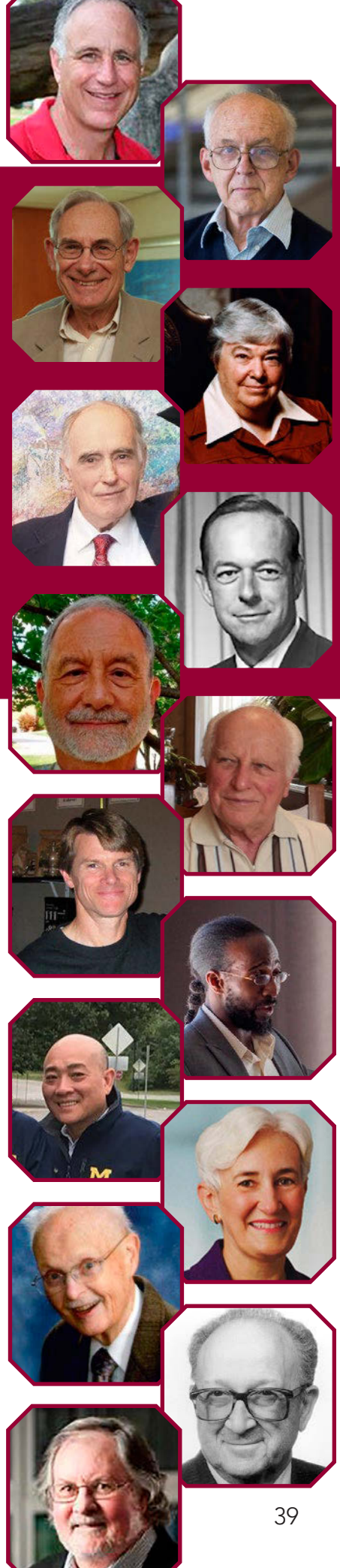
Who Inspired You?

Continuing on with our theme "**The People of Nuclear**," this article presents responses from various community members about those who inspired them—or the events or things that inspired them—to go on to have careers in nuclear.

There is an interesting mix of figures here, the most prominent being teachers who had lasting effects on their students. There are others who offered inspiration, too, including parents and other family members.

What all the respondents have in common is their inherent drive and their love of science and technology to keep nuclear moving forward.

We would like to hear your story. Write in to let us know about it and we will share it within the pages of *Nuclear News*.



Continued

Akio Yamamoto

Professor, Nagoya University

When I was in high school, I read an article in *Scientific American* (Japanese edition) on nuclear fusion technology, in which the future of fusion power was envisioned, which fascinated me and intrigued me to learn and conduct research on fusion technology. I joined the Nuclear Engineering Department of the School of Engineering at Kyoto University because the department is known for its excellence in this field. In the fourth year of the undergraduate course on nuclear engineering, I was faced with the choice of a laboratory for performing my bachelor's thesis research.

Fusion technology was appealing to many students at that time in Japan. However, there was an upper limit on the number of students that could join each laboratory. Because the university allowed only 20 enrollments each year for the undergraduate course on nuclear engineering, the number of students that could join each laboratory was also small (probably two, if I recall correctly). In the event of a conflict in selecting one's desired laboratory, the standard procedure to resolve the conflict was, interestingly, to throw a die.

Based on the random number from the die throw, unfortunately (or fortunately), I could not join the fusion research laboratory and instead chose the reactor physics laboratory. I immediately recognized the attractiveness of reactor physics and have been pursuing this academic field ever since.

Charlyne A. Smith

National Science Foundation Fellow and Nuclear Engineering PhD Candidate, University of Florida

Electricity is something that many people take for granted, especially when it is readily available. For others, electricity is so valuable that access is reason enough for celebration. I grew up in St. Catherine, Jamaica, and the latter rang true for me—even more so during natural disasters.

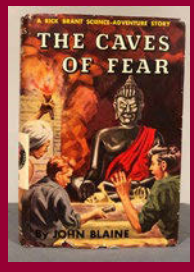
Growing up on a tropical island where the sun is in abundance for most of the year, I first turned to solar energy research for my undergraduate studies at Coppin State University (CSU). I was introduced to nuclear by Dr. Nickie J. Peters, a nuclear reactor specialist in the nuclear engineering program associated with the University of Missouri Research Reactor. Dr. Peters was invited to CSU as part of an Alumni in Excellence event hosted by the STEM club. He showed me that nuclear energy was an option that could provide reliable access to electricity on a large scale without generating greenhouse gases. After that encounter, I started to imagine the possibilities of nuclear energy being a part of the energy grid in Jamaica, and how if introduced it could almost immediately prove impactful by improving the lives of people in developing countries. That potential was enough for me to choose nuclear.

Dr. Nickie J. Peters

Steven Nesbit

President, LMNT Consulting, ANS Vice President/President-Elect

Like many in the generations before rampant electronic stimulation, I read a lot as a child and teenager. There were many books written for young readers, and I devoured series like the Hardy Boys, Tom Swift Jr., Chip Hilton, the Power Boys, and the Three Investigators. My favorite, though, was Rick Brant. Teenager Rick and his pal Scotty lived on Spindrift Island with Rick's father Hartson Brant, who headed the Spindrift Foundation of scientists. The group had great adventures all over the world, and always with a scientific twist. In *The Caves of Fear*, Rick, Scotty, their friend Chahda, and physicist Hobart Zircon traveled to the Himalayas and unraveled an international plot involving nuclear materials—specifically, heavy water. I wore the book out reading and rereading it.



I grew up thinking the potential of nuclear technology is immense, and I haven't changed my mind on that point. I can't point to a particular person for my decision to work in the nuclear energy field, but I think that Rick Brant deserves a fair share of the credit (or blame). I should probably acknowledge Hal Goodwin, the primary author of the series (under the pseudonym John Blaine).

Leah Parks

Systems Performance Analyst, U.S.Nuclear Regulatory Commission

My interest in nuclear was first inspired about 15 years ago by my PhD advisors at Vanderbilt University, Dr. Mark Abkowitz and Dr. Jim Clarke. Dr. Abkowitz, who specializes in risk management and hazardous material transportation, had served several years on the Nuclear Waste Technical Review Board, and Dr. Clarke, whose areas of expertise include chemical and nuclear waste, was serving on the NRC Advisory Committee on Nuclear Waste when I was at Vanderbilt. My curiosity was sparked by Dr. Clarke's colorful stories of the legacy of nuclear waste created during the Manhattan Project and by Dr. Abkowitz's thoughtful articulation of the way the nuclear industry approaches risk management. Dr. Abkowitz once told me when I was considering job opportunities, "You know, Leah, once you go nuclear, you rarely go back."

Dr. Mark Abkowitz

Dr. Jim Clarke

At the time I wasn't sure whether to interpret these as words of caution or as a prophecy of a lifelong fulfilling career. Fifteen years later, I'm still not sure I could explain exactly why nuclear sticks like glue. I guess there is a certain type of personality it attracts—those with a deep love of science and a devotion to realizing all the benefits technology can bring when safely managed. Whatever it is, I'm grateful to have been inspired.

Miriam Kreher

PhD Candidate, Massachusetts Institute of Technology

Although I am American, I mostly grew up in France. When given the opportunity to take an extra credit class in high school called Physics in English, I thought it could be an "easy A" and not much more. As it turns out, that class shaped my career. In just two hours a week, this class covered and compared energy sources, including their environmental impact, economic viability, and safety concerns. By the end of the year, it was obvious to me: nuclear energy has the power to save the world, and I wanted to help it do so.

How could I help? My options spanned from politics to art and everything in between. Having a scientific mind and a love for math, I chose engineering. I am now a nuclear engineer contributing to nuclear's computational modeling capability, and I have my high school bilingual physics teacher to thank for it. Thank you, Madame Nativel!

Gail H. Marcus

Consultant in Nuclear Power Technology and Policy, ANS Past President (2001–2002)

Sometimes, the smallest thing can have an outsized importance. It was November 1972, and I was about to present my first professional paper at the ANS Winter Meeting in Washington, D.C. I had invited my husband to attend, and when I picked up the registration material and gave him his badge, he was incensed. "It's pink," he said. "Doesn't ANS know that there are male spouses in the Society? You should do something about this!"

Octave du Temple

Gail de Planque

What could I do? I didn't know much about the Society, but I contacted staff headquarters. Octave du Temple, who was the executive director then, was very supportive and suggested that I do a survey of the female members of ANS. After I sent out my questionnaire, one of the recipients called me. It was Gail de Planque, who would later become the first female president of ANS. "This is great," she said. "Now, we need to organize a technical session on this subject." Which we did, in November 1975.

At that point, Octave and Gail suggested my name for one of the ANS committees. One thing led to another, and I subsequently served in many capacities, including as ANS president (2001–2002). I believe that my ANS involvement had a strong influence on my career path as well. And it all started with a pink badge.

Continued

Kevin O'Kula

Consulting Engineer, Amentum Technical Services

Growing up on eastern Long Island (New York) in the 1960s and early 1970s, I had much firsthand knowledge and experience with potatoes and farming but no awareness of the potential for a career in nuclear science and engineering. However, Brookhaven National Laboratory was just 15 miles upwind (most days), and we would experiment on the farm with BNL-irradiated seeds, and the Shoreham plant was to be built nearby, and so I was taking note. For me, it took two groups of dedicated teachers to provide the guideposts for my nuclear science and technology–based career.

Attending a parochial high school, I learned to appreciate the elegance of chemistry and laboratory thrills from a 20-something teacher, Mr. Michael Mannix. In senior year, I experienced the aura of classical and modern physics from a gifted, modest nun, Sister Mary Liguori, all of about 5 feet tall and 70 years young. These two were instrumental in pointing me toward pursuit of a career laden with heavy doses of math with a foundation in both physics and chemistry.

Later, as an undergraduate at Cornell, my advisor, K. Bingham Cady, lit the nuclear engineering flame. He suggested an Engineering Physics track and steered me to a summer job with Long Island Lighting Company and then entry into the Engineering Co-op program. Finally, in senior year, I took Prof. Paul Hartman's hands-on Advanced Physics Lab, and this experience sold me on the value of a solid laboratory work ethic (which was exactly how farming got done). It was a tough course because you "built it yourself," but it gave me confidence when an experimental thesis opportunity came up later at the University of Wisconsin. These four people, in their individual ways, really paved the way for me.

Zeyun Wu

Assistant Professor, Virginia Commonwealth University

My inclination toward nuclear engineering began in my early childhood with the realization that I was very good at math. That inclination grew to fascination during my high school days as I became more and more interested in nuclear physics. In college, I decided that a mixture of engineering and physics would allow me to study things more applicable than theoretical. This inspiration carried me to Texas A&M University, where I enrolled in the Nuclear Engineering PhD program—I found my calling in computational nuclear reactor physics. This niche area fits me to a tee because it seamlessly connected computational mathematics and nuclear physics applications.

Prof. Adams and Wu at Adams's 50th birthday party

During my time at Texas A&M, I worked closely with Prof. Marvin Adams, my PhD advisor. Dr. Adams was not only incredibly profound in the area of computational transport methods but also strictly professional in his working philosophy. His enthusiasm in nuclear engineering, his optimism surrounding our specialties, and his charming personality solidified my thinking that this field was the right one for me.

As I now enter my early/middle academia career with Virginia Commonwealth University, I direct my own computational reactor physics research group. Continuing through life, I look back to my original inspiration and realize that I am accomplishing exactly what I want to be doing. Nuclear engineering, in terms of clean energy and decarbonization, sees a bright future, and I am thrilled to be a part of it.

Emily H. Vu

Nuclear Energy University Program (NEUP) Fellowship Recipient, PhD candidate, University of Michigan

Growing up, I always enjoyed helping my dad with various projects. He showed me what was underneath the hood of a car, taught me how to safely use power tools, and never hesitated to teach me about the physical phenomena that happened around me every day. He consistently encouraged me to pursue a career in engineering.

We would talk frequently about what it meant to be an engineer, what a nuclear engineer does, and what nuclear energy is. He explained to me the process of nuclear fission and how it can be used to produce enormous amounts of energy. I was amazed by how clean and efficient nuclear energy was and the positive impacts it can have on the community and environment, and I was eager to learn more. My dad brought me to an open house at Ameren's Callaway Nuclear Generating Station, where he worked as a reactor engineer.

Emily and her nuclear family

I got to see a cooling tower in the flesh, step foot in the control room, and learn more about the make-up of a nuclear reactor.

I am grateful for the knowledge my dad so eagerly passed down to me. He has always been confident in my abilities to be an engineer, but because of him, I chose nuclear.

Rachel Slaybaugh

Assistant Professor, University of California, Berkeley

Each step along my path involved inspiration from different people in major ways, and so many more in minor ways. My parents instilled a strong awareness about negative impacts of human activity on the environment. As a college freshman, I ended up at an ANS Student Conference in Berkeley (organized by my now good friend Darby Kimball) due to a series of random events. While there, I heard from the likes of Alan Waltar about how nuclear energy was the size and shape of a coal plant but didn't emit air pollution—I knew I wanted to work in nuclear for fighting climate change.

At my first ANS national meeting as a sophomore, I was a student assistant in a session for Ted Quinn, and Ted got me involved in ANS leadership as an undergrad. In junior year I took a class from Yousry Azmy and got interested in neutronics. Yousry sent me to Oak Ridge National Laboratory as an intern, where I worked with Dick Lillie, Bernadette Kirk, and Mark Williams. It was there where computational neutronics became my chosen area of study. I had previously met Paul Wilson at ANS meetings and worked for him at the University of Wisconsin, where he and Tom Evans mentored me through my PhD.

Catherine Prat

Senior Engineer, Westinghouse Electric Company

I have always been a planner—that factor of the Type A personality so common with nuclear engineers held true for me. By age 10, I knew I wanted to be an engineer. The intersection of helping people and using technology to solve problems spoke to me. I didn't know much about nuclear engineering then, but I did know about this big company in Pittsburgh that was a leader in nuclear technology: Westinghouse.

At one point in their careers, all four of my grandparents had worked for Westinghouse. Grandpa Tony was a tech working on submarines, Grandma Pat was a secretary, Grandma Martha was a librarian at one of their research facilities, and Grandpa Chuck had Westinghouse as a client in his insurance business. From their stories, I learned a lot about Westinghouse and how it had been a giant in all facets of technology but had focused in recent years on commercial nuclear power. By the time I came across an introduction to nuclear physics in my senior year of high school, and loved it, that cemented it for me. Nuclear power was awesome, and I wanted to be a part of deploying this technology around the world.

Continued

James W. "Jim" Behrens

U.S. Navy, retired,
ANS member since 1978

I am honored to share a photo of my high school science teacher and first mentor in science, Helen Myers, who taught at Bunker Hill High School, Bunker Hill, Ill. From 1961 through 1965, Ms. Myers followed and nurtured my scientific pursuits, which included participation in annual science fairs together with classroom instruction in general science, biology, and advanced biology.

My interest in nuclear began during freshman year of high school as I learned, in Ms. Myers's general science class, about the discovery of natural radioactivity by French engineer and physicist Henri Becquerel. For my freshman science fair project, entitled "Autoradiographs," I duplicated Becquerel's 1896 experiments by irradiating unexposed dental X-ray film packets with radiation from the radium-filled luminous dials of my bedroom Timex alarm clock. This very simple science project was the beginning that ultimately led to my long career as an experimental nuclear physicist.

Helen Myers

If you wish to learn further details of my professional career in nuclear (1961–2018), I encourage you to read my 200-page autobiography, titled *The Path Traveled: A Special Collection of the Lifetime Works and Achievements of James William Behrens*, which I self-published in 2018.

Bill Rosko

North America I&C Customer Business Manager, Rolls-Royce

Between my junior and senior years in college, I had the opportunity to intern in steam turbine generator marketing. A year later I received a call from my internship manager informing me she had moved to a new organization and wanted to know if I was interested in joining their Nuclear Commercial Operations Division. I didn't know much about commercial nuclear power, but it sounded like an interesting opportunity, and I've been in the industry ever since.

My first position was in strategic marketing focusing on new markets, and then I moved to a customer-facing role supporting service centers. From there I moved to instrumentation and control (I&C), where I continued to work with global customers. That challenge led to my product management role, where I had responsibility for leading development and supply of select systems for both existing and new build. All the while I have had the good fortune to work with truly wonderful, professional, and dedicated customers and co-workers.

Currently, I'm the North America I&C customer business manager for Rolls-Royce, working with a great team out of Grenoble, France. Our industry has provided me wonderful opportunities and is an industry that's even more relevant today than when I first began.

Florent Heidet

Group Manager, Advanced Nuclear Energy Systems, Argonne National Laboratory

The person with the biggest influence on my path worked in the mining industry as an engineer since World War II and so was familiar with coal power. He also was living only a few strides away from the oldest commercial French nuclear power plant, the Fessenheim nuclear power plant. Having lived in this energy-rich region and through that era where nuclear played a key role in the regrowth of France and its energy independence, he knew the importance of nuclear energy. This was my grandfather, Guy Heidet, who first introduced me to nuclear power.

Guy Heidet

It became customary that when I would visit my grandparents over the summer for a couple of weeks, my grandfather would take me to various places to satisfy my curiosity for science and machinery. He took me as a 13-year-old kid on a tour of Fessenheim, which was my first time visiting any power plant besides a hydroelectric dam. While I did not immediately fully appreciate all the intricate details or importance of this plant, the trip sparked an interest in learning more about it and eventually joining and contributing to this, our nuclear community.

Piyush Sabharwall

Advanced Heat Transport Lead, Systems Integration Department, Idaho National Laboratory

The inspiration to be an engineer was present in the very early stages of my childhood. I was first introduced to atoms and atomic structure by my eighth-grade science teacher, which piqued my interest. Back then in India, nuclear engineering was not offered as a discipline in college; hence, I decided to pursue mechanical engineering.

I was planning to pursue my master's in mechanical engineering until I had the opportunity to interact with Prof. Qiao Wu, Prof. Jose Reyes, and Yeon Jong Yoo from Oregon State University's Nuclear Engineering Department. There, I became intrigued once again with nuclear energy. My conversations with them revived my interest, and I decided to pursue my master's in nuclear. Yeon Jong Yoo, apart from being a friend and colleague, guided me as a mentor. As my graduate work progressed, it fueled my passion for sustainability and clean energy, and I went on to earn a doctorate in the field.

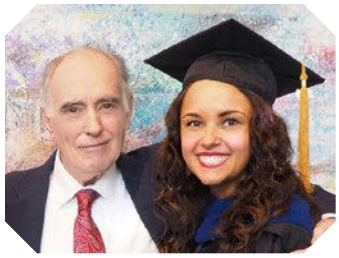
Growing up in India and experiencing pollution on a daily basis made me realize that fossil fuels cannot be a long-term solution. Having this in the background and searching for a long-term sustainability solution made my decision to pursue nuclear even easier. I am proud and honored to be part of such an environmentally conscious and enthusiastic group that understands the needs of the planet and cares about the environment and the future generations that we will leave this world to.

Kallie Metzger

Advanced Fuels Development Lead, ATF Technology, Westinghouse Electric Company

Throughout my professional career, I have been lucky to find myself surrounded by influential mentors and advocates. Dr. Elwyn Roberts stands out as the one who most inspired my career path. I met Elwyn as a graduate student at the University of South Carolina. He was my technical advisor, and he had an innate ability to ask challenging questions that rocked my research to its core. This "tough tutelage" forced me to develop strong problem-solving skills and technical chops in the area of nuclear fuel and materials.

I loved the stories Elwyn would inject from his prior career as manager of nuclear materials at Westinghouse Electric Company. He experienced the early years of civilian nuclear power and was privileged to personally discover and solve many of the very fuel behaviors I studied in textbooks. I yearned for the opportunity to contribute to something so groundbreaking. Luckily, I found my opportunity at the same place Elwyn began his career. Today, I lead advanced fuels development at Westinghouse, designing the next generation of nuclear fuels and materials. I call on an old friend whenever our program needs a challenge review. That's right—I hired Elwyn, the person most capable of asking hard questions!



Dr. Roberts and Metzger

Julie G. Ezold

Californium-252 Program Manager, Oak Ridge National Laboratory

It was the summer before my senior year of high school, and I had the opportunity to attend the Hopwood Scholarship Summer Program at Lynchburg College. I could choose one of 13 different topics for a one-week intensive study. Yours truly chose nuclear chemistry since I was going to be taking AP Chemistry in the fall. My instructor was Dr. Neal Sumerlin, associate professor of chemistry. Dr. Sumerlin was a great instructor and made the week fun and challenging at the same time. Our "textbook" was one he had written, since there wasn't one applicable for the undergraduate level he was teaching. He did an amazing job of explaining the material in terms that we could understand and providing problems that applied the information. The lab topics were detectors, half-life, and decay; they proved to be exciting and piqued my interest. We even took a memorable field trip to see the University of Virginia's nuclear reactor. Unfortunately, our van broke down, and the reactor wasn't running when we got there. When my parents picked me up, I announced that I was going to be a nuclear engineer!

Dr. Neal Sumerlin

Continued

Andrew Klein

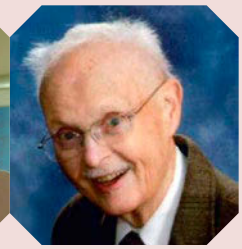
Professor Emeritus, Oregon State University, ANS Past President (2016–2017)

My real inspiration for becoming a nuclear engineer can be more broadly defined than by an individual person or opportunity. As a young student growing up in eastern Pennsylvania on the edge of coal country, one fundamental question consistently bothered me: Since electricity will be critical to the future, how can we best make electricity without polluting the air and water? The answer to this question has always been nuclear, because without it we will never approach the clean-air world that we, and our children and grandchildren, will require.

To accomplish my goal, I have crossed paths with a number of inspirational people and teachers who helped me along the way. These include Dr. Dixy Lee Ray, then-chair of the U.S. Atomic Energy Commission, who I heard speak during my freshman year at Penn State; Prof. Ed Klevans, my *de facto* advisor and mentor as an undergraduate at Penn State and a lifelong friend and colleague; and Prof. Bill Vogelsang, my thesis advisor at the University of Wisconsin and predecessor as editor of ANS's *Nuclear Technology* journal. All of these provided me with the many small and large inspirations to become a nuclear engineer.

Dr. Dixy Lee Ray

Prof. Ed Klevans



Prof. Bill Vogelsang

Alan E. Waltar

ANS Past President (1994–1995)

I grew up on a small dairy farm in western Washington, totally oblivious to the field of nuclear technology. All I wanted was to inherit the farm and build it into a first-class showpiece. But my father had a stroke while I was in the eighth grade and had to sell the farm. Fortunately, my high school science teacher, Ralph Nelson, was a master mentor and drew me into the sciences. In my small high school, with 21 in my class, I couldn't have been more fortunate than to have Mr. Nelson as my teacher of algebra, calculus, trigonometry, physics, chemistry, health—plus serving as my local Scoutmaster and driver of my school bus. He inspired me to pursue a career in science.

Later, as a senior studying electrical engineering at the University of Washington, I enrolled in Introduction to Nuclear Engineering, taught by Prof. Les Babb (head of the Nuclear Engineering Department). He was a staunch believer in and motivator for the future of nuclear engineering and was, without doubt, the major figure in my life in directing my future into this field.

These two men changed my life, for which I am forever grateful!

Warren "Pete" Miller

Former Assistant Secretary of Energy for Nuclear Energy

I entered the United States Military Academy at West Point in the summer of 1960 when the entire four-year curriculum was fixed (with no electives), leading to a B.S. in engineering sciences. In the last semester of my senior year, in 1964, a change was made—we had a choice between a course in civil engineering and one in nuclear engineering. I don't remember the nuclear textbook in detail, but comparing it to the one for civil engineering made the decision easy for me. Nuclei with orbiting electrons were much more interesting than beams and trusses.

After five years in the U.S. Army, I decided to leave active duty, pursue a master's degree in nuclear engineering, and enter the private sector. After one year at Northwestern University, my mentor and advisor, Prof. Elmer E. Lewis, saw promise in me and encouraged me to continue for a PhD. I graduated from Northwestern in 1973 with a PhD, served for almost 30 years at Los Alamos National Laboratory, and later was sworn in as Department of Energy assistant secretary for nuclear energy in 2009. Early support from the USMA and Elmer Lewis were key to launching my career.

Temitope A. Taiwo

Interim Division Director, Nuclear Science and Engineering Division, Argonne National Laboratory

I have been inspired in nuclear science and engineering by many noble acquaintances during my undergraduate, postgraduate, and employment experiences. I focus here on my thesis advisor, the late Dr. Allan Henry, during my PhD studies at the Massachusetts Institute of Technology. I interacted with him for about three years, taking two advanced reactor physics courses and working on my thesis. He was already well-established, first as manager of reactor theory and methods at the Bettis Atomic Power Laboratory and later as a professor at MIT. He had also written the famous book *Nuclear Reactor Analysis*. He was very accommodating, allowing me to practically walk into his office to discuss the progress being made in my work, including any challenges. Interactions with him enabled quality time with the famous Drs. Norman Rasmussen and Neil Todreas as well as others at MIT. I remember with gratitude Dr. Henry's encouragement to join the American Nuclear Society and the American Physical Society and his strong promotion of me to enable employment at Northeast Utilities, Connecticut. I also sought his letter of recommendation while seeking employment at Argonne National Laboratory. My interactions with him gave me confidence that I could be successful in the field.

Dr. Allan Henry

Jinan Yang

R&D Staff Member, Radiation Transport Group, Oak Ridge National Laboratory

My career started when I graduated with a bachelor's degree in applied mathematics in China and then joined the Monte Carlo Method Group at the China Institute of Atomic Energy. While there I learned about the SCALE code package and dreamed someday that I would be able to work at Oak Ridge National Laboratory—with an ultimate goal of reaching the moon!

In 1998, I had the opportunity to work on nuclear-related applications in Japan. To expand my knowledge, I started reading nuclear engineering papers. I realized that the last author on several papers I read was the same person, Prof. Edward Larsen from the University of Michigan. Unfortunately, I didn't understand the content, but I was so fascinated by the methods and ideas in these papers that I went on to read more papers having the same last author. Of course, the first authors on these papers were all Prof. Larsen's students. Fast forward to 2011, I completed my PhD studies in nuclear engineering and radiological sciences at the University of Michigan. My thesis advisor was . . . Prof. Edward Larsen!

Prof. Edward Larsen

I am very pleased with my transition from mathematician to nuclear engineer. I believe that nuclear energy can improve people's quality of life while protecting the environment.

Kathryn A. McCarthy

US ITER Project Director

By the time I started my senior year in high school, I had decided I wanted to be a music major. However, I enjoyed my math and science classes and started rethinking that plan when funding for the arts in public schools fell victim to budget reductions. My parents raised my sisters and me to make our own choices and didn't push us into any particular career path—but definitely emphasized the importance of a college degree. My father was an engineer, and that career path sounded interesting. I pivoted from music, but what kind of engineering should I pursue?

That year, the events at Three Mile Island happened, and my high school physics teacher, Malcolm Wells, talked about them in class. He talked about the clean energy produced by nuclear power and how important that was. It was intriguing to me, and I decided to become a nuclear engineer. I enrolled in the nuclear engineering program at the University of Arizona and stuck with it (even though it could be a bit of a conversation-stopper at college parties). ⊠