Christine Grant

. . . of North Carolina State University

Tonya Peeples
ChE Faculty University of Iowa
Lisa Bullard
ChE Faculty NC State
Laura Thorp
Staff writer NC State

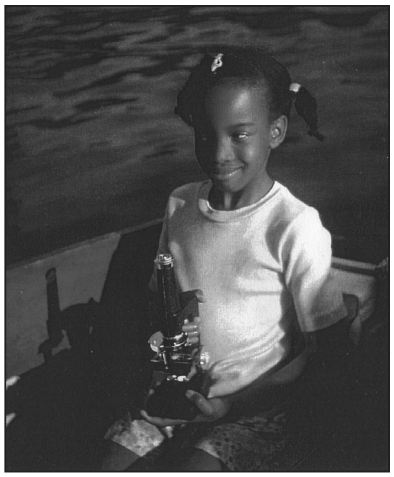
My legacy is what I like to call a mentoring legacy; it's really embodied in the diverse group of folks that I've mentored. It's this idea of an academic family tree. But it's not the traditional academic family tree. And that's what I think makes my experience empowering others my legacy; a unique contribution to the chemical engineering academy.

To say that mentoring has been an important part of Dr. Christine Grant's personal and professional life would be a bit of an understatement. It is, as she says herself, what has shaped and defined her impact in the field. Being both a leader in and a beneficiary of mentoring throughout her academic career is what has enabled her to achieve such high levels of success as a chemical engineer, providing her opportunities to define and create her own unique career path. As one of less than 10 female African-American chemical engineering full professors in the country, she recognizes that her leadership roles in the North Carolina State University College of Engineering and the American Institute of Chemical Engineers (AIChE) have provided her with an important platform to both promote and celebrate mentoring. Mentoring was present early in Grant's life. Born in Schenectady, NY, in the 1960s, she was part of one of the few African-American families in their entire school district. The importance of academia and education was established early. During the first part of her life, her father, Victor Grant, served as the superintendent of music for the entire school system and the music instructor/band director for the local high school. Her mother, Frances Bethea Grant, trained as a biology teacher, and was a stay-at-home mom until the family moved to Albany where she resumed her career as a science teacher. She eventually became a technical editor at Knoll's Atomic Power Laboratory (KAPL) where she worked in close proximity to engineers. Grant's parents were her first supporters and mentors, modeling and encouraging her to achieve academic success.

Christine speaking to a group of women engineering students at Lehigh in 2015.

Christine attended Albany High School where she excelled academically; she enrolled in AP classes, served as senior class president, and graduated 26th out of a class of about 900 students. It was here that she met one of her most influential mentors—Charlotte Criner, a school guidance counselor. Criner sought out academically talented minority students and spoke to them about the opportunities associated with the pursuit of an engineering career. Criner invited minority alumni to come back and talk to the students to encourage and to provide guidance. She sent the students on field trips to colleges of engineering (*e.g.*, Cornell, RPI, UMass Amherst, Stevens Institute of Technology) so they could see first-hand the role engineering played and the career possibilities it offered to them. Grant remembers Criner as the person who created a micro-community for herself and other students within an urban New York high school. When combined with her parents' commitment to education, Christine saw this method of connecting with students as the norm and adopted it as part of her personal career mission.

Her mother recalled how Christine was always busy and an active participant in the arts. Christine has fond memories of playing clarinet in the school band and orchestra (she eventually became first chair, first clarinet). In fact, she wanted to sing in the choir, but it would not fit into her schedule because she was so busy with her academics and student government leadership. So in what others recognize as the normal Christine fashion, she created the opportunity to perform in the choir by arriving at school before 7:30 a.m. to rehearse in a small group with the choir director. This outside-the-box thinking is what has driven her to a number of pursuits in both personal and professional realms. Her current assistant director of Faculty Advancement, Barbara Smith, says, "Christine's inexhaustible creativity is one of the best aspects of working for her—anticipating each time she will exclaim 'I have an idea' and being a part of shaping



Left, Christine with her mother, Frances Grant—the biology teacher. Right, a young Christine on the boat she helped to build with her father, looking at microbes under her solar-powered microscope. Below, her first engineering project!

those ideas into innovative programs to benefit our faculty."

In high school, it was not difficult for Christine to decide to pursue chemical engineering. In fact, Christine had been almost predisposed to this path. She always loved math and science and was very gifted in these areas. She remembers doing science and nature experiments with her mother, the biology teacher, as a young girl. As a middle-school student, Christine spent weekends with her father working on the construction of his inboard-outboard boat, a boat that she eventually would steer on the open water with her boating license. She credits her participation in a program to increase minority engineering graduates (PIMEG) through General Electric—a company that employed both her grandfather and mother—as the pivotal point guiding her to an engineering career. A field trip to a sewage treatment plant during a summer program at UMass Amherst solidified Grant's desire to pursue chemical engineering and her love for the field.

UNDERGRADUATE

Christine applied and was accepted into a number of prestigious universities: Cornell, MIT, RPI, and UMass Amherst, to name a few. She chose to attend Brown University for her undergraduate degree. As part of her participation in the GE engineering program, she had already visited Brown's campus. Christine received multiple scholarships to aid in the cost of attending Brown, including one from GE. Christine spent one day working on the dishwashing line at Brown but found that it was too messy for her; luckily, she found a much better fit working as an undergraduate researcher in the Physics Department. During her summers (1981–1984), she returned home to Albany and worked at GE in the R&D Center in chemical engineering, microelectronics, and polymers. A few years ago, Christine came full circle when she led a group of NC State engineering faculty to the GE R&D Center to learn about potential fundable research opportunities. Christine was active in the National Society of Black Engineers (NSBE), working her way up from secretary to vice president of Brown's NSBE chapter; she became president during her senior year. Christine also sang in the gospel choir and worked with the senior African American ONYX group.

During her time at Brown, Christine moved into the role of serving as a mentor to others. She served as a minority peer counselor to freshmen living in her dorm community during her sophomore and junior years. She also provided tutoring and outreach to current and prospective students as part of her work with NSBE. It was important to Christine to use her time at Brown to not only further her own education, but to reach back and pull along other students from her home community and the community around her.

GRADUATE SCHOOL

In 1984 Christine went to the Georgia Institute of Technology to pursue her graduate degrees. The recipient of a GEM Fellowship (from the National Consortium for Graduate Degrees for Minorities in Engineering), she was recruited and fell in love with Georgia Tech after visiting the campus for a national NSBE conference. She remembers being personally recruited to Georgia Tech by Professor Gary Poehlein, the department chair, who discussed the benefits of the graduate program over a cup of coffee in his office. It was several years later in that same chair's office that Professor Ron Rousseau talked to her about the pursuit of a faculty position at his former institution, NC State. General Electric again became a supporter during the final stages of her doctorate, providing the GE Forgivable Loan for students who planned to pursue a career as a faculty member.

Christine earned her Master's in 1986 and her Ph.D. in 1989. During her time at Georgia Tech, she worked with Professor Eric Clayfield (a former researcher at Shell Research in England) and Professor Michael Matteson. Her doctoral work focused on investigating the surfactant enhanced electro-osmotic

dewatering of iron oxide slurries. Christine was interested in addressing the surface and interfacial aspects of the separation of hematite slurries utilizing a chemically modified system. The primary practical application was to see if there was a relationship between the energy required to effect separation beyond that of a traditional vacuum-based system. At Georgia Tech, Christine became very interested in surface and interfacial science and was mentored from afar by Professor Clarence A. Miller from Rice University after serving as an aide in his session at a colloids conference.

Christine's faculty picture in 1989 when she joined the NC State faculty.

Christine and some peers with her graduate school advisors, Eric Clayfield (center) and Michael Matteson (far right).

As a part of her GEM Fellowship, Christine worked for Procter and Gamble in Cincinnati in the packaged detergent area in summer 1985 while pursuing her M.S. degree. She remembers how challenging it was to ascertain the role of different granular product formulations on the particle size in the effluent of the dissolution processes. This need to understand the complex relationship of chemistry, agitation, and sampling techniques to the "dinginess" or deposition on clothing was also connected to environmental aspects of laundry formulations. Her environmental interests are a thread that one sees woven throughout her career from high school summer training programs to the development of environmental courses and curricula as a faculty member. While working at P&G, she took the opportunity to teach a Saturday morning math enrichment course to inner city middle and high school students at the University of Cincinnati (UC). Imagine her surprise when in 2014 she returned to UC to give a campus-wide lecture on STEM diversity and found some of the original leaders of that program in the audience!

Christine continued her work with mentoring and advocating for other students in her field while in graduate school. She worked and spoke with undergraduate students about graduate school for STEM or specifically chemical engineering; she would counsel students on how to be successful in these endeavors. One of her most memorable mentoring experiences was perhaps a bit accidental. A student from Spelman College, Joycelyn Harrison, came to interview Christine in her office; Harrison asked Christine about where she was in her career, graduate school, and her success. Christine recalls that eventually they turned the tape recorder off and just started talking. Harrison mentioned that she was considering a career in engineering and going to graduate school. Christine was encouraging and supportive, helping Harrison complete her application package. Now, Dr. Joycelyn Harrison is a program director at the Air Force Office of Scientific Research. Christine took her NC State faculty to AFOSR a few years ago, and some of them now call Dr. Harrison their program manager—another success story that adds to Christine's academic mentoring family tree.

TEACHING, RESEARCH, AND LEADERSHIP

After finishing her doctorate in 1989, Christine took a position as an assistant professor in the Department of Chemical and Biomolecular Engineering at NC State, where she was promoted to associate professor in 1996 and full professor in 2005. She was not the first woman faculty member in the department and credits Professor Carol Hall with coaching her as a young assistant professor. During her time at NC State, Christine has taught, designed, and developed several chemical engineering courses. Her initial teaching experience was with Professor Richard Felder, co-teaching Chemical Process Principles. Felder states, "Christine is one of the most creative faculty members I know. She has created a wide range of effective programs for new faculty members and is a strong supportive resource for them." She also taught the core and honors sections of fluid mechanics, heat transfer, and mass transfer. Christine finally had the opportunity to integrate her passion for environmental aspects of chemical engineering (called "pollution prevention" in the early 1990s) into core and special topics courses. Her dual-level course, Advances in Pollution Prevention: Waste Management for the Future (developed with Professor Michael Overcash), was one of the first courses in chemical engineering on this topic. In fact, in the early days, there was not even a textbook available for this cross-disciplinary course. In addition to undergraduate/graduate students on campus, she had several students from industries around the country in the Engineering Online version of the course. She was the first advisor in what was called the Green Chemistry/Pollution Prevention option, incorporating cutting edge technologies such as nanotechnology and biosystems. Tim Anderson, dean of Engineering at

the University of Massachusetts, Amherst, says, "Christine has been a consistent source of innovation and inspiration in engineering education throughout her career. Her efforts in faculty development have been creative and inclusive, and particularly impactful for new faculty. And she is easily picked out of a crowd by her contagious laugh."

During her time at NC State, Christine's research group has focused on an evaluation of the mechanisms that control fouling and decontamination processes. The formation and removal of deposits are governed by a combination of chemical and transport processes at the solid-liquid interface, in the bulk liquid, and in the film itself. Although general models had been used to describe cleaning and fouling, there was still a lack of understanding of the fundamental mechanisms underlying both the physical and chemical aspects of these processes. Insight into both the initial stages of fouling and the removal of trace residues is necessary to develop environmentally benign cleaning technologies in the chemical, food, and electronics industries. Christine's research evolved from industrial areas where fouling and cleaning are major problems, including: (1) the hydration and removal of organics from glass; (2) the removal of calcium compounds (*e.g.*, $CaCO_3$,$CaPO_4$) and fouling residues from stainless steel; and (3) the deposition of lubricants during high speed fiber processing. Her research group has also investigated the use of additives to reduce lubricant degradation and deposit-forming tendencies at high temperatures. Further, Christine and her team have also investigated the use of supercritical CO_2 in liquid to remove organic thin films from metal surfaces.

In contrast to discontinuous studies, Christine and her team have utilized several techniques [such as total internal reflection fluorescence, solid scintillation, and a quartz crystal microbalance (QCM)] to non-invasively probe the interactive effects of hydrodynamics, temperature, and film structure on deposition and removal of organic and inorganic films from glass and stainless steel surfaces. The novelty of the work is rooted in the fact that her group utilized the QCM at elevated temperatures and pressures to measure variations in mass where the contributions to frequency variations were complex. Her projects in high viscosity systems (*e.g.*, in liquids and lubricants) were conducted before off-the-shelf analytical tools for liquid systems were available. She acknowledges her early career collaborations with Ruben Carbonell (NC State chemical engineering) and Jackie Krim (NC State physics) and currently works to promote interdisciplinary collaborations for new faculty in the College of Engineering. Her graduate students (and the dozens of undergraduate mentees) have moved into a variety of industrial and academic positions.

In the past few years, Christine has developed an interest in biomedical applications and has projects underway in collaboration with biomedical engineering faculty at NC State related to cellular-based systems. Her research connections are now focused on her latest initiative in the College of Engineering, the Mentoring Incubator, an entity created to train students in the development and management of personalized mentoring portfolios. The Incubator fosters a culture that values diversity in STEM fields at NC State, empowering underrepresented students to make informed choices about undergraduate majors, graduate school, and careers. The goal is to match students with research mentors based on their multifaceted interests; Christine personally mentors each participant in this realm, and she collaborates with faculty research mentors in the Colleges of Education and Humanities and Social Sciences at NC State.

WORK WITH OTHER INSTITUTIONS

In addition to her teaching and research at NC State, Christine has travelled to institutions around the world. During what Christine calls a "mini-sabbatical" in the summers from 1997-1999, she served as a visiting professor and researcher in the Department of Chemical Engineering and Materials Science at the University of Minnesota. This opportunity, funded in part by NSF's POWRE (Professional Opportunities for Women in Research and Education) Program, enabled her to work directly with Professor Matthew Tirrell, another academic whom she considers to be a critical career coach. During her sabbatical in 2007, she was a visiting professor in the Department of Biomedical Engineering at Duke University with Professor Monty Reichert. In the summer of 2007, she was a visiting scholar in chemistry and chemical engineering at Caltech with Professor David Tirrell; she counts the Tirrell brothers as two of her most important mentors in the research arena. Christine also recalls a very exciting trip to Australia where she spent part of her sabbatical at Monash University in the Chemical Engineering Department with Professor Xiao Dong Chen. She also did an invited plenary talk at the 2007 CHEMECA Conference (sponsored by IChemE Australia). Her talk, entitled, "The Rate Limiting Step in Chemical Engineering Growth," focused on the unique challenges and opportunities at the intersection of race and gender to grow the global chemical engineering profession. The teaching and research opportunities at other colleges and universities represent another level of mentoring in Christine's career. Christine's recent interests include science policy and the processes associated with the national funding of research. In the summer of 2011, she spent several weeks in residence at the Beckman Center for the History of Chemistry after being awarded a Chemical Heritage Foundation (CHF) Travel Award. In 2014, Christine was appointed as a visiting senior scholar at the American Association for the Advancement of Science (AAAS), spending time in residence with Dr. Shirley Malcom, the head of Education and Human Resources Programs at AAAS.

AWARDS

Christine has received numerous awards over the course of her career. The four mentoring-related awards that stand out

are the 2016 AAAS Mentor Award; the 2003 NSF Presidential Award for Excellence in Science, Math, and Engineering Mentoring from President George Bush; the Council for Chemical Research National Diversity Award; and the American Chemical Society Stan Israel Award for Diversity. An AIChE fellow, Christine says that AIChE has played an important role in her acquisition of leadership skills. She has served the Institute in a number of roles including the Board of Directors, chair of Minority Affairs Committee (MAC), and the Chemical Technology Operating Council (CTOC), and she was recognized with the AIChE Pioneers of Diversity award

Christine mentoring early career faculty Ericka Ford in her BME lab at NC State.

Christine was a recipient of the National Academy of Engineering's CASEE Boeing Senior fellowship from 2004-2005. In 1996 and again in 2001, Christine received the NC State Provost's African-American Professional Development Award. She was inducted into Sigma Iota Rho International Honor Society in 2003. The National Organization of Black Chemists and Chemical Engineers (NOBCChE) has also been an important part of her career development. A NOBCChE Kodak graduate fellowship recipient in 1987, 10 years later she received the NOBCChE Lloyd Fergusson Young Scientist Award, and 21 years later, she was the inaugural recipient of the NOBCChE Professional Award in Chemical Engineering.

MENTORING ON A NATIONAL SCALE

With the important role that mentoring has played in Christine's own life, both personally and professionally, it's hardly surprising that she's active in mentoring and faculty development on a national scale. For Christine, her mentoring history goes back to her parents. Her parents were strong advocates of teaching others to be successful, and she learned a great deal from them. From her early days as a student in NSBE, Christine's exposure at the national level to the vast network of programs was the start of her understanding of the national scale of broadening participation among faculty, students, and researchers in STEM. While she was a GEM fellow, Christine was influenced by Dr. Howard Adams, the Executive Director of GEM, who had high expectations that she actively engage in mentoring. As she became more active in AIChE in the Minority Affairs Committee, and ultimately as an elected member of the AIChE national Board of Directors, Christine was presented with a host of opportunities to work on diversity and inclusion as a part of her own career roadmap. Perhaps most importantly, the absence of faculty (and students) who looked like her took on a new meaning as Christine was establishing her own place in the field of chemical engineering. As a woman of color in her field, she wanted to help others in a similar position to avoid some of the difficulties and roadblocks that she experienced as she navigated undergraduate and graduate school, and the beginning of her professional career. After establishing her career as a successful professor, she shared her experiences with other aspiring faculty within the chemical engineering discipline. As an active member of AIChE, she helped develop mentoring networks for female faculty by simply checking in with how everyone was doing and finding out which institutions had new junior African-American faculty and graduating students. This active concern for the careers of other minority faculty extended beyond the AICHE Minority Affairs Committee and enabled her to be a central point of connection for faculty across engineering and science disciplines. She was also influenced by the many mentors and leaders in NOBCChE. The annual "meet-ups" of the minority faculty, students, and professionals at technical meetings caused a grassroots movement of sorts. In addition, as she started to affiliate with programs for women in engineering, she saw an additional need for networks of women of color in the engineering academy.

So Christine took it upon herself to create these networks. In 2007, Christine succeeded in one of her noteworthy achievements by bringing together U.S. women and minority STEM faculty and leaders from across the country and conducting a series of Peer Mentoring Summits for Underrepresented Minority Engineering Faculty (funded by an NSF ADVANCE Leadership Award), impacting over 110 female underrepresented minority (URM) engineering faculty. The 2009 summit on Cal Tech's campus in Pasadena followed the initial summit held at NC State in 2007. Several of the women attending this conference were brought into a network of mutually supportive mentors/mentees and broadening national participation. These early summits formed the foundation for Christine's current role at the national level as a thought leader and an advisor focused on broadening participation in the engineering academy at the faculty rank. Kristala L. Jones Prather, associate professor in chemical engineering at MIT, states, "Christine has been a tireless advocate for women of color all over the country. Her boundless enthusiasm and faith in our abilities are often just the boost we need to keep moving past the difficult projects and grant rejections that seem insurmountable in the pre-tenure years. I am truly

blessed to have her as an academic mentor and dear friend." She currently serves as a valued advisor to the University of Iowa Sloan University Center for Exemplary Mentoring. She is also a member of the external advisory boards for NSF ADVANCE grants (focused on the success of female in the STEM academy) at the University of Virginia, Stevens Institute of Technology, and Lafayette College.

A UNIQUE CAREER AND LEADERSHIP

Christine continued to travel around the country mentoring and conducting workshops on how to improve mentoring networks while maintaining her teaching and research at NC State. Then in 2008, Christine saw a need for a mentorship network and faculty development specifically within the College of Engineering at her home institution. So she took a chance and approached the newly appointed dean of the college, Louis Martin-Vega, about creating an office and position to meet this need. Christine knew that she wanted to be in a leadership role, but she didn't want to take the traditional path and be a department head first. With the support of the dean, Christine wrote up her own job description. In 2008, she became the first associate dean for Faculty Development and Special Initiatives in the College of Engineering at NC State. This position enabled her to continue her nationally recognized work in faculty development and infuse her own expertise in creating academic communities at her home institution, beyond the chemical engineering department.

Since its inception, the office and Christine's position have shifted and restructured to better meet the needs of the departmental faculty. Initially, Christine's associate dean responsibilities were split evenly with her responsibilities as a professor. Christine's new title as the associate dean of the Faculty Advancement reflects the fact that she has additional leadership responsibilities including managing the reappointment, promotion, and tenure process and policies at the college level. The most significant aspect of this change is the fact that Christine is now 100% focused on her position as associate dean, and this office is now part of the foundational administrative structure within the College of Engineering.

While Christine still conducts research in the Mentoring Incubator and interacts with students, her focus is now on providing for the needs of the faculty in the college as a member of the Executive Committee working alongside department heads, college leadership, and the Provost's office. Through her initiatives, Christine seeks to "empower faculty to be successful where they are, in a timely fashion, through relevant information they can easily glean from other successful faculty." Her faculty colleague, Phil Westmoreland, past AIChE president, states, "Christine's role as associate dean has given her a new platform for one of her greatest passions: helping new faculty shape their career trajectories. She has long worked with aiding prospective faculty, too, but by creating new workshops and effective skill-focused orientation, she is helping new faculty from the Colleges of Engineering and Science to jump-start and then get continued aid."

Ultimately Christine sees the goal of the Faculty Advancement Unit as bringing faculty together to learn from one another. She convenes faculty at different career stages and gives them the opportunity to engage in a roundtable discussion with "faculty sages" about how to navigate career milestones such as reappointment, pursuing tenure, and full professorship. NC State colleague Lisa Bullard observes, "Christine is a tremendous advocate for faculty development at all levels. In particular, she has been a champion for non-tenure track engineering faculty, helping them better quantify and define their contributions within their path to promotion. One of her real talents is being the 'connector' who brings people, resources, and opportunities together."

Although she is now 100% in the dean's office, Christine's impact is still felt in the Department of Chemical Engineering. Assistant Professor Chase Beisel indicates, "Christine deeply cares about me and the other junior faculty. Personally, I have greatly benefited from the programs that she has spearheaded, including a trip to the NSF and workshops on applying for an NSF CAREER award." Similarly, Assistant Professor Gregory Reeves says, "Christine has worked tirelessly to be an advocate for junior faculty. The Faculty Development programs, especially ones targeted at securing early extramural grant funds, such as the NSF CAREER award, are very visible signs for her advocacy." Even the CHE staff continue to connect with her; the former departmental business officer, Sheila Hayes, says, "Dr. Grant has continuously proven to be a great supporter of the support staff in our department. She recognizes the hard work and dedication the staff offers and is generously appreciative. She makes it a point every year to come by during Administrative Appreciation Week and prepares a breakfast, just for the staff. That really goes a long way with the staff and helps to boost staff morale."

CONTINUED MENTORING SUCCESS

Mentoring and advocating for students and faculty at all levels of education has been the thread woven throughout Christine Grant's scientific journey. Even more importantly, Christine's work has had an international impact. According to Christine, one of her proudest accomplishments occurred about 10 years ago in Ghana, West Africa. Her husband, Kwame Yeboah, grew up in a very small, very poor Ghanaian village. He attended boarding school in Ghana, then on to MIT. During a visit by Kwame and Christine, she noticed that the Kwame Nkrumah University of Science and Technology's (KNUST) engineering program was using antiquated resources and didn't have access to the computers, books, and resources of American universities. Christine pursued and received a grant from the Engineering Information Foundation and held an engineering book drive for ChE faculty. All of the books collected were sent to KNUST. The grant

also included money to purchase computers and unit operations equipment to be sent to KNUST. Being able to empower people from her husband's home country has probably been one of the most rewarding things that Christine says she has been able to do. One of the most rewarding outcomes for Christine was when the school built bookshelves, desks, and chairs to furnish a library they named the "C.S. Grant Room" in which the engineering students would study and utilize the computers. One of the KNUST students (Paa-Joe Akoto-Ampaw) actually came and received his Master's degree under Christine's direction at NC State, going on to work for an oil company in Texas after graduation. Another incredibly rewarding connection came a few years later. Christine was in Australia at Monash University as part of a 2007 sabbatical. She tells a story of running into a student (Dr. Michael Danquah) originally from Ghana who was working on his Ph.D. at Monash (he is now a faculty member). When the two met, the young man affectionately called Dr. Grant "mama"—Ghana has a tradition of referring to benefactors as "Mama" or "Papa." Over the course of meeting and getting to know this man, Grant discovered he'd studied in the library named after her—the library that she'd helped to create.

Christine and husband Kwame Yeboah and son Kofie Yeboah.

Christine's focus on faculty members creates a multiplier effect; faculty members supported through direct advising are ultimately better positioned to foster a nurturing and supportive culture for underrepresented STEM students at their home institutions. Christine's first Ph.D. graduate, Steve Beaudoin, currently CHE professor and interim associate vice provost for Academic Affairs at Purdue University, says that "working with Christine was foundational to my success. Her enthusiasm for exploration, her deep concern for my personal and scholarly growth, and her passion for excellence continue to shape the way I approach my work and are reflected in the way that I mentor my students. She challenged and inspired me, and her commitment to both the scholarship and the scholars 'in the trenches' impacted me tremendously. It is easy for faculty to become so engrossed in the pursuit of science and engineering accomplishment that they lose track of the people who are sharing the journey. Christine never lost sight of this, and I remember her commitment to me with great fondness and appreciation."

Christine's legacy was further etched into the fabric of the academy with the 2015 release of her Elsevier/Academic Press book, *Success Strategies from Women in STEM: A Portable Mentor* (co-edited with Peggy Pritchard), in which she wrote a chapter on, you guessed it, mentoring! She is enjoying her book tour and is now writing a column entitled, "STEM Resilience" for the magazine *Diversity in Action*.

OUTSIDE THE ACADEMY

Christine's early love of the arts is an integral part of her life. While most of her colleagues may not know the details of her extracurricular activities, she is an avid artist, singer, and motivational speaker. She has sung at her church, been part of a choir ensemble, and even played the piano for a women's Bible study. She has written and produced a church play, created/produced an internet gospel radio show, and worked behind the scenes in different theatrical productions.

Christine is a huge fan of special effects in the movies and dreams of working on a Hollywood film. In the meantime, her love of movie production led her to connect with artists within Disney and small special effects companies. In fact, she was instrumental in getting an NSF Career Award supporting letter for her faculty colleague, Professor Michael Dickey, in the area of liquid metals from Gene Warren, an Academy Award winner for special effects in the movie "Terminator." Dickey states, "Christine works tirelessly and enthusiastically to help provide development opportunities for both current and future faculty. She is very creative and resourceful and has a passion for nurturing young faculty. She serves as both a formal and informal mentor to many people in a number of capacities."

Christine and her husband Kwame met while working as summer interns at GE in Schenectady, NY. He was attending school up the road from Brown at MIT, majoring in electrical engineering and math. At that time, Christine was working for Kwame's brother, Yaw Yeboah, former dean of Engineering at Florida A&M/Florida State University. Both Christine and Kwame have strong ties to the Ghanaian community in NC and regularly participate in Triangle Area Ghana Association events dressed in traditional attire. Kwame is a renewable energy expert and regularly travels to Africa to lead the

NC State Engineering and Education Women faculty (and future faculty) with Christine at the close of her 2015 Professional Development Workshop: Getting the Most Out of Your Mentoring Relationships.

business and technology aspects of bringing affordable energy to developing countries. Their son, Kofie Yeboah, is pursuing a career in sports journalism at the University of Maryland College Park. Many may remember Kofie as Christine's sidekick at AIChE conferences around the country, attending his first AIChE conference when he was just two months old. Christine recalls their most interesting family bonding event occurring during summer 2014 when they lived in a 520-square-foot apartment in Washington, DC. During that summer, she was on sabbatical at the AAAS and NSF, Kwame was working in DC, and Kofie was a summer intern at *USA Today* Sports.

Christine has been able to convert her career experiences, her passion for broadening participation, and her academic leadership into an entrepreneurial venture. In the Institute for Academic Resilience (a part of her company, CoolSci Productions, LLC) she is an "academic resilience strategist" committed to making institutions a destination and not a layover for a diverse set of STEM professionals. A certified coach, Christine has coached women STEM faculty at Purdue University.

The various seasons of Christine's life story demonstrate exactly why mentoring—using one's own knowledge and resources to reach out to others and empowering them on the path for success —is so important to her. She started off on her own successful career trajectory because of her personal mentors, and she has made it her life's mission to integrate academic scholarship in chemical engineering and STEM fields with mentoring and broadening participation. She feels a sense of responsibility to help others succeed and even to surpass her own success. She's honored to see her own academic mentoring family tree growing and branching out exponentially! ❐