

# 2021 - 22 Neutrino



**American Nuclear Society**  
Savannah River Section

**July 2021 to January 2022 Edition**

**Web address: <http://local.ans.org/savriv/>**

## **Officers and Executive Committee**

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Scholarship Co-Chairs: Selina Tavano and Ken Hofstetter

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## Chair's Message

Thanks for tuning in to the midyear Neutrino update!

2021 has been an exciting year so far: our section won the 2021 Best Meetings and Programs award from ANS national; we hosted the ANS president Steven Nesbit; and we won a significant grant for Bill Wabbersen to develop a mobile app for outreach and education. Around all of this and in the middle of the pandemic, we've been trying our best to balance everybody's safety while delivering a variety of enriching and entertaining events, both professionally and socially.

We look forward to the plans we are setting up for 2022 and want to see you there! To that end, much like last year's co-chairs, I want to encourage you to join ANS National and designate that we, ANS Savannah River, are your local section on your membership. Funding from your membership is distributed to your local sections and will help us with scholarship funds and paying for events. In return you get ANS National prices on conferences and their monthly magazine. Personally, as a recent college graduate, I've also found the networking and exposure to wider industry to be invaluable. Since learning never ends, I think you'd be able to reap the same benefits.

That said, I've been involved in the ANS Savannah River section since I started at the Savannah River Site (almost two whole years ago, for anybody counting). I come from up North, where I was involved in my undergraduate school's ANS section (Hello RPI!), and am grateful to continue my involvement down South. In closing, I want to encourage you to be involved with our local section in 2022 and beyond! I look forward to seeing and meeting all of our newer and more longstanding members at upcoming events. And if you even want to join us on the executive board and shape the local chapter yourself, we will welcome you in.

I wish you luck, health, and happiness this year!

Cheers,

Madeleine Waller

ANS-SR Section Chair 2021-2022



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## Technical Meetings:

### August

#### **John Dewes spoke live to us at 1:00 AM his time in Vienna by Zoom**

On August 26, at Fat Man's Café in Augusta, ANS-Savannah River Section offered a mentally-stimulating evening with John N. Dewes, now working with International Atomic Energy Agency (IAEA), speaking to us via Zoom in Vienna. John's presentation was entitled, "A Yankee in the Hapsburg Court."

Via Zoom from Vienna to its podium. Previously with the Savannah River Site, the Savannah River National Laboratory, and then Idaho National Laboratory, Mr. Dewes now works with the IAEA to support HEU minimization efforts around the world. His work involves repatriation of HEU from various countries, use of LEU for Mo-99 production, and other related topics. John discussed his ongoing work at the IAEA as well as life as a foreigner in Vienna.



John Dewes's Presentation via Internet and the attendees

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## Technical Meetings (Contd):

### September

#### ANS National President

On September 30, Steven Nesbit the 67<sup>th</sup> ANS President gave a presentation entitled “Used Nuclear Fuel and High-level Radioactive Waste Management: Past, Present, and Future”. The meeting at Newberry Hall was well attended. The managing and disposing of used nuclear fuel and high-level radioactive waste has proven to be one of nuclear technology’s thorniest issues. It is generally acknowledged to be a political rather than technical problem, but the U.S. program to address it is at a standstill. He discussed the development and then political closure of Yucca Mountain repository. Spent Nuclear fuel now sits in spent fuel pools and dry cast storage at sites around the country. Mr. Nesbit spent substantial portions of his career involved in various aspects of spent fuel management, and he discussed the history, status, and current prospects for the issue. He also summarized the ongoing ANS activities in this area. Steve had visited and toured Plant Vogtle with member of the Executive Committee earlier during the day prior coming to Newberry Hall.



Steven Nesbit

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## Technical Meetings (Contd):

### November

#### Augusta University Presentation

On November 16, the featured speaker was Dr. Joseph Newton, the Assistant Professor of Nuclear Science at Augusta University. His presentation was on the "Workforce Opportunities in Regional Careers (WORC) and Other Initiatives for Developing Tomorrow's Nuclear Workforce". The meeting was held at Mi Rancho as a change of pace since the pandemic. Earlier this year, Augusta University received a renewal of a five-year Workforce Opportunities in Regional Careers (WORC) grant.

Under the leadership of the Principal Investigator, Dr. Joseph Newton, Assistant Professor of Physics at Augusta University, the U.S. DOE and NNSA grant helped these students to gain research and work experience via SRS internships. Dr. Newton discussed the WORC grant and other initiatives in educating and training tomorrow's nuclear workforce. The students from AU started their careers at local businesses like Savannah River Site, Vogtle and Fort Gordon.



Dr. Joseph Newton and attendees



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## December

### Annual Holiday Celebration

The 22nd ANS Holiday Celebration took place on Monday, December 6th at the North Augusta Community Center. This year's event followed last year's cancellation and featured wines from Toast Wine and Beverage in Martinez, Georgia paired with dishes from world-class caterer Terry Wick of Augusta. Terry's team assembled an eclectic menu with dishes such as Goat Cheese with Herb/Charcuterie Bread Board, Alligator Sausage, Venison Meatballs with Angel Hair Pasta, Gaucho Gumbo and Lemon-Orange Bundt Cake.



The holiday celebration went well with 33 in attendance, and will hopefully be better attended next year. The ornament-making stations went over well and everyone agree that this feature should be featured in future celebrations. The ornament stations were a new fund raiser for the Benjamin Scholarship.



Oranament Making Station

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## Outreach and Education:

### **Nuclear Science Workshop for the Furman University Science Plus Institute**

ANS member Bill Wabbersen and CNTA member Jon Guy, attended a Teachers Workshop on July 13th. This is the second time that Bill and Jon had been invited to present and discuss nuclear fundamentals for this workshop.

The workshop is a component of the Science Plus Institute and it is used as a professional development class for South Carolina teachers. Greenville County schools (GCS) runs these classes through Roper Mountain Science Center. There are several types of week-long classes that teachers can elect to take. The class that ANS-SRS supports is a chemistry class for high school teachers. It is taught by Elizabeth Gordon, a professor at Furman University, and Chynthia Siddons, a high school chemistry teacher at South Point High School in Rock Hill, SC. For the past 10 years Elizabeth has had a passion for teaching nuclear science at Furman. She teaches a fall course each year that focuses on nuclear science that includes discussion related to power, medicine, and weapons. Chynthia attended the workshop that Bill and Jon presented in 2019 and has incorporated nuclear topics into her chemistry classes.

Teachers from Title I or underserved schools are given preference for the workshop. This year there were 13 teachers in attendance from high schools all over South Carolina. Many of the teachers were first-time chemistry teachers and they were able to take equipment and materials from the workshop back to their schools for use during the school year.

During the workshop Jon and Bill presented the following topics with a focus on hands-on activities:

- Atomic Fundamentals (using the marble gold-foil experiment)
- Journey to the Center of the Atom (using the Isotope Discovery Kit)
- Basics of Radiation (using the cookie analogy)
- Half-life (using M&Ms)
- Radioactive Decay Chains (using the Advanced Isotope Discovery Kit)
- Fission (using the new fissioning cookies activity)
- Fission fragment/Spent Fuel discussion (using the new fission fragment activity)
- ALARA activity (using NORM sources, and rad detectors to understand distance and shielding)
- Energy discussion

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## Outreach and Education (Contd):

- Nuclear Science in SC
- Savannah River Site introduction

The workshop was a very full day, and the reception from the teachers was great. There were excellent discussions about their understanding and misconceptions of nuclear. It was wonderful to see teachers actively participating in the hand-on activities. Many of them stated that they and their students were very tired of computer screens and they welcomed the chance to physically engage again.



## **Landis Public Communication and Education Award**

Mike McCracken, Southern Nuclear Plant Vogtle's Communication Lead, received the Landis Public Communication and Education Award in a presentation at the ANS Winter Meeting in Washington D.C. The educational programs Mike coordinates reaches a couple thousand people each year both onsite at the Vogtle Energy Education Center (VEEC) as well as during offsite and virtual (COVID-19) programs. The audiences for these programs include four-year universities, two-year technical colleges, grade schools, plus home schools along with programs with community, government, business, industry leaders and international visitors. Mike also partners with offsite organizations to bring his public outreach directly into the communities by attending events in those communities.

Mike also provides tours of the Plant Vogtle nuclear energy facility to educators and interested participants. A typical visit includes the control room, simulator exercises and meetings with facility personnel. In addition to these public programs, his company communications roles include managing



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## Outreach and Education (Contd):

Vogle's charitable contributions program, providing content for internal and external communications (i.e., web site, social media, newsletters), encouraging and coordinating employee involvement in the community, and serving as a media relations representative as part of the company's emergency response plan.

Mike's reach is not just limited to the local community, state or even country; he has been invited to other countries to share best practices with other nuclear energy entities. He recently joined a representative from Waynesboro, Georgia to represent the U.S. at the 3rd International Nuclear Power Plant forum in Kijang, South Korea, along with representatives from eight countries. Educators from the southeast have greatly benefitted from Mike's commitment to the education of their students in better understanding the benefits of nuclear energy. He diligently works to assist local educators through workshops at Plant Vogtle. His depth of knowledge produces sessions that are engaging to the instructors and provide valuable resources and information to disseminate to students across the region. He thoughtfully uses resources to explain the many facets of the nuclear industry. He has a reputation for actively engaging the audience to increase interest and provide clarification for misunderstandings and concerns related to the industry. His infectious enthusiasm for nuclear energy has helped many students see the energy industry as a viable career option.



Mike McCracken and Dr. H.M. "Hash" Hashemian, ANS Honors and Awards Chairman

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## Outreach and Education (Contd):

### **2021 Virtual STEM College Nights**

For the second successive year, ANS Savannah River Section hosted a series of virtual Science Technology, Engineering and Mathematics (STEM) College Nights featuring Southeastern universities with top-tier Nuclear Engineering and Radiological Engineering Department faculty members and local-area graduates. Sessions were held Wednesday, October 13 and Thursday, October 14, featuring Georgia Tech and North Carolina State University, respectively. The following week included the University of South Carolina on Tuesday, October 19, and the University of Tennessee-Knoxville on Wednesday, October 20. The University of Florida was featured on Monday, October 25, and Clemson University was the final College Night school on Wednesday, November 3. Table 1 lists the presenters for each school's College Night.

Each "night" was a one-hour Zoom virtual session featuring a faculty member presenting an introduction to the department and the university, followed by remarks from an alum in Nuclear or a related Engineering department on highlights of the school and a brief overview on what they are doing now in their work in the Aiken-Augusta-Columbia area. The two overviews were then followed by a Question & Answer period. Each session was designed for viewing by college-bound, nuclear science and technology students interested in pursuing either undergraduate or graduate degrees in science, technology, engineering, and mathematics (STEM) areas, at a major Southeastern university. The 2021 College Nights emphasized Nuclear and Radiological Engineering Department opportunities for first-year students as well as extending to those anticipating graduate study. The ANS Savannah River Section served as moderator for the Zoom sessions and ran the Q&A.

Presentations and recordings from each session will be uploaded after editing to the ANS Savannah River website for prospective student use in deciding on future schools for attendance.

(<http://local.ans.org/savriv/>)

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## Outreach and Education (Contd):

**Table 1. The Virtual College Night Schedule - ANS SR October 13 November 3, 2021**

Date (6:30-7:30 pm)	School	Faculty	Alum(s)
Wednesday, 10/13/21	Georgia Institute of Technology	Professor Steven Biegalski	Ms. Nuri Sinha
Thursday, 10/14/21	North Carolina State University	Professor Robert Hayes	Dr. Tracy Stover
Tuesday, 10/19/21	University of South Carolina	Professor Travis Knight	Dr. Kathryn Metzger
Wednesday, 10/20/21	University of Tennessee	Professor Jamie Coble	Mr. Graham Jones
Monday, 10/25/21	University of Florida	Professor Kyle Hartig Professor Justin Watson	Mr. Jon Guy Mr. Bill Wabbersen
Wednesday, 11/03/21	Clemson University	Professor Lindsay Shuller-Nickles	Dr. Joseph Mannion

## Featured Nuclear and Radiological Departments

1. Georgia Institute of Technology – Nuclear and Radiological Engineering and Medical Physics Program Chair Steven Biegalski presented on October 13, 2021 and was followed by recent Georgia Tech graduate, Nuri Sinha. Nuri works at SRS with the liquid waste contractor.

Relative to a year earlier, Professor Biegalski noted that the Tech campus in Atlanta was for the most part back to normal although virtual learning and classes would be a prominent part of how learning would continue.

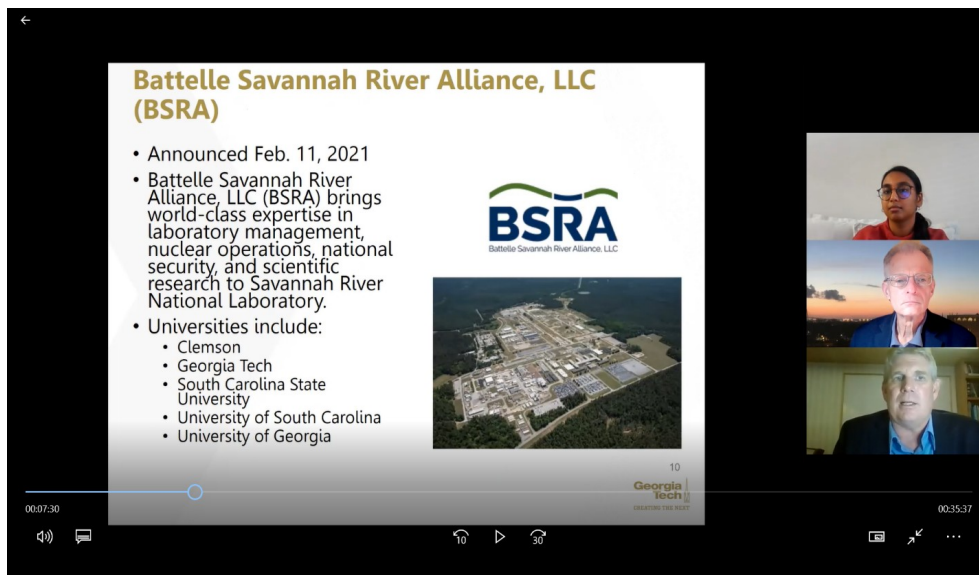


Figure 1. Alum Nuri Sinha, Moderator Kevin O’Kula and Professor Steven Biegalski discuss many benefits of a Georgia Tech education and the large number of employers in the Atlanta area and the Southeast U.S. They also covered an exciting connection with the university consortium and aspects

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## Outreach and Education (Contd):

of university involvement at SRNL with the new Savannah River National Laboratory contractor, Battelle Savannah River Alliance.

2. North Carolina State University – The second session on October 14, 2021 featured NC State. Professor Rob Hayes and NC State alum, Dr. Tracy Stover. Professor Hayes described his research interests and then highlighted undergraduate and graduate student opportunities in the Nuclear Engineering Department. Dr. Tracy Stover, ANS SR Secretary, gave an overview of the university, recommendations for undergrads, and provided insights to prospective grad students on study and life on the Raleigh campus (Fig. 2a and 2b).

**NC STATE Engineering**

## Health Physics at NCSU

<b>Health Physics Minor in the Nuclear Eng. Dept.</b> <ul style="list-style-type: none"><li>• ET105 Introduction to environmental regulations (1cr)</li><li>• NE202 Radiation sources, interaction and detection (4cr)</li><li>• NE290 Introduction to health physics (3cr)</li><li>• MEA215 Introduction to atmospheric science (4cr)</li><li>• AES323 Water management (3cr)</li><li>• ST370 Probability and statistics for engineers (3cr)</li><li>• NE404/504 Radiation safety and shielding (3cr)</li><li>• MEA412 Atmospheric physics (4cr)</li><li>• NR484 Environmental impact assessment (3cr)</li><li>• NE431/531 Nuclear waste management (3cr)</li><li>• NE490/590 Radiological assessment and nuclear emergency response (3cr)</li></ul>	<b>HP Graduate Certificate (pick 4 courses)</b> <ul style="list-style-type: none"><li>• Radiation Safety and Shielding</li><li>• Radiation and Reactor Fundamentals</li><li>• Principles of Radiation Measurement</li><li>• Nuclear Waste Management</li><li>• Health Physics and Radiological Emergency Response</li><li>• Radiological Assessment</li></ul>
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Department of **NUCLEAR ENGINEERING**

00:54:42

The slide includes a video inset on the right side showing three individuals: a man in a blue shirt, a man in a white shirt and safety vest, and a man in a red shirt in front of an NC State sign.

Fig. 2.a After covering his research interests, Professor Hayes went on to discuss both undergraduate and graduate features of the NE Department at NC State.



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## Outreach and Education (Contd):

### #3: Open door policies are there for a reason

- You are not going to school for a subject you already fully understand!
- NCSU has some of the best professors in the world!
  - **USE THEM** – You’re paying for them
- Ask questions often, go to office hours, get clarification
  - Especially as an engineer, an answer may seem correct and be totally wrong



Fig. 2.b Tracy Stover emphasized the NC State advantages and opportunities from the graduate student perspectives. He encouraged regular communication with their top-notch faculty.

3. University of South Carolina - Professor Travis Knight talked about USC Columbia and the graduate program in Nuclear Engineering. Alum Dr. Kathryn Metzger, graduate of USC’s grad and undergrad programs, provided highlights on her time at USC and especially graduate work in the NE Department. Kallie is now with Westinghouse in Columbia and is a leading subject matter expert on advanced nuclear fuels.

**Research Program: Advanced Coated Particle Fuels**

- **UO<sub>2</sub> Fuel kernel**
  - Lots of experience
  - Easier to fabricate
- **ZrC kernel coating**
  - Oxygen getter, reduce CO formation and pressure buildup
  - Reduce kernel swelling
  - Prevent kernel migration (amoeba effect)
- **Collaboration**
  - Nuclear Fuel Services

Fluidized-bed CVD Coater built at USC

Coated particles produced at USC

PyC and ZrC layers (early results)

Porter, I. E., T. W. Knight, M. C. Dulude, E. Roberts, J. Hobbs, Advanced TRISO Fuels with Zirconium Carbide for Very High Temperature Reactors, Nuclear Engineering and Design, submitted Sept. 2012

University of South Carolina

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## Outreach and Education (Contd):

Fig. 3.a Professor Knight covered aspects of his and the faculty's work at USC. He also provided an overview of graduate student opportunities at the Columbia campus.



**ANS** 


### Tonight's Alum Speaker – Dr. Kallie Metzger

- **Manager of Accident Tolerant Fuels Technology, Westinghouse's Digital and Innovation Division**
- **Recognized leader in advanced and high burnup fuel materials, serving in multiple advisory roles**
- **Past ANS Chair of Materials Science and Technology Division**
- **Experience at Idaho and Savannah River National Laboratories**
- **Key focus areas: Advanced fuel design & manufacturing; Fuel performance modeling & simulation, Advanced reactor development, and Spent fuel management and disposal**
- **Education (University of South Carolina): Ph.D., Nuclear Engineering; M.S., Nuclear Engineering, and B.S., Physics**


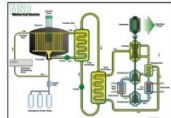


*ANS Savannah River October 19, 2021* 6


Figure 3.b Dr. Metzger, a past graduate student with Professor Knight discussed her fuels research work and how it's been great training for her career

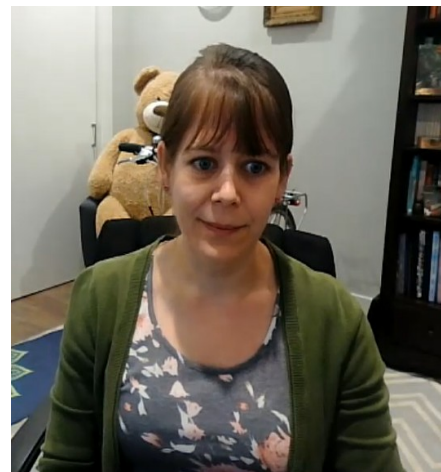
4. Graham Jones, a BS and MS (2019) graduate of UTK, followed his past faculty advisor, Dr. Jamie Coble, on the University of Tennessee – Knoxville's College Night session on October 20, 2021. Graham provided recommendations for undergrads and his opportunities he pursued while a student. Graham works for Savannah River Nuclear Solutions at SRS and is ANS SRS's Outreach Chair (Figure 4).



**Study Nuclear Engineering, Save the World!**

-  Nuclear Security & Nonproliferation
-  Advanced Nuclear Power
-  Medical Physics & Isotopes
-  Nuclear Decommissioning
-  Space Propulsion
-  Food Preservation
-  Nuclear Power





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## Outreach and Education (Contd):

**ANS** Tonight's Nuclear Professional & Alum: **Graham Jones**

- Nuclear Safety Engineer at the Savannah River Site – Since 2019
- Current focus: Downblend of Pu for shipment to Waste Isolation Pilot Plant (WIPP)
- Graduate student with Professor Coble on equipment failure studies
- Current ANS Savannah River Chair for Outreach
- Education (University of Tennessee): M.S., Nuclear Engineering (2018), and B.S., Nuclear Engineering (2017)

SEED Outreach, October 9, 2021

ANS Savannah River October 20, 2021

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Figure 4. Professor Jamie Coble (top right) of the University of Tennessee – Knoxville (UTK) notes that at UTK the departmental motto is “Study Nuclear Engineering – Save the World!” She covered opportunities and current progress in each of six areas shown top left. Graham provided an informative overview of his career as an undergraduate and graduate student at UTK.

5. The University of Florida College Night had Professor Kyle Hartig (top left in Figure 5.a) and Graduate Advisor Professor Justin Watson (bottom right) discuss opportunities in Gainesville at UF for undergraduate and graduate study. Jon Guy (top right) and Bill Wabbersen (bottom left) agreed that their experience at the University of Florida gave them a strong foundation for their careers at the Savannah River Site.



Figure 5.a The University of Florida College Zoom discussion roster included two faculty and two alumnus.



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## Outreach and Education (Contd):

**UF** Herbert Wertheim College of Engineering  
POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE  
NUCLEAR ENGINEERING PROGRAM, DEPARTMENT OF MATERIALS SCIENCE & ENGINEERING

### Possible Career Paths

- Academia
  - MS, PhD, Research at university
  - Thermal hydraulics, reactor physics, nuclear fuel/material
- Utilities/Nuclear Power Plants (NPPs)
  - Florida Power and Light (FPL) - Operates St. Lucie and Turkey Point NPP
  - Progress Energy - Operates Brunswick (NC), Crystal River (FL), Robinson (SC), and Shearon Harris (NC) NPPs
- Military – Sub/Surface Officer Navy, Army 52 Counterproliferation Officer, Air Force
- Nuclear energy companies – Research and design
  - Areva, Siemens, Westinghouse
- Regulatory, policy and/or politics
  - Nuclear Regulatory Commission (NRC)
  - NGOs - Nuclear Energy Institute (NEI), Nuclear Threat Reduction Initiative (NTI)
  - Non/Counter-proliferation – DOE, NNSA, NRC, Treasury, DoS, NGA, NRO, CIA, DIA
- National Labs
  - ORNL, LLNL, LANL, PNNL, SNL, ANL, BNL, SRNL, etc.
- Medical institutions
  - Radiology, cancer treatment, medical physics
- International agencies
  - International Atomic Energy Agency (IAEA) in Vienna (satellite office in Toronto)
  - OECD NE in Paris
  - UAE, JAEC

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Figure. 5.b Professor Hartig offered an extensive listing of potential career paths.



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## Outreach and Education (Contd):

6. Clemson University - Professor Lindsay Schuller-Nickles discussed opportunities at Clemson University for undergraduate and graduate study. She is very familiar to our Section having made an in-person presentation to the Savannah River during our Benjamin Scholarship dinner meeting in July 2021. Dr. Joseph Mannion of Savannah River National Laboratory talked about his experience at Clemson, and other early career activities.

### Where is “Nuclear” @ Clemson?

- Education
  - Undergraduate minor - Nuclear Engineering and Radiological Science (NERS)
  - Graduate degree
    - M.S. in Environmental Health Physics via Environmental Engineering and Earth Sciences
    - Ph.D. in Environmental Engineering and Earth Sciences with a focus in Nuclear Environmental Engineering and Sciences
- Research
  - Nuclear Environmental Engineering Sciences and Radioactive Waste Management (NEESRWM)

<https://www.clemson.edu/centers-institutes/neesrwm/>



Figure 6.a Professor Schuller-Nickles indicated where Nuclear Science and Technology is found at Clemson.



### Tonight's Nuclear Professional & Clemson Alum: Dr. Joseph Mannion

- 2019 – Present: Senior Scientist, Savannah River National Laboratory
- 2017 Post-Doc at SRNL
- 2011-2012: Process Engineer, Liquid Lignin
- Education
  - Ph.D., Chemical and Biomolecular Engineering (Clemson University, 2017)
  - B.S., Chemical and Biomolecular Engineering (Clemson University, 2011)

ANS Savannah River November 3, 2021

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Figure 6.b Dr. Joseph Mannion, an alum of Clemson, followed Professor Schuller-Nickles on November 3, 2021. He provided an overview of his undergrad and grad studies, and his work with SRNL.

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## Outreach and Education (Contd):

### **Summary Thoughts from ANS SRS College Nights Moderator**

Each of the six departments has found ways to teach and perform research during the pandemic. Some have maintained extensive testing and protocols should cases spike. All have expanded some form of virtual opportunities for undergraduate and graduate courses.

In general, the six interview sessions supported the realization that we're continuing to see an upturn in interest at both undergraduate and graduate levels in Nuclear Engineering and related disciplines, particularly in the Southeast. However, despite top-tier salaries for most graduates in Nuclear and Radiological Engineering, replacing the many that are leaving the workforce over the next decade will be a continuing challenge to universities, industry, and government organizations.

Again, we plan to upload presentations and faculty-alum conversations to our website. The information should be available for viewing the Savannah River website in early 2022.

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## Outreach and Education (Contd):

### Project S.E.E.D

This year's Project S.E.E.D event at USC Aiken was held on campus Saturday, October 9th. ANS set up two booths: an interactive display to detect radiation with a Geiger counter and various sources, and a demonstration of a fission chain reaction. Students were able to choose from an array of natural and manmade sources of radiation, and hold them up to the Geiger counter to see what makes it "tick", so to speak, and speak with the volunteer at the booth about any questions that came from the experience. Every 15 to 20 minutes, the second booth would be ready to demonstrate a fission chain reaction using ping pong balls and mouse traps. One volunteer would explain the fission process to the gathered crowd, how one neutron (or ping pong ball) would interact with a fissile atom (or mouse trap), which causes it to release its own energy and neutrons, which have a chance of repeating the interaction with a new atom. A few volunteers would then drop the first neutrons to start the reaction. The event was held for five hours, and reached hundreds of students and parents.



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## Outreach and Education (Contd):

**Two major ANS-Savannah River Section outreach activities are being launched in association with the University of South Carolina Aiken. Volunteers Welcome!**

In November 2021, two proposed ANS-SRS outreach projects were selected to be funded by an ANS National committee. The two projects involve the development of nuclear-themed computer/smartphone STEM Education applications. These projects will receive a total of \$4,000 through the ANS “Local Section and Student Section Strategic Fund Initiative”. Both projects will be a collaboration between ANS-SRS members and USCA’s College of Sciences and Engineering students. Student teams will be selected to complete these projects as part of their Capstone Project for the 2022-23 school year with mentoring and advice from ANS-SRS members.

The over-arching goal of the two projects is to improve the nuclear science and technology education of K-12 students using innovative computer/smartphone-based applications, developed by the undergraduate students at USCA. The development and deployment of these two applications is designed to improve ANS-SRS community outreach efforts and further engage students both in and out of the classroom in Aiken, South Carolina and Augusta, Georgia as well as other communities in the 18-county Central Savannah River Area (CSRA).

ANS-SRS’s winning proposals involve two related projects that will be developed by USCA student teams working in parallel.

Project 1 is to expand the previously developed ANS-SRS “Isotope App” beyond the current Android platform. Specifically, the Isotope App will be developed for Apple systems (iOS) and for Windows-based web applications.

Project 2 is to develop an application that mimics the physical ANS Isotope Discovery Kit that was developed by Bill Wabbersen and subsequently manufactured and distributed across the country by ANS National. The new “Isotope Discovery Kit App” (IDKA) will be used in classroom settings to demonstrate the basic principles of isotopes. The app will be developed for Android, iOS, and Windows-based web applications.



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## Outreach and Education (Contd):

After testing and deployment throughout the CSRA, the two new applications will be offered to ANS National to make available to other ANS Local and Student Sections, using “Navigating Nuclear: Energizing Our World™” and other existing ANS Programs.

Overall project planning is being led by ANS-SRS’s Bill Wabbersen. The ANS Grant will be used to procure software and licenses, procure hardware to develop the applications, procure server space, acquire high quality photos of each physical element to demonstrate uses of isotopes within the application, and to procure several dedicated devices for trial use with students.

If you are interested in participating as part of the ANS-SRS support team for these winning project proposals please contact Bill Wabbersen at 706-414-2256 or at succotash2005@yahoo.com. The initial ANS-SRS support team should be identified and in place by June 2022. USC Aiken students will be identified in the summer of 2022, with projects being launched in the early fall of 2022. The applications will be launched in the Spring of 2023.

## **Future City Resumes as a Virtual Event**

After a pause in 2021, the Future City middle school competition resumed in 2022 as a virtual competition with teams being asked to design a futuristic city using the three principles of a circular economy: designing out waste and pollution, keeping products and materials in use and regenerating natural systems.



**future City**  
COMPETITION

**A WASTE-FREE FUTURE**

Presented by:

**Aiken** **DISCOVER** **SRS**  
Ruth Patrick Science Education Center LET'S MAKE A DIFFERENCE SAVANNAH RIVER SITE

**19th Annual**  
**SC Regional**  
**Future City**  
**Competition**  
**Awards**  
**Announcement**  
January 22, 2022  
5pm  
<http://tiny.cc/SCFCAwards>

ANS Savannah River Section judges Graham Jones, Sid Keener and Kevin O’Kula evaluated all 19 teams with special emphasis on those with the Best Energy System. Final interviews were held on Saturday, January 22, 2022. Three of the 19 teams used or mentioned “nuclear” in their energy system planning.

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## Outreach and Education (Contd):

The winner of the Best Energy System was a project entitled, “Purity” of the Merriwether Middle School of North Augusta, South Carolina. Their city used biofuels to provide a clean energy source for small household devices and powerful wind turbines to produce energy for homes and businesses. To minimize litter, Purity used biodegradable packaging and bioplastics.

Overall, the first place for the 2022 SC Regional Competition was McCracken Middle School of Spartanburg. They will advance to the Future City Competition National Finals in Washington, D.C. next month. Another Merriwether MS team took second place with their city project entitled “Amorado,” and the Dreams Imagination & Gift Development Program of Williston, South Carolina placed third.

“Every year I’m impressed with the hours of work that typically goes into each city,” said Taylor Rice, who works with the SRNS education outreach division and coordinates the regional competition. “I admire their dedication and resolve to work as a team under the helpful guidance of a teacher and mentor.”

Each team of students was judged by teams of volunteers from professional societies including ANS SRS, STEM and design fields on deliverables. This included a 1,500-word essay, a scale model with a \$100 budget and a video presentation highlighting the team’s creativity, ingenuity and communication skills. Use of recycled materials for the model was encouraged.



Figure 1. Final interviews were conducted in a seven-minute Zoom session with each judging team.

# 2021 - 22 Neutrino

## Other Events:

### **ANS President Visits Plant Vogtle Units 3 and 4 Construction Site**

On September 30, Steve Nesbit and a few members of the ANS-SRS Executive Committee visited and toured Plant Vogtle units 3&4. The group met first at Vogtle Energy Education Center where they viewed a model of Westinghouse’s AP1000 prior to going on the tour. “We were thrilled to show the ANS president around the construction site of Plant Vogtle units 3&4 where the country’s only new nuclear power plant in more than 30 years is being built,” explained Vogtle tour guide and ANS member Mike McCracken. Mr. Nesbit and the local ANS representatives got to see firsthand the progress being made to finish the units so that they will safely and reliably generate carbon-free electricity for six to eight decades into the future.

Mr. Nesbit stated “Mike McCracken of Southern Company gave us a great tour of Vogtle Unit 4 plus an overview of the entire Vogtle site. It was an impressive reminder of the scale and challenges involved in constructing a large light water reactor. We all look forward to seeing Vogtle 3 and 4 join the family of operating power reactors in the United States.”



Kevin O’Kula, Steve Nesbit, Phil Cupp and Tracy Stover

# 2021 - 22 Neutrino

## Future Events

### Technical Meeting

The January technical dinner meeting featuring Dr. Kallie Metzger of Westinghouse Columbia, will be rescheduled to Thursday, February 24th at Newberry Hall. Contact ANS SR at [ans.savannahriver@gmail.com](mailto:ans.savannahriver@gmail.com) for more details and to make a reservation.

Dr. Kallie Metzger the Manager of Accident Tolerant Fuels Technology within Westinghouse's Digital and Innovation Division will be the quest speaker. As a technical leader, she manages an interdisciplinary engineering team and develops programs to ensure the successful delivery of advanced nuclear fuels.

She is a recognized industry technical leader in the area advanced and high burnup materials and serves in multiple advisory roles including:

- Deputy Chair of the Fuel Performance and Testing Technical Experts Group on extending High burnup in LWRs
- Westinghouse representative for the Nuclear Energy and Modeling Simulation (NEAMS) Advanced Reactor and Light Water Reactor Industry Councils
- Adjunct Professor at Boise State University, and past Chair of the Materials Science and Technology Division within the American Nuclear Society

A South Carolina native, she earned her bachelor's degree in physics and her masters and doctoral degrees in nuclear engineering from the University of South Carolina. As a DOE-Sponsored Integrated University Program (IUP) Fellow. She worked at both Idaho and Savannah River National Laboratories prior to joining Westinghouse.



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## Awards

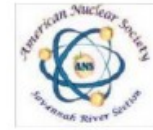
**Savannah River Section Winner of the ANS Local Section - Best Meetings and Programs**



# 2021 - 22 Neutrino



Savannah River Section, P.O. Box 7001, Aiken, SC 29804



<http://local.ans.org/savriv/>

## 2022 American Nuclear Society Savannah River Section BENJAMIN MEMORIAL SCHOLARSHIP



The Benjamin Scholarship is a competitive financial award given in memory of Dr. Richard W. Benjamin towards the first year of a four-year Science, Technology, Engineering and Mathematics STEM College/University or either year of a two-year Technical College degree program.

- **Scholarship Award(s) to be based on number and quality of applications.**
- **Seeking students with STEM career goal, potentially interested in a Nuclear Science and Technology career.**
- **Current CSRA graduating high school seniors or first-year technical college students are eligible.**
- **Application window : February 7 - April 30, 2022**
- **Required Application Materials and Evaluation Criteria (%):**
  1. Cover letter including the student's name, address, evening phone number, current school, and home email address and name of college or technical school to which the Benjamin Memorial Scholarship would be applied. If the school is uncertain, then name the current top choice(s) (10%).
  2. A one-page essay (300 words or less) on why a career in science, technology, engineering, and mathematics, and educational is the goal of the student; Highlight what you plan to pursue in college & potential career goals (40%)
  3. High school transcripts (seven (7) semesters in the case of current high school seniors); plus first-semester transcripts for applicants who are first-year technical college students, along with their entire high school transcript; (20%)
  4. Two (2) letters of recommendation from education institution or community organization individuals (e.g., teachers, coaches, service or religious organization leaders, etc.). Each recommendation is weighted 15%. (30%)
- Submit application materials by: 1) Email with attachments to: [ans.savannahriver@gmail.com](mailto:ans.savannahriver@gmail.com), or 2) U.S. mail to:  
**Benjamin Scholarship, ANS-Savannah River Section, P.O. Box 7001, Aiken, SC 29804**
- **Scholarship Award(s) will be announced in early June 2022.**