

EWLSE Update

Empowered Leaders Ready to Reach out to Women in Engineering: We Need You!

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Supportive people and relationships, female role models, and self-efficacy (the belief in one's ability to accomplish a specific task) in engineering are several of the top factors that influence whether women enter into engineering. To this end, representatives of the Empowering Women as Leaders in Systems Engineering (EWLSE) team reached out to members of the Society of Women Engineers and the American Society of Engineering Management at their annual fall conferences, to share the INCOSE and EWLSE vision and mission along with research and initiatives related to women, engineering, and leadership. In a related outreach effort, the INCOSE Academic Council report on the World Engineering Education Forum–Global Engineering Dean's Council includes a summary of a workshop given by the Global Student Forum on "Educating Future Female Engineers" which readers can find in the Academic News section of this newsletter. We invite and encourage men and women to join EWLSE and support women in engineering by adding "Empowering Women" to your committee/working groups under your INCOSE profile (click on your name after you log into INCOSE, select Profile, and proceed from there).

INCOSE / EWLSE Outreach at the 2018 Society of Women Engineers (WE18) Conference

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The Society of Women Engineers (SWE) held its annual Women in Engineering (WE18) Conference, 18-20 October 2018, at the Minneapolis Convention Center, in Minnesota. This year's theme, "Let's Break Boundaries," motivated the atmosphere of the conference to encourage leadership in engineering and foster the professional growth of women. WE18 was the largest ever with over 14,000 exhibitors, professionals, collegians, and academia in attendance. WE18 was a fantastic opportunity for INCOSE and EWLSE outreach!

INCOSE, through the EWLSE team, served as an exhibitor at the WE18 Exhibit and Career Fair among hundreds of corporations, professional organizations, government agencies, academic institutions, and more. At the INCOSE booth, a steady stream of attendees visited throughout the conference. Some were unfamiliar with professional standards, so it was an opportunity for INCOSE EWLSE members, Cornita Bullock, Federica Robinson-Bryant, and Marilee Wheaton, to share the purpose of INCOSE and its benefits to organizations and individuals, and to encourage INCOSE membership and certification. Specifically, many of the engineering student attendees expressed interest in the INCOSE certification program to enhance their education and training. Additionally, former INCOSE members received information about several INCOSE working groups and publication opportunities, and were encouraged to re-establish their involvement in the organization.

Dr. Robinson-Bryant mentioned that "INCOSE's presence at the conference seemed to be well-received. Individuals asked me a range of questions and actively engaged in conversations across a range of topics. While some participants seemed to be more aware of INCOSE's offerings and focused more on SEP certification requirements, others had no prior exposure to INCOSE and were open to receiving several takeaways." Other areas of engagement included specific EWLSE activities and initiatives, and professional mentoring for women in engineering.

The INCOSE booth had frequent visitors at the 2018 Women in Engineering (WE18) Conference.

Left: Federica greets INCOSE booth visitors; Right: Cornita and Federica at WE18!



EWLSE Update - SWE & ASEM

Throughout the conference, Ms. Bullock led an effort to provide one-on-one resume reviews with young professionals and job seekers across many engineering disciplines. She feels “it was very special to provide impromptu resume critiques and mentoring for young professionals seeking the best way to represent their work and education experiences.” This demonstrates the value of INCOSE’s presence at the conference to provide mentoring to engineers; these opportunities unveiled a pathway to discuss the relationship of many engineering disciplines to systems engineering, INCOSE support-oriented groups like EWLSE, certification, and other initiatives. The winner of the t-shirt giveaway was one such participant and she expressed her esteemed gratitude in being able to explicitly exhibit her engineering identity via the INCOSE-branded shirt that read, “The Woman. The Myth. The Engineer.”

The WE18 main events included:

- ❖ Career Fair–Exhibits from a variety of large engineering and technology corporations were present to screen the best and brightest candidates for positions at their companies. The opportunity to meet hiring managers and have an on-the-spot interview was offered to attendees.
- ❖ Keynote Speakers–Special presentations by dynamic keynote speakers, Cindy Kent, Marillyn Hewson, and Kim Underhill. Each speaker shared their unique backgrounds and gave inspirational speeches that reverberated the rhythm of the conference theme of “Let’s Break Boundaries.”
- ❖ State of Women in Engineering–SWE researchers and other industry leaders presented the latest research and data on the state of women in engineering, STEM leadership, gender bias, and STEM workplace culture.
- ❖ Invent it. Build it–Focused on peaking the interest girls in grades 6-12 in the field of engineering through discussions on how engineers help solve problems for people around the world, conversations with women engineers, and fun hands-on engineering activities. In addition, the workshop provided information on engineering clubs and scholarships.
- ❖ Other events–WE18 offered opportunities to attend other activities, such as virtual participation, general breakout sessions, plenary sessions, mega sessions, CEU credit educational events, as well as elegant banquets to honor SWE award recipients.



WE18 granted an exciting experience to the thousands in attendance to become more informed about how women can push pass boundaries to impact the future of engineering. In addition, the conference provided engineering students and professionals with valuable access to major companies, organizations, and academic institutions seeking qualified recruits in the most convenient way possible.

“As an exhibitor, participation gave me the opportunity to meet and work with successful women within INCOSE and build relationships among participants that will impact my perspective of the field and extend my own support system. While much of the efforts with the participants was a conversation to expose them to INCOSE, there were many opportunities to get to know them better and improve my own understanding of the experiences of women in engineering.” said Robinson-Bryant.

In reflecting on the event, Ms. Wheaton adds, “Participating each year in the SWE National Conference, which I have attended since my first one in Cherry Hill, US-NJ in 1980, is part of my commitment and passion. I even attended the 1988 conference in Puerto Rico when I was pregnant with my now 30-year-old twins! So that’s how I knew that SWE would be a great outreach event for INCOSE and EWLSE.”

INCOSE plans to continue outreach activities to women in engineering at WE19 in Anaheim, US-CA. Any INCOSE or EWLSE member that is planning to attend the WE19 and is willing and able to support our INCOSE/EWLSE SWE booth, please email EWLSE at ewlse@incose.org.

EWLSE UPDATE - ASEM

Where are the Women in Engineering?

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EWLSE sponsored a technical session on "Exploring Why Women Enter, Leave, Return to, or Stay in Engineering and Engineering Leadership Roles" developed by Federica Robinson-Bryant and Alice Squires at the American Society of Engineering Management Annual Conference, 17-20 October 2018 in Coeur d'Alene, Idaho, US. The Washington State University Engineering and Technology Management Department team, including students, attended the conference in large numbers.

The conference theme of "Bridging the Gap Between Engineering and Business" was a portent to bridging the gap between the 47% of women in the US labor force and the 12% of women in engineering in the US. In the United States in 2010, about 20% of engineering bachelor's graduates were women; similarly, 25% of earned engineering masters and 23% of earned engineering doctorate degrees were women. We have a long way to go to bridge the gap and at this pace of female engineering graduates, with nearly four times as many women as men leaving the engineering workforce, the gap will not close for decades to come.

As reported in the presentation, a 2017 study of 1,464 women (Fouad et al. 2017) who left engineering jobs did so primarily because of the work environment, including poor or inequitable compensation, poor working conditions, and an inflexible and demanding work environment that made work-family balance difficult. Following this, women left due to a dissatisfaction with effective utilization of their math and science skills resulting in unmet achievement needs. And finally, there was a lack of recognition at work and lack of adequate opportunities for advancement.

However, as shared directly by women, there are many reasons why women enter into engineering:

- ❖ Finding out about engineering and seeing a good 'fit'
- ❖ Attracted by what current engineers said they worked on
- ❖ Excelled at math, science, technical drawing: self-efficacy
- ❖ Family encouragement and support; one or more parents are engineers; father's influence; a belief that they can do anything
- ❖ Encouraged by a teacher or school program; success in school
- ❖ Based on job; career options; attractive salary
- ❖ After seeing the NASA moon landing video/other major events

The presentation concluded with some steps we can all take to support women in engineering:

- ❖ Raise awareness—yours and others
- ❖ Consider becoming an advocate or spokesperson for diversity and inclusion

- ❖ Be a workplace ally: when we see someone being treated as a target, stop the behavior in the moment, convey non-acceptance, change the situation going forward
- ❖ Assign non-technical and administrative tasks to all
- ❖ participants, share the load
- ❖ Become a mentor and a mentee to young engineers
- ❖ Set up open inclusive self-development workshops and training events
- ❖ Establish directors of diversity, equity, and inclusion across our institutions.
- ❖ Research uncovered one very effective step that we can take that makes the most difference for women and underrepresented minorities in choosing a career— *offer internships to women and underrepresented minorities!*

After the presentation, one female faculty member was heard saying, "This has really convinced me that I really need to get more involved in the Society of Women Engineers Chapter on my campus. I am going to do that." To which another female faculty mentioned, "I feel exactly the same way."

Are you interested in supporting the field of systems engineering by becoming a mentor for a systems engineer, or alternatively, are you seeking an experienced systems engineer as a mentor who can help you navigate the field and INCOSE? Please email incose-mentor@incose.org to start the process.

Reference:

Fouad N. A., W. S. Chang, M. Wan, and R. Singh. 2017. "Women's Reasons for Leaving the Engineering Field." *Frontiers in Psychology* 8:875. doi: 10.3389/fpsyg.2017.00875.



The Washington State University Engineering and Technology Management team - INCOSE EWLSE Founder Alice Squires at the far back left

