

2017-18 Neutrino



American Nuclear Society
Savannah River Section

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CNTA Liaison Jeff Brault

Chairman’s Message

We have made great strides in the past year to be active in our community outreach, collaborate with other local professional society groups, provide engaging technical programs for our members, and expand our scholarship program. Forward looking, our local section is set to host the PSA 2019, NETS 2020, and TOFE 2020 conferences. These are major revenue generators for our section that allows for funding of scholarships and community outreach activities. We need your help to make the conferences successful. Please consider paying it forward by volunteering some of your time to the conference organization committee and other outreach events. I encourage members and the executive committee to take an active role in making our local section meaningful for yourselves, for the local community, and for the proliferation of knowledge for nuclear science and technology nationally.



Tinh Tran

Visit our website to stay up to date at local.ans.org/savriv/

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Technical Meetings:

October

Michael McCracken, Lead Communicator for Southern Nuclear Company and Vogtle Public Relations and Education spoke on “Plant Vogtle Past, Present, and Future” with input from our own TJ Corder and Karen Bobkowski. Units 1 and 2 began construction in the 1970s with a permit in 1974. At one point construction personnel topped 14,000 making it the largest construction project in the U.S. at the time. Startup for Unit 1 was in 1987 and Unit 2 in 1989; currently operating with extension to 2047 and 2049, respectively. Mike showed a number of original construction photos. Units 3 and 4, which will be completed, have only about half the size of a construction force, planned to top out at 7,000 soon. A number of comparisons were made between the two projects such as how Units 1 and 2 had components barged in, but 3 and 4 are transported only by rail and truck. Southern Company’s complex energy portfolio was also discussed. While providing power to Georgia, Alabama, Mississippi and part of Florida, they also have solar and wind plants in California, Nevada, New Mexico, Oklahoma, Texas, and North Carolina. They are reducing to only 28% coal generation by 2021 and increasing to 14% nuclear. A little known fact, Plant Wilson just south of Vogtle is an oil plant for peaking demand and Vogtle refueling outages. Finally, Mike commented on some of the technical aspects of Units 1, 2, 3, and 4 such as fuel design, cooling tower specs, on-site spent fuel storage. The presentation ended with time lapse photos of the Units 3 and 4 construction project from ground breaking in 2009 to July of 2017.



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November

Dr. David Werth, Principal Scientist, Savannah River National Laboratory Atmospheric Technologies Division who spoke about “Evaluation and Mitigation of the Risk Due to Climate Change at the Department of Energy’s Savannah River Site”. The topic stems from an executive order issued to the DOE, and all federal installations, to evaluate the impact of climate change on future site operations. Dr. Werth approached the problem with three basic questions. First, how has climate changed at the Savannah River Site since it was built in the 1950s? He gave an overview of precipitation and temperature changes in the 1964 to 2013 period, noting a trend toward hotter days. Next, how do we predict how climate will change in the future? For this part of his talk, Dr. Werth gave a brief overview of how climatology models work, describing them as discretized fluid mechanics models that have to tackle the difficult problem of how air interacts with the surface of the earth. He discussed standard models used internationally and clarified that greenhouse emission models are changes in the heating of the surface area of the atmosphere. The third and final question was, how will climate change affect site operations? Heat and humidity affect the hours outside workers can work, how much energy is expended in environmentally controlling buildings, how the site’s forest is managed, and the behavior of the site’s water bodies. Not only are SRS’s bodies of water heat sinks and water sources, but serve as shields for cesium contained in the sediment. Dr. Werth’s study determined outside workers and site buildings were most at risk for losing work hours and costing more money to operate, respectively. The future work will be to work with DOE to develop a long term adaptive plan to prepare for future site operations in light of climate change.



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December

December was the annual Holiday Celebration. ANS Members and guests had a wonderful six course dinner with fine wines. All shared an enjoyable time with friends, family, and colleagues. Thanks to all who made this event so wonderful.



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January

The 2017-18 ANS National President Bob Coward, head of consulting firm MPR, spoke about “Nuclear Power Looking Forward: The Opportunity and the Implications”. Bob is long time commercial nuclear expert, having worked in some capacity at or for every nuclear power plant in the U.S. and a number of foreign plants. Tonight’s event was jointly hosted with CNTA and had a different format than usual. The typical dinner was replaced with heavy hors d’oeuvres. “Nuclear Power Looking Forward: The Opportunity and the Implications” highlighted the current energy situation in the U.S. where the energy markets are at a crossroads with significant disruption and serious questions regarding the direction forward. The role of nuclear power is a critical element of those decisions. He discussed the current situation, the role of nuclear power contributions in meeting “decarbonization” objectives, the overall opportunity in front of us, and the resulting implications as they relate to nuclear power in the U.S. and worldwide. Coward’s conclusion: things are not so good right now in the nuclear industry, but the immediate future is very promising. Additionally a moment was taken from tonight’s meeting to recognize last year’s winners of the Benjamin Scholarship.



February

Georgia Public Service Commission Vice-Chair Tim Echols who spoke to the section about “Why Nuclear Energy Remains Important in America”. Mr. Echols has been a commissioner since 2011, believes in a balanced energy mix, is from Jefferson, GA, and is a graduate of the University of Georgia. Mr. Echols began with a global discussion citing how nuclear became uncool with TMI and Fukushima, how Germany set the stage for closing nuclear plants (and letting energy costs skyrocket). He countered this citing how France has a good relationship with nuclear which is being passed to the next generation. Finally there was a warning that the U.S. should not let nuclear be led by Russia and China. The countries they seem to may not have the same safety standards and an accident anywhere reflects poorly on all nuclear. Echols then brought the discussion home focusing on the decision to move forward with Vogtle units 3 and 4. He indicated the positive public support for the program and

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commented on ways the commission tried to make the decision appealing including penalties if Vogtle is late, a refund to rate payers, and solar projects.

The commission always based their decision on the success of Vogtle 1 and 2 which went through a similar issue in their construction. But as Mr. Echols reminded us, there is still opposition in the form of legal protest from groups like Sierra Club and from competition with cheap natural gas. To continue making nuclear cool again the industry must be successful but also advertise – carbon free, sustainable, and safe.



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March

Charles “Chuck” Goergen spoke on “The Manhattan Project and the Origin of the DOE Complex.” Chuck Goergen is a chemist with more than forty years of experience in nuclear material processing/separations at SRS. He has a B.S. for the University of Detroit. Contrary to popular belief he did not work on the Manhattan Project. Chuck’s presentation discussed the formation of the first sites that would become the DOE complex during World War II. These included Oak Ridge, Hanford, Los Alamos, and University of Chicago/Argonne. While much Manhattan Project attention is typically placed on Los Alamos and Oak Ridge, Chuck made sure to speak on Hanford at length and about both White Sands Range and Fermi’s labs at University of Chicago. He then spoke to the post-war development of the other DOE sites within the weapons complex – Lawrence Livermore, Sandia, Nevada Test Site, White Sands Missile Range, Argonne, Idaho, Rocky Flatts, Pantex, and our own Savannah River Site. It was a good historical topic with plenty of Chuck’s levity and wit.



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April

Mr. Brandon Hodges, principle engineer for Savannah River Remediation, spoke on the replacement of Melter 2 at the Defense Waste Processing Facility (DWPF). Brandon has a B.S. from Clemson in materials and ceramics and is responsible for the success of the DWPF melter operation. The melter is the heart of the DWPF where High Level radioactive Waste (HLW) is mixed with borosilicate frit and heated to for the final vitrified glass that is the stable disposal form of SRS s legacy HLW. The failure of Melter 2 was not planned and it had far exceeded its 2 year design life. It was delivered to SRS in 1989 but operated from 2003 to 2017 pouring 2819 canisters of HLW. It was efitted only once, in 2010, to increase the melting rate and had several design improvements over Metler 1. The pour spout was lost in January of 2017, electrodes failed in February 2017, and by March a thermowell cooling water leak was detected. It was decided to de inventory the melter and replace it. This was a significant effort on the part of SRR, DWPF, and SRNL. Melter 2 had lasted so long that the decision was made to wait until failure to prep the disposal pathway for Metler 2 and to get Melter 3 ready to install.

Parallel project to get Metler 2 out of DWPF and into a waste vault and to get Metler 3 prepped were started. The maximize the disposal of contamination waste (anything from DWPF that has HLW glass stuck to it) the box for Melter 2' s disposal was also filled with accrued contaminated equipment and scrap (e.g. piping) from DWPF before being sealed in its concrete vault. To further reduce the risk of contamination, the box was sprayed with a fixative before leaving DWPF. Melter 3 meanwhile was prepped for operationand preloaded with a clean batch of glass frit. Melter 3 was in DWPF by June 2017, in its cell by July, and operational by December. DWPF also took the opportunity to complete maintenance and improvements that could only be done during a Melter replacement outage. Hanford Site observers were on hand to watch the evolution.



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May

In our first ever Facebook live stream, John Williams of Southern Company spoke on the topic of “Accident Tolerant Fuel”. Mr. Williams has been with Southern Company since 2005 and has over 20 years of experience in nuclear fuel including core design, storage, research with NEI, and as the Nuclear Fuel Director for Southern Company. He is a graduate of Georgia Tech. Much of the industry began working on accident tolerant fuel more than 10 years ago, but that work was accelerated by the 2011 Fukushima events. The fuel was brought to the industry at a rapid pace so it would be available to support the current reactor fleet. Phase 1 of 3 of this was a national evaluation taken on by national labs, the regulators, and universities and fuel vendors. Phase 2, which is where the industry is now, elected the three most promising accident tolerant fuel technologies for testing. Phase 3 will be full scale commercial roll out. The DOE wanted test assemblies in reactors by 2022, Southern Company’s Plant Hatch beat that by 4 years, becoming the first reactor in the U.S. to load test assemblies of accident tolerant fuel. Mr. Williams explained there are three aspects to accident tolerant fuel: improved coping time, reduced oxidation and hydrogen generation, and improved mechanical performance.



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July

The July meeting started with presentation of the Richard Benjamin Scholarship winners. See the separate section for details. Following distribution of the scholarship awards, guest speaker Professor Brian Powell, Robert Fjeld Professor of Nuclear Environmental Engineering and Science at Clemson University and Joint Appointee, Savannah River National Laboratory, presented his innovative work on how radionuclides move in the environment. He and his staff are performing laboratory and field studies to develop new models for radionuclide subsurface transport including plutonium, neptunium, and technetium. This research is especially important for better understanding conditions near nuclear waste management sites in the U.S., the United Kingdom, and elsewhere.



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Benjamin 2018 Scholarship Presentation

During the July 12, 2018 meeting of the Savannah River Section of the American Nuclear Society(ANS) three Benjamin Memorial Scholarship awards were awarded to CSRA students to help defray college costs for the 2018-2019 academic year of study. The awards are provided in the memory of its long-time member, Dr. Richard (Dick) Benjamin (1925-2013), to students expressing academic and career interests in science, technology, engineering, and mathematics (STEM) fields, and particularly those wishing to major in a field associated with nuclear science and technology. This year's \$2,000 Scholarship winners are Natasha Flores of Aiken High School, Kathryn Foral of Evans High School, and Michael Ray of Aiken High School. The near term plans of the three Scholarship winners are in keeping with the STEM core areas intended for support through the Benjamin Memorial awards. Ms. Flores will begin her study in Animal Science at Clemson University. Ms. Foral is beginning study in the School of Public Health at the University of Georgia. Mr. Ray will begin his studies in Engineering at Clemson University.

The Scholarship winners along with their parents were recognized. Chip Lagdon, 2018-19 Chairman of the ANS Savannah River Section, represented the Section and distributed the Scholarship certificates and checks to the students. He encouraged each of the recipients to work hard, graduate, but allow time to have fun when they could.

In addition to the Scholarship awards, Scholarship Chair Kevin O'Kula announced three additional students who would receive runner-up, or Benjamin Commendation awards. Students receiving the Commendation Award are Sarah Martinez (Academy of Richmond County) attending Georgia Southern University, Sydney Pepper (South Aiken High School) attending the University of South Carolina Honors College, and Steven Poore (Silver Bluff High School) attending Clemson University.



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Outreach and Education:

CSRA College Night

September 14, CSRA College Night. Representing the ANS-SR were Stony Reid (SRNS), Tracy Stover (SRNS), Karmen McWilliams (Oak Ridge University Partnership), Maeley Brown (AECOM), and Tinh Tran (AECOM). ANS-SR provided information to parents and students about careers in nuclear, nuclear technology and science. Also provided was information on ANS National and local section scholarships, and colleges/technical schools in the southeast that offer a nuclear engineering degree, and our own personal stories of our career path from high school, college, and through the work place, and fielded a variety of questions. The number of students interested was 50.

Science Education Enrichment Day

October 7, The event occurred at Ruth Patrick Science Education Center and USC Aiken. The ANS presenters were Dan Thomas, Brett Bland, Fred Pilot, Marty Macher, Steve Kimura, and Bob Eble. We had three tables going for most of the day. The fission chamber handled by Dan Thomas and Fred Pilot. The naturally occurring radioisotopes, detector and shielding; and the balloon nuclei and chart of the nuclides. ANS presenter spoke to over 300 students and family members. There were several memorable moments like when a young girl was handed one of the helium balloons. She obviously had never done this before because she held it loosely from the bottom and after one little giggle, it took off. She looked so depressed, and another balloon was filled for her. She held on to this one. A lessened learned, tying balloons is not as easy as it appears. Trying to tie 14 balloons together took about ½ hour. The smaller balloons were harder than the bigger ones. In addition, the smaller ones did not float so we tried to fill them to the max making them harder to tie together. We will get better the next time. This was the 33 rd Annual S.E.E.D. event



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Class Room Nuclear Blitz

October 16 thru 20th, the ANS and Areva supported 13 classroom sessions. Dan Thomas and Bob Eble made five presentations to about 150 students in the advanced and honors chemistry classes of Ms Poppy and Mr. Overholser at South Aiken HS on Tuesday. We attended the Teller Lecture on Thursday night with guest speaker James Conca, Science Contributor to Forbes on Energy and Nuclear Issues. On Friday, Michael Fendler and James Mercer (Southern Company) made five presentations to students from North Augusta High School. Over 100 students were involved.

October 18, Augusta University STEM Day. 4 groups of high school students; about 80 total involved. fifteen minute presentations on radiation basics, nuclear fission and nuclear power. Dan Thomas and Bob Eble made the presentation.

October 19, Kennedy Middle School; radiation basics; nuclear fission with the fission chamber, and nuclear power, four classes with about 80 total students. Dan Thomas and Bob Eble made the presentation.

October 21, Aiken Atoms in the Alley; general public display. Displayed balloons filled with helium that represent isotopes and have the audience guess which there are. Whoever answers correctly will win a prize. I had the chart of the nuclides there to help. We had about 70 folks enjoy the festivities. Dan Thomas and Bob Eble made the presentation.

November 21 and 22nd; Chukker Creek Elementary School; six classes with about thirty students per class. 180 total students; We used the radiation detector to show properties of radioactive materials and the fission chamber made with mouse traps and ping pong balls to show properties of fission and its uses in a nuclear reactor. Dan Thomas and Bob Eble made the presentation.

Nuclear Trivia

January 25, 2018 was Nuclear Trivia at the Aiken Brew Pub. We had the regular crowd and a few newcomers for some rounds of nuclear-themed trivia complete with nuclear-themed prizes, such as banana bread, fiesta ware, and ionizing radiation trefoil coasters.

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Future City

January 20 The winner of the “Best Energy System” was awarded to St Mary on the Hill’s city of “New Arborea.”. Judges were Ken Fernandez, SRS, Shanna Xia, SRS, Tinh Tran AECOM, and Dan Thomas, Areva MOX. This was 16th annual South Carolina Regional Future City Competition. The goal is to help middle school students better understand the practical applications of math and scientific principles. The program fosters an interest in science, technology, engineering, and math through hands-on components and helps students better understand the practical applications of STEM principles. Since the program began, it has been recognized by the education and engineering communities as an innovative learning approach.

The Future City Competition challenges students to design a city at least 100 years in the future and incorporate a solution to a citywide challenge that changes each year. This year’s topic was “The Age-Friendly City”. Teams will identify an age-related challenge that exists in today’s urban environments and engineer two innovative solutions that allow their future city’s senior citizens to be as active and independent. The competition was held at the University of South Carolina Aiken. The first place regional team traveled to Washington DC during National Engineers Week to compete against the other regional teams.



Girl Scout Merit Badge

February 19, Vogtle Nuclear Power Plant Visitors Center Girl Scout Merit Badge Program; four tables were set up with four nuclear related topics; radiation basics with the radiation detector; radioactive isotopes used in the world with the chart of the nuclides; Half-life demonstration with M&Ms; and radiation contamination protective clothing. There were about twenty girl scouts in the program. Bob Eble and Michael Fendler participated from ANS.

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Guinyard-Butler Middle School STEAM Fest

March 22nd, Dan Thomas and Michael Fendler, representing Orano, the MOX project, and the American Nuclear Society, participated in Guinyard-Butler Middle School's 6th Annual STEAM Fest. The topic of Radiation Science, Nuclear Power, and general uses of nuclear science was presented to four classes of approximately twenty-five 8th grade students. The students learned about the different types of radiation and natural occurring sources of radiation, before getting to use radiation detectors, and then learned about fission chain reactions, before seeing the mouse-trap fission chamber demonstration, and then learned about nuclear fuel used in commercial power plants and applications of nuclear science in medicine, space exploration, and agriculture, before learning about the colleges and universities that teach nuclear science and engineering, what jobs use the skills, and what the average starting salaries are for the jobs. The kids asked lots of questions and were interested in the topics.

Williston DIG STEM Festival

Dan Thomas, Steve Kimura and Bob Eble attended the Williston DIG STEM Festival on Saturday April 21st representing ANS and Orano. We provided presentations on fission, nuclear fuel, power plants, radiation detection, isotopes and radiation dose biological impacts. We talked to approximately 100 students and their parents. I talked to one young student, Katrisha, a 7th grader who is especially interested in nuclear science and biology. She and her mother asked where she might go to get more information. I recommended the ANS web site and USC Aiken summer programs. She later brought a classmate over to hear the radiation basics presentation again. Bob gave her an ANS scholarship program brochure. She was most interested in radiation hormesis and the effects of radiation on the immune system. It was enjoyable time but tiring.



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April 26, Lake Forest Hills; Four- 45 minute presentations to thirty student in each class. There were a 120 students total. Dan Thomas and Michael Fendler presented the information provided.

Future Topical Conferences

The following Topicals are being sponsored by the Savannah River section.

PSA 2019

The PSA 2019 is being held on April 28 to May 3, 2019 in Charleston, SC at the Charleston Marriott. The Savannah River has the honor of co-hosting the 2019 International Topical Meeting on Probabilistic Safety Assessment and Analysis (PSA 2019). The bi-annual conference was last held in Pittsburgh, PA in 2017. We at ANS-SR are looking forward to hosting leading experts in PSA from around the world next April. More information will be forth coming, but for now you can visit the PSA 2019 website at http://psa.ans.org/2019_ to learn about the program and the organizing committee.

TOFE 2020

The Technology of Fusion Energy (TOFE) 2020 Topical will be held in Charleston, SC, on April 19-24, 2020. The General Chairs: Greg Staack (Savannah River National Laboratory) and Gregg Morgan (Savannah River National Laboratory). The Program Chair is Paul Korinko (Savannah River National Laboratory).

NETS 2020

Jeff Brault is the General Chair for NETS 2020, (Nuclear and Emerging Technologies for Space).

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Upcoming Events for ANS Savannah River

| | |
|--------------------|---|
| September 13, 2018 | CSRA College Night |
| September 25, 2018 | Technical Dinner Meeting, Speaker: R. Craig Williamson, South Carolina Universities Research and Education Foundation |
| October 18, 2018 | CNTA Teller Lecture, Dr. Jose Reyes, Co-founder and CTO of NuScale Power (SMR concept) |
| November 8, 2018 | Technical Dinner Meeting, Dr. Charles R. (Chip) Martin, 2018 ANS Glenn T. Seaborg Science and Engineering Policy Fellow |
| December 4, 2018 | 20th ANS Holiday Celebration Event – North Augusta Community Center |

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Election results for the 2018-19 Officers and Executive Committee

The local section held elections for the 2018-19 year. The results are as follows:

| | |
|---------------------|-----------------|
| Chairman | Chip Lagdon |
| Vice Chairman | Amanda Bryson |
| Secretary | Tracy Stover |
| Treasurer | Daniel Thomas |
| Outreach Chair | Bob Eble |
| Membership Chair | Luke Hallman |
| Young Members Chair | Michael Fendler |
| Programs Chair | Kevin O’Kula |
| Publications | Phil Cupp |
| Arrangements | Tim Mckinsey |
| Admin | Dianne Shelton |
| Retiree Liaison | Mel Buckner |
| Vogle Liaison | TJ Corder |
| CNTA Liaison | Chuan Wu |
| Augusta University | Greg Passmore |

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American Nuclear Society – Savannah River Section Local Section Application

Note: This form can be filled out online at local.ans.org/savriv/join/

Directory Information:

Last Name: _____ First Name: _____ M.I.: _____ Suffix: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Email Address: _____ (used only for newsletter distribution, notification of meetings, and requests for local activity support)

Phone: _____

Occupation: _____ Employer: _____

Location: _____

Job Title: _____

Education Completed: Degree Year Graduated Course of Study

| | | |
|------------------------------|-------|-------|
| <input type="checkbox"/> BS | _____ | _____ |
| <input type="checkbox"/> MS | _____ | _____ |
| <input type="checkbox"/> PhD | _____ | _____ |

Section Information:

Are you a National ANS Member? Yes ☐ No ☐

If Yes: To what do you belong?

| | | |
|--|---|---|
| <input type="checkbox"/> Accelerator Applications | <input type="checkbox"/> Biology & Medicine | <input type="checkbox"/> DD&R |
| <input type="checkbox"/> Education & Training | <input type="checkbox"/> Decommissioning & Environmental Sciences | |
| <input type="checkbox"/> Fuel Cycle & Waste Management | | |
| <input type="checkbox"/> Fusion Energy | <input type="checkbox"/> Human Factors | <input type="checkbox"/> Isotopes & Radiation |
| <input type="checkbox"/> Material Science & Tech | <input type="checkbox"/> Mathematics & Computation | <input type="checkbox"/> Criticality Safety |
| <input type="checkbox"/> Nuclear Installation Safety | <input type="checkbox"/> Operations & Power | <input type="checkbox"/> Radiation Protection & Shielding |
| <input type="checkbox"/> Reactor Physics | <input type="checkbox"/> Robotics & Remote Systems | <input type="checkbox"/> Thermal Hydraulics |
| <input type="checkbox"/> Aerospace | <input type="checkbox"/> Young Members | <input type="checkbox"/> Comp Medical Physics |
| <input type="checkbox"/> Nuclear Nonproliferation | | |

Are you a National Committee Member? Yes ☐ No ☐

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Are you interested in working on a local committee? Yes ☐ No ☐

(e.g.: Executive Committee, Membership Committee, Scholarship Committee, Topical Committee, Outreach Committee...)

Interests: _____

Comments: _____

***Membership is free, and you do not have to be an ANS National member
Please forward completed application to ans.savannahriver@gmail.com***