Pi Tau Sigma-Delta Tau in Spring, 2016.

not the school or country of origin. Members from the Society of Women Engineers were also invited to attend this meeting as Ms. Miller is a great example to women students in the field of engineering and the sciences.



Left to Right: Oliver Barnes, Prof. Michael Sutton our PTS advisor and Mrs. Barnes at the Spring Lecture

Oliver L. Barnes (A Founder of PTS-DT)

The chapter was fortunate enough to have Mr. Barnes as a guest lecturer in our Speaker Series. This was one of our largest crowds, with nearly 50 students and faculty attending. The students learned much from his view of how the nuclear industry has changed throughout time and also its relationship with a generational shift.

Also remarkable was his account of the history of the founding of PTS-DT at USC. All current members have only ever known about our chapter is the recent activities, so hearing that it was remarkably robust and active in its early years at USC was enlightening to all attendees.

Andrew Bastian (Technetics)

Mr. Bastian, another former ME graduate and a lifetime PTS-DT member, gave an interesting lecture. Equipped only with the blackboard and chalk, Mr. Bastian managed to provide a full lecture hall of members with valuable life lessons about aspects of failure and ways to counteract it. His enthusiasm and positivity were well received by all those attending.

Above: Mr. Andrew Bastian discusses challenges faced at all stages of a career

Below: Mr. Robert Smith with Prof. Sutton

Mr. Robert Smith (A Founder of PTS-DT), US Army Engineering Corp

A distinguished engineer with the US Army, Mr. Bob Smith highlights the importance of social skills in engineering and how to refine them. Also a founding member of the chapter as well as returning speaker, his talks are always very informative and useful. Of particular note in Mr. Smith's talk was one statement. "If you do not volunteer, then you may well be the one left out." In making this statement, Mr. Smith gave two examples where individuals took on added responsibility or unexpected challenges, resulting in advancement in their careers and long term success. He encouraged all PTS-DT members to push into new areas without fear.

Patrick Rodgers (Textron Specialized Vehicles)

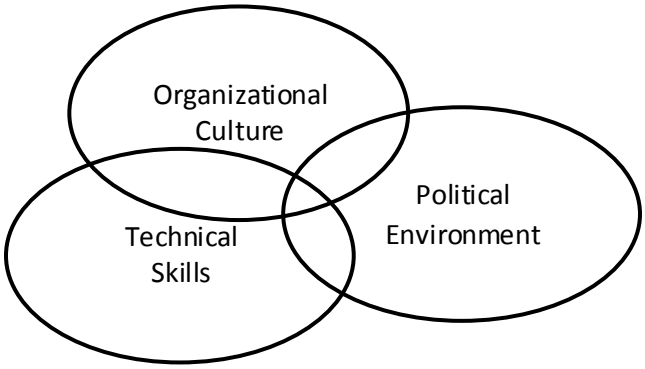
Another USC ME graduate who is a lifelong PTS-DT member, Mr. Rogers outlined the types of products and activities that occur at Textron Specialized Vehicles and how mechanical engineering can prepare graduates for these opportunities. Of particular note in Mr. Rogers talk were discussions regarding the breadth of knowledge that may be required in some of their activities; electronics, computer software, mechanical systems and dynamic analysis all are areas where an engineering graduate may be asked to participate and solve problems.

Mr. Patrick Rogers, Textron Industries, presenting as part of the PTS-DT Seminar Series

Dennis O'Connor (Bosch)

Discussing the career paths throughout Bosch and the products they provide customers, Mr. O'Connor gave the most insightful talk of the year. Mr. O'Connor started his talk by stating that the most important time in an organization is how you start out. He then showed the drawing on the right.

Mr. O'Connor then asked students to guess (0% to 100%) the percentage of importance that each one of these items has in the success of an individual. After discussion, he said that there is a wealth of data now that shows understanding culture is 60%, negotiating the political environment is 30% and doing outstanding technical work is 10%. Thus, learning the culture of an organization is one of first items to address.



Regarding culture, he gave the example of knowing what time people come to work in your organization! If the culture is to come at 7am, even though the nominal work day starts at 8am, then you need to get there at 7am, not 8am! Regarding the political aspect, Mr. O'Connor gave the example of knowing your boss and what he likes to do. For example, if he likes to play golf, you may want to figure out if you can play golf too! Regarding technical skills, he gave the example of an assignment doing stress analysis. When given this assignment, you should not only do the stress analysis as requested, but ask a few questions and see if you could do more analysis on different shapes or use different materials and then offer options when submitting your work.

At the end of the lecture, there were several students who stayed afterwards to ask additional questions regarding the "real world of engineering" as described by Mr. O'Connor.

E. Service Activities

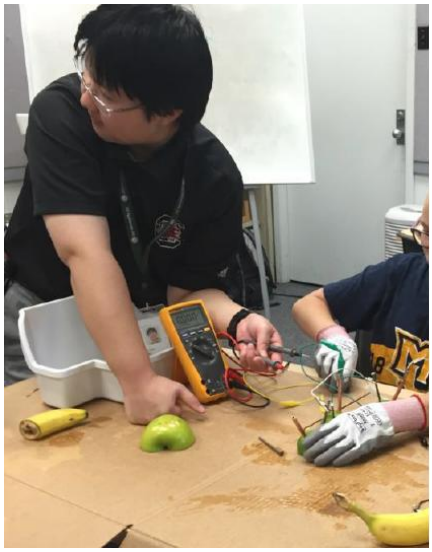
As part of the Engineering Week (E-Week) activities at USC, PTS-DT had a large group of members and initiates (there were 11 this year) that assisted with the setup and demonstration of water-propelled bottle rockets and a special hands on demonstration of a lever. The bottle rocket activities was led by USC Lab Engineer David Westbury, who received the PTS-DT Outstanding Service Award in 2014-15. The rocket demonstration is a long-standing favorite of the attendees. always with great turnout and interest. E-Week provides children and adults alike with education about the various areas of engineering and science. Many organizations and departments have tactile activities as well as presentations, and the chapter was fortunate to have a good volunteer group for this event.

Above: Volunteers prepare a rocket for launch as a local TV station and children watch

Left: Member Anthony Nyugen uses a bicycle pump to build pressure in a rocket made from a 2-liter soda bottle

Also contributing to E-Week was PTS-DT member, Matthew Testa. Matthew designed a small hydraulic lift that used hydraulic multiplication to lift moderately heavy objects with minimal force. After he designed the model on PTC Creo 2.0, requirements for physical properties were calculated. He then performed static and dynamic structural analysis on the model to ensure the material planned for use would be sufficient to carry the load and hence safe to operate in a public environment. After completion of the design, he fabricated the prototype in the USC Mechanical Engineering Machine Shop. For E-Week. He then developed a poster for visibility and presented his demonstration at a booth. Those that came to his booth were allowed to examine and test the hydraulic lift while Matthew explained briefly how it worked.

In addition to service activities for the Department of Mechanical Engineering, all initiates are encouraged to perform additional service to the community at large. Initiates and members participate in many diverse activities for volunteering or community service. Some of those are like Rylan Burdette and Chau Tran who offered to help with young kids and are serving as good role models for future STEM students. Rylan (shown on right) volunteered at the Burton Center to accompany and teach physically or mentally handicapped children about baseball, while Chau (pictured below) organized and ran a kid's workshop for GE's "Take Your Child to Work Day." Using various fruits, kids could learn about circuits and batteries through running hands on experiments.



Chau Tran, PTS-DT Vice President, conducting an electrical basics workshop for kids

Rylan with his "buddy" Matthew

Others like Jared O'Quinn (pictured below with a friend) opted to donate physical labor time in the outdoors, picking up litter and/or volunteering at local animal shelters (like Hunter Goman, right). Other members of PTS-DT and our initiates participated with Habitat for Humanity.

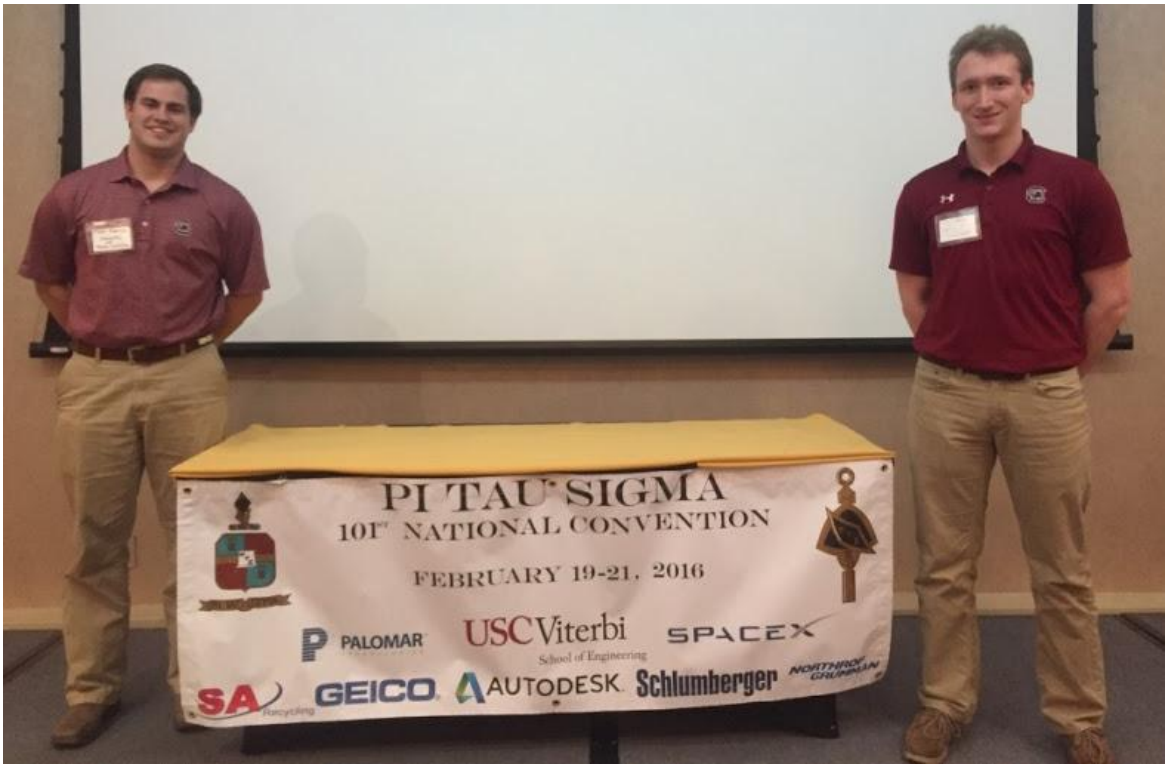
Hunter Goman walking a dog for local shelter Pets, Inc.

Jared O'Quinn with friend helping at a "Service Saturday" conducted by the USC Leadership and Service Center

F. Annual National Convention

The annual Pi Tau Sigma National Convention was held on February 19-21, 2016 at the University of Southern California in Los Angeles, California. This was a great opportunity for two of the chapter's members to represent PTS-DT and connect with members from other chapters. The 2015-2016 President, Ian Adkins, and senior Josh Porter traveled from Columbia, South Carolina to Los Angeles to attend. Both Ian and Josh found the University of Southern California to be a fantastic host, and the convention enjoyable as well as informative. The opportunity to ask leadership from other chapters how they addressed issues that PTS-DT also may encounter was very helpful for present and future use of this chapter.

Especially noted was the speaker from Space-X, as his point of view from a growing industry perspective was very informative. The annual convention is an event that this chapter hopes to continue by sending members to represent Pi Tau Sigma-Delta Tau.



Above: Josh Porter (L) and Ian Adkins (R) representing PTS-DT at the national convention

G. Preliminary Listing of New Activities Planned For 2016-2017

At the close of this successful school year, some goals were set for the 2016-2017 upcoming year. A main goal to accomplish within the future is to fully activate and regularly maintain the PTS-DT website as a way to connect both existing and past members as well as showcase the society's activities to the public. The chapter realizes the potential of technology to connect and empower its members, both past and present.

New to the chapter, an upcoming activity planned for the future is to liaison with other USC organizations for charity fundraisers and activities. In the past, this chapter has hosted internal trivia nights, however no recreational activities were planned for public attendance or general socializing. Hopefully this will foster fraternal spirit within the various USC engineering organizations as well as serve as an opportunity for members to contribute to the community.