Science of Nuclear Energy and Radiation

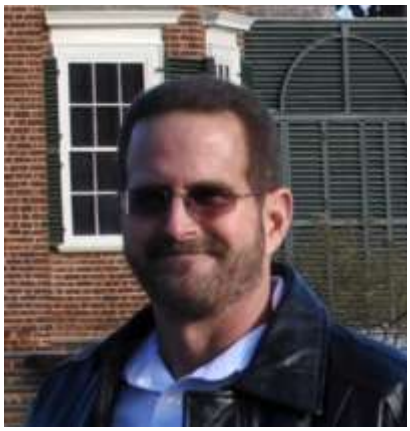
Science Teacher Workshop

July 22-26, 2013

Instructors and Speakers Bios

Hosted by:

Mr. Rod Adams



Rod Adams has been studying energy production systems for more than 50 years, first as an engineering officer on board nuclear powered submarines and then as an independent researcher. His interest areas have included large storage batteries, hydrogen generators, diesel engines, gas turbines, wind propulsion, solar thermal and nuclear fission. He left active duty and founded Adams Atomic Engines in 1993 to design and market nuclear powered gas turbines.

As part of his company's efforts to share its knowledge of the technology, he began publishing Atomic Insights, (www.atomicinsights.com) which has continued to evolve and is currently a blog that attracts about 10,000 unique visitors each month. He also produces the Atomic Show podcast to share news and insights about energy technologies from an atomic perspective.

After 6 years of entrepreneurial activity, Rod accepted a recall to active duty in 1999.

Rod retired from the US Navy as a Commander in September 2010. He is now working for The Babcock & Wilcox Company as a member of the B&W mPower™ reactor development team. He has been an active member of the American Nuclear Society since 2004 and joined the Virginia chapter of the ANS when he moved to Lynchburg in 2010. He was recently elected as an at-large member of the board of directors.

Dr. Sama Bilbao y León

…joined the Department of Mechanical and Nuclear Engineering at Virginia Commonwealth University (VCU) in January 2011 as Director of Nuclear Engineering Programs and Associate Professor. She was one of the key individuals involved in the creation of the Dominion-sponsored Master in Nuclear Engineering offered by VCU from the fall of 2007. Until December 2010, Sama was the Technical Head of the International Atomic Energy Agency (IAEA) Water Cooled Reactors Technology Development Unit and she was in charge of all IAEA activities in support of the development and near term deployment of advanced water cooled reactors and their associated fuels. From February 2001 until March 2008, Sama was a Nuclear Safety Analysis Engineer at Dominion Generation, where she worked on the development and licensing of new methodologies in core thermal-hydraulics and nuclear safety analysis in support of Dominion's nuclear power stations. Previously, as a researcher at the University of Wisconsin – Madison, Sama conducted research on experimental and computational thermal-hydraulics and nuclear safety as well as energy and environmental policy. She also participated in the design of nuclear micro-batteries to power nano-devices. At the Escuela Técnica Superior de Ingenieros Industriales of the Universidad Politécnica in Madrid she was involved in the simulation and analysis of severe accidents and nuclear safety.

Sama is one of the founders of the North American Young Generation in Nuclear (NA-YGN), and served as Public Information Chair since its creation in 1999 until May 2005. Sama is also an active member of the American Nuclear Society (ANS) since 1995, both nationally and locally (UW-Madison and VCU student sections, Virginia and Austria local sections). Her dedication to spreading the good news about nuclear earned her the ANS 2002 Public Communications Award. In 2007 she received the NA-YGN Founder Award, the highest award given to an NA-YGN member, which rewards leadership, vision and dedication. In 2007, and again in 2010, Sama was elected to the national Board of Directors of the American Nuclear Society. In 2011, she received the ANS Mary Jane Oestmann Women's Achievement Award. Sama is a member of ASME, ASEE, SWE and WIN.

Sama holds a bachelor's degree in Mechanical Engineering and a master's degree in Energy Technologies from the Polytechnic University of Madrid; a master's degree and a PhD in Nuclear Engineering and Engineering Physics from the University of Wisconsin – Madison; and an MBA from Averett University.

Mr. David A. Christian

David A. Christian is executive vice president of Dominion Resources, Inc., and chief executive officer of the company's Dominion Generation Group operating segment.

He oversees the more than 28,000 megawatt generation operations of Dominion's merchant fleet and regulated electric utility.

Christian joined Virginia Power in 1976 and has held a variety of management positions with Dominion. Before assuming his current position in June 2009, Christian was president and chief nuclear officer of the company's Dominion Nuclear business unit from October 2007 to May 2009.

He is immediate past chairman of the board of directors of Nuclear Electric Insurance, Ltd. (NEIL), and also serves on the NEIL executive and governance committees. He is a member of the board of directors of the Nuclear Energy Institute, where he serves on the executive and audit committees. Christian is a board member of the Foundation for Nuclear Studies, CultureWorks (formerly the Richmond Arts Council), and the Dominion Foundation. He also is a member of the Committee of 100 at Virginia Tech and serves on the advisory boards for the College of Engineering at both Virginia Tech and Virginia Commonwealth University.

Christian has a degree in mechanical engineering from Virginia Tech and a master's degree in business administration from Averett College. He graduated in 1990 from the Institute of Nuclear Power Operations senior plant management course and completed the Executive Program of the Darden Graduate School of Business Administration at the University of Virginia. He also is a graduate of the Harvard Business School's Advanced Management Program.

Dr. March Crosthwaite

...is the Program Director of the Nuclear Medicine Technology Program at the Department of Radiation Sciences of the Virginia Commonwealth University. He has a Master's in Education with an emphasis in Occupational Administration (May 1989, University of Louisville).
Certificate in Nuclear Medicine Technology, BA in biological sciences at Drake University, He has served on the Society of Nuclear Medicine Technology. He has been a member of the Nuclear Medicine Technology Certification Board.

Mr. Brett Dooies

… is a nuclear engineer with five years of experience at GE Hitachi Nuclear Energy. In his current role, he performs safety analyses for operating boiling water reactors as part of the fuel licensing process required for plant operation. The analyses simulate postulated transient events to assign operating limits for the fuel throughout the plant's operating cycle. He also performs analyses supporting new product development, power uprate projects, and emergent issues related to plant operation. Prior to his current role Brett was a member of the Edison Engineering Development Program, GE's engineering leadership training program. While on program Brett worked on a variety of rotational assignments in areas such as advanced liquid metal reactors, fuel manufacturing, and reactor fuel and core design. Brett graduated from the University of Florida with his B.S. in Nuclear Engineering in 2006 and his M.S. in Nuclear Engineering in 2008. He currently serves as the vice chair/chair elect of the Wilmington ANS Local Section and will serve as co-chair of the Nuclear Criticality Safety Division 2013 Topical Meeting, being hosted in Wilmington, NC this fall. Brett lives in Wilmington with his wife Samantha.

Mr. John Echols

… is a graduate student at Virginia Tech in Material's Science with a focus on nuclear materials. He has recently given presentations on his work in fusion materials at the Symposium of Fusion Energy and the Pulsed Power and Plasma Science conferences. Other research John is involved with includes investigation of structural materials for generation IV reactors and materials challenges for reactor flow probes.

John received his B.S. in Physics from Virginia Tech in 2007 and specialized in accelerator and neutrino physics.

Mr. Trey Gebhart

…is a Ph.D. student at Virginia Tech studying mechanical and nuclear engineering, specializing in plasma stability and fueling of magnetic confinement fusion reactors. He received his undergraduate degree in mechanical engineering in 2011 and his masters in mechanical engineering in 2013, both from Virginia Tech. He is a member of the VA section of ANS and the president of the Virginia Tech student section. He is also the student liaison for the fusion energy division of the national ANS.

For the past two years, Trey has held a teaching assistant position for the undergraduate nuclear engineering classes at Virginia Tech. This will also be his third year helping out with the Science Teacher Workshop.

Ms. Margaret Harding

I am a business leader with an extensive background in nuclear engineering technology, regulatory compliance and sound business practices. With more than 30 years of experience in the nuclear industry, I have outstanding problem solving skills with a proven track record of delivery. My strong written and verbal communication abilities coupled with excellent coaching and interpersonal skills make me a formidable ally in the nuclear industry.

I was asked by the American Nuclear Society to be one of their key spokespersons following the earthquake and tsunami in Japan, as events unfolded at the Fukushima nuclear power plants. I became a key contact for numerous journalists and reporters because of my extensive understanding of the technology of the Fukushima nuclear power plants and my outstanding ability to communicate the complicated issues to the media and the general public. I responded to more than 400 media inquiries, including Fox, CBS, MSNBC, NBC Nightly News, the Today Show, the New York Times, ABC, CNN, Nature, the Discovery Channel, NYPR and numerous national and international publications. In doing so, I ensured accurate information was available to the public and the media. The American Nuclear Society recognized these efforts with a Presidential citation in 2011 and the 2012 Special Award for Media and Communication.

I have a Bachelor of Science degree in Nuclear Engineering from Iowa State University (ISU). I serve on the Industrial Advisory Council for ISU's Engineering College as well as the advisory board for the Nuclear Engineering minor at ISU. In addition, I created and teach a unique course that sets the nuclear industry in context of politics, economics, society, and technology for engineering students at ISU. I am working to expand the course beyond ISU.

Dr. Brian Hinderliter

... is presently an Associate Professor in the Mechanical and Nuclear Engineering Department at Virginia Commonwealth University, having moved from a Research Scientist position in Coatings and Polymeric Materials Department at North Dakota State University. His Ph.D. research was focused on phase growth in thermal barrier hard coatings at University of Virginia in the Materials Science and Engineering Department. Prior to returning to UVA, Brian worked as a nuclear engineer and Health Physicist at Knolls Atomic Power Laboratory after completing M.S. in Nuclear Engineering and Engineering Physics and M.S. in Medical Physics from the University of Wisconsin at Madison. Brian is a Certified Health Physicist and a Professional Engineer (Nuclear).

Ms. Andrea Jennetta

… is the owner and president of International Nuclear Associates, Inc., the publisher of *Fuel Cycle Week*. She has 25 years working in the nuclear fuel cycle.

Andrea's cynicism can be traced to her first job in the industry as a Department of Energy contractor (with Westinghouse) on the doomed Yucca Mountain Project.

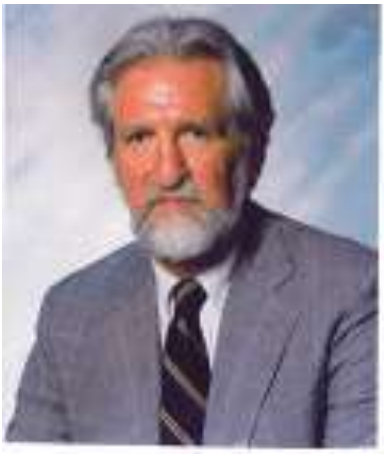
After escaping to Washington, DC, she held policy analyst positions at nuclear consulting firms such as Science Applications International Corp. and NAC International before joining NYNCO to manage its *FUEL* publications.

In 2002, Andrea founded *FCW*, the only nuclear industry publication with a sense of humor, incisive analysis and discernible opinions. Today she pens Nuclear Buzz, a column on the uranium market and anything else in the global industry that merits commentary, ridicule or praise.

Andrea is newly appointed to Pop Atomic Studios' board of directors, a 501(c)3 nonprofit organization whose mission is to use the power of visual and liberal arts to enrich the public discussion on atomic energy.

She received a B.A. in History from the University of Nevada-Las Vegas in 1989. Follow her on Twitter: @NuclearBuzz

Dr. W. Reed Johnson



. . . graduated from the Virginia Military Institute with a BS in Physics in 1953, completed a year-long course in nuclear engineering at the Oak Ridge School of Reactor Technology, and in 1 962 was awarded the D.Sc in Engineering Physics from UVA. From 1954-57 he worked in the nuclear submarine program, and on the Army Package Power Reactor. He was Project Engineer for the UVA Research Reactor and from 1962-64 Director for the Philippine Research Reactor. Reed was associated with the UVA Nuclear Engineering Program from its beginning in 1 957 until the program was ended in 1998. He developed and taught graduate offerings in radiation shielding, nuclear power plant safety and nondestructive testing. >From 1974 until 199 1 , Reed was a member of the Atomic Safety and Licensing Appeal Panel resolving technical and legal issues in licensing many of the nation's nuclear power plants. Reed has been associated with the Science of Nuclear Energy and Radiation course for Middle and High School science teachers since its inception in the early 1980s.

Ms. Maya Keller

…has been the Radioanalytical Lab manager and training coordinator at the Thomas Jefferson National Accelerator Facility since 2009. She is responsible for managing personnel and equipment in the Radioanalytical Laboratory as well as developing the education curriculum and training materials on radiation safety at Jefferson Lab.

Maya is also active with the local chapter of the Health Physics Society (HPS) and has been a member of the national HPS since 2004. Recently, she became the chair of the Society's Professional Development Committee which tries to encourage others to become certified.

Previously, Maya was a health physics instructor and dosimetry coordinator at Idaho State University. From 2000-2004 she worked for the Radiation Safety Service at the University of Michigan where she was responsible for over 200 laboratories conducting research using radioactive materials.

Maya holds a bachelor's degrees in Physics and Political Science from Dickinson College and a master's in Physics from Idaho State.

Dr. Brian Mays

... has been employed in the nuclear industry for the past ten years, during which time he has worked on a wide variety of projects for government and industry in North America and Europe. Much of his work has focused on advanced nuclear reactor designs, such as gas-cooled and sodium-cooled reactors. He is currently part of the technical staff at AREVA Federal Services in Lynchburg, Virginia.

Brian earned a B.S. in Physics and Mathematics and a Ph.D. in Engineering Physics, both from the University of Virginia. He has long been connected with the Virginia Section of the American Nuclear Society, having received a special award from the section when he was still a high-school student. He served as the chair of the section in 2004-2005.

Mr. James Miller

. .holds a B.A. degree in physics from Shippensburg University and a M.S. degree in nuclear engineering from the Pennsylvania State University. He has also completed graduate work in astrophysics at the University of Maryland and Penn State, and is a veteran ofthe U.S. Navy. Recently he retired for the *second* time from Dominion Virginia Power where he spent 36 years in the Nuclear Analysis and Fuel department. He is presently an adjunct professor and instructor in the Department of Mechanical and Nuclear Engineering at Virginia Commonwealth University where he has taught courses in introductory nuclear engineering, reactor theory, the nuclear fuel cycle, and the economics of nuclear power.

Mr. Joe Montague

...holds a Bachelor's degree in Nuclear Engineering and a Master's degree in Resource Economics from the University of Florida. Prior to his current position as an Engineering Training Instructor, Joe was a project engineer on Dominion's Nuclear

Analysis and Fuel staff. For 25 years he was involved in the procurement of Dominion's nuclear fuel. Mr. Montague was directly responsible for administration and vendor liaison for the fabrication of the nuclear fuel components and related services used in all seven of Dominion's nuclear reactors. During that time, he has been continuously involved in nuclear education and information outreach programs through the American Nuclear Society, North American Young Generation in Nuclear and Dominion.

Mr. Paul Riley

1995 BS grad of MC\I/VCU's nuclear medicine technology program. Certified nuclear medicine technologist with a specialty certification in nuclear cardiology. Member of the Society of Nuclear Medicine and American Society of Nuclear Cardiology. Ten years clinical experience.
Joined the faculty at VCU Radiation Sciences on March 2006 as Clinical Coordinator for Nuclear Medicine Technology Program. Prior to assuming his role as Clinical Coordinator, Paul worked for 11 years as a nuclear medicine technologist in both hospital and private cardiology settings. He has also has served as an affiliate clinical instructor for VCU's Nuclear Medicine Technology Program. He is pursuing a Master of Public Health degree at VCU.

Mr. David Sanderson

… has worked in the nuclear power field since 1967. He received his training in the U. S. Navy Nuclear Power Program, and served three years on the USS Enterprise. He went to work at Surry Power Station in November 1971. He worked in the Operations Department as an operator and supervisor, receiving a Reactor Operator license and a Senior Reactor Operator license. In 1981 he transferred to the Training Department at Surry, and trained newly hired personnel in the theory and practice of nuclear plant operations. He retired from Dominion in June 2010.

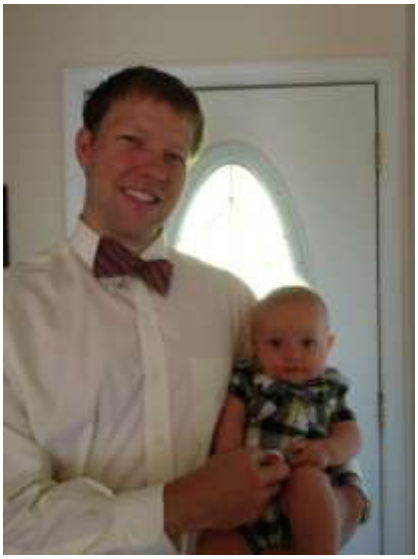
Mr. Carl Tarantino

…has been employed with Dominion Resources, Inc. for 29 years as a Power Reactor Health Physicist, Carl Tarantino, certified by the National Registry of Radiation Protection Technologists and American Board of Health Physics, works in the Corporate Nuclear Licensing & Ops. Support Department with primary responsibilities for providing technical support/oversight of the fleet's Radiation Protection programs, managing the Groundwater Protection Program, and coordinating the company's nuclear safety review activities. Upon obtaining his BA in Biology from St. John Fisher College, Rochester, NY, in *1975* Carl was commissioned in the US Navy's Medical Service Corps as a Radiation Health Officer, serving with the Navy' s Environmental Health Center, performing radiological and industrial hazards evaluations for fleet and shore based naval installations. Carl received his MS in Health Physics from the University of Florida's Environmental Engineering Program, Gainesville, and FL. in 1981 and received his MBA from Averett University, Danville, VA, in 2004. An active plenary member of the national Health Physics Society (HPS) since 1981, the local Virginia chapter since 1983, and the Virginia section, American Nuclear Society since 1998, Carl has a passion for teaching Nuclear Science and promoting career interests in Health Physics. Carl was the Science Teacher Workshop (STW) Coordinator for his local chapter for seven years, continues as staff presenter on Biological Effects of Ionizing Radiation for annual STWs, was member and chair of the HPS Science Support Committee, and currently fills a three year term on the HPS Board of Directors.

Dr. Gary C. Tepper

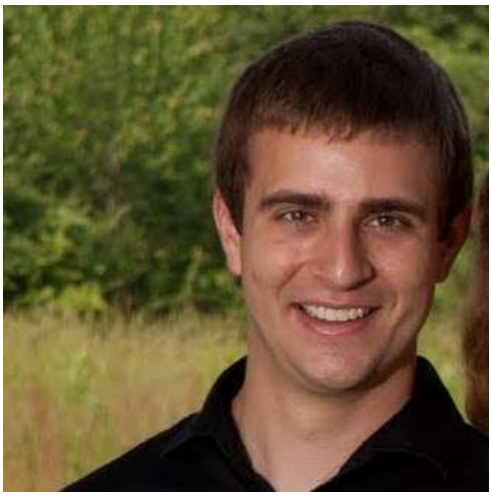
…graduated with honors and distinction from Penn State with a B.S. degree in Engineering Science. He then received his M.S. and Ph.D. in Engineering Physics from the University of California at San Diego. Dr. Tepper is currently the Chair and a Professor in the Department of Mechanical Engineering at Virginia Commonwealth University (VCU). Prior to joining VCU, Dr. Tepper performed research at the Space and Naval Warfare Systems Center (SPAWAR) in San Diego. His research focuses on the investigation and development of advanced materials, devices and integrated engineering systems for chemical sensing, air filtration and gamma radiation detection.

Mr. Caleb Tomlin



… is a graduate of The University of Virginia, where he earned a degree in Engineering Science. He currently works for AREVA in their Nuclear Island Systems Engineering group. He has been active in NAYGN for the past four years. Currently chairing the Nuclear Advocacy group which focuses on outreach to the public about the benefits of nuclear power. Prior to joining AREVA Caleb worked for B&W in their Nuclear Operations Group.

Mr. Brian Vitiello

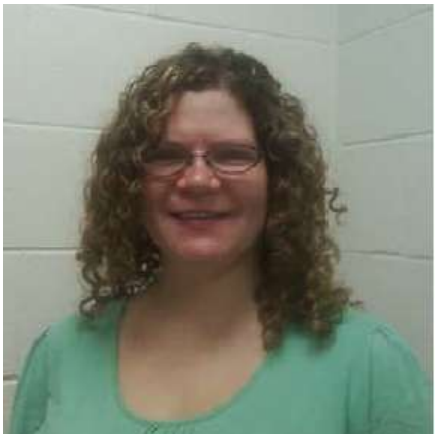


. . . graduated from the University of Wisconsin with a MS/BS in Nuclear Engineering in 2008. His master's thesis focused on the safety analysis of converting the Wisconsin research reactor from High Enriched Uranium to Low Enriched Uranium fuel. Since graduation, Brian has worked the last 4 years at Dominion in Nuclear Safety Analysis, performing thermal-hydraulic and transient analysis for Dominion's nuclear power plants. Brian is the 2012-13 Vice-Chair / Chair-Elect for the Virginia Section of the American Nuclear Society and has held several other positions within the local ANS section.

Mr. Keith Welch

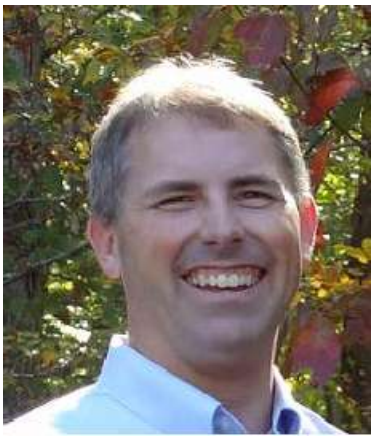
…has over 30 years of experience in health physics. He is currently the deputy radiation control manager at Thomas Jefferson National Accelerator Lab, where he has been employed in operational health physics for over 20 years. Prior to working in accelerator radiation safety, he worked as a technician, supervisor and technical trainer in the commercial nuclear power industry. He began his career working as a radiation protection technician supporting overhaul and repair of Naval nuclear power plants. He is a registered Radiation Protection Technologist and an associate member of the American Academy of Health Physics. Keith has a B.S. degree in technical management, and will complete his Masters in health physics in 2013.

Ms. Connie Woolridge



…currently teaches VCU Chemistry, VCU Calculus, VCU Pre-calculus, Honors Introduction to Engineering and Advanced Engineering in the High Tech Academy program at Highland Springs Technical Center in Henrico County. She began teaching ten years ago, after working as a sales, marketing, and customer service representative at MassTech, a mass spectrometry company. She received her B.S. degree in Chemistry and Theatre from Mary Baldwin College, her M.S. degree in Analytical Chemistry from Louisiana State University, and her M. Eng. Degree in Nuclear Engineering from Virginia Commonwealth University. She is a current member of the Society of Women Engineers.

Mr. Chris Wells



. . . is a graduate of the University of Florida with B.S. and M.S. degrees in Nuclear Engineering. Since 2000, he has worked at Dominion doing Methods Development work in the Nuclear Core Design group. His duties include development of reactor physics methodologies, spent fuel pool criticality analysis, computer software design for reactor physics applications, startup physics testing, and flux map analysis. Chris enjoys discussing nuclear subjects with students of all ages and has participated in speaking engagements at Richmond area schools and Science Museum of Virginia events.