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ABOUT SWE:
The Society of Women Engineers (SWE), founded in 1950, is a not-for-profit educational and service organization. SWE is the driving force that establishes engineering as a highly desirable career aspiration for women. SWE empowers women to succeed and advance in those aspirations and be recognized for their life-changing contributions and achievements as women engineers and leaders.
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Honoring Our Legacy

The Society’s strength is found in its membership and grassroots orientation. And at the core are the contributions and achievements of individual members whose efforts, in turn, have positioned talented individuals as change-agents contributing to the transformation of our entire industry. This rich history of individual and collective accomplishments, of contributing to the greater good of all women in engineering, reflects well on who our members were, who they are, and who they will be. This legacy exists for all of us to learn from and to hold closely as we move into the future.

In October, SWE members and supporters met in Long Beach, Calif., for WE09. The conference provided a dynamic stage from which to launch the Society’s 60th anniversary celebration. The SWE 60th Anniversary Gallery gave attendees the opportunity to view historical photos and other items. During “Celebrate SWE!” actress Carolyn Mignini played the role of Beatrice Hicks, the Society’s first president, and video clips highlighted our significant history and the diverse achievements of our pioneers and members. However, that was only the beginning. Throughout the coming year, we will continue to celebrate 60 years of inspiring perspectives and defining success on your own terms.

You can be part of the SWE60 celebration by completing an oral history. The SWE Grassroots Oral History Project encourages individual sections and members to interview colleagues, mentors, and engineering pioneers to capture both the everyday and the extraordinary stories, experiences, challenges, and accomplishments of women engineers. By participating in this project, you will not only become engaged in the living history of women engineers, but also contribute to future historical and sociological research on women in engineering.

The interviews will be helpful in many ways. You can incorporate them into a section project, use excerpts in a presentation at your region conference, or even as inspiration for an exhibit at a community event. The knowledge gained from the interviews can also be useful in outreach activities. The SWE Grassroots Oral History Project Toolkit, which includes guidance on how to conduct an oral history, is available in the Resource section of the SWE Archive community in MySWE Communities [cop.swe.org].

Another way to celebrate SWE60 is to explore our different definitions of success. The WE09 Define Your Own Success contest drew many outstanding entries that deeply moved and inspired me — some brought tears to my eyes, and some made me smile. Although the contest is over, we encourage sections and regions to continue hosting events for members to share their own definitions of success. On the SWE60 page of our Web site, you can share your personal history online in our virtual memory book, as well as thank those who have made a difference in your life, with our downloadable mentor appreciation certificate.

On May 27, SWE will commemorate Founders’ Day. It was on this day in 1950 that a group of women met to establish the Society of Women Engineers. Please see the article on page 24 for ideas on how your section can recognize this important day in our history.

Let’s use the yearlong SWE60 celebration to inspire more women engineers to advance and achieve success on their own terms.

Nora Lin
FY10 SWE President
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"Don’t Stay in the Shadows"

All I want is to be recognized as a good engineer.” From our collegiate members embarking on their first classes, to retired members reminiscing about their careers, I frequently hear SWE members voice this sentiment. But listening to Eng. Sara Akbar summarize her goal reminds me of the shared values, passions, and challenges of women engineers around the globe.

I had the wonderful opportunity and honor to attend the World Federation of Engineering Organizations (WFEO) General Assembly and the International Engineering Congress on Alternative Energy Application in November. WFEO recently established a standing committee on Women in Engineering (WIE). As a member of the U.S. delegation, I focused on the WIE meetings and WIE-sponsored sessions. One session, “Don’t Stay in the Shadows,” while targeted to women early in their careers, inspired an audience of men and women at all career stages.

Eng. Marie-Hélène Therre, of the National Council of Engineers and Scientists of France and chair of the WFEO-WIE, named the session to emphasize two points. First, rarely does the public, who benefits daily from the products and services of engineers, recognize the contributions of engineers. We remain in the shadows until something goes wrong, and then we become quite visible. Second, Eng. Therre noted that within our profession, women engineers remain in the shadows. As women engineers, we must show our enthusiasm and highlight our accomplishments.

Eng. Akbar’s words were the preface to her personal story of moving out of the shadows and her belief that engineers should be featured as the behind-the-scenes heroes they often are. After completing her degree, Eng. Akbar joined Kuwait Oil Company as a petroleum engineer and sought out the training and career opportunities to advance on her path. For example, she persuaded her management to give her a position on an offshore oil rig, the first woman in Kuwait to do so.

When her expertise and leadership were needed to deal with the destruction of the oil fields from the Iraqi occupation of Kuwait, Eng. Akbar moved out of the shadows. All women engineers at the session shared her pride as she told how her team was the first to shut down one of the hundreds of burning and gushing wells. In 45 days her team brought 42 wells under control. She noted that she had worked hard for 10 years — including during the occupation — but no one noticed. During those 45 days, however, Kuwait found a hero in a female petroleum engineer. Today, Eng. Akbar is the deputy chairman and managing director of Kuwait Energy Company.

Fortunately, few of us are challenged to perform under such extreme situations. But without a spotlight focused on our contributions, we must trust in our capabilities to bring our work — and the value of our profession — out of the shadows.

Betty Shanahan, CAE, F. SWE
SWE Executive Director & CEO
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Defining Moments

There is much to contemplate as we enter the second decade of the 21st century. Still a new century, to what extent will the defining moments of the past 10 years determine the remaining 90? Leaving politics aside for the moment, consider some of the issues facing science, technology, engineering, and mathematics — the STEM disciplines.

In the next few decades, will we still be struggling to increase the pipeline to the STEM fields, and to ensure that the pipeline is diverse? Will gender differences in school and the workplace become irrelevant? Will the quality of K-12 STEM education improve, so that students in the United States no longer have a lackluster performance when compared to their peers around the world? Will breakthroughs in STEM fields provide the means to solve humanity’s pressing problems?

The answers to these, and many related concerns, speak directly to the Society’s mission, purpose, and core values. And our individual and collective actions now will help to determine those future answers.

We have begun a year-long celebration of our 60th anniversary, with much to honor and commemorate. The anniversary theme, “Success on Your Own Terms, 60 Years of Inspiring Perspectives,” addresses both individual and collective notions of success and ways of being in the world. The women who came together in May 1950 at Camp Green created a strong foundation for their own benefit and that of successive generations. The “founding mothers” addressed the issues of their day, in hopes of creating a better future.

With notions of “defining moments” and creating a better future uppermost, this issue provides information and food for thought. Our cover story, “Transforming Transportation,” by Charlotte Thomas, looks at women working on technologies that have the potential to revolutionize the ways that goods and people get from point A to point B. From improving the daily commute to decreasing CO₂ emissions, their effects will be far-reaching. For a fascinating read, please turn to page 28.

In recognition of Black History Month, Sandra Guy examines the unique role of historically black colleges and universities, and interviews SWE members attending or teaching at HBCUs. Please see “HBCUs: Impacting the STEM Pipeline in a Multitude of Ways,” on page 36.

Rounding out the issue, an update on the Society’s public policy efforts and developments in this arena can be found on page 10. Learn about SWE history and suggestions for celebrating Founders’ Day (May 27) on page 24. You can also read about anniversary-related events interspersed with coverage of the WE09 conference, beginning on page 44 and continuing for 10 more pages.

Director of Editorial & Publications
anne.perusek@swe.org
Public Policy Update

BY ANNE M. PERUSEK, SWE DIRECTOR OF EDITORIAL AND PUBLICATIONS

In late November, SWE President Nora Lin joined other leaders in the science, technology, engineering, and mathematics community at the White House, where President Obama announced “Educate to Innovate,” a campaign for excellence in STEM education. The goal is to improve American students’ lackluster performance in STEM disciplines, moving them from the middle to “the top of the pack” over the next decade. To accomplish this, the president announced a series of partnerships between companies, foundations, non-profit organizations, and science and engineering societies, which are backed by commitments of more than $260 million in financial and in-kind donations.

President Obama’s goals include:
• increasing STEM literacy so all students can think critically in science, math, engineering, and technology
• improving the quality of math and science teaching so that American students are not outperformed by those in other countries
• expanding STEM education and career opportunities for underrepresented groups, including women and minorities

The president said, “Scientists and engineers ought to stand side by side with athletes and entertainers as role models, and here at the White House we’re going to lead by example. We’re going to show young people how cool science can be.” Indeed, an annual science fair at the White House that will showcase the students who win national competitions in science and technology is part of the effort.

Referring to the importance of increasing the participation of underrepresented groups, he also said, “We’re going to expand opportunities for all our young people — including women and minorities who too often have been underrepresented in scientific and technological fields, but who are no less capable of succeeding in math and science and pursuing careers that will help improve our lives and grow our economy.”

In addition, among the public/private partnerships the president announced was National Lab Day. This event, to be held in May, will connect students in grades 6-12 to hands-on learning and is a platform from which member-based organizations such as SWE can contribute. National Lab Day will be a culmination of a sustained effort throughout the year rather than a single-day’s celebration. Upgrading science labs, supporting project-based learning, and building communities of support for STEM teachers are among the goals of National Lab Day.

The National Lab Day and the proposed National STEM Week are both supported by the STEM Education Coalition — of which SWE is a member. Following the president’s announcement, the coalition sent a letter pledging to back these efforts. SWE was one of 200 organizations to sign the letter.

Earlier in November, SWE’s government relations public policy committee was part of a congressional briefing sponsored by the National Coalition for Women and Girls in Education (NCWGE). Cathy Pieronek, J.D., chair of SWE’s government relations, spoke as a member of the panel, along with David Sadker, Ph.D., author of Still Failing at Fairness; and Fatima Goss Graves, vice president for education and employment at the National Women’s Law Center. Lisa Maatz, director of public policy and government relations at the American Association of University Women, moderated the discussion.

Titled, “STEM Education: How Gender Bias Hurts Girls, Boys, and U.S. Competitiveness,” more than 85 representatives from congressional offices, federal agencies, nongovernmental organizations, industry, and academia attended.

Topics covered at the briefing included:
• the presence of gender bias in schools and its harmful effects on both girls and boys
• differences between male and female rates of participation in STEM professions, and the detrimental effect this has on U.S. competitiveness
• what can be done to increase the participation of women and minorities in STEM
• how tools such as Title IX can be used by the federal government

The NCWGE includes member organizations such as the American Association of University Women; Girls Inc.; the American Federation of Teachers; Association for Women in Science; National Women’s Law Center; the National Alliance for Partnerships in Equity; Women’s Sports Foundation; and like-minded organizations committed to equity in education. SWE has been a member since 2006.

It is worth noting that around the same time of the congressional briefing and shortly before the announcement of “Educate to Innovate,” a study released by the American Association of State Colleges and Universities (AASCU) underscored the importance of efforts to improve STEM education. According to the study, the United States’ advances in science and edge in the global marketplace are threatened by the drop in the number of college degrees, particularly degrees in STEM. Data indicate that the United States and Germany are the only two nations where those between the ages of 25-34 have attained less education than their parents’ generation.
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Through their ongoing advertising in SWE Magazine, these companies make an important commitment to the Society of Women Engineers. Their efforts to recruit technical women demonstrate their dedication to diversity, and their recognition that SWE membership is a valuable asset.

Photo taken at WE09.

Front row: Paula McDonald (Aerojet), Amy Yip (Chevron), Lisa Newkirk (NAVAIR), Elizabeth Byrnes (Goldman Sachs), Geri Castanon (BAE Systems), Jeannie Lee (Jacobs)

Second Row: Julie Martinet (DuPont), Malla Francisco (Lockheed Martin), Stephanie Smith (General Dynamics C4 Systems), Cheri Chappelle (Illinois Tool Works), Patricia White (National Security Agency), Barbara Haney (Intel), Lisa Silipigno (Schlumberger)

Third Row: Stefanie Chiras (IBM), a Central Intelligence Agency recruiter, A. J. Dale (Boeing), Betty Shanahan (CEO & executive Director, SWE), Jill Peterson (Exxon Mobil), Nora Lin (president, SWE), Corinne Brinnier (Johns Hopkins University APL), Jenna Samra (MIT Lincoln Laboratory)
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In an effort to educate the public about the engineering profession, in 1951 the National Society of Professional Engineers created Engineers Week. Since then, through the support of the more than 100 professional societies, corporations, and governmental agencies that make up the National Engineers Week Foundation, EWeek has evolved into a yearlong educational promotion that includes intriguing outreach events designed to introduce young people to engineering. As a visible member of both the foundation and the Engineers Week Coalition Diversity Council, the Society of Women Engineers embraces the opportunity to be a force in inspiring young girls and women to explore the profession and gain the confidence to excel.

This year, the American Society of Civil Engineers, along with corporate partner ExxonMobil, serves as chair of EWeek. A crucial element of the EWeek mission is to improve the image of engineers, elevating the profession to its well-deserved role as an appealing career option and making known the immeasurable benefits society reaps from the work of engineers. Additionally, EWeek provides a forum to underscore the value of science, math, and technical literacy.

Engineers Week prompts an array of activities, from T-shirt design contests to egg-drop competitions to designing our cities of the future. With a bit of creativity and passion, we can reach out to tomorrow’s engineers through fun and compelling activities that demonstrate the vast possibilities engineering holds.

In the last few years, Engineers Week has gained momentum through the popularity of social media. “Discover Engineering” videos debuted on YouTube in 2008, and a number of SWE sections use Twitter and Facebook to post news of their EWeek events.

Following are some of the highlights of EWeek 2010:

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take place on Feb. 20 at the National Building Museum in Washington, D.C. The annual event features hands-on activities and demonstrations to introduce kids and their parents to the world of engineering.

Discover Engineering (www.discoverengineering.org) is a Web site facilitated by the National Engineers Week Foundation that serves as a valuable resource for introducing young people to engineering. Among the plethora of information found on the site are descriptions of the various types of engineers and what they do, historical engineering facts, and video activities. The “Cool Stuff” section offers games and downloads, as well as instructions for such projects as making slime or designing paper airplanes.

Future City™ Competition. This year’s challenge drew more than 33,000 middle school students from 1,100 schools across the country. Working from the theme “providing an affordable living space for people who have lost their home due to a disaster or financial emergency,” participants were tasked with building cities using recycled materials and adhering to LEED-recognized standards. The national finals will take place in Washington, D.C., during EWeek.

In a 24-hour period spanning March 10-11, the Global Marathon For, By and About Women in Engineering will reach out to women around the world in a live forum covering issues facing women in engineering and technology. This year’s theme is Launching Tomorrow. An outgrowth of Introduce a Girl to Engineering Day, the event includes live Internet chats, webcasts, teleconferences, and prerecorded sessions. Honorary chairs Leslie Jones, senior vice president and chief information officer with Motorola Inc., and Nan Mattai, senior vice president, Rockwell Collins Engineering and Technology, will lead the marathon.

Introduce a Girl to Engineering Day is scheduled for Feb. 18. A product of the first National Engineers Week Diversity Summit, which took place in 1999, this special day is designed to give K-12 girls and young women the opportunity to experience engineering firsthand. Women engineers serve as mentors by introducing girls to the profession in a direct and personal way through access to real-life engineering projects and solutions.

New Faces of Engineering is a program that recognizes the accomplishments of engineers less than 30 years old. Please turn to page 18 to read about SWE’s 2010 nominees. This list comprises only a sample of the numerous events planned for EWeek 2010. For more details, visit www.eweek.org.
Intel is proud to support the Society of Women Engineers and its efforts to empower women to achieve their full potential in careers as engineers and leaders.

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While Engineers Week is a time to acknowledge the work of all engineers, the New Faces of Engineering program provides a special opportunity to recognize early-career engineers whose work has already made a positive impact on society.

New Faces of Engineering focuses on engineers 30 years old or younger, who have been out of school for two to five years. Candidates must have a degree in engineering from a recognized U.S. college or university, or from an equivalent international educational institution, and be a member of a sponsoring Engineers Week partner.

By putting faces on younger engineers, the program aims to enhance and improve the public perception of engineering. New Faces of Engineering is also intended to promote incentives for college engineering students to explore their career options, as well as encourage high school students to pursue engineering as a career.

Candidates are selected from the EWeek sponsoring societies and members of the EWeek Diversity Council. A founding member of the Diversity Council, the Society of Women Engineers has participated in the New Faces program since the program’s inception in 2003.

This year, SWE selected five nominees based on submissions from local sections. The top SWE nominee will compete with top nominees from other societies, and one candidate will be selected and featured in USA Today, along with the top candidates from the sponsoring societies. New Faces of Engineering

2010

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Name: Angel McMullen-Gunn

Employment: Senior Mechanical Engineer/Manufacturing Business Manager, Hamilton Sundstrand

Education: • B.S. in mechanical engineering and M.Eng in engineering management, University of Nebraska; M.S. candidate in quality systems management with Six Sigma Black Belt Certification, The National Graduate School

Activities: • SWE Eastern Nebraska Section counselor for University of Nebraska-Lincoln Region • Professional membership coordinator • Eastern Nebraska Section council representative, 2007-2009 • National conference professional volunteer logistics coordinator, 2006 and 2009 • Vice president, Eastern Nebraska Section, 2007-2008 • Event coordinator, Girl Scouts: Engineering the Future, 2007 • Nominator for the University of Nebraska-Lincoln Chancellor’s Award for Contributions, 2009 • Keynote speaker, 2006, and volunteer, 2005-2009, University of Nebraska-Lincoln’s Women Interested in Engineering • American Society of Mechanical Engineers, E-Mentor • Seward County Young Professionals founding member, events chair (2007), fundraising co-chair (2007)

Statement: A senior mechanical engineer and manufacturing business manager at Hamilton Sundstrand’s Mechanical Operations in York, Neb., Angel McMullen-Gunn serves as the plant site test engineering expert by supporting flow test systems for hydraulic aerospace components. She also leads the log control manufacturing and shipping and receiving departments, and is the first female manufacturing business manager in the 26-year history of the plant. McMullen-Gunn has been instrumental in the growth of the plant’s co-op program, actively recruiting to nearly triple the number of students hired in the past two years.

As an advocate for engineering outreach, McMullen-Gunn holds multiple leadership roles within the Society of Women Engineers. As past vice-president of the Eastern Nebraska Section, she coordinated events with the Girl Scouts of the USA, and has served as keynote speaker and volunteer for the University of Nebraska-Lincoln Collegiate Section’s annual Women Interested in Engineering event for high school youth. She also mentors several students through the American Society of Mechanical Engineers E-Mentoring Program.
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**Name:** Amanda C. Muller, Ph.D.

**Employment:**
Systems Engineer, Northrop Grumman

**Education:**
B.S. and M.S. in biomedical engineering, Wright State University; Ph.D. in Engineering, Worcester Polytechnic Institute

**Activities:**
- Scholarship chair, SWE Space Coast Section
- Module leader for the Space Coast Section’s Introducing Girls to Engineering and WOW! That’s Engineering® workshop
- Human Factors and Ergonomics Society

**Statement:**
Amanda C. Muller, Ph.D., is a human factors specialist and an expert in task analysis and user interface development. Her work on the Beyond Line of Sight upgrade to the Joint STARS surveillance aircraft helped to deliver this urgent operational need program on time with a high customer-satisfaction rating. This product is currently being flown in-theater and is improving the capabilities of the U.S. armed forces in combat.

Dr. Muller also worked closely with end-users on the development of operational requirements for the Enhanced Land/Maritime Mode upgrade to Joint STARS, resulting in a product that met the technical requirements of the program and accounted for user needs. She has worked with universities, subcontractors, foreign companies, and other Northrop Grumman business units in planning and developing a large-scale internal research and development program to create innovative user interfaces for flight control, which have the potential to change the way aircraft are flown. Dr. Muller recently transferred within Northrop Grumman, and has taken a lead role in a high-profile Naval research program.

---

**Name:** Ami C. Shah

**Employment:**
Embedded Software Engineer, Northrop Grumman

**Education:**
B.S. in electronics engineering, Sarvajanik College of Engineering and Technology, Gujarat, India; M.S. in electrical engineering, Purdue University

**Activities:**
- Committee member for SWE Purdue University Calumet Collegiate Section, 2003
- An organizer of a SWE cultural event at Purdue University Calumet
- Mentor, Northrop Grumman’s “WORTHY” program for high school students
- Webmaster for Northrop Grumman Women Engineers Group, 2009

**Statement:**
Ami Shah is an embedded software engineer for Northrop Grumman Corporation. She leads the design, development, and validation of the multiplatform test software for Infrared Countermeasure Systems that protects airplanes from missile attacks. Her work in developing the Automated Test software under various projects has improved the testing process; reduced the cost, testing time to find failures, and software maintenance; and increased customer satisfaction and software reusability.

Her leadership; time management; and on-time, in-budget quality software development have led to her receiving several awards in her professional career. Among them are the Timely Award Programs for Leadership, Results Sharing Award for LAIRCM at Northrop Grumman, and the Agricultural Division Award at John Deere.

Shah has served as a committee member for SWE Purdue University Calumet Collegiate Section, and participated in a SWE recruiting event at Northwest University with Northrop Grumman.

She was part of Northrop Grumman’s “TEACH” initiative, which presents the engineering process to school teachers. She also volunteered to model and perform dance during Multicultural Week in an effort to promote diversity at Northrop Grumman.
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Name: Andrea Ippolito

Employment: Scientist, Boston Scientific Corporation

Education: B.S. in biological engineering and M.Eng in biomedical engineering, Cornell University

Activities: • First vice president, professional development, SWE Boston Section
• Treasurer, Boston Section, 2008-2009
• Recording Secretary, Boston Section, 2007-2008
• Co-founder, Biomedical Engineering Society, Boston Industry Chapter
• Chair, Women’s Network (Boston locations), Boston Scientific
• Director-at-large, Cornell Club of Boston

Statement: As a research scientist for Boston Scientific, Andrea Ippolito currently designs experimental assays to study the effect of drugs and materials from medical devices on cardiovascular cells. She gains further insight of the foreign body response to medical devices to allow engineering teams to design safer, more effective products.

Ippolito was identified by senior management to help lead a cross-divisional effort to develop collaboration networks across a $1 billion research and development organization. At Boston Scientific, she is recognized as an advocate for women in engineering and was chosen to launch and lead the women’s network at the corporate headquarters.

Ippolito became passionate about SWE’s mission as an undergraduate at Cornell, where she served as president of the collegiate section in 2005-2006, and director of outreach in 2004-2005. She currently serves as the first vice president for the Boston Section, leading the professional development events for the section. Previously, she served as the section’s treasurer and recording secretary.

Her enthusiasm for her work in the bioengineering field led Ippolito to found the first Biomedical Engineering Society industry chapter in Boston in 2008.

Name: Chrissa Roessner, P.E.

Employment: Project Engineer, The Louis Berger Group Inc.

Education: B.S. in civil engineering, New Jersey Institute of Technology; M.S. in civil engineering, Rutgers University; M.B.A. in finance and M.S. in international business, Seton Hall University

Activities: • National Society of Professional Engineers
• Precast Concrete Institute
• Project Management Institute
• President, Younger Member Group, American Society of Civil Engineers, New Jersey Branch, 2006-2008
• Adjunct professor, New Jersey Institute of Technology, 2007

Statement: Over the last five years, Chrissa Roessner, P.E., has used her highway and bridge design experience to help design and manage the Interchange 6 to 9 Widening Program, one of the largest projects ever undertaken by the New Jersey Turnpike Authority.

Through her roles with The Louis Berger Group, Roessner was responsible for the preliminary design of over five miles of mainline widening, including ramp connections to and from service areas. In addition, she led the highway design for the major reconfiguration of the Interchange 7A connections.

Roessner is a member of the SWE New Jersey Section. In addition to her work and SWE activities, she serves the community through her role as president of the local Younger Member Group of the American Society of Civil Engineers. She is a licensed engineer in New York, New Jersey, and Pennsylvania.
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Goldman Sachs is proud to sponsor the Society of Women Engineers National Conference.
Sixty years ago, a resolute group of women who were ahead of their time gathered to create the foundation for what is now a more than 20,000-member-strong organization at the forefront of the profession. As we celebrate our diamond anniversary, it is timely for SWE sections to honor the significance of that historic occasion through special events and activities.

The Society of Women Engineers

Founders’ Day

MAY 27, 2010

Over the weekend of May 27, 1950, some 60 women engineers and engineering students came together in New Jersey at the Green Engineering Camp of The Cooper Union to take part in the first national meeting of the Society of Women Engineers. The women represented the Society’s four original districts, or sections: metropolitan New York City; Philadelphia; Washington, D.C.; and Boston. It was during this historic gathering that the founding members elected Beatrice Hicks as SWE’s first president.

The Society grew over the next three years with the creations of the Chicago, Detroit, and Los Angeles sections. In 1951, 112 people attended the first official SWE national convention in New York City.

While the 1950 meeting marked the official beginning of SWE, efforts to form a national organization of women engineers and women engineering students can be traced to as early as 1919, when Elsie Eaves, Hilda Counts Edgecomb, and Lou Alta Milton, engineering students from the University of Colorado in Boulder, wrote to the deans of engineering schools around the country requesting information on other women in engineering and architecture programs. Although some of the deans rebuffed their letters, the women’s efforts eventually led to the establishment of the American Society of Women Engineers and Architects, a professional network created to support women engineers and offer direction to young women interested in pursuing engineering as a profession.

In the 1940s, U.S. involvement in World War II became the catalyst for women to find new opportunities in engineering due to the shortage of male workers. As a result, female student groups at the Drexel Institute of Technology in Philadelphia and The Cooper Union and City College of New York held meetings and developed networks to support one another.

In April 1949, another historic meeting took place when more than 80 women engineering students participated in a conference at the Drexel Institute of Technology. Among those in attendance was Doris McNulty, P.E., an electrical engineering student who went on to become a founding member of SWE. A charter member of the Philadelphia Section, McNulty passed away in July 2009. Please turn to page 68 to read her obituary, which contains more fascinating insights into SWE’s history.

Now, 60 years after that extraordinary weekend in New Jersey, we encourage all sections to organize a local event or activity designed to recognize Founders’ Day 2010. Following are a few suggestions you may want to consider:

• Host a reception or banquet for your section’s past-presidents.
• Produce a section oral history for submission to the SWE Grassroots Oral History Project.
• Make a Founders’ Day cake to serve at your reception or banquet. Consider having a competition with awards given for taste, originality, and appearance.
• Craft a section archival digital scrapbook.
• Create a section quilt patch for a SWE national quilt.
• Arrange an outreach activity to celebrate the day.

The Society of Women Engineers

WINTER 2010
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THE VALUE OF GETTING TOGETHER

In the early years of the Society, long before the present region-based structure was established, the value of getting together on a geographical basis was acknowledged. In founding member Doris McNulty’s essay, “Reflections on SWE’s 50th Anniversary,” she wrote that her section, Philadelphia, “also participated in the Eastern Seaboard Conference, which was an adjunct to the National annual Convention.”

Today’s region conferences are highly anticipated events, each with its own local flavor, and are frequently noted in the Yearbook section of SWE Magazine’s summer issue as one of the annual highlights. They are similar to the Society’s national conference — offering workshops, networking opportunities, career fairs, and technical tours — but done on a regional scale over the span of one weekend, making them closer to home and more affordable in terms of time and expense. Following are the 2010 region conferences:

REGION A: February 26-28
Stockton, Calif.
Hosted by the University of the Pacific collegiate section
Contact: k_hammarstrom@pacific.edu or jovieda@hotmail.com
www1.pacific.edu/student/clubs/swe

REGION B: January 29-31
Phoenix, Ariz.
Co-hosted by the Phoenix and Arizona State University sections
Contact: regionBconference@swe.org
http://sweregionb.org/region-conference

REGION C: February 5-7
Dallas
Hosted by the University of Texas at Dallas collegiate section
Contact: amy.pickup@gmail.com
http://swe.utdallas.edu/2010

REGION D: March 5-7
Memphis, Tenn.
Hosted by the University of Memphis collegiate section with support of local MAL
Contact: RegionDConference@swe.org or Wendy.Cocke@kcc.com
www.swe.org/regionD/regionDconference/

REGION E: March 19-21
Philadelphia
Hosted by the Philadelphia and University of Pennsylvania sections
Contact: ajwaller@gmail.com or julieaw@seas.upenn.edu
www.seas.upenn.edu/~swe/website/introduction.html

REGION F: April 10
Boston
Hosted by Boston University collegiate section
Contact: ebony.joseph.swe@gmail.com, sabyrnes@bu.edu, hanlone@bu.edu, heat@bu.edu, or ashivers@bu.edu
www.swe.org/RegionF

REGION G: March 5-7
Lexington, Ky.
Hosted by the University of Kentucky collegiate section
Contact: leah.dieball@uky.edu
www.engr.uky.edu/student.orgs/swe/region_g_conference.html

REGION H: January 29-31
Urbana, Ill.
Hosted by the University of Illinois at Urbana-Champaign collegiate section
Contact: vwierec2@illinois.edu
http://swe.ec.uiuc.edu/

REGION I: February 26-27
Columbia, Mo.
Hosted by the University of Missouri collegiate section
Contact: rtfwd@missouri.edu
http://engineering.missouri.edu/swe/

REGION J: April 9-11
Richland, Wash.
Hosted by the Eastern Washington Section
Contact: dimple.h.patel@gmail.com or aliceorrell@gmail.com
www.swe.org/regionj/jcon10

For more information on general SWE region and section activities, please contact Alyse Stofer, director of regions, at arstofer@gmail.com.

Discount amount varies in some states. Discount is not available in all states or in all GEICO companies. One group discount applicable per policy. Coverage is individual. In New York a premium reduction is available. Some discounts, coverages, payment plans and features are not available in all states or companies. Government Employees Insurance Co. • GEICO General Insurance Co. • GEICO Indemnity Co. • GEICO Casualty Co. These companies are subsidiaries of Berkshire Hathaway Inc. GEICO: Washington, DC 20076. GEICO Gecko image © 1999-2010. © 2010 GEICO
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Changes in how we perceive and use transportation promise to revolutionize more than just the movement of people and goods. From the economy, to the environment, to basic assumptions, the impact is far-reaching. And women engineers are at the forefront of the technologies and applications that will do just that.

If you have never searched for a parking space in a crowded parking lot, you probably have experienced similar headaches involved with getting from point A to point B. The transportation of goods and people profoundly affects all aspects of life — and in increasingly stressful ways. Fortunately, current research promises to change transportation and with it our society, our environment, and our economy. Consider these possible solutions to the parking predicament: You reserved a parking spot on your cell phone so there is one waiting for you; or an electronic sign indicates that the station 10 miles down the road has 50 parking spaces left. In either example, you make the train.

With such options, bigger issues than getting to work on time are solved. As transportation engineers implement more advanced technology into daily commutes, people are more likely to use public transportation. An increased use of public transit means fewer cars on highways and in parking lots, which translates into fewer traffic deaths, less emissions, less reliance on oil, and an overall better quality of life.

“Transportation is not a field or discipline, but a human activity,” stated Ann M. Brach, Ph.D., P.E., deputy director of the second Strategic Highway Research Program at the National Academies’ Transportation Research Board. “It accounts for 10 to 11 percent of the GDP [gross domestic product] and is about 18 percent of household expenditures. Everything is transported at some point.”

Continuing concerns about the many problems in our transportation systems are transforming not only how we transport ourselves and our goods, but also how we as an auto-centric society will perceive the assumed necessity of the 2.5 cars in the average garage.

As Nicole White, P.E., P.T.O.E., and principal at Symmetra Design, a transportation consulting company, noted, “Our biggest problem is that we have more vehicles than capacity.” Retooling transportation includes encouraging people to think about transportation methods other than private vehicles.

**Entrenched dilemmas**

Engineers in state and federal government departments of transportation, university research labs, and private sector companies are making significant progress toward changing how we will perceive and use transportation in the not-too-distant future. And they have the technology to make it all happen. However, technology is not the only answer, as each solution in the convoluted traffic jam of problems seems to generate yet another dilemma.

Consider our neglected transportation infrastructure, for example. As each year passes, it must serve millions more, yet...
funding remains the biggest obstruction. “There is no ribbon cutting for maintenance,” stated Cathy McGhee, P.E., associate director for research at the Virginia Transportation Research Council.

Maintenance isn’t as exciting as opening a new highway, so it tends to be overlooked in state transportation budgets. The American Recovery and Reinvestment Act of 2009 is a start, though according to Catherine Ross, Ph.D., the Harry West Professor and director of the Center for Quality Growth and Regional Development at Georgia Tech, “It targets local transportation projects that are focused mostly on discretionary grants and projects that are shovel-ready.”

Revenue to repair infrastructure problems could be generated by offering single-occupant drivers the option of paying extra to use the high-occupancy vehicle (HOV) lanes. Initially, the problem could be solved, but at the same time, it creates another. With access to the HOV lane available for a price, more single-occupant cars would jam the highways as a result.

This type of scenario prompts Dr. Ross to ask, “How will this solve problems in air quality?” In her view, the focus must also be on the environment and sustainability.

According to Susan Shaheen, Ph.D., co-director of the Transportation Sustainability Research Center at the University of California, Berkeley and Honda Distinguished Scholar at ITS-University of California, Davis, transportation accounts...
for 33 percent of U.S. greenhouse gas emissions and continues to grow. Consequently, transportation has a notable effect on climate change.

Adding yet another facet to the entrenched dilemmas, Dr. Ross added that transportation is deeply tied to our country’s competitive advantage. In a worldwide market, we must increase productivity and find new opportunities to stay in the race. “Our transportation infrastructure is the advantage. That’s where the rubber meets the road,” she said, looking to the demands that a global economy exerts on mobility.

**Human factors**

Despite the enormity of the challenges facing transportation engineers, much progress has been made with viable, cost-effective, and practical solutions. One of these projects tackles the problems from the driver’s perspective. According to the second Strategic Highway Research Program (SHRP 2), fixing transportation begins with analyzing the driver’s behavior in real-world situations. In the largest naturalistic driving study to date, which Dr. Brach oversees, 3,000 volunteers from several sites in the U.S. will have their cars instrumented with a data acquisition system comprising cameras, radar unit, and wireless communication. For two years the volunteers’ driving habits will be noted by video of images captured through the windshield, of the driver’s face and hands, and cabin interior. Lateral and vertical acceleration, motion, and turn signals — even the presence of alcohol — will be recorded. Outside the car, radar will note the range of objects in front of the vehicle.

As Dr. Brach explained, most previous studies used simulators and closed tracks. Earlier naturalistic driving studies were much smaller, on the order of 100 to 200 vehicles. “We know about vehicles and highways but very little about drivers, who are the biggest part of the equation,” she said. With the data, engineers can assess how drivers react and adapt to their vehicles, road environments, and traffic controls, and how these factors contribute to their driving patterns, including road rage. Looking ahead, the data will provide the basis for intelligent transportation systems and how human behavior affects them.

Observing drivers from another angle, MIT researchers in collaboration with the Personal Robots Group at the MIT Media Lab, MIT’s SENSEable City Lab, and the Volkswagen Group of America Electronics Research Lab are altering the human/vehicle relationship with an in-car personal robot. The Affective Intelligent Driving Agent (AIDA) will merge knowledge about the driver’s environment with the driver’s priorities and needs. AIDA will analyze a driver’s mobility patterns, keep track of common routes and destinations, and draw on its knowledge of the environ-
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ment beyond what is seen through the windshield. With the knowledge of a driver’s home and work locations and shopping preferences, the robot will suggest routes that avoid traffic jams as well as alert drivers to get gas.

Meanwhile, at the Virginia Department of Transportation, engineers are exploring how vehicles can communicate with the infrastructure and other vehicles in an IntelliDrive project. The auto industry already has implemented intelligent driving to some degree, but it is mostly from a vehicle-to-vehicle application. As associate director for research at the Virginia Transportation Research Council, Cathy McGhee, P.E., recalled when traffic engineering consisted of traffic signals and impact studies on parking. Now she’s working with leading-edge technologies to study such factors as intersection collision avoidance using information from a signal and approaching vehicles. Other IntelliDrive applications will monitor and provide a driver with roadway conditions.

Advanced traffic control systems are already in use and have demonstrated their effectiveness in reducing travel time and delays, but, due to cost, many jurisdictions in the U.S. use traffic control strategies that vary only by time of day without recognition of the variations in traffic that occur from hour to hour and day to day. McGhee cited a system that changes based on conditions and use rather than time of day. “Adaptive controls respond to what traffic is on the road. The system is balanced to what is thrown at it, which requires more detection than what time it is,” she explained. Although this requires a larger investment in infrastructure-based detectors today, advancements like IntelliDrive could provide an unprecedented data stream in the future.

Smart infrastructure

The next stop in remaking transportation is smart infrastructure, as engineers research integrating intelligent transport systems into the materials in roads and bridges. These would respond, for instance, to loading. Dr. Ross mentioned embedded carbon nanotube sensors that could detect mechanical stress or cracking in concrete. Self-sensing concrete pavement with embedded sensors will detect traffic flow as the pavement itself becomes “smart.”

Lisa Fontana Tierney, P.E., senior director of traffic engineering at the Institute of Transportation Engineers, explained that real-time transit information should motivate more people to use public transportation. Instead of waiting at a bus stop without knowing whether the bus came or when it’s coming, a more advanced global positioning system (GPS) could provide real-time information. Using satellite technology and advanced computer modeling, vehicles are tracked on their routes to get their actual positioning, which is then factored in with the intended stops and traffic patterns. Using wireless devices, customers will know exactly when the bus will arrive. “As the technology improves, it will broaden and become more reliable,” she stated. GPS services are already in use in a number of states and Canada.

Since public transit plays such an integral role in solving transportation problems, university and state department of transportation (DOT) collaborations are looking at ways to make buses, for instance, more reliable and efficient. Sponsored by the U.S. DOT, the California Partners for Advanced Transit and Highways (PATH) together with the California DOT and transit agen-
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*FORTUNE Magazine, 2009
“With its own position and the positions of surrounding vehicles through wireless communication, a vehicle will have situational awareness.”

Jihua Huang, Ph.D., assistant research engineer, California Partners for Advanced Transit and Highways

Virginia Tech SHRP 2 strategic highway research program: Video images of the view out the front and rear windsminss, the passenger side view, the driver’s face and hands, and the cabin will be recorded.

Additionally, rates of acceleration, lateral and vertical motion, the presence of alcohol within the cabin, position information, turn signal actuation and other variables such as steering wheel angle, speed, seat belt use and air bag deployment will be recorded through various sensors. Radar will be used to identify objects in the front of the car, their range, and the rates at which the range changes. An incident push button will allow participants to report critical events and emergencies. Separately, data will also be collected on roadway elements such as road type, geometry, shoulders, safety furniture, signage, pavement markings, and more for the roads most frequently used by the volunteer drivers. Detailed investigations of selected crashes will also be conducted.

Based on a differential global positioning system (DGPS) and an inertial navigation system integration is yet another PATH research focus. One application of this is a cooperative collision warning system, which combines vehicle positioning with wireless communication to detect imminent collisions. “With its own position and the positions of surrounding vehicles through wireless communication, a vehicle will have situational awareness,” Dr. Huang said. “Based on that data, a driver can be warned of the potential of a collision.” She explained that existing commercial collision warning systems are based on radar or light detection and ranging (LIDAR), which is directional. With DGPS, vehicles can estimate their positions more accurately with the addition of a local reference station to augment the GPS satellite data. Using wireless communication, vehicles communicate their positions and motion data with one another to achieve 360-degree situation awareness. The further integration of DGPS, wireless communication, and radars (or LIDARs) will make available comprehensive active safety systems for vehicles.

Parking alternatives

Parking is also an integral component of managing traffic and encouraging the use of public transportation. For that reason, University of California, Berkeley researchers are piloting a Smart Parking program. As Dr. Shaheen noted, “Every auto and bike trip begins and ends with a parking space.” In that context, the Smart Parking program is examining ways to alleviate crowded parking areas by using advanced technology to change parking fees according to usage during different times of the day or, more dramatically, to encourage some people to shift to other modes of transportation.

The U.S. Environmental Protection Agency estimates that 50 percent of trips...
taken are by single drivers going less than five miles. Dr. Shaheen asked, “If we provided drivers with real-time information and allowed them to make reservations in advance, would they come off the highways and take public transportation?” She noted that bike lockers are available in San Francisco bus stations. In addition, University of California, Berkeley’s Transportation Sustainability Research Center is researching smart parking for trucks, which create more traffic and accidents as they look for spaces to pull over, often parking illegally on the shoulder of the road.

In other, similar parking advances, White, from Symmetra Design, commented that Calgary, Alberta, Canada, is already using a ParkPlus system instead of metered parking so that people can pay at their parking locations or by cell phone with a preexisting account. The system sends a text message when the meter is about to expire.

While transportation engineers explore ways to make private vehicles and public transportation more reliable and safe, the growing phenomenon of car sharing, or providing drivers with a fleet of shared vehicles on an hourly basis, is looking to greatly minimize the number of privately owned vehicles. In 1999, Dr. Shaheen researched this area as part of her doctoral and postdoctoral work with CarLink I and CarLink II. CarLink I was the first smart car system in North America that employed electronic and wireless communications. This program provided people with cars to share in completing the first and last miles of their commutes between public transportation and their homes or jobs.

The idea caught on, and since then car sharing has “taken off in North America,” Dr. Shaheen said. As of July 2009, 26 car-sharing programs, with 323,681 members, share 7,772 vehicles. Taking the idea to a commercial level, Zipcar, for example, is becoming a familiar way to get around many major U.S. cities and going mainstream with major car rental companies. Automakers are also looking seriously at car sharing as a mobility service. “There is a lot of advanced technology involved in car sharing,” said Dr. Shaheen, “such as smart card address and electronic reservation systems.”

Transportation is an attractive field to engineers who want to make a tangible difference in people’s lives. As White observed, “Transportation directly influences the quality of life.” Given this, and the fact that transportation engineers have more advanced, cost-effective, and efficient technology available than ever before, the field is quite promising. “The possibilities are really endless as to what can be done as technology costs come down over time,” noted Dr. Shaheen. “Some of these concepts have been around for 50 years, but we didn’t have the tools we do today. What can we do 10 years from now?”

To learn more
For further information about women’s involvement in the transportation industry, visit the Women in Transportation Seminar, Advancing Women in Transportation Web site at www.wtsinternational.org.
HBCUs: Impacting the STEM Pipeline in a Multitude of Ways

With impressive legacies and a focus on the individual, these historically black colleges and universities nurture students’ educational and career aspirations in ways that affirm, expand, and challenge.

BY SANDRA GUY, SWE CONTRIBUTOR

Jabreel Walker, a 22-year-old process engineer for Shell Oil’s joint-venture Motiva Enterprises LLC refinery in Norco, La., wants to tell the world what a positive and empowering experience she had attending a historically black college, Prairie View A&M University in Prairie View, Texas.

“Because Prairie View is a smaller school [with an enrollment of slightly more than 8,000], it was like family,” said Walker, who served as president of the university’s SWE collegiate section during her junior and senior years, and as vice president her sophomore year.

“The teachers cared about whether the students passed, whether they graduated, and they cared about us,” she said. “I’m sure I would have succeeded anywhere, but I wouldn’t have been as successful [without the Prairie View experience]. I was provided all of the tools necessary to succeed in classes, in job interviews, and in my career,” said Walker. She credits her involvement in SWE conferences with enabling her to obtain an internship in mid-2007 with Dow Chemical Co., in the company’s thermal oxidizing plant.

Building on a strong legacy

Walker grew up in Dallas and was unfamiliar with Prairie View’s impressive history when she started school there: It is the second-oldest institution of higher learning in Texas and boasts among its alumni Nathelyne Archie Kennedy, P.E., the school’s first female engineering graduate. Kennedy is believed to be one of the first African-American women in Texas to become registered as a professional engineer. She founded her own civil/structural consulting engineering firm, Nathelyne A. Kennedy &

Prairie View A&M University was the first state-supported college in Texas for African-Americans. Founded in 1876, it is the second-oldest public institution of higher learning in the state. Shown on the far right is a major walkway through campus; near right is the electrical engineering building.

CREDITS: PRAIRIE VIEW A&M UNIVERSITY
Walker learned about the university’s historic importance when she competed in the “Miss Prairie View” pageant during her junior year. She later met Kennedy at school functions. Walker and her fellow students made history of their own: They successfully fought for the right of college students to vote in local elections, and lobbied for local funding to support an elementary school located on the Prairie View campus. The elementary school had no central air conditioning and received less financial support than others in the area. During her tenure as SWE section president, the membership increased by 110 percent, to 40, and Walker took a leadership role in Prairie View’s first co-hosting of a SWE regional conference, with the University of Houston.

Yet Walker came close to ignoring Prairie View in favor of her original college choice, the University of Oklahoma. Walker originally wanted to attend a big-name college and, “I didn’t want to be in the middle of nowhere,” she said. Walker’s mother persuaded her to apply to Prairie View’s summer-before-college enhancement program for science, technology, engineering, and mathematics (STEM) students, so that she could get college-campus experience and pre-college credits.

“The director of the program called and said they would love to have me, all expenses paid. I wanted to hang out with my friends before I left for college, so I said, ‘I don’t think so,’” Walker recalled. “Another director called the house and asked to speak to my mother. He convinced my mom that it was a good idea.”

Research indicates that Walker isn’t alone in having initially rejected a niche college that ultimately proved to be the best fit for her goals. Indeed, a national study by Carnegie Communications, a Westford, Mass.-based higher-education research and consulting firm, released in December 2008, revealed that high school students today are not as attracted to women’s, historically black, or Catholic colleges as they are to public and other private colleges and universities. However, misperceptions about these colleges can be overcome if the “niche” colleges sharpen their communications to prospective students.

The research, conducted with a nationwide, Web-based sample of 860 high school students in August and September 2008, found that African-American enrollment in historically black colleges and universities (HBCUs) increased by 13 percent between 1998 and 2004, compared with a 37 percent increase in African-American student enrollment in colleges overall during that period. Only 11 percent of the African-American students surveyed said they would “likely” apply to an HBCU.

“The lack of interest in these niche sectors [HBCUs, women’s, and Catholic colleges] occurs despite evidence that graduates go on to be disproportionately successful in their careers and in graduate school,” the research concluded. “For example, research at Michigan State University found that 40 percent of African-Americans with Ph.D.s earned bachelor’s degrees from HBCUs, and 85 percent of African-American physicians attended HBCUs.”

Debra K. Godfrey, Ph.D., executive vice president of market research and brand strategy for Carnegie Communications, said the firm’s research showed that HBCUs “focus on the person, allowing the student to generate self-confidence, as opposed to focusing on the way society might label her.”

“These colleges and universities say, ‘The individual has worth,’ and these students end up believing that. The students are given opportunities to demonstrate their abilities through leadership,” Dr. Godfrey said. “Transformation happens in higher education, but the transformation is far greater in these types of institutions.”

http://www.ed.gov/about/whitehbcu/edlite-index.html
A separate study published online in September 2008 by the University of Pennsylvania-Graduate School of Education showed that HBCUs help African-American women succeed in STEM fields. The case study of Spelman College, a historically black women’s college in Atlanta, found that among the key reasons for STEM career success among Spelman College alumnae were the school’s structural characteristics, the cooperative rather than competitive peer culture, the faculty’s efforts to actively encourage and promote students’ success, and the availability and use of academic supports and undergraduate research opportunities.

The study also found that students chose Spelman because its promotion of black women’s achievements in STEM fields resulted in students entering the school with high aspirations. Furthermore, students maintained those aspirations while there; and both students and faculty acknowledged the academic, psychological, and financial barriers that undermined black women’s participation in STEM fields. While Spelman does not have an engineering department, it does offer a “dual degree engineering program,” through which a student obtains a liberal arts degree from the school, along with an engineering degree from an approved engineering school.

African-American women received 36 percent of bachelor’s degrees awarded to blacks in engineering in 2001, according to National Science Foundation data released in 2004, the latest available.

Laura Perna, Ph.D., associate professor in the University of Pennsylvania Graduate School of Education and first author of the study, said that HBCUs have an important message that should be widespread because HBCUs play a vital role in ensuring that African-American women entering their institutions with an interest in STEM careers can achieve their goals.

Walker’s experience at Prairie View A&M mirrors the studies’ findings in terms of the largely unspoken ways that HBCUs promote their students’ achievements: Walker received faculty support, career encouragement, a home-like environment, and mentoring from her advisor, Felicia Nave, Ph.D., an associate professor of chemical engineering who introduced Walker to SWE.

Walker credits other faculty, including Kelvin Kirby, Ph.D., an electrical engineering professor who helped her find scholarships and offered career counseling and networking support, as well as her mother, Pamela Chism, for her advice and unwavering support, for providing critical help throughout her college career.

“I always thought of going to college as a privilege,” Walker said. “Not everyone goes to college,” she noted, adding that in many, if not most, parts of the country, “African-Americans couldn’t have sat in [an integrated] classroom 60 years ago.”

**Seeing the light in each individual**

Reentry student Grace L. Thompson, a 32-year-old sophomore at Morgan State University in Baltimore, has discovered her talents at the HBCU years after struggling with algebraic factors in high school.

“When I had math problems in high school, it messed with my self-esteem,” said Thompson, who is majoring in industrial engineering at Morgan State. “No one stepped up to help.”

After high school, Thompson attended classes at a local community college, but dropped out and spent years working in a variety of jobs: in retail, at McDonald’s, as an airport baggage handler, and at a call center.

She summoned the courage to return to school after she “got tired of being broke,” and took her father’s advice to attend an HBCU. Thompson’s father, Garland Thompson, had been an editorial writer for the Baltimore Sun, and he had written about Morgan State.

“He encouraged me to go into engineering, and he said an HBCU would look out for you [as a student], and that the staff would be on your side, as opposed to a competitive school where you would face resentment.”

- Grace L. Thompson, reentry student and industrial engineering major at Morgan State University.
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Collins, who grew up in Columbia, Md., steeped in the Math, Engineering, Science Achievement (MESA) program from the time she was in the fourth grade.

An electrical engineering major who tutors younger students, Collins was impressed with SWE’s mission, with the section’s past president, Renee Etoty, and its members’ commitment to mentor younger women. Collins quickly learned about Morgan State’s history and is taken by the great achievements of alumni in engineering fields and in teaching engineering, including teaching at Morgan State. “It’s a welcoming environment,” she said. “Teamwork is very much emphasized for engineering students.”

As president of the SWE section, Collins intends to host a second open-discussion panel with women who work for major corporations such as Boeing, Lockheed Martin, and Northrup Grumman. In addition, the section is hosting an etiquette program featuring Michelle Reese, Ph.D., the SWE advisor who runs a microwave-technology lab. The program will help students understand, among other things, which utensils to use during a formal dinner. Interestingly, Dr. Reese was one of the first women to receive a Ph.D. from MSU’s school of engineering.

### Women find success in teaching engineering at HBCUs

Two other SWE members, Yvonne “Y.Y.” Clark, P.E., F.SWE, and Montanez A. Wade, both engineering professors at Tennessee State University in Nashville, Tenn., also attended HBCUs by happenstance. Both value their tenures at TSU, which is also an HBCU.

Clark wanted to attend the University of Louisville (Ky.) in the late 1940s, but was barred due to race. She was accepted to the University of Illinois at Urbana-Champaign, but she wanted to experience living in a dorm, and that was not an option at the time.

Because she met all of the admissions criteria at its institution, the University of Louisville paid her tuition to attend Howard University, a historically black college in Washington, D.C. In other words, the University of Louisville paid for her not to attend school there.

Clark ended up having a terrific experience at Howard, where she was the sole female engineering student, and the captain of and chaperone for the cheerleading squad. As the only woman in her engineering classes, she felt proud rather than alone. Clark became the first African-American woman to graduate from Howard University with a mechanical engineering degree.

She went on to become the first African-American woman to graduate with a master’s degree in engineering management from Vanderbilt University in Nashville, Tenn. Other “firsts” include working at the Frankford Arsenal materials gage laboratory in Philadelphia and at RCA’s machinery-design unit in Newark, N.J.

Clark joined the mechanical engineering department at Tennessee State University in 1955, just 10 days after marrying a biochemistry professor at TSU’s Meharry Medical College. Clark joined SWE in 1952, is a life member and Fellow, and received SWE’s Distinguished Engineering Educator Award in 1998.

She appreciates the opportunity that teaching at a historically black college provides her to “make sure that the students are learning to be productive once they get their B.S. degrees.” This includes helping students understand how to grow out of their high school behaviors; and to learn respect, manners, and other cultural aspects of success. “I can tell the students these things, and feel comfortable telling them,” she said.
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A Journey in Self-discovery

Montanez Wade’s mother, the late Valencia Johnson Wade, majored in education at Tennessee State University and became a first-grade teacher, while her father, Fred S. Wade, attended TSU for two years to get an engineering degree. He became a 21-year career military serviceman in the Navy, and then returned to TSU to obtain a criminal-justice degree. Montanez Wade remembers being surprised when she discovered her dad knew one of her engineering instructors from his time as a student at TSU. “I never knew he had studied engineering,” she said.

Wade may not have known that her father studied engineering at TSU, but she clearly knew that TSU was an HBCU, and understood that the culture fit with her sense of belonging and appreciation of the African-American sense of identity. As a member of her high school forensics team, Wade recited and deeply felt an association with the poetry of Langston Hughes, Maya Angelou, and Nikki Giovanni. She can easily recite Angelou’s “Phenomenal Woman,” and Hughes’ “The Negro Mother,” today, and now creates her own improv poetry.

She also discovered new worlds with the help of “an amazing physics teacher,” Donald D. Savoy, Ph.D. Dr. Savoy turned his homework lab into “a place to hang out,” with blackboards all around the room. “He would ask questions so that the students thought through the physics problems. It was very encouraging,” said Wade, who attributes a part of her teaching style to Dr. Savoy’s influence.

Dr. Savoy’s lab served as a place where he introduced students not only to physics concepts, but to a telescope from which they could view the sky; a dark room where they learned to process black-and-white photos; and a then-unusual philosophy of vegetarianism, to which he adhered.

“He introduced me to seeing the rings of Saturn through the telescope,” Wade said. “You’d start with physics, but it might take you somewhere else. … Professor Savoy was a holistic teacher whose knowledge transcended physics.” Wade joined SWE during her undergraduate years, when she also became active in the National Society of Black Engineers. Since there were eight women in the electrical engineering program, and NSBE is co-ed, SWE provided an outlet “where we could be us,” she said.

After graduation, she went to work as a member of the technical staff at AT&T’s Bell Laboratories in North Andover, Mass., doing circuit design and testing in the linear hybrid integrated circuits area. Her favorite part of the job was troubleshooting problems at the manufacturing plant when a wireless-phone chip had problems and required a redesign.

After three years there, Wade earned her master’s in electrical engineering with an emphasis in image processing at the University of Tennessee Space Institute in Tullahoma, Tenn. The university had just made headlines for naming its first African-American vice president, Wesley Harris, Ph.D. Dr. Harris was committed to academic excellence, was active in engineering education, and the institute had begun a more concerted effort to attract students of color. After graduation, Wade taught at TSI before returning to TSU to teach in 1994. Now more than ever, she appreciates TSU’s history.
• adopting a multifaceted approach that includes attention to students’ academic and psychological readiness for success in these fields
• encouraging supportive, cooperative relationships among students rather than competitive peer relationships
• adapting STEM curricula and instructional practices to promote students’ achievements, as well as their confidence in their ability to succeed in STEM courses
• addressing the financial challenges that may require students to work substantial numbers of hours while enrolled

Dr. Godfrey of Carnegie Communications said the HBCUs can have their teachers and alumni speak to potential and prospective students about their focus on students as individuals, and how they can help students succeed.

Kristin R. Tichenor, vice president for enrollment management at Worcester Polytechnic Institute, a Worcester, Mass., university of mostly white male students enrolled in undergraduate and graduate STEM disciplines, has increased enrollment of women of color by reaching out to HBCUs as potential feeder schools. It has done so by creating a marketing brochure for women; promoting career opportunities in engineering; running workshops for local high school guidance counselors; and dropping the SAT exam as an entrance requirement. Prospective students can demonstrate their potential through photo journals, research papers, catapult designs, robotics projects, and the like. The university also gives only As, Bs, and Cs, and does not give failing grades.

“Our efforts to attract women are about selling engineering to a population who would not otherwise put it on their list,” Tichenor said. The women’s brochure features smiling, casually attired WPI students, and highlights profiles of individual women telling how they enjoyed working in teams on engineering projects, and learning how to contribute research toward solving global problems in the university’s “Great Problems” seminars.

“The women’s brochure spends very little real estate [space] focusing on us as an institution,” Tichenor noted.

Tichenor and a colleague also studied alumni of WPI’s magnet math and science high school, and found that “minority students who had enrolled in intensive math and science programs, and who had the required academic qualifications, were more likely to pursue math, technology, and science majors in college,” Tichenor said. “Our takeaway was, if minority students are given the right academic preparation and exposure, they are likely to pursue STEM careers.”

For the first time, WPI set aside a day last spring for HBCU students and their advisors to visit WPI to learn about the graduate school. “We are most eager to enroll these [HBCU] students for their graduate work,” Tichenor said. “We hear from our corporate partners that they want us to be educating more broadly, and to help them diversify the workplace.”
THE 2009 SOCIETY OF WOMEN ENGINEERS’ NATIONAL CONFERENCE PROVIDED A SPECIAL OCCASION FOR SWE MEMBERS TO CELEBRATE THE PAST WHILE LOOKING FORWARD TO A FUTURE RICH WITH POSSIBILITIES. MORE THAN 4,500 ATTENDEES GATHERED IN LONG BEACH, CALIF., WHERE THE CONFERENCE THEME, WOMEN ADVANCING THE WORLD OF TECHNOLOGY, RESONATED THROUGH NEARLY 120 SESSIONS, AS WELL AS SPECIAL EVENTS, TOURS, THE CAREER FAIR, AND OTHER ACTIVITIES. THE KICKOFF OF SWE’S 60TH ANNIVERSARY COMMEMORATION GAVE ATTENDEES THE OPPORTUNITY TO EXPLORE A BIT OF THE SOCIETY’S HISTORY. AND, IN KEEPING WITH THE CONFERENCE THEME, THOSE IN ATTENDANCE, AS WELL AS THOSE UNABLE TO BE AT WE09, COULD FOLLOW THE ACTIVITIES THROUGH SWETALK ON TWITTER.

THURSDAY’S KEYNOTE BREAKFAST SPEAKER, DARLENE J.S. SOLOMON, PH.D., CHIEF TECHNOLOGY OFFICER FOR AGILENT TECHNOLOGIES, EMphasized that the technological and societal challenges we face will be resolved only if women play a stronger role in finding solutions. SHE capturred the theme of WE09 by offering four strategies to advance the world of technology, including continuing to push the limits of what is possible. Citing nanotechnology as an example, Dr. Solomon ended her talk by taking the audience on a journey through nine orders of magnitude — from a view of the Earth from 1 billion meters in space, to an image of the high-structural DNA molecules of a virus.

The opening of the 60th Anniversary Gallery treated visitors to a pictorial history of SWE and provided a glimpse of things to come. The day’s events began with a panel presentation by scholars who are collaborating to produce a special journal based on research conducted at the Reuther Library, the official repository of the Society’s archives. The peer-reviewed volume will be published at the end of the anniversary celebration.

The gallery featured archival photos; artifacts; clips from oral history interviews; and a video of “Betty the Engineer,” an episode from the 1950s TV show Father Knows Best. Visitors also were invited to contribute personal anecdotes about their SWE experiences to the I Remember book. In addition, the travel-
ing exhibit “Petticoats and Slide Rules: SWE, A History of Women Engineers” was on display outside the gallery.

WE09 also marked the beginning of the SWE Grassroots Oral History Project. A workshop offered ideas for sections and members to capture their individual histories through interviews and other special projects.

In between sessions and other activities, the Lava Lounge, introduced last year, offered a welcoming space for conference-goers to relax, connect, and videotape their thoughts about SWE.

To minimize WE09’s ecological footprint, organizers strived to make the conference a “green” event — from refillable BPA-free water bottles to reduce waste from disposable bottles, to “green” tote bags and lanyards, online session evaluations, and a number of green-focused sessions.

As a prelude to the traditional Thursday evening opening of the Career Fair, Rhythm Extreme energized attendees with a rousing percussion performance. Following the ribbon cutting, more than 200 exhibitors welcomed visitors to their booths and hospitality suites.

The awards banquet provided a forum to recognize the 2009 recipients of SWE’s major awards, including Achievement Award recipient Aslaug Haraldsdottir, Ph.D., of The Boeing Company (please see page 46 to read Dr. Haraldsdottir’s acceptance speech). A complete listing of this year’s award recipients appeared in the Conference 2009 issue of SWE Magazine.

Saturday night’s “Celebrate SWE!” event ushered in the official beginning of the Society’s 60th anniversary. Actress Carolyn Mignini’s portrayal of Beatrice Hicks, SWE’s first president, along with a collection of video clips, showcased the Society’s history and the accomplishments of its members. In a touching moment, SWE Past President and Fellow Pat Brown received a standing ovation in honor of her being a SWE member since 1950.

Invigorated by the theme of our diamond anniversary, “60 years of inspiring perspectives and achieving success on your own terms,” those in attendance filled the ballroom with energy and enthusiasm to close WE09 and look forward to WE10 in Orlando.
Good evening, everyone. It’s been a wonderful evening so far, as I’ve probably never been in a gathering with so many talented and accomplished women. What an honor to be here.

This has been an eventful and bittersweet week for my family and me. I’d like to first take a moment to remember a dear friend and colleague at Boeing, who passed away last Saturday in the prime of his life. Ewald Schoemig came to Boeing in 2001 and was my mentee and close colleague from the very first day. He has had a hand in my presence here tonight, both by writing one of the letters that supported my application, and by his significant contributions to the work we do every day at Boeing. Thank you, Ewald; we will remember always.

The important lesson that I have learned in my career since leaving school in 1987 is that engineering is not about technology; it is about people. This is sometimes difficult to remember, but the work we do is about improving the lives of people in our communities and around the world. It is about people also because all of our accomplishments are made possible when people decide to work together to make something happen. And, conversely, when our projects fail, it is often because people don’t come together, but rather pull in different directions due to conflicting goals and agendas. So tonight I’d like to tell you stories about the people who helped me become a good engineer and, I hope, also a good person to work with.

A special black cap

The stories start in Iceland in the ‘50s, back when the streets of Reykjavik were dirt roads, and there was no television. My father, Haraldur, who wanted to be here in Long Beach with us tonight, but couldn’t due to his chronic illness, was already advancing to a leadership role in the city’s bus company.

One winter day, he took my brother and me on a drive to the end of a bus line a little way out of town to visit a widow who lived in a little house that once had been a farm. Outside her house was an old tractor, and even though it was covered in snow, my brother and I demanded to sit in the driver’s seat and try turning the wheel. My father took a picture of each of us, and he showed me this picture recently, saying that already back then it was clear to him that I could get very serious about machinery.

My mother, María Aslaug, who is here with us tonight, is a sharp lady and was one of a remarkable group of young women who graduated from the only academic preparatory college in Reykjavik in 1949. When I was about 4 years old, I was at my grandmother’s house looking through odds and ends in the hallway closet, and up on the top shelf I saw a black cap with a shiny white top. I asked grandma whether I could borrow the cap, and she explained that it was a very special thing to my mother, because she had gone to school and worked hard many, many years to earn this beautiful cap. It was as if this cap opened up my mind to the wonders of school and learning, and I declared right then that I also was going to go to school many, many years so I could have a beautiful cap just like that.

A passion for learning

School was always a true passion for me, and my life until age 30 centered on soaking up knowledge at many excellent schools. I had many wonderful teachers, but one in particular comes to mind, because she symbolizes so much of a woman’s educational and career experience. I had just turned 19 when my beautiful daughter, Bára, who is also here tonight, was born, right in the middle of the fall semester of my senior year in preparatory college. I was taking a full load of math, physics, and chemistry, and was determined to get back to my homework quickly and pass all my classes. But it wasn’t easy; the baby was demanding all of my energy, and her dad was working 80-hour weeks. Then, a couple of weeks after Bára was born, my math teacher, Anna, called me at home with congratulations and wanted to
find out how I was doing. Well, a couple of days later, she showed up at the house with two of my girlfriends from class, and from then on we had calculus lessons at my kitchen table every week until finals. It is all about people making a difference.

Twelve years later I was working hard on my doctorate in mechanical engineering when I discovered the joy of another pregnancy. I was expecting my son, Yonas, who is also here tonight with his wife, Colette. I soon had to let my thesis advisors know what was going on. Both were very excited about the news, and Pierre [one of my advisors] immediately said, “Aha, I know something very important about this from my wife who is an obstetrician. You must finish all the work before the baby is born, or else it might never get done. So, let’s take your due date, subtract two weeks for uncertainty, and schedule your dissertation defense no later than that day.” Which is exactly what we did, and I was very pregnant on the day that I defended my dissertation.

That spring my mom was able to travel from Iceland to Ann Arbor, Mich., for my graduation, and we were two very proud ladies holding a 3-month-old baby boy and my Ph.D. diploma on graduation day. On that same visit I took her to see Michigan State University in East Lansing, where she had hoped to go to school at age 20, but was unable to because there just wasn’t a way to pay for it. She has always been excited about my education and career, because my generation of women has had so many more options.

**Historic shifts**

Things have changed tremendously since my mother and her girlfriends struggled to stay in school, and many were unable to pursue advanced degrees due to a lack of resources and interest in women’s education and career options. There were 35 women in her 1949 graduating class at Iceland’s only college prep school, out of a class size of 101, and only a third of those women were able to pursue advanced degrees at some point in their lives. One became a lawyer, one a professor at Iceland’s Medical School, another a practicing physician, and my mother rose to the position of department head in the Ministry of Social Affairs. Three of the women studied languages and literature; one of them is a well-known novelist; and, quite remarkably, one became the first woman elected president of Iceland, and served unchallenged in that role for the maximum term of 16 years.

I grew up with this group of women coming to our house often for the Scandinavian-style “sewing club,” and when
I snuck in before bedtime to grab some sweets from the table, they always wanted to know how I was doing in school and what I was planning to pursue. I know this is one of the reasons why I always thought education and a professional career were the normal thing to do.

Mechanical engineering, though, even for my generation of women, was a bit of a stretch. And how did I choose that topic? Strangely, I got to it through a process of elimination. I had come to a point with my music studies where I realized I would have to start spending many hours a day with my flute, by myself, to advance beyond the point I had reached at age 19. And I realized I would not enjoy that much solitary work, nor the intense competition that is inevitable in pursuing a career in such a small professional market. Thus I decided to pursue a university degree instead, and sat down with the University of Iceland course catalog.

I simply read the entire catalog, from front to back, and crossed out every topic until I got to the letter “v” for verkfræði, which is engineering. This topic had lots of math and physics that sounded quite interesting, but also seemed practical and “real.” Wow, I discovered that there is a whole world of theories and methods and tests that can be used to design and build all the most sophisticated things around us! And when I got to velaverkfræði, which is mechanical engineering, I realized that I could learn at school about all the mechanical things my dad and my brother had been working on without me in the garage all these years. I became convinced that “women can do this just as well as men can,” and my course was set.

I was quite fortunate to be one of five women starting out in my first year of engineering school, and I will confess that their friendship and support was a key factor in my perseverance through that first intense year of work. All of us graduated with engineering degrees, the largest group of women to complete engineering degrees at the University of Iceland at the time. Again, although the studies certainly required sharp minds and hard work, it was very much about the people, working together and making friends. The atmosphere in the 1970s was drastically changing in our favor, equal rights was a major force, and, fortunately, most people I have worked with have embraced that philosophy to the best of their abilities.

It’s all about people

My early career in engineering took several interesting twists and turns in industry and academia, and eventually I settled in at Boeing Commercial Airplanes in Seattle. My primary work focus for the last 16 years has been air traffic management and avionics, which has a personal connection for me because my family is now spread across 100 degrees of longitude and 30 degrees of latitude. The air traffic management system is also an area of fascinating complexity, due to its global reach, the many safety-critical systems that support it, and the extreme diversity of people and professions who work with it. Technology moves rather slowly in aviation, and again, it is all about people: The system must be extremely safe so that people have confidence in air travel; the system must be affordable and equitable because transportation is so fundamental to our economies; and there are so many different and strongly held opinions about how the system should be architected. But, most importantly, air traffic management work at Boeing brought my fiancé Matt and me together, and he is one of the colleagues who has had the most positive impact on my career and on what our Boeing team has accomplished.

Engineering has been an extremely exciting and rewarding career for me; opened doors to many fascinating studies and beautiful places; and enabled me to live, work, and travel in the world’s most interesting regions. I am truly grateful for all the interesting work I have been allowed to do, and for the friendship, collaboration, and support of so many good people all around the globe. I’d like to thank the colleagues who wrote support letters for me: Ewald Schoemig, Bob Schwab, Scott Pelton, Kevin Brown, Steve Bradford, and Christian Pusch. I’d also like to thank Kathrine Beck for her excellent editing of my application package, and June Ogawa and other SWE leaders at Boeing who believed I could be a winner.

Tonight is truly one of the high points of my professional career. I thank you for the honor you’ve bestowed on me, and for being here to celebrate with me tonight.
SWE's legacy was built over the past 60 years. And with a simple $60 gift you can help our legacy continue strong. Your tax-deductible, unrestricted donation will allow you, and future engineers and technologists, to be inspired by our strong past, find motivation in our thriving present, and impact our promising future.

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Kimberly-Clark Corporation Outreach Girl Scouts Program Award
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Large Section: Southwest Texas

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Large Section: Orange County

Membership Recruitment Award
Small Section: Western New York
Medium Section: Wichita
Large Section: Space Coast

Membership Retention Award
Small Section: Eastern Nebraska
Medium Section: Wichita
Large Section: Orange County

SWE History Award
Large Section: Detroit
Large Section: Philadelphia
Medium Section: Central New Mexico
Medium Section: New England Shoreline

Professional Development Program Award
Large Section: Detroit

Professional Development Event Award
Medium Section: Wichita
Large Section: Central Illinois

Professional Development Media Award
Large Section: Wisconsin

Strategic Communications Awards – Professional
Best Print Newsletter Award
1st Space Coast
2nd Central New Mexico
3rd Wisconsin

Best Section/MAL Web Site Award
1st Philadelphia
2nd Minnesota
3rd Charlotte-Metrolina

Best Public Relations Program Award
Large Section: Orange County

COLLEGIATE SECTIONS AWARDS
Kimberly-Clark Corporation Outreach Event/Series Award
Small Section: California State University, Long Beach
Medium Section: University of Central Florida
Large Section: California Polytechnic State University, San Luis Obispo

Kimberly-Clark Corporation Outreach Girl Scouts Award
Small Section: University of North Florida
Large Section: Iowa State University

Membership Recruitment Award
Small Section: Franklin W. Olin College of Engineering
Medium Section: University of Missouri
Large Section: Texas A&M University

Membership Retention Award
Small Section: Tennessee Technological University
Medium Section: University of Louisville
Large Section: Colorado School of Mines

Collegiate Membership Transition Award
University of Michigan, Ann Arbor

The Boeing Company Multicultural Program Award
Prairie View A&M University
University of Houston
University of Central Florida

SWE History Award
University of Illinois at Urbana-Champaign (Honorable Mention)

SWE History Award
University of Illinois at Urbana-Champaign Program Award
University of Illinois at Urbana-Champaign

Professional Development Award
Large Section: Tennessee Technological University

Professional Development Event Award
University of Texas at Austin

Professional Development Event Award
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Outstanding Collegiate Section Awards

Gold Level:
California Polytechnic State Univ., San Luis Obispo
Cornell University
Prairie View A&M University
Rensselaer Polytechnic Institute
University of Texas at Austin

Silver Level:
Bradley University
Carnegie Mellon University
Colorado School of Mines
Franklin W. Olin College of Engineering
Iowa State University
Massachusetts Institute of Technology
Michigan State University
Minnesota State Univ., Mankato
Northwestern University
Pennsylvania State University
Purdue University
Texas A&M University
Trinity University
Univ. of Alabama, Tuscaloosa
Univ. of California, Berkeley
Univ. of California, Los Angeles
Univ. of Colorado at Boulder
Univ. of Hawaii at Manoa
Univ. of Illinois at Urbana-Champaign
University of Kentucky
University of Louisville
Univ. of Michigan, Ann Arbor
University of North Dakota
University of North Florida
Univ. of Southern California
Univ. of Wisconsin-Madison
Valparaiso University
Wayne State University
Wright State University

Bronze Level:
New Mexico Institute of Mining and Technology

Certificate of Merit Award
Northern Illinois University
Rutgers University
University of Pittsburgh
Award Highlights

Certificate of Participation
University of Florida
Boeing Team Tech
1st California Polytechnic State Univ., San Luis Obispo, Team 1
1st California Polytechnic State Univ., San Luis Obispo, Team 2
2nd University of the Pacific
3rd University of Wisconsin-Madison

SME Bowl Competition
1st Region i: Square Root (-1)
2nd Region C Gulf Coast
3rd Region F New England

Collegiate Poster Competition
Graduate:
1st Anne Silverman, Univ. of Texas at Austin
2nd Jessica Dawn Ventura, Univ. of Texas at Austin
3rd Samia Subrina, Univ. of California, Riverside

Undergraduate:
1st Amy Frees, Univ. of Alabama
2nd Kristina Wang, Univ. of Colorado at Boulder
3rd Jillian Franke, Univ. of Illinois at Urbana-Champaign

“Stilettos to Steel Toes” Essay Contest
Grand prize honoree: Julia Alspaugh, Virginia Tech

From Georgia Tech, the section that submitted the most entries, we congratulate:
1st Caitlin Chapin
2nd Sydney Urbach
3rd Kassandra Stephens

From Carnegie Mellon:
1st Susan Lace
2nd Rebecca Asher
3rd Nikunja Kolluri

From Virginia Tech:
1st Laura Spieldenner
2nd Amy Bhatia
3rd Victoria Walsh

* Distinguished New Engineer not present: Patricia Walker
** Emerging Leaders not present: Peggy Panagopoulos Flaherty and Julie Rolfs.

1. With award coordinator Semahat Demir, Ph.D., from left, the Rodney D. Chipp Memorial Award recipients Neil Gillespie, Rear Adm. W.G. Shear Jr., and Craig Barnes.
2. Upward Mobility Award recipient Joanne Maguire.
3. Distinguished Engineering Educator Amanie Abdelmessih, Ph.D., of Saint Martin’s University.
4. SWE President Nora Lin, left, with Resnik Challenger Medal recipient Margot Wasz, Ph.D.
5. Distinguished New Engineers, from left, Jessica Rannow, Diane LaFortune, Mary Perkinsen, and Reena Singh Lee.*
7. At “Celebrate SWE!” Diana Madden, right, receives the Outstanding Counselor Award from SWE President Nora Lin.
8. Presented by immediate past president, Virginia Connolly, right, shown with FY10 President Nora Lin, center, the President’s Award was given to the General Electric Women’s Network.
9. SWE Outstanding Faculty Advisor Candace S. Sulzbach, P.E., right, with some of her students from the Colorado School of Mines.
10. The 2009 College of Fellows with coordinator Janis Mantini, far left. From left: Marge Inden, Michelle Tortolani, Janet L. Williams, Toni L. Doolen, Ph.D., and Sandra Postel.
Team Tech Collegiate Competition

From quick-protection tents for soldiers in Iraq, to “smart” window technology, to solar-powered football stadiums, entries in the 2009 Team Tech student competition indicated a high level of sophistication and abundant opportunities for learning.

BY TERRI MORSE, SWE, THE BOEING COMPANY

In keeping with its 18-year tradition, this year’s Team Tech student competition provided rich opportunities for multidisciplinary student teams to work directly with industry partners on real-world products and services. Sponsored by The Boeing Company, over the course of 2009, seven teams from six different universities competed for over $8,000 in prize money. Months of effort by the teams culminated in a competition at the SWE conference in Long Beach, where first place was awarded to two teams from California Polytechnic State University, San Luis Obispo.

Cal Poly team one was challenged by Lockheed Martin Aeronautics Company to develop a small-scale hinge moment measurement system for use in wind tunnel testing. The team developed and then demonstrated for attendees the prototype they designed, meeting all of the company’s initial requirements. Through this experience, the collegiates learned skills in computational fluid dynamics analysis, along with wind tunnel testing and actually working in a team on a real-life project.

Cal Poly team two worked with Walt Disney Imagineering developing a fully automated system to test the strength and endurance of various materials under consideration for ride vehicles. Their solution was a vertical drop tower system to simulate the collision between a fully loaded, moving ride vehicle and a stationary one, and uses a load cell to record the “jolt” that park guests on the moving vehicle would feel.

Both Cal Poly teams and their leaders — Nadia Shraibati, Nathaniel Hague, and Eric Davis — developed the test systems, overcame challenges along the way, and created lifelong team friendships in this learn-by-doing experience.

Second place went to the University of the Pacific for their work with United Cerebral Palsy, Amulet Technologies, and a 2½-year-old Spanish-speaking client to design the “Tiny Tot 2.5.” This augmentative and alternative communication device provides activity-based therapy and motor skills for challenged children under the age of 3. “In less than 15 weeks, our team successfully designed a device that met all functionality requirements provided by UCP, at a lower life-cycle cost than other AAC devices,” team leader Megan Kalend stated. The team was able to produce devices that normally cost $7,000-$10,000 for under $500.00.
The University of Wisconsin-Madison took third place, under Holly Powell’s leadership. The team worked with Diageo plc, a gin and vodka manufacturer. Their goal was to determine an environmentally friendly and cost-neutral method of disposing the waste products that result from the distillation process. Their solution gave Diageo two practical processes: the land application of berries for fertilizer, and using both the charcoal and berries for windrow composting.

If the idea of working on a team with an industry partner to solve a real-world problem fascinates you, now is the time to consider assembling a team for 2010. Initial project proposals are due Jan. 15, 2010. For more information, check out the Team Tech Student Competition on the SWE Web site at: http://societyofwomenengineers.swe.org/index.php?option=com_content&task=view&id=13&Itemid=121.

SME Bowl Winners

BY IRENE V. HODOR, SWE, EXXONMOBIL TORRANCE REFINERY

The Subject Matter Expert (SME) Bowl, sponsored by ExxonMobil, challenges SWE colleagues’ knowledge in science, math, physics, engineering, and technology. This competition also challenges their knowledge of SWE history, policies, and procedures. A long-standing tradition at the national conference, SME Bowl was held again this year in Long Beach.

The competition is structured so that regional winners receive prize money to benefit their region’s collegiate members, while the individual team members also win prize money for their personal use. An honorable mention to all of the SME Bowl Team members for participating!

1ST PLACE – Region i
($2,000 regional prize, $100 per team member)

**Team Members:** Eryn Ammerman, Colorado School of Mines; Stacie Biava, Colorado School of Mines; Caylee Johnson, Colorado School of Mines; David Lee, University of Tulsa; Kimber Lemon, Wichita State University

2ND PLACE – Region C
($1,500 regional prize, $75 per team member)

**Team Members:** Deena Akinrinsola, Texas A&M University; Cindy Diaz, Texas A&M University; Katherine Gallets, University of North Texas; Dominique Lim, University of Houston; Hina Aziz Rehman, University of Houston

3RD PLACE – Region F
($1,000 regional prize, $50 per team member)

**Team Members:** Mariah Dellea, Northeastern University; Kerri Liss, Northeastern University; Norma-Ester Medina, Rensselaer Polytechnic Institute; Meghan Murray, Franklin W. Olin College of Engineering

 PARTICIPATING TEAMS:

**Region A:**
University of the Pacific, working with United Cerebral Palsy and Amulet Technologies

*Tech for Tots: Developing Assistive Technology for Toddlers*
Team leader: Megan Kalend; 2nd Place

**Region B:**
California Polytechnic State University, San Luis Obispo working with Lockheed Martin Aeronautics Company

*Hinge Moment Measurement System for Conceptual Aircraft Wind Tunnel Models*
Team Leader: Nadia Shraibati; 1st Place Tie

California Polytechnic State University, San Luis Obispo working with Walt Disney Imagineering

*Vertical Drop Tower*
Team Leaders: Nathaniel Hague and Eric Davis; 1st Place Tie

**Region H:**
University of Illinois at Urbana-Champaign working with Northrop Grumman

*IM SAFE (Invisible Military, Self-Assembling, Field Efficient) Tent*
Team Leader: Jillian Franke

Iowa State University working with Pella Corporation

*Dynamic Window Design*
Team Leader: Carol Faulhaber

University of Michigan working with University of Michigan Center for Sustainable Systems and United Solar Ovonic

*SOLADIUM, Design and Feasibility of Implementing Photovoltaic Devices on Michigan Stadium*
Team Leader: Jacqueline Hibbard

University of Wisconsin-Madison working with Diageo plc

*Team Green Bucky*
Team Leader: Holly Powell; 3rd Place
Celebrating 50 Years:
Mary Berry, P.E.
Esther Conwell, Ph.D.
Martha Fowler
Anna Hradel
Josephine Webb, P.E.

Celebrating 25 Years:
Julie Albertson
Lea Anderson
Elizabeth Joy Arnold, P.E.
Theresa Arnold, P.E.
Mary Ann Baker
Lisa Bird
Naomi Brill
Colette Brosseau
Vicki Brown, Ph.D., P.E.
Magna Altamirano Cayll
Sherita Ceasar
Lisa Clifton
Ellen Coan
Noelle Cochran, P.E.
Jacqueline Cochrane, P.E.
Amy Conner
Virginia Connolly, P.E.
Madonna Cornelissen
Dorothy Cottner
Lynn Daniels, P.E.
Coleen Davis
Ruth Davis, Ph.D.
Ann Marie Eisenraut, P.E.
Debra Evans
Jennifer Fairchild
Brenda Flam
Sheryl Gracewski, Ph.D.
Loretta Greene
Linda Grevera, P.E.
Karen Henry, Ph.D., P.E.
Michele Hiener
Tina Holliday, P.E.
Nancy Insprucker
Betty Irish
Andrea Karalus
Deborah Keesler
Mary Ann Kennedy
Katharine Kent, P.E.
Susan Lavergne
Nancy Carrell Lawrence, P.E.
Mary Elizabeth Lentzen
Michelle Lepak
Catherine Lowery, P.E.
Margaret Lyons, P.E.
Sandra Mandawe
Lori Martin
Donna Matthews
Terumi McKenna, Ph.D.
Georgette Michko, Ed.D.
Lisa Mirisola
Lisa Morrison
Karen Morse
Terri Morse
Debra Nelson, P.E.
Ann Norton
Colleen Nye
Mary Nye, P.E.
Jean Panos, P.E.
Marguerite Pelose
Catherine Pieronek, J.D.
Nancy Pon
Elizabeth Gillis Raley, P.E.
Laura Ritzow
Holly Ross
Cheryl Ryan
Laura Santos
Leela Sasaki
Susan Thomas Schlett
Laura Schofield
Shivran Siddhu
Marianne Gehring Smith
Elizabeth Snyder
Jean Statler, P.E.
Constell Steinhaus
Ann Marie Stimpson
Frances Stuart
Cheryl Tague
Gina Burke Tarke
Martha Tateosian
Marjorie Tatro
Justina Taylor
Holly Teig
Laura Thomas, P.E.
Rebecca Thyne
Karen Van den Avont, P.E.
Caroline VanIngen-Dunn
Nancy Vincent
Joan Wenaas
Linda Williams, P.E.
Karen Wilson, P.E.
Penny Wirising
Kelli-Ann Wright

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The Highest Honor for Technological Achievement

Esther S. Takeuchi, Ph.D., Greatbatch Professor in Power Sources Research in the University at Buffalo School of Engineering and Applied Sciences, received the National Medal of Technology and Innovation, the highest honor awarded in the U.S. for technological achievement. Dr. Takeuchi, a UB faculty member since 2007, is the first UB professor to receive this honor. She received the medal from President Obama at a White House ceremony.

The National Medal of Technology and Innovation recognizes individuals or companies for outstanding contributions to the promotion of technology for the improvement of the economic, environmental, or social well-being of the United States.

Two Leading Engineers

The American Society of Mechanical Engineers paid tribute to the engineering and scientific achievements of 10 of today’s leading engineers, educators, and inventors, two of whom were women. Mary T. Drouin, senior project manager at the U.S. Nuclear Regulatory Commission, received the Bernard F. Langer Nuclear Codes and Standards Award, which recognizes an individual(s) who has contributed to the nuclear power plant industry through the development and promotion of ASME Nuclear Codes and Standards or the ASME Nuclear Certification Program. Bonnie J. Dunbar, Ph.D., N.A.E., P.E., president and CEO of the Seattle Museum of Flight, was awarded the Ralph Coats Roe Medal, which recognizes an outstanding contribution toward a better public understanding and appreciation of the engineer’s worth to contemporary society.

Bright Young Engineers and Educators

Forty-nine of the nation’s brightest young engineering researchers and educators were selected to participate in the National Academy of Engineering’s first Frontiers of Engineering Education symposium. Twenty-six of the participants were women. Engineering faculty members in the first half of their careers who are developing and implementing innovative educational approaches in a variety of disciplines met to share ideas and learn from research and best practice in education. They produced a charter to bring about improvement in their home institutions.

The participants were nominated by fellow engineers or deans and chosen from a highly competitive pool of applicants. Following is a list of the women participants:

- Mary Besterfield-Sacre, Ph.D., University of Pittsburgh
- Surita Bhatia, Ph.D., University of Massachusetts
- Cordelia Brown, Ph.D., Purdue University
- Monica Cox, Ph.D., Purdue University
- Elizabeth Gerber, Ph.D., Northwestern University
- Margret Hjalmarson, Ph.D., George Mason University
- Lisa Huettel, Ph.D., Duke University
- Kathleen Issen, Ph.D., Clarkson University
- Jennifer Karlin, Ph.D., South Dakota School of Mines
- Caitlin Kelleher, Ph.D., Washington University in St. Louis
- Gül Kremer, Ph.D., Pennsylvania State University
- Tanya Kunberger, Ph.D., Florida Gulf Coast University
- Hazel Marie, Ph.D., Youngstown State University
- Margaret Martonosi, Ph.D., Princeton University
- Christina Mastrangelo, Ph.D., University of Washington
- Jennifer Maynard, Ph.D., University of Texas
- Ann McKenna, Ph.D., Northwestern University
- Joanna Millunchick, Ph.D., University of Michigan
- Roseanna Neupauer, Ph.D., University of Colorado
- Susan Roberts, Ph.D., University of Massachusetts
- Julia Ross, Ph.D., University of Maryland, Baltimore County
- Ann Rundell, Ph.D., Purdue University
- Jen Schneider, Ph.D., Colorado School of Mines
- Sahra Sedigh Sarvestani, Ph.D., Missouri U. of Science & Technology
- Lisa Zidek, Ph.D., Florida Gulf Coast University
- Julie Zimmerman, Ph.D., Yale University

CyberInfrastructure Leadership

A pioneer in grid computing, Francine Berman, Ph.D., vice president at Rensselaer Polytechnic Institute, received the inaugural Ken Kennedy Award for Cyberinfrastructure Leadership from the Association for Computing Machinery and the IEEE Computer Society. Dr. Berman was recognized for her leadership in building national-scale cyberinfrastructure — the environment that supports rapidly expanding computing and information services over networked resources, including the Internet. Established in 2009, the Kennedy Award recognizes substantial contributions to programmability and productivity in computing and significant community service or mentoring contributions.

A Standard Bearer for Gen Y

Laurie Maxson, a teacher and career and technical education director for Project Lead the Way® in Colorado Springs, Colo., received the 2009 Outstanding Partner Award by the Society of Manufacturing Engineers Education Foundation. The award honors her ability to balance the educational...
needs of young people, Generation Y, with the complex challenges facing industry in its need for a technically savvy work force.

Serving as an effective conduit between both entities, Mason’s involvement helped secure financial support and in-kind donations from organizations such as 3M, Intel, and the Kauffman Foundation, making it possible for the Education Foundation to offer science- and technology-based youth programs.

Recognizing Women Engineers Who Make a Difference

The Anita Borg Institute for Women and Technology recognized the efforts and impact women make in four areas: social impact, technical leadership, emerging leadership, and change agent. This year’s recipients are:

Ekaterina Fedotova: The Social Impact Award honors an individual or team that has caused technology to have a positive impact on the lives of women and society or has caused women to have a significant impact on the design and use of technology.

Fedotova is the director for PH International’s Information Dissemination and Equal Access Project, a community-based network that provides basic and job-related computer skills training to increase employability among underserved, disadvantaged populations in 51 Russian cities.

Ruzena Bajcsy, Ph.D.: The Technical Leadership Award honors a woman who has inspired the women’s technology community through outstanding technological and social contributions.

Dr. Bajcsy is professor of electrical engineering at the University of California, Berkeley, where she is also Director Emerita of the Center for Information Technology Research in the Interest of Society. She has had an astounding impact in the fields of active vision, computer vision algorithms for medical imaging, and telepresence.

Nadya Mason, Ph.D.: The Denice Denton Emerging Leader Award honors a junior, non-tenured faculty member under the age of 40 at an academic or research institution pursuing high-quality research in engineering or physical sciences while contributing significantly to promoting diversity in his or her environment.

In her research, Dr. Mason, assistant professor of physics at the University of Illinois at Urbana-Champaign, focuses on electron behavior in low-dimensional, correlated materials.

Oreoluwa Somolu, Halima Ibrahim, and Anne Ikiara: The Change Agent Award honors three women.

Oreoluwa Somolu, founder of the Women’s Technology Empowerment Centre, is passionate about empowering women and girls of Nigeria through the use of information and communication technologies, as well as encouraging them to pursue technology careers.

Halima Ibrahim’s initiative, the Mu’assassatul Mar’atus Salihah Women’s Skill Acquisition Centre, is one of the biggest initiatives to emerge from the Community Technology Skills Program in Nigeria over the last three years.

Anne Ikiara is the general manager of NairoBits Trust, an organization that deals with youth and women empowerment. NairoBits has a vision of giving youth technical, social, and entrepreneurship skills to enable them to positively change their circumstances.

President-elect for ASCE

In the fall of 2010, Kathy Caldwell, P.E., president of Caldwell Cook and Associates in Gainesville, Fla., will become president of the American Society of Civil Engineers. Caldwell joined Caldwell Cook and Associates after retiring as president of JEA Construction Engineering Services Inc., a wholly owned subsidiary of Jones Edmunds and Associates Inc.

Caldwell’s career at Jones Edmunds spanned almost two decades, during which time she served as a design engineer, project manager, and senior construction resident engineer for a variety of public works clients before becoming division manager and then vice president. Caldwell is currently an adjunct professor at the University of Florida.

P.E. License Requirements to Change

The National Council of Examiners for Engineering and Surveying (NCEES) continues to address additional education requirements for engineering licensure that, upon adoption by any specific state-level jurisdiction, could go into effect as early as 2020. The additional education requirement calls for an engineering licensure candidate to obtain a master’s degree or its equivalent prior to the P.E. exam.

Jon Nelson, P.E., NCEES vice president, Central Region, pointed out, “The basic problem statement was described very well by the National Academy of Engineering’s report Educating the Engineer of 2020. They said, ‘It is evident that the exploding body of science and engineering knowledge cannot be accommodated within the context of the traditional four-year baccalaureate degree.’”

Nelson continued, “It is my opinion that the changes were made because the majority of the NCEES members are concerned that the body of knowledge required for licensed professional engineering practice which should be addressed by education cannot fit into four-year programs.”

He noted that the NCEES recommends that this new educational requirement not be retroactive. Individuals who were licensed without the additional education but before the new standard is required should not have to attain the additional education, even when seeking comity licensure in another state.

An Extraordinary Impact on Engineering

The National Academy of Engineering presented two awards for extraordinary impacts on the engineering profession. John Casani, who has made important contributions to deep space exploration, received the Academy’s Founders Award. Sheila Widnall, Ph.D., received the Arthur M. Bueche Award for leadership in expanding the opportunities for women and minorities in engineering.

In addition to her remarkable aca-
ademic career in fluid dynamics, Dr. Widnall has attained the highest levels of public service and championed the role of women in engineering. Her career has many firsts. She was Secretary of the Air Force from 1993-1997, making her the first woman to lead an entire branch of the U.S. military in the Department of Defense. She was the first MIT alumna appointed to the faculty in the School of Engineering in 1964 and the first female faculty chair in 1979. In 2000, Dr. Widnall became the first woman to serve as president of the American Institute of Aeronautics and Astronautics.

**Connecting Professional Practice and Education**

The Department of Civil and Environmental Engineering of Florida A&M University–Florida State University was the grand prize winner of the 2009 National Council of Examiners for Engineering and Surveying’s Engineering Award for Connecting Professional Practice and Education. The department received the prize for its submission, Senior Capstone Course: Collection of Projects with Featured Everglades Restoration Project.

Through the capstone course, students learn about nontechnical professional issues, such as ethics, teamwork, and communication skills, and complete a design of a civil or environmental engineering project. Professional practitioners give classroom lectures, provide real-world design projects, mentor students, and evaluate students’ results.

The featured senior design project included student teams working with the U.S. Army Corps of Engineers on two restoration projects in the Florida Everglades.

**You’ve Got the Best Job in America**

Systems engineer tops the list of 50 Best Jobs in America according to the November 2009 Special Report on CNNMoney.com. Highlighting SWE member Anne O’Neil, a chief systems engineer at the NYC Transit Authority, the report states that “Demand is soaring for systems engineers, as what was once a niche job in the aerospace and defense industries becomes commonplace among a diverse and expanding universe of employers, from medical device makers to corporations like Xerox and BMW.”

Corroborating CNNMoney’s take on engineering jobs, a June 2009 Forbes.com article written by Tara Weiss stated that “For the second year in a row, engineer is the hardest job to fill in America.”

**Not a Very Good Trend**

According to a recent Families and Work Institute study, the health of employed American workers is trending downward in a number of important areas. Among its many findings, the report reveals:
- 41 percent of employees report experiencing three or more indicators of stress sometimes, often, or very often.
- One in three employees experiences one or more symptoms of clinical depression.
- One in five employees has trouble falling asleep either very often...
or fairly often.

- 31 percent awaken too early and have trouble falling back to sleep, also very often or fairly often.
- 21 percent are receiving treatment for high blood pressure and 14 percent are being treated for high cholesterol.
- Furthermore, the report finds that nearly half (49 percent) of U.S. employees have not engaged in regular physical exercise in the last 30 days, including 22 percent who are not engaging in any rigorous physical exercise.
- Despite a push to stop smoking at 58 Sciences and Engineering?

What Influences Women’s Careers in Biomedical and Behavioral Sciences and Engineering?

Two Cornell research teams have each received National Institutes of Health grants to identify factors influencing the careers of women in biomedical and behavioral sciences and engineering. The two grants are part of 14 grants awarded, totaling $16.8 million, in response to a 2007 National Academies report, “Beyond Bias and Barriers,” that called for a broad, national effort to maximize the potential of women scientists and engineers.

Wendy M. Williams, Ph.D., professor of human development, and Stephen J. Ceci, Ph.D., the H.L. Carr Professor of Developmental Psychology, both in the College of Human Ecology, received $1.4 million over four years to establish the Cornell Institute for Women in Science. The money will fund a series of studies that aim to assess and reduce gender bias in recruitment, mentorship, and evaluation in science, technology, engineering, and mathematics fields. The project will explore how women and men are recruited to and informally trained in graduate school, and how they are evaluated when they apply for their first tenure-track position.

Engineering Common Medical Problems

When it comes to medicine, one might consider Shayn M. Peirce-Cottler, Ph.D., a professional problem-solver. One of the University of Virginia’s most prolific inventors, the biomedical engineer has developed a number of innovative tools to assist clinicians in battling some of medicine’s most difficult challenges.

Dr. Peirce-Cottler’s work with special cells found in fat, or adipose, tissue could have a tremendous impact on the treatment and prevention of many complex medical conditions.

Working with University of Virginia plastic surgeon Adam J. Katz, M.D., she has found that these cells — known as adipose progenitor cells — can be used to restore the blood flow vital to organs and tissues. Healthy blood flow is a key component in the treatment of a variety of diseases, among them cardiac ischemia. Caused by inadequate blood flow to the heart, cardiac ischemia is the leading cause of death in the United States.

Among Dr. Peirce-Cottler’s many other collaborations is the development of a device that streamlines the insertion of pressure-equalization tubes into the eardrums of children with chronic ear infections, the most commonly performed surgical procedure in the United States.

By Morgan Estabrook, UVAToday

Are Birds More Efficient Than Planes?

In the search for better ways to fly, researchers have long pondered the question: Which is a better system — the flapping wings of birds and insects or the fixed wings of your average 747?

The answer depends on a host of variables, including the size of the object and the type of flight. If maneuverability is the goal, birds and insects seem to have the advantage. When it comes to efficiency, most aeronautical engineers would agree that the fixed-wing airplane is the smartest design.

According to a new Cornell study,
however, an optimized flapping wing could actually require 27 percent less power than its optimal steady-flight counterpart at small scales. The study, by Jane Wang, Ph.D., professor of theoretical and applied mechanics, and graduate student Umberto Pesavento, is published in the Sept. 11 issue of Physical Review Letters.

To find an optimum combination of motion and wing orientation, the researchers analyzed the interactions between a wing and its aerodynamic wake in two dimensions for a group of flapping motions with characteristics similar to those observed in hovering insects, using fruit fly wing dimensions as a model.

For the fixed-wing scenario, the optimum occurs at a specific angle of attack. Therefore, at first glance, flapping flight would seem less efficient because the wing would necessarily deviate from the optimum condition.

Building on Dr. Wang’s previous work studying insect flight, the researchers constructed a special family of wing motions that allowed them to optimize a range of parameters, including optimum angle of attack, turning speed, frequency, and timing between pitching and flapping for a wing of the same size and with the same amount of weight to support. The most efficient flapping motion, they found, required significantly less power than the corresponding fixed-wing motion.

By Lauren Gold, Chronicle Online e-News

Five Technologies That Will Change Everything

Writing in the Oct. 20, 2009, PC World, Glenn Fleishman cites “Five new technologies are on their way that will give users unprecedented access to data thanks to new high-speed connections and user interfaces.” Following is his list:

- The new USB 3.0 standard preserves backward compatibility by allowing older cables to plug into newer jacks
- Video streaming over Wi-Fi
- 3D TV – Panasonic and other high-definition TV makers are looking to faux 3D technology to provide stereoscopic depth
- Augmented reality in mobile devices – a bionic contact lens that would paint imagery and information directly on the eye
- Web pages built with HTML5 will display the same on any browser – desktop or mobile

Stanford University
Department of Computer Science Faculty Opening

The Department of Computer Science at Stanford University invites applications for a tenure-track faculty position at the junior level (Assistant or untenured Associate Professor). We give higher priority to the overall originality and promise of the candidate’s work than to the candidate’s sub-area of specialization within Computer Science.

We are seeking applicants from all areas of Computer Science, spanning theoretical foundations, systems, software, and applications. We are also interested in applicants doing research at the frontiers of Computer Science with other disciplines, especially those with potential connections to Stanford’s main multidisciplinary initiatives: Energy, Human Health, Environment and Sustainability, the Arts and Creativity, and the International Initiative.

Applicants must have completed (or be completing) a Ph.D., must have demonstrated the ability to pursue a program of research, and must have a strong commitment to graduate and undergraduate teaching. A successful candidate will be expected to teach courses at the graduate and undergraduate levels, and to build and lead a team of graduate students in Ph.D. research. Further information about the Computer Science Department can be found at http://cs.stanford.edu. The School of Engineering website may be found at http://soe.stanford.edu.

Applications should include a curriculum vita, brief statements of research and teaching interests, and the names of at least four references. Candidates are requested to ask references to send their letters directly to the search committee. Applications and letters should be sent to: Search Committee Chair, c/o Laura Kenny-Carlson, via electronic mail to search@cs.stanford.edu.

The review of applications will begin on January 4, 2010, and applicants are strongly encouraged to submit applications by that date; however, applications will continue to be accepted until the position is filled, but no later than May 1, 2010.

Stanford University is an equal opportunity employer and is committed to increasing the diversity of its faculty. It welcomes nominations of and applications from women and members of minority groups, as well as others who would bring additional dimensions to the university’s research and teaching missions.
Lessons Learned: Smoothing the transition from school to work

An early-career engineer reflects on her transition from being a “fish out of water” to a key contributor, and what she has learned professionally and personally.

By Bianca Mccartt, SWE Editorial Board

Early five years ago, I finished my bachelor’s degree and started working in industry, learning a lot about myself during this time. Unlike college, where I felt confident in my engineering and leadership abilities, at work I suddenly had that “fish out of water” feeling. The company, GE, was enormous, with no familiar faces, lots of acronyms and jargon, and technology that was completely new to me. On top of that, everyone around me seemed to be extremely knowledgeable. I spent a lot of time figuring out what people were saying. I didn’t have a strong grasp of my role there, let alone what my future goals ought to be.

After the initial shock, I started looking at some of the lessons I learned, and how I could have made the transition easier.

From introductions to intriguing work

Being on six-month rotational assignments forced me to learn one skill very well — introducing myself to a new group. I expected that my manager would introduce me to everyone, and in my first two rotations, fortunately, someone did. By my third rotation, I was introduced to three people out of the 100 who worked in the same office. Most of them did not assume they needed to introduce themselves to me, either. For a couple of months, I hardly knew anyone and felt like a stranger every time I walked in. I realized later that in such a large organization, it is hard to differentiate between who is new and who is passing through.

As a new person, I learned to take the initiative to introduce myself. I met a lot of nice and helpful people just by saying, “Hi, my name is Bianca. I’m new to this group and I’m just trying to get to know everyone. What’s your name and what do you do here?”

At work, someone suggested that I look for a topic that intrigues me — something I would want to understand better, even if it was not totally required for the task. It was further suggested that I develop an expertise by digging into this topic, to be inquisitive, and ask lots of questions. At GE, our leaders are always saying, “Be passionate about your work.” Passionate might seem like a strong word, but the more you feel that way, the better your performance will be.

Self-knowledge leads to understanding others

I’ve learned that it’s essential to understand your own personality and preferences. Typically, people working in analysis roles tend to be introverted, detail-oriented types, and therefore those departments have a relatively quiet atmosphere. The role is very much defined as a “keep your head down, focus on the task in front of you,” and “find the answer,” type of job.

However, I am atypical of this group. I tend to be more extroverted, like to work with people, am most comfortable viewing the big picture, and am always coming up with ideas. I took the position as a way to stretch myself, knowing that it was not a role I would naturally gravitate to. I didn’t feel that my grasp of the fundamentals was strong enough, and I wanted to understand the analysis that drives our designs. I needed to develop confidence in my ability to catch mistakes, and see the underlying reasons for decisions. My goal was to stretch outside my comfort zone and develop my engineering intuition.

My neighbor in heat transfer analysis had spent 15 years working in our “advanced aerodynamics” group and could be described as a poster child for the “stereotypical” engineer. He and I would occasionally chat, and it was often amusing because of his unique outlook on life. He had spent most of his career specializing in the design of cooling features on second-stage high-pressure turbine nozzles and didn’t have much perspective on subjects outside of his specialty. This extended beyond aircraft engines to the world at large. This became quite evident one day when I picked up my iPod® and he

Passionate might seem like a strong word, but the more you feel that way, the better your performance will be.
We all want to fulfill our responsibilities to others, but that will not be possible for long if we neglect our own needs.

I believe there is value in having more than one mentor, and having a broad network can be beneficial in helping find great mentors. You need technical mentors and career mentors. You might want a mentor who is only a few years ahead of you in their career, as well as one who is established and has many jobs to reflect on. Different mentors will offer conflicting advice. This will lead to options you would not have previously considered, and you can arrive at your own conclusions about the most appropriate choice.

I signed up for the mentoring program during my first year at GE and was paired with a man who had been with the company for 20 years. Around the same time, I was also invited to become the mentee of one of our senior engineering leaders in the chief engineer’s office. The focus of our discussions was my next rotational assignment, and I asked them both to advise me on where I ought to go. I would ask the same questions and get different answers. One said, “You really have to get experience in performance; that is the fundamental language of our business.” The other said, “Pick an area to become an expert in and take different jobs in that one area. Spend six months in design, six months in analysis, six months in test, and six months in development. If you really want a strong foundation, specialize in rotating parts.”

It was all good advice and had served them well, but it was impossible to do both. Ultimately, I did what appealed to me and took a rotation in marketing. It was educational on so many levels, but it wasn’t at all similar to my mentors’ advice. I continued to see my mentors and told them what I was doing in marketing.

To my surprise, both thought I got a unique experience that was more practical than they would have expected. Even without following it to the letter, I learned a lot from the advice that my mentors gave me and was able to build on it through the choices I made for myself. With only one mentor, I might have just done as I was told, because the path would have seemed so straightforward. By having two, I realized that there is a lot of flexibility in the “right” answer.

**Work/life balance**

One of the biggest challenges when transitioning to a full-time job is finding work/life balance. This is intensely personal because what one person considers balance, others will experience as over committing. The best advice I received is, “Put your own oxygen mask on first.” We all want to fulfill our responsibilities to others, but that will not be possible for long if we neglect our own needs.

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**Toward Better Understanding of Self and Others**

How can we enhance self-knowledge and understanding? And how can we better predict and manage our own behavior, especially when dealing with the demands of the diverse environments in which we work and live, and at times when powerful responses are triggered? Part of the answer is found in understanding and applying the principles of emotional intelligence.

The Society of Women Engineers’ professional development webinars program offers a three-part series on emotional intelligence, entitled “Can’t We All Just Get Along: Improving Your Emotional Intelligence.” This series focuses on assessing your emotional intelligence (EQ) for better problem solving, conflict resolution, and communicating in a team of diverse perspectives. Originally shown in December 2008 and January 2009, the webinars are among the more than 45 webinars available to download at no cost to members.

To access these or other webinars, please visit: www.swe.org/learning.

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**POINT OF VIEW**

asked, “Is that a transistor radio?” I was speechless. I couldn’t even have told you what a transistor radio looked like at the time; I had to look it up on Wikipedia!

On the other hand, after two years of sitting next to him, I can say that I’ve learned a lot from the experience. I have learned about working with people who are drastically different from myself, and have learned what unique strengths I bring to this job. Our interactions have helped broaden my horizons, and I hope they have done the same for him. I have also learned to be patient, and how to effectively work with each individual in the group.

I have also developed a different perspective on networking, which is often thought of as a way to find that next great job. To me, networking is valuable as a way of bringing a new perspective to my current job. I learned to seek people performing different functions in other departments, and other companies. This became an avenue for me to better understand the way the company operates as a whole, learn best practices to bring to my work, and expand my understanding of how the system works together. I have found the SWE professional section to be very helpful in growing my network this way. Through SWE and our company’s women’s network, I have established friendships with women in a variety of roles, and I am able to put together the big picture.

We all want to fulfill our responsibilities to others, but that will not be possible for long if we neglect our own needs.
In the past, I prioritized my responsibilities to others as higher than taking care of myself. When I first came to GE, I was finishing my master’s thesis. At the same time, I also was strongly committed to reinvigorating our SWE section and helping my husband find friends in our new city. To accomplish all this, I sacrificed my exercise time and I postponed getting involved with horses again, or focusing on any hobbies. This certainly forced me to slow down for a few weeks. Over time, I’ve realized that for the sake of my health and well-being, I must make my own happiness a priority.

Over time, I’ve realized that for the sake of my health and well-being, I must make my own happiness a priority. Although an employer can provide work/life balance support, I have to draw the line on how much of my time is given to others. Employers will always want as much of your time as you are willing to give, and the same can be said for family and anyone else who depends on you. One of the most valuable lessons — to be responsible to my own needs so that I can serve others — was key to my transition from college to young professional.

Bianca McCartney is a digital engine owner at GE-Aviation, where she is responsible for the management of assembly design data to facilitate collaboration on the GE38, GE90, and CFM aircraft engine product lines. She graduated with a B.S.M.E. in 2003 from the University of Kentucky. A member of the SWE Magazine editorial board, she served as the South Ohio Section’s president in FY08.

Make Your Age Your Ally

Whether in the early stages of your career or a veteran of the work force, you can create an environment in which age is a non-issue, and position yourself to be perceived as “just right.”

BY JILL S. Tietjen, P.E., F.SWE AND MARY D. PETRYSZYN, SWE

Does it seem that Goldilocks and the Three Bears have entered your place of employment? They have categorized you as “too young” or “too old.” Their skepticism to the contrary, no matter your age, you can be viewed as “just right.” Following are some tips to convince Goldilocks and the Three Bears (aka your management) that with the skills you have today, your flexibility to adapt to new situations, and your passion for lifelong learning, you really are “just right.”

Your current skills

When was the last time you did a skills inventory? Many of us do not take the time to consider our skills on a regular basis, but there truly is no time like the present. Over your career, you will change positions, and possibly even industries. Maybe you found your passion in service to our country, and did a tour in the military or government. Maybe you’ve been in both private industry and academia.

You probably developed skills even at those jobs you had during college. Remember them? Did you serve as a teaching or research assistant, laboratory aide, or computer service tech to help make ends meet and pay for tuition, books, and room and board? In developing your inventory, remember to include all of the skills you acquired through your experience in the Society of Women Engineers and other volunteer organizations. It is quite possible that your job hasn’t yet provided you the opportunity to prove out the skills that you have already demonstrated in SWE.

Have you organized all of the volunteers, coordinated with corporations, and balanced the budget for an Evening with Industry? In thinking through your volunteer activities, you might discover, for example, that you have skills that include leadership, project management, budgeting, and working with people.

When assessing your abilities, there are indeed various dimensions — beyond breadth and depth — to consider. And it is important to think through an area that might be particularly challenging: the “translatable” element. For instance, it may be fairly easy to jot down skills from your current and past jobs (and volunteer positions) — systems engineering, project leadership, people management, conflict resolution, negotiation skills, financial acumen, and the like. And you may be able to succinctly describe your depth of knowledge and experience in specific areas of environmental health and safety, medical equipment sales, or power distribution system design. But it may take some ingenuity to translate these skills and experiences to articulate your true talents.

For example, characterize your project leadership skills in combination with your power distribution system design experience in such a way to establish that you have managed a team of engineers through design of a system deliv-
Flexibility to adapt

Change is inevitable, in both our personal and professional lives. Being able to respond and adapt as a situation changes is a highly desirable trait. Even better is the ability to anticipate changes coming and adjust in advance. Do you ever marvel at those people who always seem to be in the right place at the right time? Or do you find yourself amazed at the ability of that person from accounting who just became the head of contracts? That could be you, if you can translate your skills effectively and are courageous enough to accept the challenges of situational change.

Here are some things you can do to improve your adaptability:

• Anticipate
• Pay attention to the signs that can provide you some clues, such as new idioms being used or changes to your company’s strategic focus
• Stay attuned to the culture and the direction leadership is taking, and acclimate accordingly

Your alignment and positive approach will go a long way in showing your understanding and keeping you attuned with the future. In the end, these characteristics show a level of maturity and business acumen — irrespective of age or experience.

Your passion for lifelong learning

While your acquired skills and adaptability can position you well, over your career you can expect some gaps as you determine what you’d like to do next and where you’d like to position yourself in the longer term. In addition, we’ve already said that change is inevitable. Even in industries or areas that might be viewed as static and static, look below the surface and you’ll see that change is everywhere.

Thus it is mandatory that you develop or nurture your zeal for lifelong learning. First, define the gap you need to fill or an area in which you want to learn more. Then, read as much on the subject as you can. Take training courses and continuing education classes. Be sure to find a mentor — maybe even several. Ensure that you put all of this learning into practice; this is what translates knowledge to wisdom. And wisdom is not a function of age — it is timeless.

As you translate your skills and experience in a way that aligns you with your desired goals, you create an environment that gives you much more influence over your own journey. In addition, your ability to adapt to changes and strive for continuous learning all along the way will help ensure that age or length of service are no longer issues, making you “just right.”

Jill S. Tietjen, P.E., is a Fellow life member of the Rocky Mountain Section. The president and CEO of Technically Speaking Inc., she served as the 1991-1992 national president of SWE.

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Solution to puzzle from p. 70

ENGRAVED
PODCASTS
TEXTING
TWEET
LINKEDIN
FRIEND
EMAIL
FACEBOOK
YOUTUBE
RSVP
TELETYPES
PAGER
YOUTUBE
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PODCASTS
TEXTING
TWEET
LINKEDIN
FRIEND
EMAIL
FACEBOOK
YOUTUBE
RSVP
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PAGER
YOUTUBE
LINKEDIN
FRIEND
SNAILMAIL
Maneuvering the Realm of Social Networking

A discussion between a savvy Facebook user and a newcomer offers tips and advice to enhance the experience and protect oneself.

BY MARILYN REEDER, SWE EDITORIAL BOARD, AND BIANCA MCCARTT, SWE EDITORIAL BOARD

Marilyn: Both of my sons are on Facebook, and I would like to join the network to keep up with them. My concern, however, is that Facebook can make it too easy for me to learn things I may not want to know and that they wouldn’t want me to know. How do you control the content that people see?

Bianca: If you want to control how others see your information, the place to start is under Settings>Privacy. There is an option there to change your privacy settings for groups of people (Everyone, Friends of Friends, Only Friends), as well as for specific individuals.

When you make someone your friend, you have the option of adding him or her to a list. You can customize your privacy settings so that different lists have different access levels to your information.

Marilyn: What is “your wall”?

Bianca: Your wall is like a message board where your friends can write messages to you that other people can see. Also, when you play a Facebook game, take a quiz, post a link, post a comment to someone else’s wall, or upload photos, it will show up on your wall as one of your activities.

Facebook will also ask you if you want this information to show up on your news feed, which means “Do I want this to show up on my friends’ ‘home’ pages on Facebook?”

Marilyn: Are your friends’ home pages what the people you accept as friends see?

Bianca: Each of your Facebook friends has a unique home page, which is a collection of recent activities from their friends. If you post a photo, for example, that activity might show up on a list of recent activities on all of your friends’ personal pages. But those who have a lot of friends might not see it because their home pages continually refresh with current activity. If they click on your name, though, it will send them to your wall, which will show all of your recent Facebook activity. Unless you set the privacy settings otherwise, your friends can see your wall and profile information.

Marilyn: If you don’t set privacy settings, can everyone on Facebook see your profile?

Bianca: The default is that everyone on the Internet has access to certain personal information, such as your education and work experience, as well as your personal wall posts.

Marilyn: OK, since my primary concern about joining Facebook is that I don’t want everyone to see everything I post, I should be sure to customize my privacy settings, as well as not post anything that could put me in a poor light.

Bianca: Right. Be sure to look at all five privacy setting options and each tab contained in each to understand precisely how your information is being shared.

Marilyn: What would you tell someone who is just starting out on Facebook to do first? What advice would you give them to protect themselves from making mistakes they may later regret?

Bianca: I would tell them to start by filling out only information they would feel comfortable making public. And I would strongly recommend going into the privacy settings and making sure everything there is set so that “Only Friends” can view information. This is the simplest way to restrict information to people you have chosen to be connected to.

If you are concerned about specific individuals, you can specify that certain parts of your profile are not visible to them by selecting “Customize.” For example, you may choose to limit access to the photos you have been tagged in so that others cannot share an embarrassing picture of you with your friends.

You may also want to set limits on who is able to find you in a Facebook search. I have my Privacy>Search set so that only “Friends of Friends” are able to locate me in a search. I also limit the content that is shown when someone who is not on my friends list searches for me. I think this is the safest setup for most individuals.

Protect yourself against hackers

Marilyn: As an experienced Facebook user, do you have any warnings for new users?

Bianca: Yes. Sometimes hackers will try to get to your information through your Facebook friends. If you see a posting on your wall that looks like it is from your friend, but it doesn’t make
sense and tells you to go to a link and fill out information, you should beware. Ask your friend if they really posted it, as their account may have been hacked.

Marilyn: So hackers try to mine information just like phishing schemes in e-mail?

Bianca: Exactly. People are more trusting because they think the posting has come from a friend. I have seen a scheme where a person’s profile was “infected” and it sent messages to all their friends that the person needed help. Hackers can be crafty.

Another thing to be careful about are Facebook applications — quizzes, games, and the like. When you add those applications, you are allowing them access to your profile information and your friends’ profile information. The applications come from third parties, who may be harmless, but might be looking for information to use. I try not to add applications personally. If you use them, you should periodically check the privacy settings of your applications. You may have agreed to share more information than you realize.

The American Civil Liberties Union developed an enlightening quiz application called “What Do Quizzes Really Know About You?” to educate people about this concern. Here is an article about the ACLU’s awareness campaign:


Marilyn: It seems to me that my concerns about Facebook can be addressed in the same way my concerns about e-mail or chatting are: by using common sense and not just assuming that everything is safe. I need to question things that don’t seem realistic and be careful — the same as when I get an e-mail telling me I’ve won a lot of money, or one from the bank that says to “click here to update your information.”

Bianca: Yes, absolutely. It may look like it is coming from someone you know on Facebook, but if it seems strange, beware.

Marilyn: Does Facebook have a way of alerting you to problems they become aware of?

Bianca: Facebook seems to have made an effort to address many of these concerns, though I do not recall specific warnings. Other users are often the first source of information about issues like hacked accounts.

Overall, I have found that the value of keeping up with my friends (and current events I am interested in) outweighs the potential risks. It is just good to be aware of what you are sharing and with whom.

LinkedIn

Marilyn: You use both Facebook and LinkedIn. Are there any different concerns for using LinkedIn?

Bianca: I’m not aware of any specific different concerns. LinkedIn users seem to be more guarded about sharing information because it is detailed professional data. I see a lot of recruiters on LinkedIn, as well as HR people from companies. People do not seem to post about day-to-day information on that utility as much as they do on Facebook.

I would certainly say that the same rules apply: Be vigilant about what you click on, and take into consideration what you share and with whom you share it.

Marilyn: I am on LinkedIn and I am careful about whose invitation I accept. It seems that if I belong to a group, I often get e-mail requests from recruiters who are also members, but I’m relatively confident it comes from the group.

Bianca: I ignore a lot of requests. Unless it is coming from someone I know or something that definitely seems legitimate to me, I tend to ignore it.

Marilyn: You have given me some good advice and convinced me that I should join Facebook so that I can keep in touch with my kids and my nieces and, of course, some other friends.

It seems that common sense, a questioning attitude, and vigilance are the mantra for using it — just like the Internet in general and e-mail.

Editor’s Note: In December 2009, Facebook updated its privacy settings. Among the changes for Facebook users is the ability to set specific options for each individual post. It is important, however, for users to review the privacy settings carefully, and to understand that the default setting for certain information is available to the public, that is, anyone with Internet access. The new policy can be found at http://www.facebook.com/policy.php?ref=pf.

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Bianca McCartt is a digital engine owner at GE-Aviation, where she is responsible for the management of assembly design data to facilitate collaboration on the GE90, and CFM aircraft engine product lines. She graduated with a B.S.M.E. in 2003 from the University of Kentucky. A member of the SWE Magazine editorial board, she served as the South Ohio Section’s president in FY08.
BY MARILYN REEDER, SWE EDITORIAL BOARD

Avid readers make time for reading. Occasional readers fit it in whenever they can and express dismay at the lack of time they have to enjoy a variety of publications. Readers whose jobs take them out of town frequently find carrying a number of books a burden. Today, the pleasure of losing one’s self in a good book is often supplanted by work demands and family obligations. However, with the development of reading technologies, which include reading systems and devices, there are ways to get your reading fix while going about your routine. The two most popular technologies are audio books and handheld readers, also known as e-books.

Audio books

In the multitasking era in which we live, audio books provide a means to enjoy books while we drive, exercise, or even garden. Commuters listen to audio books to make better use of their time on the road, and long car or airplane rides can be made more pleasant by listening to a book.

There are two primary ways to access audio books: CDs or downloads. The Audio Publishers Association reports that the popularity of downloads is increasing, growing 4 percent in 2008, and the audio book industry reports $1 billion in annual revenue. The popularity of this media may be due partly to the number of teenagers (53 percent) reporting that they have listened to an audio book. The increasing number of devices available to take advantage of audio books is a significant factor in the rising popularity of this medium.

Getting the Most from Reading SWE Online

Four years ago, SWE readers were given the option to read the magazine online via Nxtbook Media™. With this technology, current and past issues are retrievable anywhere you have access to a standard Web browser.

Basic navigation of the Nxtbook version of the magazine is an intuitive process. Clicking on the “turned-up” page corners allows you to move page by page, forward or backward, through the issue. To go directly to an article without flipping pages, simply access the Contents page and click on the article title.

While knowing these fundamental characteristics of Nxtbook will let you move through the magazine with ease, are you aware of some of the other features that will enhance your experience with the digital issue of SWE?

In the latest version of Nxtbook, several of the most useful features can be found in the three tabs below the magazine.

• The left tab provides a link where you can subscribe to an RSS feed of the magazine, making it easy to archive all issues.

• The middle tab opens up thumbnails that will take you to particular sections of the issue quickly.

• The right tab offers a similarly easy way to navigate the current issue, listing the page numbers above the tab, which will show the thumbnails as you drag your mouse over the numbers. This can be fun, much like shuffling a deck of cards, and it is an easy and direct way to get to specific articles or ads within the magazine.

Above the issue, you will notice additional tools you may find helpful. For instance, with the zoom-in, zoom-out option, you can tailor the size of the copy to suit your reading preference, as well as choose to view an article one page at a time or in full-screen mode.

By clicking on various toolbar icons, you can bookmark specific pages, forward an article to colleagues and friends, print pages, and add your own notes. In addition, you can perform a keyword search not only within the current issue, but you can ask Nxtbook to search every issue back to Fall 2006.

The technology provides a simple, effective means for sharing magazine content through Digg, Twitter, Facebook, and LinkedIn, or to bookmark content using Delicious.com or Google Bookmarks. Sharing content via these networking sites increases the Society’s impact.

The digital issue also offers a convenient way to research the employers advertising in SWE. Every ad contains a direct link to the company’s Web site, sometimes to a special SWE page they have developed to welcome you to their opportunities. This is comparable to the print version, where companies insert a code or key number in an ad, to determine an ad’s impact.

In your search for career leads, please remember to visit these companies, and that your membership and participation in SWE activities is an additional credential you bring to the job search.
tage of this technology also may be a factor.

Audio book CDs can be listened to on a computer, in a car, or on a walk — anywhere you have access to a CD player — and they are as easy to share as a paperback. Audio book downloads can be listened to on many different devices. Books can be downloaded to an MP3 player, such as an iPod® or Sansa®, or to cell phones like the Palm® Treo™ or the iPhone®.

Of course, books can also be downloaded to a computer and played on a media player. The audio book aisle in the large bookstores has grown, and most online bookstores offer downloads directly from their sites, or they will direct you to www.audible.com. It is more difficult to share audio book downloads than music, as audible does not allow audio book sharing, but iTunes® does, under the umbrella of shared music. However, the bookmark feature is lost, which may present a problem for some users.

Handheld readers

Another option, and an excellent choice for long trips, vacations away from home, or for individuals who are not audio learners, is the handheld digital book reader. The two most popular of these devices are the Kindle™, offered by Amazon, and the Sony Reader™. These mechanisms allow the user to have numerous books on one device. Barnes & Noble offers an e-book reader that can be used on mobile devices that have Palm OS®, Windows Mobile®, or Symbian® operating systems.

All of these readers allow you to read on a PC as well. For those who love the tactile feel of a traditional book and enjoy turning pages, however, this may not be a desirable option. These devices offer the ability to carry a small library of reading material in a compact package. All are more lightweight than toting a suitcase full of paperbacks, but they do not offer the same feel as printed matter. Some individuals are very comfortable with them, especially as an alternative, but others find them difficult to read. As with any new technology, you need to examine the differences to determine which device is right for you.
IN MEMORIAM

Doris M. McNulty, P.E.
SWE Founding Member, Attended Camp Green Meeting

Doris McNulty, P.E., of the Philadelphia Section, died July 15, 2009, following a short illness. She attended the meeting at Camp Green in 1950, where the national Society of Women Engineers was established. She was a founding member of the Society and a charter member of the Philadelphia Section.

McNulty was also a member of the women engineering student group recognized by Drexel University in 1949 — one of the precursors of the Society. She wrote about this experience in an essay, “Reflections on SWE’s 50th Anniversary,” recalling that she was one of 83 engineering students from 19 colleges who attended a conference for women engineering students at the Drexel Institute of Technology (as the institution was then named) on April 2-3, 1949. Present at the meeting was industrial engineer Lilian Moller Gilbreth, Ph.D., the “mother of engineering,” as well as the mother of 12 children, who was memorialized in the book, Cheaper by the Dozen.

Active in the Philadelphia Section from its earliest days through 1977, when work took her overseas, McNulty rejoined the section in 1992 following her retirement from United Engineers and Constructors, which is now part of Washington Group. Upon retirement, she became a valued resource to the section and was installed in the Philadelphia Section Hall of Fame in 2009.

McNulty held most offices, sometimes for several terms, as well as chairing a number of committees. On the national level, she served on the board of directors and as managing editor of the Society’s first publication, Journal of the Society of Women Engineers, precursor of the present-day SWE Magazine. For at least the first two years, the Journal masthead listed the publication office with a Philadelphia address, which happened to be McNulty’s home.

She began studying electrical engineering at Drexel shortly after the end of WWII. After two years, finances forced her to take a job as a draftsman at General Electric. She returned to Drexel as an evening student, received her technical diploma in 1957, and her degree in 1958. She became a registered professional engineer in 1961.

Her career included working as a designer for one of Westinghouse Steam Turbines’ subcontractors, and as an engineer for Electric Boat Company in Groton, Conn., followed by 35 years with United Engineers and Constructors. Interesting assignments included two years as site engineer for the construction of the Point Lepreau nuclear power plant in Canada, and seven years working in Italy as a consultant to a power plant project. She retired from the company as a consulting instrumentation and controls engineer in the power division.

McNulty’s contributions to the profession came to the public’s attention in 1972, when the Engineers’ Club of Philadelphia honored her during Engineers Week, and the Philadelphia Inquirer ran a seven-column story about her in the paper’s Sunday edition.

She was pleased by younger members’ interest in the early days of SWE and the Philadelphia Section, and strongly supported the section’s activities surrounding the section’s history and the Society’s 60th anniversary.

Sources:
“Reflections on SWE’s 50th Anniversary,” Doris McNulty
Journal of the Society of Women Engineers, Vol. 1, Number 1, Spring 1951, through Vol. 2, Number 4, June 1952

Beatrice Gallatin Beuf
102 Years Old, Early Supporter and Benefactor

Beatrice (Bea) Gallatin Beuf of Big Horn, Wyo., died April 21, 2009, at her home in Big Horn. An early supporter and associate member of the Society, Beuf was a member-at-large in Region J.

Because of a childhood illness, Beuf was not expected to live past the age of 18 and consequently did not finish high school or attend college. As a young woman she read the classics, traveled extensively, and divided time between family homes in New York City and Big Horn. She married Count Carlo Beuf on New Year’s Day, 1931. The couple had two sons.

Known for her generosity and intellectual curiosity, Beuf read extensively and became an enthusiastic member of the Society. Carolyn Phillips, F.SWE, Society past president and former trustee, recalls that Beuf provided considerable financial support in the early days of the organization. Margaret “Pritch” Pritchard recalls that Beuf had an exciting and colorful life, and deeply valued her SWE membership and connections with members. Beuf met or was associated with a wide range of people, including Charles Lindbergh; astronaut Bonnie Dunbar, Ph.D.; Madame Chiang Kai-shek; and Marilyn Monroe, and kept in occasional touch with Queen Elizabeth II.

A strong supporter of the University of Wyoming, Beuf donated books to the library, established a scholarship, participated in decisions regarding scientific research, and allowed researchers to study wildlife on her ranch, sometimes providing free housing. The university awarded her an honorary Ph.D. in 1996. She continued to ride her horses until her mid-90s and drove her jeep into the foothills of her ranch well after her 100th birthday.

Sources:
University of Wyoming, American Heritage Center
The Sheridan Press, April 2009

For expanded articles on these fascinating women, please see the electronic issue.
Doris McNulty, P.E., of the Philadelphia Section, died July 15, 2009, following a short illness. She attended the meeting at Camp Green in 1950, where the national Society of Women Engineers was established. She was a founding member of the Society and a charter member of the Philadelphia Section.

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She was pleased by younger members’ interest in the early days of SWE and the Philadelphia Section, and strongly supported the section’s activities surrounding the section’s history and the Society’s 60th anniversary. McNulty appears in a video clip on the Philadelphia Section’s Web site:

http://www.philaswe.org/history/video.html. In the video, the formation of the SWE group at Drexel is recalled with founding member Alma Kuppinger Forman.

— Anne Perusek

Sources:

“Reflections on SWE’s 50th Anniversary,” Doris McNulty

Journal of the Society of Women Engineers, Vol. 1, Number 1, Spring, 1951, through Vol. 2, Number 4, June 1952

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— Anne Perusek

Sources:

University of Wyoming, American Heritage Center
The Sheridan Press, April 2009

Additional Life Experiences

Beatrice Gallatin Beuf came from a family whose roots in the American West go back to the days of Thomas Jefferson’s presidency. According to the obituary in her local newspaper, The Sheridan Press, below are some prominent highlights from her long and interesting life.

- Her great-great-grandfather was Albert Gallatin, Thomas Jefferson’s secretary of state, who provided the money to Lewis and Clark to explore and map the western United States. Because of this, mountains and rivers in the region bear the Gallatin name.

- Her great uncle, Regis de Trobriand, was the general in charge of the Territory of the Dakotas, which covered much of Wyoming, Nebraska, and the Dakotas in the 1870s.

- The family raised polo ponies and provided horses for the cavalry. While growing up, Beatrice became a skilled horse whisperer.

- She traveled extensively to Europe, was proficient in French, and took a round-the-world cruise. While in Ceylon, she persuaded an elephant trainer to allow her to ride an elephant into a river and give it a scrub down.

- When Charles Lindbergh was barnstorming across the country in the early 1920s, he landed on one of the family’s polo fields at the ranch. Bea had her first airplane ride with him.

- Bea and her husband, Count Carlo Beuf, lived in Beverly Hills in the early 1930s, where Carlo was director of foreign production for Metro-Goldwyn-Mayer. The studio intended to send them to Carlo’s native Italy to run the business from there, but they declined due to concerns that war was approaching.

- The couple returned to the family ranch, where their second son was born, and Bea took an active role in running the ranch while helping Carlo write books and New York Times articles.

- A physically and mentally active person, Bea played polo, figure-skated, and herded cattle.
A Strong Return on Leadership

The SWE Corporate Partnership Council (CPC)—founded by the Society’s most prominent supporters—is a mutually beneficial relationship for its members and the Society. The CPC is vital in keeping SWE in touch with industry trends and developments and providing generous financial contributions to support innovative projects, ongoing operations and the overall SWE infrastructure. In turn, Council members reap many valuable benefits such as prime access to SWE programs and services that help them achieve their recruiting, retention and advancement goals for women in engineering. Together SWE and its CPC are working to diversify and advance the field of engineering.

For more information visit SWE.org/Partner
Social Networking

SWE Smiles welcomes submissions of humorous anecdotes from you, the readership. Please submit original (non-copyrighted) materials to swemag@swe.org or by post to the SWE Editor at SWE headquarters.

ACROSS
1 fancy invitations for weddings, etc.
2 news about people
3 audio files
4 web-based interface for social networking
5 make content available
6 telephone shared by families
7 shared widely and fast
8 writing from your phone
9 micro-blogging
10 device for real-time shared video
11 message device showing numbers
12 shared video
13 old networking between distant friends
14 Répondez s'il vous plaît
15 professional networking site
16 portable audio device
17 area served by towers
18 writing what you want
19 another web site for social networking
20 shared connection on Facebook
21 letters through USPS

DOWN
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2 text-based message from computer
3 make content available
4 web-based interface for social networking
5 telephone shared by families
6 device for real-time shared video
7 shared widely and fast
8 writing from your phone
9 micro-blogging
10 message device showing numbers
11 professional networking site
12 old networking between distant friends
13 140 characters
14 another web site for social networking
15 shared connection on Facebook
16 letters through USPS
17 area served by towers
18 writing what you want
19 writing from your phone
20 web-based interface for social networking
21 professional networking site

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Purdue University Faculty Openings
Aeronautics & Astronautics
Purdue University

The School of Aeronautics & Astronautics (AAE) at Purdue University seeks outstanding individuals with a Ph.D. and a strong background relevant to aerospace engineering. Currently, AAE faculty members conduct research and teaching in the broad disciplines of Aerodynamics, Aerospace Systems, Astrodynamics and Space Applications, Dynamics and Control, Propulsion, and Structures and Materials. Candidates with interests in these areas are encouraged to apply. Details about the School, its current faculty, and research may be found at the Purdue AAE website (https://engineering.purdue.edu/AAE).

Candidates should have a distinguished academic record, exceptional potential for world-class research, and a commitment to both undergraduate and graduate education. Tenure-track positions are available at the assistant and associate ranks. For consideration, please submit curriculum vitae, statement of teaching and research interests, and the names and addresses of at least three references to the College of Engineering Faculty Hiring website, indicating interest in AAE. Review of applicants begins 2/15/10 and continues until the positions are filled.

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The Alexander von Humboldt Foundation enables highly-qualified scientists and researchers of all nationalities and fields to conduct extended periods of research in Germany with academic hosts at German institutions. Women are encouraged to apply.

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Humboldt Research Fellowship for Experienced Researchers

- For scientists and scholars who have completed a doctoral degree within the past twelve years
- Fellowships may be divided into a maximum of three visits lasting three months or longer; applications may be submitted at any time; monthly stipend of 2450 EUR

Additional allowances are available for accompanying family members, travel expenses, and German language instruction. Application materials and information are available at:

www.humboldt-foundation.de
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*Employers in bold are SWE Magazine Heritage Club Members*
As the number of women studying engineering boomed in the 1970s, SWE’s membership became more diverse. To better meet the needs of an evolving membership, in 1980 the board of directors established the Minority Concerns Committee. Originally intended to address the needs of members in a “double bind,” the MCC focused on African-American, American Indian, and Hispanic-American women, who were vastly underrepresented in terms of both gender and ethnicity. In addition to developing a bibliography of information resources, the committee organized sessions at the national conferences and worked to create a SWE award for minority members. In 1994, the MCC was renamed the Multi-Cultural Committee to more accurately reflect the broader diversity of cultural and ethnic groups within SWE.

-Troy Eller, SWE Archivist

SWE President Nora Lin presents The Boeing Company Multicultural Award to a representative from the University of Central Florida Collegiate Section at the 2009 national conference. The MCC’s call for a minority award came to fruition in 1996 when SWE first awarded the Motorola Foundation Multicultural Award for multicultural programming excellence, and in 2002 with the introduction of the Boeing Multicultural Award. Since their inceptions, both awards have had slight variations in name.

As MCC chair, Carol Moncrief coordinated the May/June 1986 issue of U.S. Woman Engineer, the precursor to SWE Magazine. Articles covered the participation of women minorities in engineering and some of the social and cultural challenges they experienced. The issue also profiled several members, such as Francine Savage, left, whose photo graced the cover.

The MCC hosted the “It’s a Small World After All” panel during the 1981 SWE national convention in Anaheim. Speakers discussed the collegiate and professional experience of minority women engineers.
Work for Naval Air Systems Command (NAVAIR) and you’ll support our Sailors and Marines by delivering the technologies they need to complete their mission and return home safely. NAVAIR procures, develops, tests and supports Naval aircraft, weapons and related systems. It’s a brain trust comprised of scientists, engineers and business professionals working on the cutting edge of technology.

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Beverly Mentzer
Engineer