SAMUEL GLASSTONE AWARD SUBMISSION

2014 - 2015

University of Florida American Nuclear Society Student Section



Assembled by:

Victoria Graham Noah Heintz Kent Hippler Jitesh A. Kuntawala Mikaela Maher Allan Martin Patrick Moo Hannah Morbach Dustin Popp Haitang Wang Nick Yap May 1, 2015, 2015

American Nuclear Society Attn: Honors and Awards 555 North Kensington Avenue LaGrange Park, Illinois 60526



To whom it may concern:

I take great pleasure in strongly supporting the application of the University of Florida American Nuclear Society Student Section (UF ANS) for the Samuel Glasstone Award. As a faculty advisor I have had the pleasure of observing and interacting with the creativity, drive, and energy of the officers and members of the UF ANS. This has been my first full academic year as a UF ANS faculty advisor and it has further shown the amazing and dedicated work that the local chapter does over the course of a full academic year. It has been an eventful year, and I am very impressed with the vitality of the UF ANS student section and its members in particular.

A large number of educational and informative activities and site visits have been organized by the UF ANS chapter the past year. This includes conferences, local outreach, study visits, and industry interactions among others. Several invited guest speakers have been a part of the general UF ANS meetings to bolster participation and create connections. A large number of social events have been planned and conducted without problems generating a positive camaraderie and bolstering our retention rate for students in the nuclear engineering program and the ANS-related degrees. The chapter has also expanded the ANS exposure beyond the traditional nuclear field by conducting events together with other organizations. That has also been evident in events such as boy-scout day for nuclear badges, engineering fair and UF engineering knowledge bowl. Fundraising for good causes have also been conducted and speaks volumes about the big hearts and good intentions in UF ANS. The UF ANS chapter has further participated in and conducted a variety of events such as NRC hearings, NPP site approval hearings, local elementary school outreach, newsletter distribution and industry outreach.

They have taken steps towards modernizing their fundraising, and taken great initiative in setting up a UF ANS online store for memorabilia. The fundraising has enabled a vibrant program and a very large presence at all of the national ANS meetings which is a tremendous bonus to our UF ANS students. A number of national ANS conference awards, scholarships, and fellowship awards have further affirmed the UF ANS presence at the ANS national stage and I am confident that will keep increasing. I hope that the Samuel Glasstone award committee recognizes the outstanding work and accomplishments of this organization when they consider candidates for the 2015 Samuel Glasstone award.

Sincerely yours,

Andreas Enqvist, Ph.D. Assistant Professor, Faculty Advisor UF ANS enqvist@mse.ufl.edu 352 294 2177



American Nuclear Society University of Florida Student Section



May 1, 2015

American Nuclear Society Attn: Honors and Awards 555 North Kensington Avenue LaGrange Park, Illinois 60526

Dear Committee Members:

Enclosed please find the University of Florida American Nuclear Society Student Section 2015 Glasstone Award Application. This report summarizes the numerous UF ANS activities held during the 2014-2015 academic year. Members of our student section matured professionally and enjoyed themselves while performing these activities productive to the nuclear and the University of Florida communities. Our members feel that these achievements are principle aspirations of the society and our student section. It is in this spirit that the accomplishments have been successful and influential over this past year.

Sincerely,

Patrick Moo President 2014-2015

Enclosure

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1 Introduction

With the continued growth of the University of Florida Nuclear Engineering Program over the past year, The University of Florida American Nuclear Society Student Section (UF ANS) has been instrumental in the program's quest to regaining its position as one of the nation's elite nuclear engineering academic institutions. UF ANS has become the face of UF nuclear engineering students through their outreach, advocacy of nuclear science and technology, as well as supporting the largest student presence at national conferences. This has shown members of the public and nuclear communities that the University of Florida Nuclear Engineering Program is and will continue to be a prominent member in its field.

Coming off of a Glasstone Award winning year in 2014, UF ANS has continued to excel in student involvement within the Nuclear Engineering Program and other on-campus engineering societies. UF ANS has gone to great lengths to not only match the previous year's accomplishments, but to surpass them. Highlights of this year's achievements include:

- Public advocacy for the construction of Turkey Point 6 & 7 and the Coqui medical isotopes facility.
- Career insight through hosting guest speakers and providing opportunities to tour the Port St. Lucie and Vogtle nuclear power plants.
- Community and university outreach by hosting several events demonstrating basic principles of nuclear science.
- Supporting and organizing the representation of over 20 UF nuclear engineering students at the ANS Winter Meeting in Anaheim, CA.

2 Section Management

2.1 Executive Board

UF ANS functions are coordinated by an Executive Board (E-Board) consisting of nine officers: the President, Vice-President of Internal Affairs (VP Internal), Vice-President of External Affairs (VP External), Treasurer, Secretary, Benton Engineering Council (BEC) Representative, and three members of the Board of Governors. Elections for these positions are held during the last general body meeting of the spring semester.

2.1.1 President

The President for this year was Patrick Moo, a senior in the Nuclear Engineering Program. This was Patrick's third year as a member of the E-Board, previously holding positions as VP External, and Social Chair. Patrick oversaw all ANS activities by drafting agendas for the E-Board meetings, leading the general body meetings, hosting guest speakers, designing and ordering this year's UF ANS t-shirts and pins, organizing nuclear advocacy programs and events, organizing UF ANS representation at the ANS Annual, Winter, and Student Conferences, as well as acting as the section's liaison between the ANS Student Sections Committee. Hannah Morbach, the current VP External, has been elected as President for the 2015-2016 year.

2.1.2 Vice-President of Internal Affairs

This year's VP Internal was Nick Yap, a junior in the Nuclear Engineering Program. Nick was instrumental in organizing on-campus and in-house events, including the coordination of the Materials Science and Engineering Department Societal Welcome Back BBQ, Fall Retreat, Engineering Society Volleyball Tournament, and the End of the Year Banquet and Awards Ceremony. Nick also worked closely with the Social Chair by organizing several social events throughout the year. Kent Hippler, the current Treasurer has been elected as VP Internal for the 2015-2016 year.

2.1.3 Vice-President of External Affairs

Hannah Morbach, a junior in the Nuclear Engineering Program served as this year's VP External. Hannah was responsible for coordinating off-campus events, including the tours of the Port St. Lucie and Vogtle nuclear power plants. Hannah also designed and ordered this year's ANS collared shirts and was valuable asset to the E-Board by helping organize several outreach events. Dustin Popp, a sophomore in the Nuclear Engineering Program has been elected VP External for the 2015-2016 year.

2.1.4 Secretary

This year's Secretary was Mychaela Coyne, a senior in the Nuclear Engineering Program. Mychaela's main duties were to pass along information about ANS events from the E-Board to the general body by sending out meeting minutes, creating Facebook events, and RSVPs for tours, socials, and the UF ANS Banquet. Mychaela was also in charge organizing and distributing "Nuke News", the UF ANS Newsletter. Noah Heintz, a freshman in the Nuclear Engineering Program has been elected as Secretary for the 2015-2016 year.

2.1.5 Treasurer

This year's Treasurer was split between two longstanding members of UF ANS. Chelsea Collins was the treasurer during the fall semester and played an important role in the success of UF ANS activities by drafting the budget for the entire year, as well as securing funding for all ANS events. Chelsea received her master's degree at the end of the fall semester, at which time the position was taken over by Fundraising Chair, Kent Hippler. Kent went on to plan fundraising events at local establishments, which was a new venture for UF ANS. Tory Graham, a junior in the Nuclear Engineering Program has been elected as Treasurer for the 2015-2016 year.

2.1.6 Benton Engineering Council Representative

The BEC Representative for this year was Laura Patino. The BEC Representative is a critical role for all engineering societies at the University of Florida, as they help ensure that additional funding for supplies and events is brought into the societies via the Benton Engineering Council. Laura attended all of the BEC meetings and relayed information on upcoming BEC events to the UF ANS E-Board. Lindsey Olson, a sophomore in the Nuclear Engineering Program has been elected as BEC Representative for the 2015-2016 year.

2.1.7 Board of Governors

This year's Board of Governors was comprised by Jitesh A. Kuntawala, Paul Johns, and Jonathan Rosales, all of whom are graduate students in the Nuclear Engineering Program. The Board of

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Governors acts as advisors to the President and other E-Board members when it comes to planning and implementing UF ANS activities. The Board of Governors is traditionally meant to help ease burdens caused by E-Board turnover as more experienced members graduate from year to year. The Board of Governors for the 2015-2016 year will consist of UF ANS veterans Patrick Moo, Nick Yap, and Lucas Rolison.

2.2 Chairs

The E-Board also has four chair positions: Fundraising Chair, Social Chair, Boy Scouts Committee Chair, and Historian. Elections for the chair positions are held during the first general body meeting of the fall semester.

2.2.1 Social Chair

Mikaela Maher was this year's Social Chair. Mikaela's main duties were to organize UF ANS social events, including the Fall Retreat, tailgate parties, as well as the Halloween, Fall, and Spring Socials.

2.2.2 Fundraising Chair

This year's Fundraising Chair was Kent Hippler. Kent took several new initiatives throughout the year to raise money for UF ANS activities. Kent took over as Treasurer at the beginning of the spring semester.

2.2.3 Boy Scouts Committee Chair

For the second consecutive year, Chris Greulich held the position of Boy Scouts Committee Chair. Chris was responsible for planning and hosting the all-day Boy Scouts Nuclear Science Merit Badge Workshop.

2.2.4 Historian

Nuclear engineering freshman, Eric Campbell served as this year's Historian. The position of Historian was created this year to aid in documenting events for the Newsletter and end-of-year reports. The Historian also coordinates the drafting of these documents.

2.3 Faculty Advisor

The Faculty Advisor for UF ANS is Dr. Andreas Enqvist. Dr. Enqvist helped facilitate UF ANS activities by acting as the main liaison between the E-Board, the department, and the College of Engineering. Dr. Enqvist attended all ANS E-Board and general body meetings to provide faculty input.

3 Operations

3.1 Financial Planning

At the onset of the 2014-2015 year, UF ANS had one spending account through student government which contained all the monies of the organization. The funds in this account are allocated by the President and Treasurer to finance UF student attendance at ANS conferences, and to finance

various events throughout the year, including outreach events, general body meetings, socials and the End of the Year Banquet. This year Chelsea Collins served as the UF ANS treasurer for the fall 2014 semester and Kent Hippler served as the treasurer in Spring 2015.

3.1.1 Creation of Wells Fargo Business Account

In the fall 2014 semester, Chelsea Collins and Kent Hippler worked together to open a business account for UF ANS that is independent of the university. The account was opened with Wells Fargo, because of the bank's significant presence at UF. This account has simplified the reimbursement process for members, and it serves as a well-regulated repository for all ANS funding sources including donations, sponsors checks and fundraising revenue.

3.1.2 Creation of UF ANS Online Store

In the fall 2014 semester, Chelsea Collins and Kent Hippler worked together to open a business account for UF ANS that is independent of the university. The account was opened with Wells Fargo, because of the bank's significant presence at UF. This account has simplified the reimbursement process for members, and it serves as a well-regulated repository for all ANS funding sources including donations, sponsors checks and fundraising revenue.

3.1.3 Sources of Funding

UF ANS activities and events are funded by various organizations, including departments within the University of Florida, and ANS sections. This revenue is contained in ANS' Student government account and ANS' Wells Fargo Business checking account. UF ANS uses these funds to sponsor members to attend the American Nuclear Society Winter Conference and Student conference. Additionally, UF ANS funds tours of nuclear power facilities including Port St. Lucie and Vogtle nuclear power plants, and outreach at the university. For the 2014-2015 fiscal year, UF ANS was sponsored by the following organizations. The Benton Engineering Council (BEC) serves as a liaison between UF engineering societies and the UF student government. The BEC allocates UF ANS \$1000 for each of the conferences, and \$400 for the ANS End of the year banquet. ANS Florida Section sponsored UF ANS with \$3000 for the ANS Winter Conference. Revenue collected from the Glasstone Award and UF ANS local fundraising events have been applied to the End of the Year banquet, and social/community outreach events throughout the year. Sources of ANS funding and the amounts provided for the 2014-2015 year are shown in Table 1.

Source of Income	Amount
BEC	\$2,400.00
Glasstone Award - ANS National	\$750.00
ANS Florida Section	\$3000.00
UF ANS Fundraising	\$60

Table 1: Funding sources and amounts provided for the 2014-2015 year.

3.2 ANS Merchandise

Patrick Moo and Hannah Morbach designed new polos, t-shirts, and pins to sell to local and student ANS members. In keeping with the tradition last year and due to the merchandise's popularity,

sales were extended to faculty, staff, alumni, and family and friends of the ANS members. The polos were priced at \$25 each, the t-shirts at \$10 dollars each, and the pins at \$3 dollars each.



Figure 1: UF ANS Lapel Pins



Figure 2: UF ANS Polos

3.3 ANS Emails and DropBox

To simplify communication between officers, Gmail accounts were created for the majority of the E-Board members this year. These accounts were used for all ANS at UF communication and were created for a smoother transition between board members in the years to come. The email addresses for each of the officer positions are listed in Table 2. For the second year in a row, DropBox was used

Table 2: ANS officer e-mai	ls
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Position	Email
President	ufl.ans.president@gmail.com
VP Internal	ufl.ans.vpinternal@gmail.com
VP External	ufl.ans.vpexternal@gmail.com
Secretary	ufl.ans.secretary@gmail.com
Treasurer	ufl.ans.treasurer@gmail.com
BEC Representative	ufl.ans.bec@gmail.com

to store files for the E-Board to use. E-Board meeting notes, agendas for general body meetings, financial planning information, conference and tour sign-ups, and event photographs were some of the items shared via DropBox.

3.4 Newsletter

UF ANS continued its issuing of the award winning newsletter, "Nuke News" this year by expanding the technical content and details of UF ANS activities. Nuke News sought to highlight student

research by featuring one or two UF nuclear engineering student projects. The format was revised from recent years, as well. An example of this year's newsletter can be found in the appendix.

3.5 Social Media

Throughout the year a Facebook group was utilized as an efficient and effective tool for communication among members. The Facebook group, ANS at UF, was used to notify members of events, general body meetings, tours, and socials, and to allow members to post interesting facts or questions for the benefit of the group.

4 General Meetings and Events

4.1 ANS General Body Meetings

UF ANS holds a General Body Meeting each month throughout the semester. The president gives a presentation going over upcoming events. Members interested in participating in events are able to sign up at the meetings. We also serve pizza and it is a great way for members across different classes to meet and communicate. In addition, we have guest speakers attend some of the meetings to talk about career opportunities. The dates, meeting type, location, and times for the 2014-2015 meetings are shown in Table 3.

Table 3:	General	body	meeting	dates,	types,	locations,	and	times.
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Date	Meeting Type	Location	Time
September 3	GBM	Rhines 125	5:30 pm
October 1	Guest Speaker: US Navy	Rhines 125	6:00 pm
October 24	Guest Speaker: NEI Clean Energy America	Rhines 125	6:00 pm
November 5	Scholarship Workshop	Rhines 125	$5:30 \mathrm{\ pm}$
January 14	GBM	Rhines 125	5:30 pm
February 18	GBM	Rhines 125	5:30 pm
March 18	GBM	Rhines 125	$5:30 \mathrm{\ pm}$
April 15	Elections	Rhines 125	5:30 pm



Figure 3: ANS at UF members attending a GBM



Figure 4: NEI Clean Energy America Speaker

4.2 ANS Executive Board Meetings

The Executive Board holds meetings the week before each General Body Meeting. We set the agenda for the General Body Meeting and meet with the faculty adviser in order to plan and discuss future events.

4.3 Coordination with Other Organizations

4.3.1 Materials Science and Engineering Welcome BBQ

In September, the Materials Science and Engineering department held an outreach event for the various engineering societies within the department, which includes UF ANS. The event was a Barbeque open to all students at the university, with a focus on the recruitment of new engineering students into the Materials Science and Nuclear Engineering departments. Over 50 students attended the event, and freshman nuclear engineering students have since become involved with UF ANS after attending the event.

4.3.2 UF Women in Nuclear, ANS Local Section, UF ANS Joint Dinner Meeting

The UF Women in Nuclear (WiN), ANS local section, and UF ANS hosted Dr. Kimberley Gilligan and Dr. Scott Stewart from Oak Ridge National Laboratory to discuss the Next Generation Safeguards Initiative and host an "Ask Me Anything" session with UF NE students. The meeting concluded with an interactive game called The Secret Objective Standoff. The meeting began with questions to Dr. Gilligan and Dr. Stewart, which included questions about graduate school, post-masters and post-doctorate work, and specific work opportunities at Oak Ridge National Laboratory. Dr. Gilligan and Dr. Stewart also addressed questions from younger students on how to get internships and job offers with minimal nuclear-related knowledge and experience. Following the "Ask me Anything", The Secret Objective Standoff is a simulation that requires participants to select countries to represent and then determine secret nuclear objectives. The countries then take turns trying to achieve their secret objectives while trying to thwart other countries from reaching theirs. This activity exposes students to the more political side of the nuclear industry.

4.3.3 Benton Engineering Council

The University of Florida Benton Engineering Council (BEC) has an annual Engineering Week celebration that includes outreach, leadership, and social events to celebrate engineering students and their disciplines. UF ANS participated in the Engineering Fair (E-Fair), which is a two day event where engineering disciplines present what their field entails and the real life applications of their field. There were over fifty STEM related organizations from around the University displaying interactive activities to middle school and high school students from the surrounding counties. UF ANS set up a model town, train station, and boat port with Co-60, Sr-90, and Am-241 disk sources hidden inside and had visiting students use Geiger counters to determine the location of the hidden sources. This activity gave UF ANS members the opportunity to explain to younger students what radiation is, how it works, and the real life applications of radiation detection. It also gave UF ANS members the opportunity to advocate on the behalf of the advantages of nuclear power and research to teachers and parents.



Figure 5: ANS UF Engineering Bowl team

4.3.4 UF Engineering Knowledge Bowl

UF ANS participated in the 2015 Engineering Knowledge Bowl as part of the UF Engineering Week events sponsored by the Benton Engineering Council. After finishing in first place in the preliminary round, the team fell short to the UF Quiz Bowl team in a narrow defeat on the Final Jeopardy question during the final event held on the opening day of E-Week. Overall, UF ANS placed 4th out of nine teams participating in the knowledge bowl.



Figure 6: ANS UF Engineering Bowl team

4.3.5 College of Engineering Societies Volleyball Tournament

On Sunday, January 25, 2015, ANS hosted the Engineering Society Volleyball Tournament. Teams from ANS, AIChE, SHPE, Material Advantage, and Engineering Ambassadors all participated in the double-elimination sand volleyball event. Towards the end, both ANS teams faced off to enter the final game against Engineering Ambassadors. ANS 1 lost in the finals to the Engineering Ambassadors team, who went undefeated for the entire tournament. All the participants said they had a great time at the event, and we hope to have more inter-society socials like this in the future.



Figure 7: ANS UF hosted Volleyball Tournament

4.3.6 Society of Women Engineers

The University of Florida Society of Women Engineers (SWE) hosted their annual eSwamp Retreat at Lake Wauburg on August 31, 2014. This event allowed incoming female freshman and transfer students in the College of Engineering a chance to learn about and join the various engineering organizations at UF. Over 200 students attended the event, many of which interacted with enthusiastic members from ANS. Patrick Moo, Hannah Morbach, and Laura Patino spoke to the young women about opportunities in nuclear engineering, ANS, and WIN. Two new female members were added to the student membership from this event.



Figure 8: ANS UF members at eSwamp

4.3.7 College of Engineering - Pi Day Celebration

The University of Florida Benton Engineering Council (BEC) hosted a Pi Day Celebration outside of the Marston Science Library in the center of campus on March 13, 2015. The celebration

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included comments Dean Judith Russell, the Dean of University Libraries, and Provost Joseph Glover as well as a digits of pi memory contest, a free-hand circle drawing contest, pie sales, tabling by engineering societies, and the opportunity to pie participating students and professors for a donation. The donations from the event went toward UF Dance Marathon and the Children's Miracle Network. The event hosted UF students as well as students from local high schools. UF ANS participated through tabling to increase awareness about our society and the nuclear industry. We set up one model town with hidden disk sources and had high school and college students and parents use Geiger counters to find the hidden sources. Tabling at this event also gave UF ANS the opportunity to connect with incoming UF freshman interested in studying nuclear engineering and advocate on the behalf of the advantages of nuclear power and research to parents and other UF students. As part of the Pi Day celebration, two UF NE faculty participated in the "pie your professor for a donation" activities. Dr. James Baciak and Dr. Andreas Enqvist allowed students to pie them in the face with whipped cream pies. As well as proceeds going to the UF Dance Marathon and Children's Miracle Network, Dr. Baciak made an in kind donation to Gigi's Playhouse and Dr. Enqvist made a kind donation to complete vaccination sets for those who can't afford them.



Figure 9: UF NE Director, Dr. James Baciak, taking part in Pi Day festivities



Figure 10: UF ANS Faculty Advisor, Dr. Andreas Enqvist, taking part in Pi Day festivities

4.4 ANS Conferences

This year, ANS at UF has continued to send students to the three National ANS conferences to attend the meetings and present their research. ANS at UF considers conference experiences invaluable to students in the opportunity they provide to network with professionals and other students alike. Students use the conferences as a means to develop professionally and to become involved in ANS at a national level, and ANS at UF is dedicated to making sure students have the opportunity to attend and are encouraged to do so.

4.4.1 ANS Annual Meeting

The 2014 Annual Meeting was held in Reno, Nevada from June 15th to 19th. Nicolas Silva represented ANS at UF at the conference, presenting his research with Dr. Yong Yang on Hydrogen Migration, Precipitation and Re-Orientation in Nuclear Spent Fuel Cladding in Dry Storage. ANS at UF also received recognition with student Danny Permar receiving the Fuel Cycle and Waste Management Division John D. Randall Scholarship.

4.4.2 ANS Winter Meeting

ANS at UF sent 20 students to the 2014 ANS Winter Meeting and Nuclear Technology Expo in Anaheim, CA. Many students participated in the Student Program and several students took positions on committees that function at a national level. Several students also presented their research at the conference. Three UF graduate students participated in the Student Poster Session; Lucas Rolison presented in the category of Nuclear Fusion and Jitesh Kuntawala and Paul Johns presented in the category of Materials Science and Technology. Two students presented at the conference as well. Justin Paluch presented his research on a Hybrid Time-Dependent Transport Analysis Tool during a Reactor Physics Technical Session and Juliusz Kruszelnicki presented his research on the Impact of Focusing Grid Electrodes and Pulsed Power on Modified IEC Fusion Device during a poster session in the embedded topical meeting on Fusion Energy. Juliusz Kruszelnicki was awarded Outstanding Student Paper at the conference. In addition to being very involved in governance and

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research, ANS at UF students were active in the social events during the meeting. They also made the most of their trip across the country to Anaheim, going to Disneyland, visiting Hollywood, and road-tripping across Los Angeles to Roscoe's House of Chicken and Waffles.



Figure 11: ANS at UF members attending the 2014 ANS Winter Meeting

4.4.3 ANS Student Conference

The 2015 Student Conference, held from April 9th-11th, was hosted in College Station, TX at Texas A&M University and featured the research accomplishments of over one hundred students across the world. Keynote speakers included Special Assistant to the Director General for Strategy at the IAEA Ambassador Zef Mazi, Head of the Texas A&M Nuclear Engineering Department Dr. Yassin Hassan, and ANS President Dr. Michaele (Mikey) Brady Raap. UF students participated in RELAP5 and CFD workshops, and toured facilities such as Texas A&M's TRIGA Reactor and Thermal Hydraulics Laboratory. The conference also included a two-day career fair that provided students with an opportunity to meet professionals and pursue job and internship opportunities. ANS at UF students also helped represent the UF Nuclear Engineering Graduate Program at its respective booth with new faculty member Dr. Lee Winfrey. Five UF students presented at the conference, participating in both the poster session and podium presentations. Senior Patrick Moo and graduate student Jitesh Kuntawala dual-presented a poster on UF ANS Student Section Best Practices, graduate student Lucas Rolison presented his research with Dr. Kelly Jordan on his Preliminary Signal to Noise Calculations for X-ray Backscatter Radiography of Spent Fuel Canister Welds, senior Juliusz Kruszelnicki presented his research with Dr. James Tulenko on Property Analysis and Advanced Manufacturing Technique Development for Light Water Reactor Annular Composite Fuel, and sophomore Dustin Popp presented his research with Dr. Sedat Goluoglu on the Impact of Nuclear Data Improvements on Criticality Safety Guidelines. UF came home from the conference with two awards: Dustin Popp won Best Presentation for the Nuclear Criticality Safety track and Juliusz Kruszelnicki tied for Best Undergraduate Paper Overall.



Figure 12: ANS at UF members Juliusz and Dustin with their best paper awards.

4.5 ANS End of the Year Banquet

To close out the spring semester, the ANS annual banquet was held at a local apartment clubhouse. Members dressed formally and had a range of activities to participate in, including ping pong, billiards, air hockey, and socializing. The banquet was then catered by 4 Rivers BBQ, including a plethora of food items such as pulled pork, roast beef, mac and cheese, sweet potato casserole, and tea. The president gathered everyone's attention, then announced awards for best professor, best undergraduate student, and best graduate student. The new executive board for the coming fall semester was announced, and members proceeded to honor graduating seniors and wish others well as they part for their summer endeavors.

5 Public Information and Outreach Events

5.1 Turkey Point Unit 6 & 7 Site Hearing

ANS at UF students had the unique opportunity to attend the Site Selection Hearing for Turkey Point Units 6 & 7 in front of Florida Governor Rick Scott and his Cabinet. It was a wonderful, engaging, and educational glimpse into some of the decision making bodies behind the nuclear industry. The Governor, Attorney General, Commissioner of Agriculture, and the Chief Financial officer all recognized our group in the audience. The paused the proceedings and called us to the dais for a group photograph were they commended us for our efforts. It was stimulating to see the interactions of opponents and proponents in this public governmental proceeding. The group of nine in attendance which included Madison Martin, Patrick Moo, Joseph Cashwell, Logan Blohm, Lucianne Behar, Jonathan Rosales, Nicolas Silva, Hernan Godoy, and Jitesh A. Kuntawala proudly stood together at the podium and provided comments in support of new nuclear generation. "Our generation is the future of clean energy and the future of our economy. New nuclear energy supply is essential to both. Nuclear Energy means jobs. This is attractive to students who graduate college and look for jobs that can help them get a start (especially those of us who have student loans to pay off!). These nuclear plants represent the future employment of engineers like us." The input was very well-received by the cabinet and proponents of the new reactors. Following the public comment, the Siting Board voted unanimously to approve the proposed site.



Figure 13: UF ANS students with the Florida Governor and his Cabinet

5.2 Boy Scouts Workshop

ANS at UF sponsored a community outreach event on February 28th, 2015 by hosting a Nuclear Sciences Merit Badge workshop open to Boy Scouts chapters in Florida. At the workshop, Boy Scouts of ages 12-17 learned about various nuclear topics including the history of nuclear power in the USA, radiation, the fission process, and career opportunities in nuclear engineering. UF Nuclear Engineering students taught the topics at the event and shared their internship and research experience with the young scouts. Finally, Chris Greulich, a nuclear engineering graduate student led a tour of the detection lab, where the scouts conducted a detection experiment.



Figure 14: Local boyscouts and ANS student members team up for a nuclear science merit badge workshop.

5.3 Plant Vogtle Tour

On March 22, 2015, a group of 11 UF ANS members visited Vogtle Electric Generating Plant for an extensive tour of Southern Company's facilities. The day started early with a 5 hour drive from Gainesville to the site, in Camden County, Georgia. Upon arrival, the students toured the Visitor Center, where they interacted with a working model of an AP1000. They watched a picture presentation of Vogtle 3 and 4 that displayed the rapid construction progress that had been made since UF ANS's last tour in January 2014. Then, the students went on a construction site perimeter driving tour of Vogtle 3 and 4. Their tour guide was able to answer their questions and explain the pilot methods used to put together the containment building among other integral parts of the new reactor sites. After the driving tour, they toured the Vogtle 1 and 2 control rooms. The last year they toured the site, they had been shown a simulated reactor trip, and this year they were able to see Vogtle 1 & 2 Senior Reactor Operators in action in the control rooms. This was a detailed learning experience, as the students were able to see what it actually takes to construct a nuclear power plant as well as what it takes to operate a plant. The day ended with lunch provided by the site and group photos. Students that visited Plant Vogtle included Kian Nowroozi, Christian Artunduaga, Noah Heintz, Hannah Morbach, Oscar Espinosa, Luci Behar, Pat Moo, Florian Buhlman, Danielle Naegelle, Sonata Valitis, and Allan Martin.



Figure 15: ANS at UF students in front of the Vogtle units 1 & 2 $\,$

5.4 St. Lucie Nuclear Power Plant Tour

On October 21, 2014, a group of 13 nuclear engineering students, mostly freshmen and sophomores, from the University of Florida's ANS Student Section got a behind-the-scenes look at Florida Power & Light Company's St. Lucie Nuclear Plant. They toured the site during National Nuclear Science Week, which annually celebrates those who are dedicated to nuclear power generation, nuclear medicine and related areas of national defense and education. The students began their visit with a walk-through of St. Lucie's Energy Encounter and spent time in the plant's Training Simulator, an exact replica of the Unit 2 control room. A nuclear training supervisor explained the numerous processes, procedures and equipment used in the control room to make sure the units are operating safely. Site Vice President Joe Jensen told the students he felt they were getting into the industry at a time where there is opportunity for future growth and job opportunities. He also commended the

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group for their effort learn outside the classroom setting and seek out opportunities to interact with nuclear engineering professionals. Despite a steady rain, students put on their personal protective equipment (hard hat, safety glasses, gloves and ear protection) and walked down the Unit 2 turbine deck to see the rest of the plant site. It was an eye-opening experience for these young students, especially since, for most of them, it was their first power plant tour. Students included (from left to right) Christopher Greulich, Mahdi Kassam, Hernan Godoy, Allan Martin, Noah Heintz, Jack Morrison, Kenneth Fernandez, Hannah Morbach, Oscar Espinoza, Alec Neller, Sahjmori Dunn, Zachary Oram, and Robert Weinmann-Smith.



Figure 16: UF ANS Students at St. Lucie Nuclear Power Plant

5.5 Painting the 34th Street Wall

A tradition, here at the University of Florida, is for organizations or individuals to paint on the 34th Street wall, the "community bulletin board". An event was hosted for interested members and students to participate as the UF ANS chapter painted a mural depicting a comparison of equivalent nuclear and traditional fuel sources. Around 10 individuals were involved in this exciting social activity which reached the community with positive information on nuclear energy.



Figure 17: UF ANS Students in front of the 34th Street Wall

5.6 Turkey Point Units 6 & 7 Environmental Impact Statement Hearing

Before even the sun had risen, a group of UF ANS members were on the highway headed to the NRC Environmental Impact Statement Public (EIS) Hearing regarding the construction of Turkey Point 6 & 7 in Homestead, Florida. The purpose of UF ANS comments were to support the nuclear industry and show that they were in agreement that nuclear power is safe, clean, and economically beneficial to South Florida. Prior to the hearing, an open house gave the students time to speak with many of the NRC employees that directly contributed to the conclusions reached in the EIS. This allowed the students to further understand the degree to which the NRC evaluated all aspects of the proposed reactors and their construction. They also spoke with other several Florida Power and Light (FPL) employees and members of the public, including Greg Brostowicz, an FPL nuclear communications manager. Over lunch Greg encouraged the students to continue working on their studies and to stay involved with the public relations aspect of the nuclear industry. Nuclear power cannot expand unless the public believes it to be safe and reliable, which makes public information on nuclear energy a central focus of UF ANS. During the actual public comments portion of the hearing, UF ANS President, Patrick Moo addressed the Commission, highlighting that,

Nuclear power plants typically operate at capacity factors above 90%, making them the highest among all major forms of energy. Nuclear power is also the only emissions-free base load energy source for large grids like those in South Florida. This is critical to Florida, since we are a state that relies on clean air and beautiful beaches. Turkey Point 6 & 7 would avoid more than 265 million tons of CO2 emissions in the first 40 years of operation, which is the annual equivalent of removing more the 56 million cars from the road. By providing the clean and affordable energy that these plants would produce, we would help ensure that Florida remains one of the best states to visit and reside in.

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Patrick was followed by Nicolas Silva, a Ph.D. student in the Nuclear Engineering Program, who praised FPL for the creation of thousands of jobs during construction and over 800 jobs during operation, as well as for the environmental benefits of nuclear power plants over a coal or natural gas powered plant. Sophomore Allan Martin also expressed confidence in the thoroughness of the NRC and Army Corps of Engineers drafted EIS. Allan also stated that UF nuclear engineering students fully support the construction of the new units at Turkey Point. The students' comments were well received and were highlighted in the Miami Herald the following day. UF ANS believes that they successfully displayed the interests and goals of ANS and the nuclear industry.



Figure 18: UF ANS Students with FPL Communications Personnel

5.7 Fall Festival at Meadowbrook Elementary

Every year a local elementary school called Meadowbrook Elementary has a fall festival with carnival games, prizes, and booths for local organizations. Upper and lower-classmen both participated in traveling to the elementary school, setting up a booth, and collecting tickets for students to participate in different nuclear activities. UF ANS set up a model town, train station, and boat port with Co-60, Sr-90, and Am-241 disk sources hidden inside and had visiting students use Geiger counters to determine the location of the hidden sources. This activity gave UF ANS members the opportunity to explain to younger students what radiation is, how it works, and the real life applications of radiation detection. The booth also had information on the American Nuclear Society, how nuclear power plants work, statistics on radiation, and different radioactive items for festival participants to learn about. The festival also gave UF ANS members the opportunity to advocate on the behalf of the advantages of nuclear power and research to teachers and parents.

5.8 Coqui Radiopharmaceutical Medical Isotope Public Information Campaign

Coqui Pharma, a prospective medical isotopes producer recently announced plans to construct two reactors in Alachua, Florida, a small city ten miles north of the University of Florida. There are only a small number of medical isotope producing facilities in the world, with no major producers in the United States. This has caused medical professionals to rely on imported supplies from Europe and Canada. Mo-99 which is an isotope critical for diagnostic applications cannot be stockpiled due to its short half-life. This makes the availability of a domestic supply invaluable to hospitals in the United States. When UF ANS learned of these plans, an initiative was taken to inform the public on the benefits of constructing the planned facility in Alachua. Members of the UF ANS E-Board reached out to Coqui President, Carmen Bigles and Public Affairs Coordinator, Kevin

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Tilbury to offer assistance in providing technical input for public relations. Coqui and UF ANS came to an agreement that we would draft documents that would be available to the public. These documents are intended to be used for local governments and home owners associations. UF ANS and Coqui are also teaming up to have open forum events on campus and the surrounding areas in the coming months. Forums will also be available online, which will lead to further collaborations with experts in the medical and nuclear industries from across the country.

6 Socials

6.1 ANS Fall Retreat

A couple weeks after the start fall semester, the UF ANS held its third annual Fall Retreat at Ichetucknee Springs State Park. A picnic was held near one of the main springs, featuring sand-wiches and refreshments from Publix. Then the group swam in the spring for an hour to cool off. The rest of the social involved group members migrating between playing sand volleyball and swimming in the spring.



Figure 19: UF ANS members at Ichitucknee Springs State Park

6.2 Halloween Social and Pumpkin Carving Contest

Among the UF ANS chapter's social outreaches, this year, was the fall festival event. Members and interested students were invited to participate. Each person brought their own pumpkin and were encouraged to carve something nuclear related or generally creative. A dinner with festively themed refreshments, including apple cider and pumpkin flavored baked goods, was provided for the 20 or so attendees as they socialized and decorated their holiday gourds. The best pumpkin design was voted on and that member, Mikaela Maher, won a free ticket to the Newberry Haunted Corn Maze, the second portion of the fall festival event. There, attendees could ride a mechanical bull, play with animals in the petting zoo, or be haunted in the maze.

6.3 ANS End of Fall Social

At the end of the fall semester, a few days before finals, a social was organized at the ANS President, Patrick Moo's house. The group watched a Florida basketball game and enjoyed refreshments throughout the night, reflecting over the semester's triumphs and struggles.



Figure 20: UF ANS members carving pumpkins



Figure 21: UF ANS members at the Halloween Social

6.4 ANS Tailgates

ANS and WIN hosted four tailgate parties outside of the Nuclear Sciences Building in the past year to raise money for the UF version of the March of Dimes and Gator March for Babies. Food like hot dogs, hamburgers, chips, and sodas were provided for attendees who in return donated \$5 to Nuclear Gators March of Dimes team. The goal of the tailgates was to raise \$100. By the end of the day, ANS and WIN had exceeded the goal. They were literally "WE" moments not only just for enjoying the time with close friends and releasing from school pressure, but also spreading love to whom in needs. A group photo was taken at one of the tailgates, shown in the following.



Figure 22: ANS members at the UF ANS Tailgates

6.5 Gator Engineering Alumni Tailgate

UF ANS participated in the Gator Engineering Tailgate Reunion prior to the UF vs. Missouri Homecoming football game. UF ANS joined several other societies by setting-up and displaying pertinent information related to nuclear engineering. Several nuclear engineering alumni stopped by to talk about their careers and the state of the UF Nuclear Engineering Program. UF ANS has long maintained an excellent relationship its alumni, providing a valuable career insight and connections to current students.



Figure 23: UF ANS members tabling at the Gator Engineering Alumni Tailgate

7 Conclusion

UF ANS has once again shown that it is among the best student organizations in the country for the advocacy of nuclear science and technology. The University of Florida's goal to have one of the premier nuclear engineering programs in the country is something the UF ANS is well aware of. UF ANS will continue to play a pivotal role in making this a reality by our continued demonstration that the University of Florida has one the best and most active groups of students in the nuclear community.



Appendix A



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UF NE Student Contributes to Ongoing Fusion Ignition Research at Lawrence Livermore National Lab

By Lucas Rolison

Lawrence Livermore National Laboratory (LLNL) is home to the National Ignition Facility (NIF), the world's largest and most energetic laser facility. The NIF operates 192 laser beams that all converge into the center of a large target chamber, where different targets can be used in order to study various aspects of high energy density physics. One of the biggest efforts made at the NIF is fusion ignition using inertial confinement fusion (ICF). Fusion ignition is reached when more energy is released from the fusing of atoms than what was put in by the driving mechanism; in the case of the NIF, its laser beams. ICF is one way to achieve fusion ignition and it is being attempted at the NIF by compressing a small Deuterium-Tritium (DT) ice capsule to extremely high densities, thereby creating the ideal conditions for the hydrogen isotopes to fuse.

Though ICF is achievable in nature (stars), it is extremely difficult to create it in a controlled setting such as at the NIF. This is because it is an inherently unstable process, with hydrodynamic instabilities being a major cause of failure. One important form of hydrodynamic instability is the Rayleigh-Taylor instability (RTI). RTI occurs at the interface between two fluids when a lighter fluid is being accelerated into a heavier fluid. Any perturbations at this interface will grow in time and cause mixing of the two fluids. This is bad in the case of ICF at the NIF because each occurrence of RTI in the capsule can result in the mixing of the plastic ablator with the DT that it is encasing, which will quench the fusion reaction.

Due to the dangerous nature of RTI mixing, it is important to understand and characterize the sensitivity of RTI growth to experimental parameters at the NIF. One such analysis is the sensitivity of RTI growth to small changes in the laser power of the laser drive, which was the focal point of the author's internship this past summer. The laser pulse used at the NIF is shaped in a certain way so that better compression and stability can be reached, allowing for increased fusion burn. There are different shapes that have been tested but the one that the sensitivity analysis was conducted on was the original "Low-Foot" drive that was used during the National Ignition Campaign.



Figure I. NIF Low-Foot laser pulse with exaggerated uncertainty boundaries

To conduct this analysis, 1000 1-D simulations were ran inside the code S_n radiation HYDRA; once using an transport method and then again using a diffusion transport method. In each of these 1000 simulations, the code was given a uniquely and randomly perturbed radiation source that is directly correlated to small, random fluctuations in the laser drive. It is note that these small important to fluctuations all fit within the uncertainty boundaries set for the laser delivery requirements determined by the NIF (see Figure I). After the 1000 simulations were run (once for S_n and again for diffusion), RTI parameters were calculated and the data was analyzed for trends.

Upon analysis, an important disconnect was discovered between S_n and diffusion simulations, as shown in Figures 2 and 3 (Next Page). For a given Legendre Mode, the time integrated RTI growth values that were calculated for the 1000 S_n simulations showed a bimodal distribution during the onset of deceleration in the capsule. This means that given a standard laser pulse with its small, inherent uncertainties in power delivery – there is a possibility for a significant increase in RTI when the capsule beginning decelerate during is to compression. Upon further analysis, it was seen that simulations with higher RTI growth tended to have a slightly weaker (-2% flux) final shock in the laser pulse. When his same analysis was conducted for the 1000 diffusion simulations, this bi modal distribution was no longer present and it only showed the lower growth regime of the S_n results. This disagreement is significant because all of the 2D and 3D simulations are ran using the diffusion method, which means there is a possibility that design choices and other decisions were made based on an incomplete picture of the hydrodynamic instabilities that are occurring in the capsule. This may provide insight as to why repeated experiments during the national ignition campaign would have widely varying amounts of mix, even though the experimental setup was held constant



Figure 2. Histogram of time integrated RTI growth for S_n simulations



Figure 3. Histogram of time integrated RTI growth for diffusion simulations

This sensitivity analysis was the first of its kind and is only a preliminary look into the phenomena. Therefore there is a large amount of room for improvement and expansion. Future work would include running more simulations to improve confidence. statistics and increase the RTI improvement upon growth calculations, testing other laser pulses, and using different target designs in the simulations that have been tested in the past and present.

For more information about LLNL and its ongoing research at the NIF, go to lasers.llnl.gov

The author would like to give a big thanks to Luc Peterson, his mentor during his summer internship. His guidance,

leadership, and detailed knowledge on the subject provided the author with all the tools needed to succeed this summer.

UF Students Maintain Internship Experience with NextEra Energy

By Chelsea Collins

This summer, UF nuclear engineering students and ANS members Chelsea T. Collins. Mikaela Maher, and Hannah Morbach interned with NextEra Energy, an energy company headquartered in Juno Beach, FL, with eight commercial nuclear power units in Florida, New Hampshire, and Wisconsin. The internship lowa, program ran from the end of May until the second week of August. Chelsea, a graduate student, interned with the Nuclear Fuels department at the Juno Beach headquarters. Mikaela, a senior, interned in Reactor Engineering at the Port St. Lucie plant located in Jensen Beach, FL, and Hannah, a junior, interned in Reactor Engineering at the Turkey Point plant located in Homestead, FL. This internship was their second internship at NextEra for both Chelsea and Mikaela.



UF Nuclear Engineering students and ANS members (from left to right) Hannah Morbach, Mikaela Maher, and Chelsea T. Collins interned with NextEra Energy, based in Juno Beach, FL, this summer.

Chelsea worked with the Nuclear Fuels department at headquarters on a VIPRE-BOA code analysis for the Point Beach nuclear power plant located in Wisconsin; this analysis used thermal hydraulic input from the reactors at Point Beach to determine if the core for either unit was at risk of developing CIPS (crud induced power shifts). CIPS can occur when crud builds up on the fuel in the reactor and causes a shift in the axial power distribution. In Reactor Engineering at St. Lucie, Mikaela supplied power maneuver support to the members of the Reactor Engineering team and assisted with technical specification surveillances. She also got the opportunity to observe spent fuel pool activities and participate in a walk-down of containment. In Reactor Engineering at Turkey Point, Hannah assisted with the updating of the plant curve book. Some of her highlights from the summer included observing the receipt of new fuel on site and surveillance in the spent fuel pool of a metamic inserts campaign, the first time a had performed NextEra plant the maneuver.

Although they were based in different locations, there were multiple intern events hosted at Juno Beach that brought all of the interns together, including a Welcome Event during the first few weeks of the summer where the interns from sites across the 26 states NextEra Energy is located in gathered to network and hear from different executives in the company. This was followed by a Nuclear Intern Welcome event, where the nuclear interns were given the chance to meet and interact with the nuclear executives at NextEra as well as the Chief Nuclear Officer (CNO), Mano Nazar. Additionally, at the conclusion of the summer, the nuclear interns from each site traveled to the luno Beach location to give a presentation of their duties and accomplishments from the summer to the nuclear executives and members of the Human Resources College Recruiting team. The summer was extremely successful for all three ANS members, as all were offered return internship or job offers based on their graduation dates and plans. For any further information about the internship program at NextEra, please feel free to contact either Chelsea, Mikaela, or Hannah and they will be happy to provide you with further details or to discuss the program with you.

So far this year...

Coming off the previous academic year which saw UF ANS winning the Samuel Glasstone Award for Best ANS Student Section in the country, we've already had several successful events! The first general body meeting was attended by over forty students. These meetings are an excellent way to learn more about upcoming events, outreach, and hear guest speakers. Our next meeting will be Wednesday, October I at 5:30 PM in Rhines Hall, Room 125. This meeting will feature LT William Boyd from the Navy who will be giving a presentation on the Navy's nuclear programs. As always, there will be free pizza and drinks!



UF ANS members await the beginning of the first general body meeting.

ANS recently teamed up with the other societies within the Material Science and Biomedical Departments for their second annual Kick Off BBQ. There were over 200 attendees who were able to socialize, learn more about the different student societies, and enjoy BBQ.

UF ANS has also hosted two tailgate parties this year which were attended by several nuclear engineering students, friends, and professors.

Announcements

ANS T-Shirts

UF ANS is having t-shirts made. To order in person, please contact Chelsea Collins at ufl.ans.treasurer@gmail.com or order online by contacting Patrick Moo at ufl.ans.president@gmail.com. Orders must be placed by September 24.



2014-2015 T-Shirt Design

The t-shirts are \$10 a piece (+\$2 for sizes 2XL and up) plus \$5 shipping for orders being sent out of town.

ANS Fall Retreat

There will be a Fall Retreat to Ichetucknee Springs State Park on Saturday, September 27. There will be several activities as well as food and drinks. This is a great opportunity to become better acquainted with fellow classmates and ANS members. Cars will be departing from the Nuclear Sciences Building at 10:00 AM. For more details or to RSVP, contact Nick Yap at ufl.ans.vpinternal@gmail.com.

Port St. Lucie Tour

UF ANS will be doing a tour of Port St. Lucie Nuclear Power Plant on Thursday, October 16. The spots for this tour are now full; however, we are also looking for students interested in touring Kings Bay Naval Station. No date has been set at this point but please RSVP by contacting Hannah Morbach at ufl.asn.vpexternal@gmail.com.

National Nuclear Sciences Week

UF ANS and Professor K. Goluoglu are looking for volunteers to attend several area schools as part of an educational campaign for National Nuclear Science Week. If interested, please contact Nick Yap at ufl.ans.vpinternal@gmail.com.

ANS Student Conference

UF ANS is looking for undergraduate and graduate students who are interested in presenting their research at the ANS Student Conference at Texas A&M from April 9-11, 2015. Those who submit papers will be provided a hotel room at the conference. For more details, contact Patrick Moo at ufl.ans.president@gmail.com

ANS Calendar

Sept. 24	T-Shirt Order Deadline
Sept. 27	ANS Fall Retreat
Oct. I	ANS General Body Meeting
Oct. 16	Port St. Lucie Tour
Oct. 18	COE Homecoming Tailgate
Oct. 20-24	National Nuclear Science Week

What is ANS at UF?

The American Nuclear Society Student Chapter at the University of Florida is an organization of Nuclear and Radiological engineering students dedicated to the promotion of nuclear science and technology for the benefit of humanity. This chapter is instrumental in informing the public of everyday radiological applications

American Nuclear Society 202 Nuclear Sciences Building Gainesville, FL 32611

If you would like to join ANS or have potential news for the next issue, please contact the Secretary, Mychaela Coyne, at ufl.ans.secretary@gmail.com

Become an ANS National Member

The American Nuclear Society is a nonprofit, scientific and educational institution with roots dating back to 1954 when its founding members recognized a need to unify professional activities within the diverse fields of nuclear science and Today, Society's technology. the membership draws from an array of 11.000 industries. encompassing professionals including engineers, scientists, educators, and students. The Society's main objective is to promote the advancement of nuclear related engineering and science, but additionally encourages research, provides scholarships, disseminates information, hosts meetings highlighting scientific and technical papers, and cooperates with government agencies, educational institutions, and other similar organizations.

For more information or to join, please visit www.ans.org/join

