



# The Neutrino



American Nuclear Society  
Savannah River Section Newsletter  
P.O. Box 7001, Aiken, SC 29804  
March 2014 - July 2015

<http://www.ans-sr.org> and <http://local.ans.org/savriv/>

## 2014 – 2015 ANS-SR Leadership

### Section Officers:

#### **Chair**

TJ Corder, Southern Company

#### **Vice-Chair**

Chuan-Fu Wu, ESH Solutions

#### **Treasurer**

Jay Bilyeu, Retired DOE/SR

#### **Secretary**

Peter Shaw, Westinghouse

### Executive Committee and Liaisons:

#### **Arrangements Chair**

Sid Keener

#### **Education Outreach Chair**

Bob Eble, AREVA Federal Services

#### **Membership Chair**

Tinh Tran, URS PS

#### **Program Chair**

Carl Mazzola, CBI

#### **Communications Chair**

Kevin O’Kula, URS PS

#### **Topical Chair**

Rob Addis, SRNL

#### **CNTA Liaison**

Jeff Brault, ANL Consultant

#### **Young Members/NAYGN Liaison**

Kevin Departhy, CBI

#### **Plant Vogtle Liaison**

Phil Cupp, Southern Company

#### **Retiree Liaison**

Mel Buckner, Retired SRNL

#### **Past Section Chairs**

Kevin O’Kula, URS Professional Solutions  
2013-2014

Tinh Tran, URS Professional Solutions  
2012-2013

#### **Administrative Assistant**

Diane Shelton

[ans.savannahriver@gmail.com](mailto:ans.savannahriver@gmail.com)

## **Message from ANS Savannah River Chair TJ Corder**

Hello!

It is my honor to be able to write this Chair's message, and I want to begin by letting you know I am proud to be a part of your organization! Our local ANS section provides many benefits and opportunities, and we have received repeated national recognition for them. ANS National gives out just four awards for large local sections, and we have won each of them within the past two years. This year we clinched three of the four (see pp. 11-12 for article)! In case you haven't heard, ANS-SR received the large local section awards for Best Meetings and Programs (for the second year in a row), Best Section Management, and Best Membership. Last year we also received the award for Best Public Information and Outreach. Thank you, thank you, thank you for the time you have given to support our mission of promoting awareness and understanding of the application of nuclear science and technology.

With that introduction, let me ask you, what benefit have you gotten from your membership in our local section of ANS?

The communities in our area are certainly seeing great benefit. These past few years have been dynamic. We have seen a surge in student participation in events like Nuclear Science Week (held annually in October) and growing desire by teachers in our area to learn about nuclear science. I love seeing the enthusiasm on students' faces when talking about what they might want to study in college or learning how the nuclear world around them works. Our teacher outreach program is especially important because when we equip teachers to teach nuclear science, we are multiplying our efforts. We have multiple events each month and we need new volunteers to sustain our efforts.

We also promote education through scholarships. In early 2014, the Dick Benjamin Memorial Scholarship was founded, in memory of our longtime friend and local section member and leader. The scholarship supports local students choosing to study in one of the science, technology, engineering, and mathematics (STEM) fields or technologies. If you, too, want to support this mission, it's worth noting that our local section has recognition by the IRS as a fully tax deductible 501(c)(3) charitable organization. In addition, members who attend our technical dinner meetings have an opportunity to network with other professionals and hear a distinguished speaker share their expertise. For example, I found Dr. Moody's vision on the future of SRS very insightful. Flip through this newsletter to see summaries of the recent notable speakers we have recently hosted. (Continued page 2).

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## **Chair's Message (continued from page 1)**

Topical meetings are another opportunity to get both professional and technical development, and connect with the national ANS organization. In 2016 we will host the TRITIUM 2016 topical, and in addition to several leadership roles with this conference, we will need volunteers to help with smaller assignments or to be mentored on how to run a Topical. It's an integral part of how ANS advances technology. (See related article on p.4).

Finally, we have the perfect opportunity to build for the future by establishing strong partnerships with other organizations like the North American Young Generation in Nuclear (NAYGN), whose members are enthusiastic and excited about the future. It's contagious! These organizations are growing faster than our industry can come up with acronyms to describe them. All kidding aside, the stage is set for us to leverage our existing base of nuclear professionals and this influx of young energy as our region leads the nation in building new nuclear capacity. What better way to promote the awareness and understanding of nuclear science and technology?

The feedback we are getting is that our programs greatly enrich and benefit those who attend, and I want to be sure we are benefiting you. Be on the lookout for surveys on how we can improve our section in the new year. In the meantime, [help us learn what is important to you](#); send us a note at [ANS.SavannahRiver@gmail.com](mailto:ANS.SavannahRiver@gmail.com).

I'll wrap up this message by asking you to think about the future and beyond: How do you want to grow the benefit you get from the Savannah River chapter of ANS?

I'm excited about the possibilities.

TJ Corder  
2014-2015 ANS SR Chair



## **Southeastern Summer Nuclear Institute (Contributions from CNTA, Mel Buckner, Others)**

Twenty-one middle and high school teachers from Georgia and South Carolina took time out of their busy summer schedules to participate in the Southeastern Summer Nuclear Institute (SSNI) July 15-17 to promote nuclear education and workforce development in the southeast. The Institute was hosted by Citizens for Nuclear Technology Awareness (CNTA) and was directed to teachers who have an interest in learning or sharing more knowledge about nuclear technology applications. The key goal was to promote student interest in science, technology, engineering, and mathematics (STEM) education and related careers. Mel Buckner (SRNL retiree) and Mike McCracken (Southern Company) coordinated the first SSNI as a pilot program to enhance teacher outreach activities during the summer vacation months in the Central Savannah River Area (CSRA).

(Continued on page 3)



SSNI Teachers visited the Vogtle Unit 1&2 Simulator and participated in a training exercise. The teachers also visited the Unit 3&4 simulator and were impressed by the advanced digital technology.

The agenda for the Institute included a tour of Georgia Power's Vogtle nuclear power station in Burke County, GA, with visits to the Vogtle 3&4 construction site, simulator exercises, and meetings with nuclear power reactor personnel. The Institute also featured a tour of the Savannah River Site (SRS), including waste management facilities and briefings on activities at the Savannah River National Laboratory. Classroom workshops on the mornings of July 16 and 17 at the University of South Carolina Aiken, emphasized atomic and nuclear fundamentals, power generation fundamentals, nuclear technology applications, risk (real vs. perceived), and nuclear workforce opportunities. Hands-on activities were used to illustrate important technical concepts and scientific principles which the teachers can use in their classrooms.

Attendees received educational resources including a DVD with the workshop presentations and reference materials, teacher guides and outreach materials from the American Nuclear Society (ANS), a certificate of completion and \$50 in gift cards. All meals were provided and on campus housing was available for those attending from outside the local area.

Follow-up with the teachers is planned during the school year to assess the lasting impact of the Institute and the value of the materials provided to the teachers. Based on the initial teacher evaluations, they were nearly unanimous in their rating of the overall value of the Institute (4.89/5.00) and the likelihood of recommending to other teachers (4.84/5.00). Their comments were consistent with these high ratings. Several suggested three full days next time. Also, they were impressed with the collaboration among schools, industry, and business, and the strong community involvement, particularly the dedication of the

volunteers, who contributed to the overall success of the Institute. Based on this very positive response, planning for the second SSNI during the summer of 2016 has started.



Jon Guy explains the chart of nuclides using the Isotope Discovery Kit. The Kit was developed by SRS nuclear engineer and ANS SR member Bill Wabbersen, and is available through the ANS Outreach website, <http://www.nuclearconnect.org/in-the-classroom/for-teachers/isotope-discovery-kit>. It is regularly used by our Section members and other ANS sections.



Sharon Marra, Senior Vice President and Deputy Director of the Savannah River National Laboratory presented the Savannah River Site Waste Management Program to the teachers.

### **ANS Section Vice-Chair Chuan Wu**

The Vice-Chair of the ANS SR Section for the 2014-2015 term is Dr. Chuan-Fu Wu, co-owner of ESH Solutions, Inc. ESH Solutions began business operation in Barnwell, South Carolina in 2013. The company provides technical consulting services in environmental compliance, nuclear safety, radiation protection, quality assurance, and waste management to governmental and commercial nuclear facilities.

Chuan has been an active member of the ANS since 1994. He cofounded the ANS local section in Carlsbad, New Mexico, and served as the first Chair of the section. He also served on the ANS Public Information Committee during 1998 – 2001. In addition to supporting the ANS, Chuan serves on the U.S. National Committee to the International Electrotechnical Commission (IEC) for Technical Committee 45B “Radiation Protection Instrumentation”, the Program Advisory Committee of Waste Management Symposia, and the International Collaboration Committee of the Health Physics Society. He is also a member of the Federal Senior Executives Association.



Chuan is looking forward to expanding his role with the ANS SR Section. He has more than 30 years of combined experience in nuclear energy, environmental protection, workplace safety, and project management at the Oak Ridge National Laboratory, the Waste Isolation Pilot Plant (WIPP), and the DOE Office of Environmental Management (including Senior Executive Service positions during 2007 – 2011). Chuan has developed many professional relationships and friendships through his long career. Now he has been able to renew many of these in his move to the Central Savannah River Area. Consequently, while he is relatively a newcomer to the ANS SR Section, he is well-known to many.

Chuan has a PhD in Nuclear Engineering from MIT and an MBA from the University of New Mexico. He was born and raised in Taiwan, where he received a BS in Nuclear Engineering and an MS in Health Physics, both from the National Tsing-Hua University.

Chuan begins his one-year term as ANS SR Section Chair in July 2015. If you haven’t already, please make it a point to greet Dr. Chuan Wu and welcome him as the Savannah River Section Chair at our first fall meeting.

### **Savannah River Section to Host the TRITIUM 2016 Conference Charleston, SC ♦ April 2016**

The 11th International Conference on Tritium Science and Technology, *Tritium 2016*, is scheduled for April 17-22, 2016 in Charleston, South Carolina. This will be SR’s next topical conference hosting opportunity and comes less than three years after the very successful PSA 2013 Conference in Columbia, SC. The ANS sponsored conference, to be held at the Charleston Marriott, will be technically coordinated through the Savannah River National Laboratory (SRNL) with key participation by our section’s membership. Some of the individuals and their support functions to the conference are:

- Rob Addis (SRNL) – General Chair
- Jim Klein (SRNL) – Technical Program Chair
- Lee Hamilton (SRNL) – Exhibits Chair
- Tinh Tran (URS Professional Solutions) - Registration Chair
- John Dewes (SRNL) – Finance Chair
- Kevin O’Kula (URS Professional Solutions) – Publication Chair.

In addition, Karen Bobkowski, Bob Rabun and Carl Fields are serving on the Exhibits/Sponsors Subcommittee.

*Tritium 2016* expects over 300 participants, with perhaps as many international participants as U.S. participants. The SR Section benefits significantly from hosting these types of topical meetings, as the revenue they generate makes possible our outreach, public education, and scholarship support (See for example, the following article on the Benjamin Memorial Scholarships).

The objective of *Tritium 2016* is to provide a forum for an exchange of information on science, technology, engineering, and general experience in safe tritium handling for fusion, fission, pharmaceutical, and other isotopic applications for peaceful uses. The Call for Papers distributed worldwide is found on page 13.

ANS SR needs your help, especially during the conference itself. Reach out to Tinh Tran ([tinh.tran@aecom.com](mailto:tinh.tran@aecom.com)) if you can volunteer in some way at next April's conference.

### **The Savannah River Benjamin Memorial Scholarship: Two Years of Recognizing Exceptional STEM High School Seniors**

The first two years of providing Benjamin Memorial Scholarships have been successful. We summarize the first two groups of winners by the award year.

**2014:** The Savannah River Section of the American Nuclear Society (ANS) awarded its first class of Benjamin Memorial Scholarship in May-July of 2014. The Scholarships are the first provided in the memory of long-time member, Dr. Richard (Dick) Benjamin (1924-2013) to students expressing academic interests in science, technology, engineering, and mathematics (STEM), and particularly those wishing to pursue a career in a field associated with nuclear science and technology.

The first Scholarship winners were Jacob Williams of Harlem High School, Brandon Bolton and Peyton Tharp of South Aiken High School, and Eric White of North Augusta High School. Mr. Williams began study in the Nuclear Technology Program at Augusta Technical College later in 2014. Mr. Bolton began study in Chemical Engineering at the University of South Carolina – Columbia. The other two Scholarship winners began study at Clemson University, with Ms. Tharp entering the Calhoun Honors College in Biomedical Engineering, and Mr. White entering Mechanical Engineering.

Commendation Awards went to Nicole Fuller of North Augusta High School attending Southern Illinois University, Brandi Graham of Harlem High School attending Mercer University, Ryan Hammond of North Augusta High School attending Clemson University, Dallas Hayes of Davidson Fine Arts Magnet School attending the University of Georgia, and Joseph Rabin of Aiken High School attending Clemson University.

Student winners were recognized during the July 17, 2014 SR monthly technical dinner meeting at Augustino's Restaurant (Augusta Marriott at the Convention Center) in Augusta. Financial support of \$6,500 was provided to nine students in total, four at the Scholarship level and five at the Commendation level (See photo on page 6). Jeff Gasser of the

Southern Nuclear Operating Company later provided a technical presentation on the construction status of the Units 3 and 4 at Plant Vogtle.

**2015:** The second round of the Scholarship awarded three Scholarships and three Commendation awards to 2015 graduating CSRA high school seniors on Monday evening, June 1, at the Section's monthly dinner meeting at Newberry Hall in Aiken. The awards were presented immediately before remarks from Mr. Eugene Grecheck, then Vice President and Chair-Elect of ANS, and currently, the 2015-2016 ANS President.

The \$1,500 Scholarship winners were Muhammad Ali Rizvi of Aiken High School, David Stoner of South Aiken High School, and Jessica Tran of Davidson Fine Arts Magnet School (Augusta). The near-term plans of the three Scholarship winners are in keeping with the core areas intended for support through the Benjamin Memorial awards, with Mr. Rizvi beginning study in the Computer Engineering at Georgia Tech, Mr. Stoner planning to study Mathematics at Harvard University, and Ms. Tran planning to study Biological Engineering at the University of Georgia. (See photo on page 7).

Commendation Awards of \$750 were also awarded later in June to Grace Huber of Lakeside High School, Chance Pittman of Aquinas High School (Augusta), and Allison Swiecki of Midland Valley High School (Graniteville). Ms. Huber plans to attend Georgia Tech and plans to major in biology. Mr. Pittman will attend the University of Georgia and plans a career in the nuclear field. Ms. Swiecki will begin study at the University of South Carolina – Aiken in a science discipline.

Savannah River Section Scholarship Chair Kevin O'Kula noted, "All of the Benjamin Memorial Scholarship applicants were impressive in what they have accomplished in a very short time, and the Scholarship Committee had difficult choices to make. However, the six awards were made to students who are truly exceptional, and are well on their way of becoming the next generation of our country's leading scientists, engineers, educators, mathematicians, technicians, and related professionals."

Dick Benjamin was a mentor to many nuclear science and technology professionals in the Aiken-Augusta area for over four decades. He received his B.A. in Engineering from Lamar University, M.S. in Nuclear Engineering from Southern Methodist University, and earned his PhD in Nuclear Physics from the University



The 2014 Benjamin Scholarship winners Brandon Bolton, Peyton Tharp, Mrs. Sally Benjamin, Eric White, and Dr. Mel Buckner (ANS Savannah River Section Scholarship Chair). Not present - Jacob Williams. The Selection Committee included Tinh Tran, Sid Keener, Pete Shaw, Kevin O’Kula and Mel Buckner (Chair).

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of Texas in 1965. After a three-year post-doctoral study at the Swiss Federal Institute of Technology, Dick came to the Augusta area in 1968 with the acceptance of employment at Savannah River Laboratory (now Savannah River National Laboratory). He worked in many technical areas during his Savannah River Site career, most notably being the Reactor Physics, Atmospheric Technologies, and Advanced Planning Groups, and the Accelerator Production of Tritium Project. During his long and illustrious ANS career, he was active with the Fuel Cycle and Waste Management and Environmental Sciences Divisions. In June 1992, Dick represented ANS at the first United Nations Framework Convention on Climate Change held in Rio de Janeiro.



2015 ANS Savannah River Benjamin Memorial Scholarship winners received their awards on Monday, June 1 at the monthly dinner meeting of ANS Savannah River. Shown (left to right) are Scholarship recipient Muhammad Ali Rizvi, ANS President-Elect Gene Grecheck, Scholarship recipient Jessica Tran, and Savannah River Section Chair TJ Corder. Not present was the third Scholarship recipient, David Stoner.



Scholarship Chair Kevin O’Kula presented a biographical summary of each of the winners during the June 1, 2015 Award Presentation and also gave credit to the three runners-up (Commendation Awards). The 2015 Scholarship Committee included Mel Buckner, Ken Hofstetter, Karen Bobkowski, Jonathan Lowrie, Amanda Bryson, and Chair O’Kula.

**SEED Day – Aiken, South Carolina – October 2014**

Our Section again supported the Science Education Enrichment Day (SEED) Day program at USC Aiken on October 11, 2014.



(Above) Bob Eble discusses the “Mouse-Trap” fission chamber at SEED Day,  
(Bellow) Overhead view shows a portion of the students, teachers, presenters and volunteers at SEED Day.



## **STEM Fest and ANS Savannah River at Guinyard-Butler Middle School**

Bob Eble, Robert Gilmore, and Dan Thomas, members of the Savannah River Section, attended “STEM Fest” at Guinyard-Butler Middle School in Barnwell, S.C., on March 26, 2015. They spoke to five seventh and eighth-grade classes, and in total interacted with about 80 students. Three presentations were made to each class. The first presentation included an introduction to radiation science and a hands-on experiment on radioactive decay and radiocarbon dating using M&Ms (very popular presentation given the students were allowed to eat the exhibit materials). The second presentation provided details of the effects of distance and shielding on radiation dose rate from a  $^{137}\text{Cs}$  button source, and the third was on fission, uranium fuel, and nuclear power.

Eble provide a number of lessons learned comments. He stated, “It took several classes before we got the timing down for each of the 70 minute presentations. The students especially enjoyed the M&Ms and the fission chamber. Several good questions came up. One girl asked if she had a 30 year half-life how long would she live. I explained that half-life is a statistical or mathematical expression that can only be applied to many numbers of events. There is no way to define half-life for only one. However, if we expressed it for all of the atoms in her body, then we could show that her atoms would remain radioactive for several hundred years or over 10 half-lives.

We were also asked about the value of a single PWR fuel pellet. We didn’t have that information available but we estimated that the cost is about \$10. We explained that the value would be based on the cost of electricity in the service area but would be about \$20 per pellet.

There were several questions concerning the height, weight and radiation dose rate from a fuel assembly. When I asked one group what they had learned from our presentation one student said, “I like the way you use a negative exponential function to represent the half-life.”

The Section team had a chance to meet with Mr. Craig Hart, the principal. They indicated that it is always a pleasure to meet with his students and that in general they are well disciplined and attentive. In an e-mail to the three presenters inviting them back for next year’s STEM Fest, Melanie Corell, an eighth grade science teacher and chair of the school’s Science Department, said, “You sparked the students’ interest in STEM, which is exactly what we want every presentation to accomplish! Thank you for your well-thought-out, excellent, hands-on presentation activities. You hit a home run with the students.”



Robert Gilmore shows a student how radiation reading varies with distance during STEM Fest.

## Future City January 25, 2014

Sid Keener, Herb Demart and Bob Eble helped judge in the Future City competition January 25, 2014, at USC Aiken. There was a drop-off in competition from 2013 yet there were still 34 teams competing in 2014. The team from Paul Knox Middle School, *Magnicity*, won the best energy systems award using 5000 MW of nuclear power and recycling their used fuel for additional power.

The best Automation/Computer Applications special award was won by St. Mary's team, Fremtiden, with an all-electric ocean tidal generation system and an automated car transport system. The best overall city was from Aiken Area Home Educators.



ANS SR judge Sidney Keener poses with the Aiken Area Home School team, overall winners of 2014 Future City



## South Aiken High School Career Day

ANS SR participated in the South Aiken HS career Day event on January 29, 2015. We had four volunteers from ANS Savannah River section, Karen McLain, Dan Thomas, Martin Washington and Bob Eble. Bob Eble reported, "I think that most of the students that were interested in nuclear engineering received good feedback from our volunteers. I guess that we were able to talk with about 50-60 students. It may have been a better format since it was one-on-one communication but discussions were only about 10-15 minutes in length. Having 1 or 2 separate classrooms gives us the ability to talk to 50-60 students for 30-40 minutes so more information can be exchanged in a classroom environment."



Dan Thomas speaks with South Aiken High School students on nuclear science and technology careers



ANS Display at Career Day at South Aiken H.S.

South Aiken H.S. Career Day (continued)



Martin Washington speaks on his work as an engineer in a nuclear facility to a student.

### **2016 Benjamin Memorial Scholarship Fund**

Help a deserving college-bound CSRA student and cut your tax liability for 2015. Consider making a donation to the Benjamin Memorial Scholarship Fund for deserving CSRA high school seniors in the class of 2016. ANS Savannah River is a 501(c)(3) organization and all donations are tax-deductible. Bring a check to one of our technical dinner meetings, or send your contributions to:

ANS Savannah River  
Benjamin Memorial Scholarship  
P.O. Box 7001, Aiken, SC 29804

### **Savannah River Section Recognized for Best Large Section Membership, Meetings and Programs, and Management by ANS HQ**

Savannah River Local Section Chair TJ Corder was notified by ANS Headquarters on October 15, 2014 that our Section had been selected to receive award recognitions for the 2014 Large Local Section Best Membership, Meetings and Programs, and Section Management. ANS SR Past Chair Kevin O’Kula accepted the award on behalf of the Section from ANS President Michaele Brady Raap at the November 2014 ANS Winter Meeting and Nuclear Technology Expo in Anaheim, California.

American Nuclear Society  
555 N. Kensington Ave.  
La Grange Park, IL 60526  
708-352-6611



October 15, 2014

Mr. Corder,

It is my pleasure to inform you the **Savannah River Local Section** of the American Nuclear Society (ANS) has been selected to receive the 2014 Large Local Section Best Membership, Meetings and Programs, and Section Management. Congratulations!

The winning sections for each category are as followed:

**Small Local Sections:**

Best Membership – **Pittsburgh**  
Best Meetings and Programs – **San Diego**  
Best Public Information – **Pittsburgh**  
Best Section Management – **Pittsburgh**

**Large Local Sections:**

Best Membership – **Savannah River**  
Best Meetings and Programs – **Savannah River**  
Best Public Information – **Idaho**  
Best Section Management – **Savannah River**

The awards will be presented by Michaela Brady Raap at the President's Special Session to be held Monday, November 10, 2014, beginning at 4:00 p.m. at the Disneyland Hotel, Anaheim, California.

Please contact Ashley Jiminian via telephone at (708) 579-8290 or by email at [ajiminian@ans.org](mailto:ajiminian@ans.org) by Monday, October 27 to notify her of who from the Section will be present at the President's Special Session to accept the award.

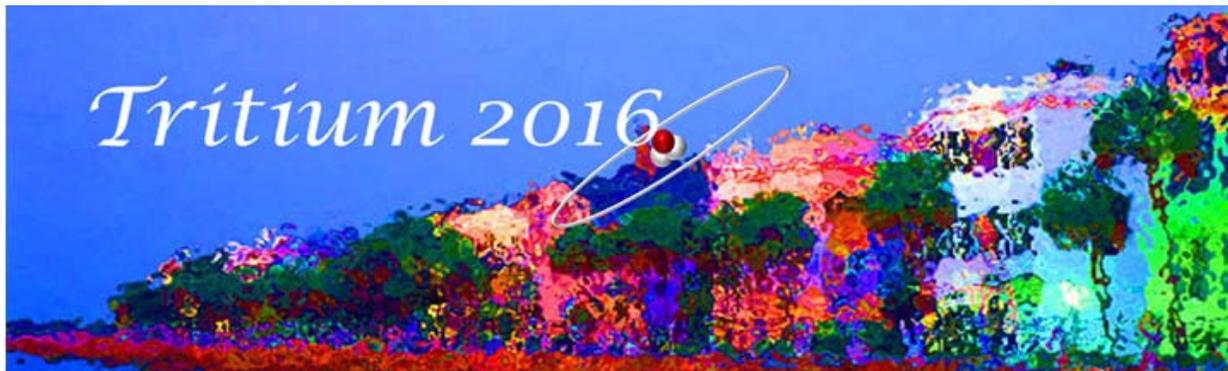
Sincerely,



Steven J. Zinkle  
Chair, ANS Honors and Awards Committee

## TRITIUM 2016 Call for Papers

(continued from page 4)



# Call for Papers

## 11<sup>th</sup> International Conference on Tritium Science & Technology

April 17-22, 2016 ♦ Charleston Marriott ♦ Charleston, SC, USA

<b>Summaries Due:</b>	<b>October 16, 2015</b>
<b>Author Notification:</b>	<b>December 11, 2015</b>
<b>Full Papers Due:</b>	<b>April 12, 2016</b>
<b>Final Papers Due:</b>	<b>August 2016</b>

Authors should submit 300 word (min.) summaries in English via the conference website <http://epsr.ans.org/meeting/?m=213>. The summary should clearly state objectives, methods, results and conclusions of the work. MS Word format (use template).



<http://tritium2016.org>



# ANS



### TRITIUM 2016

The objective of the conference is to provide a forum for an exchange of information on science, technology, engineering, and general experience in safe tritium handling for fusion, fission, pharmaceuticals, and other unclassified isotopic applications. The 11<sup>th</sup> edition of this triennial Conference is sponsored by the Fusion Energy Division and cosponsored by Decommissioning and Environmental Sciences and Nuclear Installation Safety Divisions of ANS, and is hosted by the ANS Savannah River Section. Full papers will be published in **Fusion Science and Technology**.

### Suggested Paper Topics

- Biological Effects
- Containment and Decontamination
- Environmental impacts
- Fusion and fission concepts
- Groundwater issue resolution
- Measurement, monitoring and accountancy
- Safety and waste management
- Standards and Implementation
- Tritium processing (purification, isotopic separation, recovery, etc.)
- Tritium facilities and operation
- Interactions with materials
- Tracer techniques and isotopic effects
- Tritium supply, transport and storage
- Tritium breeding and extraction
- Water and air detritiation

#### General Chair:

Dr. Robert P. Addis  
Savannah River National Laboratory, USA

#### Technical Program Chair:

Dr. James E. Klein  
Savannah River National Laboratory, USA

Charleston, SC, USA April 17-22, 2016

## Tours of Plant Vogtle

In what has become a rite of spring for the last two years, Phil Cupp and others from Southern Company have put together information sessions and tours for SR Section members and guests. Each tour was about three or so hours in length and had this approximate timeline:

<u>Time</u>	<u>Activity</u>
11:00 – 12:00	Arrive at Visitors Center; Lunch and a short, technical update meeting with Mike McCracken (Plant Vogtle Communications Coordinator)
12:00 – 1:30	Driving tour outside Vogtle Electric Generating Plant Units 1&2 and inside VEGP 3&4
1:30 – 2:00	Closing activities at the Visitors Center.

Tours were conducted May 15, 2014 and then again on May 21, 2015. The Section appreciates Southern Company’s resources, especially those of Mike McCracken and Phil Cupp, to plan, coordinate and execute these opportunities to tour, ask questions, and see first-hand the progress in nuclear new build for the 21<sup>st</sup> century right in our backyard.



Tour group in May 2014 upwind of VEGP’s cooling towers.



Technical Tour at Vogtle Electric Generating Plant: May 2014

### **Bringing Science into the Classroom – Teacher Workshop – February 18, 2014**

A hands-on, focused workshop was provided to 11 Columbia County teachers at Lakeside H.S. on February 18, 2014. The Workshop described nuclear technologies and their impact on our region. There were six classes over an eight hour day. An Atomic Fundamentals class featured a Geiger–Marsden experiment (using marbles and wood blocks learned at ANS workshop in Nov 2010) (Presenter: Ed Donner, CNTA). A Power Generation Fundamentals class included a base load demo with hand crank generators and lights, it also included a fuel pellet energy comparison (Presenter: Ken Stephens, CNTA). A Nuclear Fundamentals class included a 3D physical Periodic Table/Chart of the Nuclides that the teachers had to assemble and create, a radiation interaction demo using cookies, half-life experiments using M&Ms and Twizzlers, and distance and shielding demos using GM detectors (Bill Wabbersen, ANS-Savannah River). A Nuclear Technologies class described the many real world uses of common isotopes (Presenter: Mel Buckner, ANS-Savannah River). A Risk class compared everyday risks to nuclear (Presenter: Robert Wilson, CNTA). Finally, a sixth class described regional nuclear uses and careers (Presenter: Mindy Mets, SRS-CRO).



Mel Buckner oversees teachers with the Chart of the Nuclides.

## Technical Program Highlights: March 2014 – June 2015

**March 2014 – Fukushima Recovery:** Following a cancellation due to the Great Aiken-Augusta ice storm of 2014 in February 2014, Dr. Robert Sindelar, Senior Advisory Engineer with SRNL, discussed recovery efforts from the event at the Japanese Fukushima-Daiichi nuclear power plant in a March 2014 meeting at Enterprise Mill, Augusta, GA. Dr. Sindelar’s talk, “Environmental Remediation of a Large-Area Land with High Contamination,” discussed the aftermath following the tsunami, flooding and nuclear aftermath following the Great East Japan Earthquake on March 11, 2011. Bob said that this led to an airborne release of radioactive material that settled and caused contamination of a large portion of the lands to the extent to cause very high air dose rates, necessitating evacuation of the population. The Government of Japan, Ministry of the Environment is executing their charter to plan, sponsor, and oversee decontamination work. As an Embassy Science Fellow in a two-month assignment in Japan, the work of the MOE, other Japanese agencies supporting the MOE, and contractors performing the field work were evaluated in the context of a remediation system. Observations and recommendations made during the assignment were presented.



Dr. Robert (Bob) Sindelar

**April 2014 – What Contemporary Nuclear Safety Research is Telling Us About Severe Accidents in Nuclear Power Plants:** The April 22, 2014 meeting was held at the Willcox Inn in Aiken. Dr. Kevin O’Kula of URS Professional Solutions, immediate past Chair of the SR Section, and peer reviewer of NRC and Sandia National Laboratories research, discussed current-day research on extremely unlikely nuclear power plant accidents. He noted that while severe accidents are extremely unlikely, they are never impossible. Ongoing



research by the U.S. Nuclear Regulatory Commission, national laboratories, and international groups conclude that releases, should they occur at all, are much smaller and delayed than previously estimated. In addition, individual risks to the public posed by these hypothetical events are well below safety goals to the general public. O’Kula closed by saying that while

nuclear energy is a sustainable, carbon-free engine for growth in the U.S. economy as well as that of the rest of the world, assuring its safety requires dedicated technical people to remain vigilant, look for vulnerabilities and ask the tough questions.



**May 2014 – Safe Removal of Highly Enriched Spent Nuclear Fuel:** John Dewes of SRNL discussed “Removal of Highly Enriched Uranium from Hungary and Ukraine” in his presentation on May 22, 2014 at Bobby’s BBQ in Warrenton, SC. His presentation highlighted recent international efforts to eliminate highly enriched uranium from Hungary and Ukraine, including air transport of spent fuel.

John N. Dewes is the Director of Global Security in the National Security Directorate at the Savannah River National Laboratory. His organization is responsible for a portfolio of DOE/NNSA and Homeland Security Programs and Projects that include test and evaluation, training, and international non-proliferation. John received his B.S. in Nuclear Engineering from Purdue and a M.S. in Nuclear Engineering from the University of South Carolina, and is a licensed Professional Engineer in Indiana and South Carolina. In both 2008 and 2013, John received the Secretary of Energy's Honor Award for his support of nonproliferation related recovery efforts



**June 2014 – Alternate Production of Tritium:** Dr. Steve Sheetz of SRNL presented the June 10, 2014 technical meeting topic, “Alternatives for Tritium Production in Advanced Reactors” at Newberry Hall in Aiken, SC. Steve noted that tritium is essential to the effectiveness of America's nuclear stockpile. He provided an overview of the past, present, and future of tritium production in the United States. He covered the need for new tritium production and then summarized a series of nuclear reactors analyzed as alternative irradiation sources. Steve is currently a Nuclear Energy program manager within the Clean Energy Directorate of SRNL. He is the laboratory’s lead for the DOE Fuel Cycle Options program and is developing plans for advanced tritium production.

**July 2014 – VEGB Units 3 and 4 Construction Update:** The July 17, 2014 meeting of the Savannah River Section was held at Augustino’s (Augusta Marriott) and featured Jeff Gasser of the Southern Nuclear Operating Company. Jeff is the Executive Vice President of Operational Readiness and Site Integration for the Plant Vogtle 3 and 4 Project. He provided a construction update of Plant Vogtle Units 3 and 4 and a discussion of the industry construction experience with the AP1000.

Prior to Mr. Gasser’s presentation, the Section gave its first-ever 2014 Benjamin Scholarship awards to graduating high school students.



**September 2014 – Salt Waste Processing Facility Update:** The September 2014 technical meeting featured Dr. Thomas D. Burns, Jr. Vice President of Engineering for Parsons, and was entitled, "Salt Waste Processing Facility Project Status and Key Lessons Learned". It was held September 9th at Enterprise Mill in downtown Augusta, Georgia. Dr. Burns discussed the current status of the Savannah River Site's Salt Waste Processing Facility, a multibillion dollar, first-of-a-kind radiochemical processing plant for stabilizing more than 100 million gallons of legacy waste from plutonium and tritium production at SRS. He also covered the major lessons learned in bringing the project to the 70% physical construction completion stage.

**October 2014 – Nuclear Education Pipeline:** "Nuclear Engineering Education Pipeline Lessons - from Secondary to Graduate School" was presented by Ms. Lisa Marshall in the October 2, 2014 meeting at Newberry Hall in Aiken. Ms. Marshall presented the national Science, Technology, Engineering & Math (STEM) trends and discussed how ANS, as a professional organization, and North Carolina State, as one of the schools preparing students, are working to attract and retain students in the discipline.



**November (Second October) Meeting, 2014 - DOE-SR Status Overview and Outlook - Vision 2020:** Dr. David C. Moody, Manager U. S. Department of Energy Savannah River Operations Office, spoke to the Section in a second meeting for October (October 30) at Houndslake Country Club. His remarks focused on a vision for the Savannah River Site by 2020. Dr. David C. Moody is the Manager of the DOE-SR Operations Office at the Savannah River Site (SRS) in Aiken, South Carolina. As a career member of the Senior Executive Service, Dr. Moody has more than 36 years of experience in the fields of environmental science and nuclear chemistry.



Dr. Moody oversees the Site's environmental management program, leading the efforts at SRS to accelerate disposition of legacy radioactive liquid waste and empty and close waste storage tanks; disposition transuranic (TRU) waste and legacy plutonium and uranium materials; accelerate area cleanup and closures across the Site; remediate soil and groundwater; deactivate and decommission surplus facilities; and consolidate and process nuclear materials, like plutonium and spent nuclear fuel.

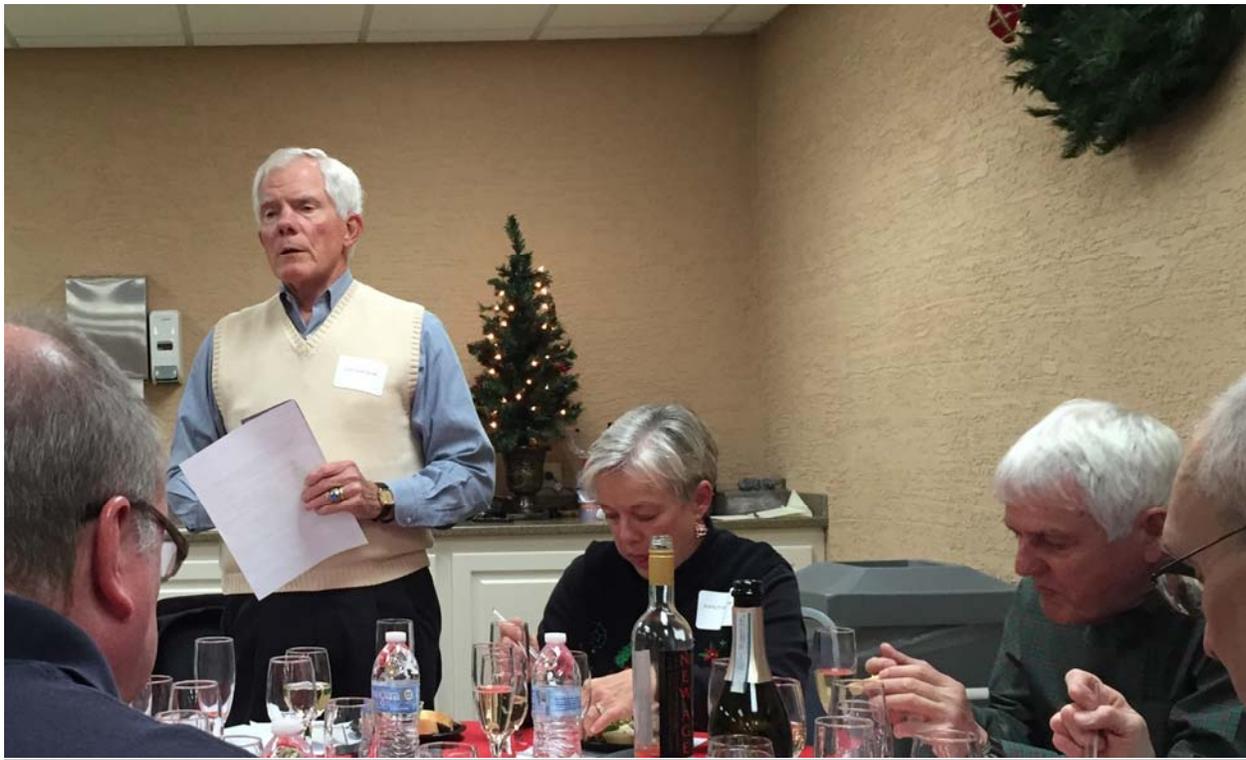
Prior to his September 2010 appointment, Dr. Moody served for five years as Manager of DOE's Carlsbad Field Office where he directed the administration of the Waste Isolation Pilot Plant (WIPP) and the National Transuranic Waste Program. In his early career, he served in several capacities at Los Alamos National Laboratory (LANL), to include LANL's senior technical advisor to Rocky Flats for nuclear waste management and co-leader for the environmental restoration program at Rocky Flats.

**December 2014 - Holiday Celebration:** The 16<sup>th</sup> Holiday Celebration was held on Monday, December 8, 2014, at the North Augusta Community Center with members of ANS SR, the Health Physics Society, the Institute of Nuclear Materials Management, and the general public. Terry Wick’s unique food menu coupled with Wine World’s superb libations highlighted the night. This was the first Holiday Celebration without Dick Benjamin, and Sally was fighting off an illness, but attendees had an informative and fun-filled evening after toasting Dick.



ANS SR Chair TJ Corder welcomes attendees to the annual holiday celebration of food and wine (←).

Len Sjostrom of Wine World discussed individual wines throughout the evening after first leading a toast in memory of Dick Benjamin (↓).





**January 2015 - Nuclear Forensics:** The first meeting of 2015 was held January 12th at Cotton Patch Restaurant 816 Cotton Lane (near 8th and Reynolds Streets) in downtown Augusta, Georgia. The speaker was Dr. Justin E. Halverson, Manager of Materials Compatibility and Welding Technology at Savannah River National Laboratory (SRNL) at the Savannah River Site. Dr. Halverson spoke on "Nuclear Forensics". He said that nuclear forensics has become a prevalent area of research and study within both the academic community and the national laboratories. Although the term "Nuclear Forensics" is at most 20 years old, much of the technology was practiced and applied before the field of Nuclear Forensics was "invented." Dr. Halverson described the technology, its applications, its history, and some of the political aspects of nuclear forensics using personal experiences as illustrations.

**March 2015 – Present and Future Status of the Global Nuclear Industry:** “Strategic View – Nuclear” was a high level view of the present state and future of the global nuclear power industry presented by Ms. Carlyn Greene, Executive Director, Backend Publications and Mr. Bill Linton, Principal, Linton Consulting. The March 2015 ANS-Savannah River Section technical meeting was held March 30th at the Red Lobster in Augusta, Georgia.

Mr. Linton provided a country by country look at expected demand and supply growth and the outlook for new power development showing where the growth of the supply chain will occur based on demand trends and political policy. Ms. Greene then gave a ‘value chain’ look at the industry considering the challenges of fuel and waste and country policy. Since managing nuclear materials and waste is a significant issue for the Aiken participants she spoke in more detail on this topic.

**April 2015 - Gatherers/Hunters to Agrarian to Industrial to Information Age, What's next, What's our role?:** The April 2015 Section technical meeting was conducted April 27th at the Business and Education (B&E) Building at the University of South Carolina Aiken main campus. The speaker was Bill Jackson, President of Success Staging International, LLC. Bill’s talk was entitled, “Gatherers/Hunters to Agrarian to Industrial to Information Age, What's next, What's our role?” This discussion explored the changing systems around us. It raised questions on what roles we might play, or should we play. Possessing a technical background typically provides an improved ability to understand complex systems and make informed decisions on issues, risks, and opportunities. Mr. Jackson’s presentation asked questions regarding how we individually and collectively use these skills and the knowledge gained through applications. Also, how to help ourselves, our families, our community, our country, our world? Is helping all of these even possible? He concluded in the affirmative (Yes), and provided a thought-provoking discussion.

**June 2015 - Challenges and Opportunities: Nuclear Technologies and ANS:** Our last meeting of the 2014-2015 year featured the President-Elect of ANS, Mr. Eugene S. Grecheck. The event was co-hosted by the Citizens for Nuclear Technology Awareness (CNTA) and held on Monday, June 1, 2015 at Newberry Hall in Aiken. Mr. Grecheck spoke about the challenges facing ANS as well as its opportunities. This dinner meeting occurred less than two weeks before Gene became ANS President. He succeeds Dr. Michaele Brady Raap as the 61st ANS President, and is Principal of Grecheck Consulting LLC, where he provides management and technical consulting to the nuclear industry, with emphasis on performance improvement, regulatory issues, and developing and integrating emerging technologies.



Prior to his presentation, Mr. Grecheck and ANS SR Chair TJ Corder presented the Benjamin Memorial Scholarship awards to the 2015 winners.



“Later-in-career” attendees to June 1, 2015 meeting at Newberry Hall featuring Vice-President Gene Grecheck and the 2015 Benjamin Scholarship winners.



“Early-in-career” attendees to the June 1, 2015 meeting at Newberry Hall featuring Vice President Grecheck and the Benjamin Memorial Scholarship winners.

### **Postscript: Extraordinary Summer for Benjamin Memorial Scholarship Winner**

One of the 2015 Benjamin Memorial Scholarship winners, David Stoner, had a noteworthy summer. After earning a spot on the USA’s Mathematical Olympiad team (one of six team members), and three weeks of problem-solving preparation training in Pennsylvania during June, David and team journeyed to Thailand for 56th International Mathematical Olympiad in July with 104 nations competing. The USA team won for the first time in 21 years, narrowly edging out China. Individual gold medals were won by David and four of his team members. Congratulations, David, and best of luck at Harvard this fall!



USA’s International Math Olympiad team with South Aiken H.S. graduate and Benjamin Memorial Scholarship winner David Stoner (front row, far right)

## Nuclear Trivia Nights

Several Nuclear Trivia Nights were held in the 2014-2015 period, including August 14, 2014 (below) at the Carolina Ale House, and January 22 and April 30, 2015 at the Aiken Brewing Company. The edition shown below was held in conjunction with the NAYGN Southeastern Regional Conference.



*The Savannah River Section of  
ANS in conjunction with the  
NAYGN Southeastern Regional  
Conference Present:*

# Nuclear Trivia Night

**(Find Answers to Nuclear Science & Technology's  
Trickiest Questions)**



**Thursday, August 14, 2014 7:00-8:30 PM**  
**Carolina Ale House**  
**203 Robert C. Daniel Jr Parkway,**  
**Augusta, GA**  
**No Registration Fee – Show up, Form Teams,**  
**Have Fun**

**Note: This is a different venue from past Trivia Nights**

## Teacher Workshop – April 25, 2014 - USC Aiken,

American Nuclear Society SR and Citizens for Nuclear Technology Awareness (CNTA) have jointly developed and implemented a workshop for K-12 teachers called “Bringing Nuclear into the Classroom.” The workshop includes hands-on activities that demonstrate the fundamentals and benefits of nuclear technology and energy applications. Workshops are presented several times each year with more than 225 teachers in the local region participating since the first workshop in 2009. A workshop was conducted on April 25, 2014 at the Ruth Patrick Science Education Center (RPSEC) through a Mathematics and Science Partnership grant from the SC Department of Education. The grant is a three-year project focusing on Science, Technology, Engineering and Mathematics (STEM) for teachers from Aiken and Bamberg Counties. Twenty-eight teachers participated in the workshop and received educational materials for use in lesson planning and hands-on classroom demonstrations. Additional sponsors include the local Health Physics Society, Energy Solutions, the SRS Community Reuse Organization (SRS-CRO), and the Aiken Rotary Club, making this a community-wide effort to raise the awareness of STEM education.

The Workshop described nuclear technologies and their impact on the Central Savannah River Area region.



Bill Wabbersen gives a demonstration at USC Aiken Workshop, April 25, 2014.

There were six classes taught in two separate sessions over an eight-hour day. An Atomic Fundamentals class featured a Geiger–Marsden experiment (using marbles and wood blocks first observed at the ANS workshop in Nov 2010) (Presenters: Ed Donner, CNTA & Bill Wabbersen, ANS SR). Additional classes presented were: (1) Power Generation Fundamentals that included a base load demo with hand crank generators and lights, it also included a fuel pellet energy comparison (Presenter: Brad Swanson, CNTA); (2) Nuclear Fundamentals that included a 3D physical Periodic Table/Chart of the Nuclides that the teachers had to assemble and create, a radiation interaction demo using cookies, half-life experiments using M&M's and Twizzlers, and distance and shielding demos using GM detectors (Presenters: Ed Donner, CNTA & Bill Wabbersen, ANS SR); (3) Nuclear Technologies that described the many real world uses of common isotopes (Presenters: Mel Buckner, ANS SR & Bill Wabbersen, ANS SR); (4) Risk that compared everyday risks to nuclear (Presenters: Ken Stephens, CNTA & Bill Wabbersen, ANS SR); and (5) Regional nuclear uses and careers (Presenter: Susan Wood, CNTA).

A workshop was also held on May 16 at the University of South Carolina Salkehatchie in Allendale, SC. The same format was used in this outreach event.

## **Journey to the Center of the Atom (March 18 and April 5, 2014, and April 11, 2015)**

ANS SR and CNTA supported the Annual South Carolina Junior Academy of Science (SCJAS) which was held at Trident Technical College on April 5, 2014 for approximately 200 science students and 150 teachers and college professors from around the state of South Carolina. A Radiation Exhibit and a hands-on focused Nuclear Fundamentals class that were presented include the ANS-Isotope Discovery Kit (a 3D physical Periodic Table/Chart of the Nuclides that the students had to assemble and create. The presenter was Ed Donner (CNTA) with support from Bill Wabbersen, ANS Savannah River, and Robin Brigmon, SCAS. The response from the teachers and students at the South Carolina Academy of Science was extremely positive.

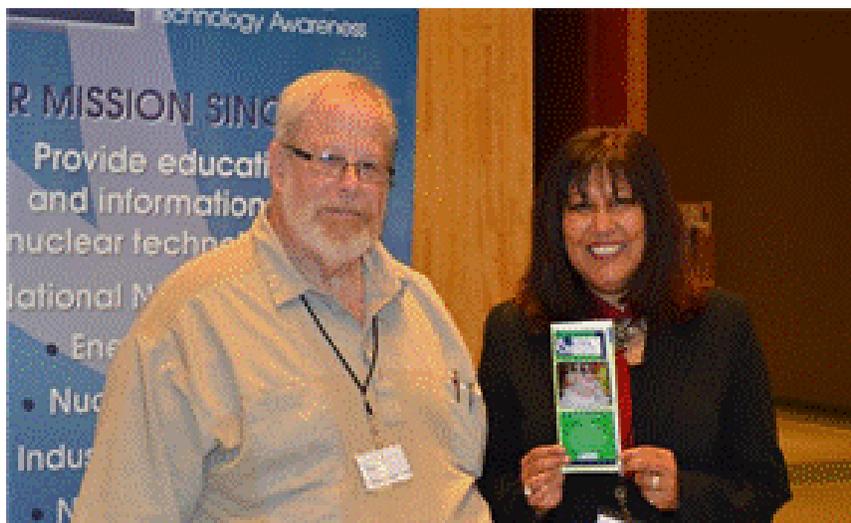


The teachers attending have already asked how they can get their own kit that they can use in their own classes.

The 2015 SCJAS was held April 11, 2015 at Furman University. CNTA and ANS SR again teamed on the “Journey” demonstration.

Jon Guy and Bill Wabbersen teamed to provide an earlier rendition of this exhibit/demonstration for Abbeville 11<sup>th</sup> grade students on March 18, 2014. This event was held at USC Aiken’s Ruth Patrick Science Center.

(←) Students are instructed on the Isotope Discovery Kit with Ed Donner providing the direction (2014).



Ed Donner with Dr. Pearl Fernandes, President of SCAS, Dean of USC Honors College (2014)

## Do You have the Oldest Neutrino?

The ANS SR Section is trying to locate the oldest printed copy of the Neutrino for its archives. If you believe you have one of the oldest editions, bring your Neutrino to a local Section dinner meeting during the fall (September – November 2015). The owner of the oldest printed Neutrino will receive a dinner voucher good for any three dinner meetings in spring of 2016. Please contact Kevin O’Kula ([kevin.okula@aecom.com](mailto:kevin.okula@aecom.com)) for more information. Past and current SR officers and Executive Committee members are not eligible.

### Upcoming Events:

**October 8, 2015 – First Fall Technical Meeting, David Del Vecchio, (CB&I AREVA MOX Services) – Aiken Center for the Arts (Newberry Hall catering)**

**October 10, 2015 – SEED Day USC-Aiken**

**November 8 – 12, 2015 - 2015 ANS Winter Meeting and Nuclear Technology Expo, Washington, D.C.**

**December 1, 2015 – Holiday Celebration, North Augusta Community Center**

**April 17 – 22, 2016 – 11<sup>th</sup> International Conference on Tritium Science and Technology (TRITIUM 2016), Charleston, SC**

**June 12 – 16, 2016 – 2016 ANS Annual Meeting, New Orleans, LA**

### **Join ANS-SR on Facebook, Twitter and YouTube**

FACEBOOK: <http://www.facebook.com/pages/ANS-SavannahRiver/143771258995015>

TWITTER: [http://www.twitter.com/ANS\\_SR](http://www.twitter.com/ANS_SR) (note the underline between ANS and SR)

YouTube: <http://www.youtube.com/user/ANSSavannahRiver>

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

## American Nuclear Society – Savannah River Section Local Section Application

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### 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	___	___

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### 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

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: \_\_\_

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