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NSF Webinar - 5/16/19

An 'amazing opportunity' - Women in IT Networking at SC (WINS)

WINS
Women in IT Networking at SC

WOMEN IN IT NETWORKING AT SC (WINS)

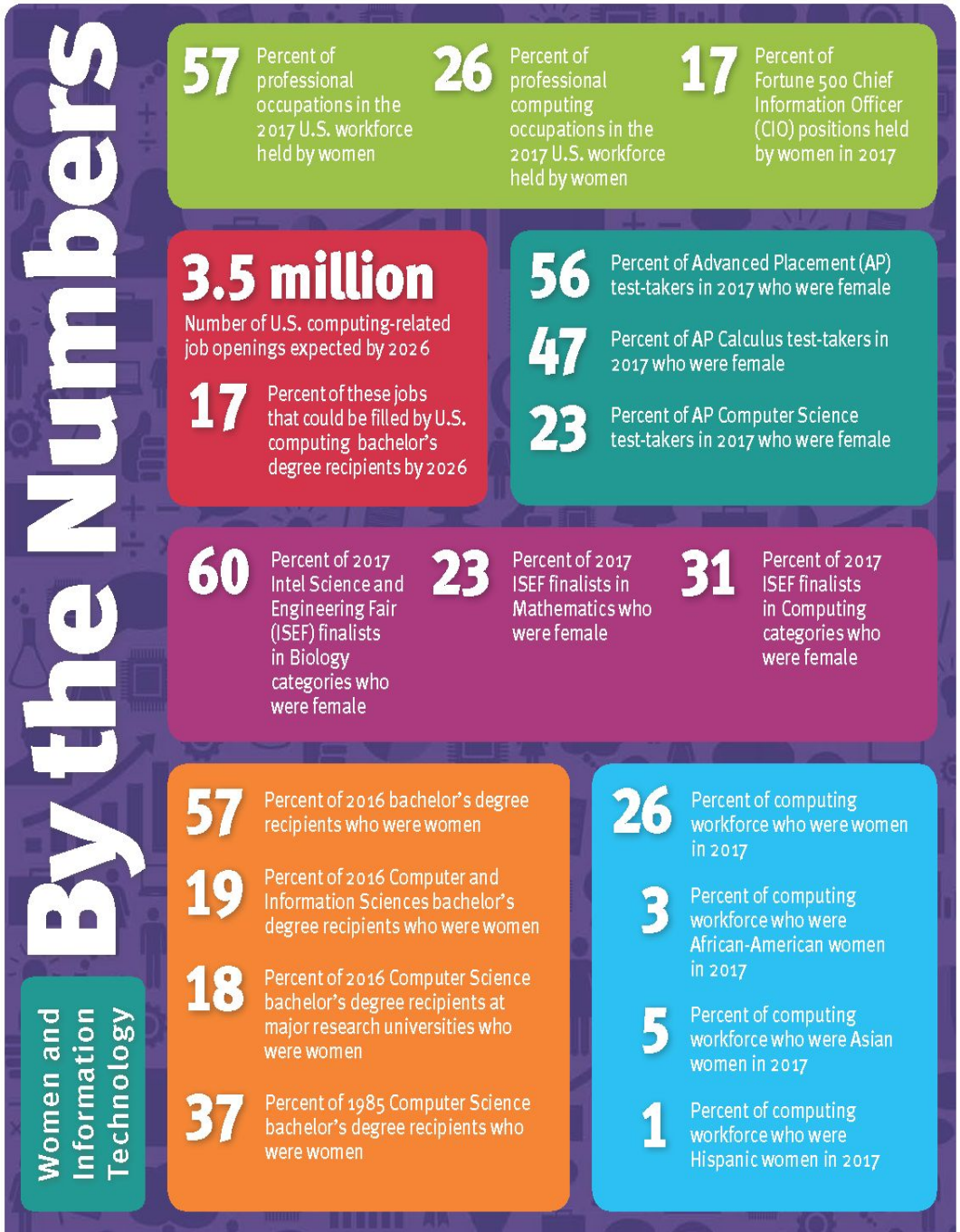
"They taught me that when women lock arms, at whatever level in society, they can change the world."
-Melinda Gates

"It's not the rise of women and the fall of men. This isn't about bringing women in and leaving others out. It's about bringing women in as a way to bring everyone in." - Melinda Gates

"People see better what looks like them." - The Overstory

Why Are We Involved?

- Women in IT for 30+ years
- Colleagues approached us about submitting a grant to try and increase women's participation in Supercomputing (SC15) SCinet
- UCAR had an active NSF grant that we were able to add a supplement on to pilot the program
  - NSF and DOE have been very supportive of this effort
- We have learned so much - didn't know the scope, scale, and drivers of the problem
- We have gained so much more than we have given



The problem

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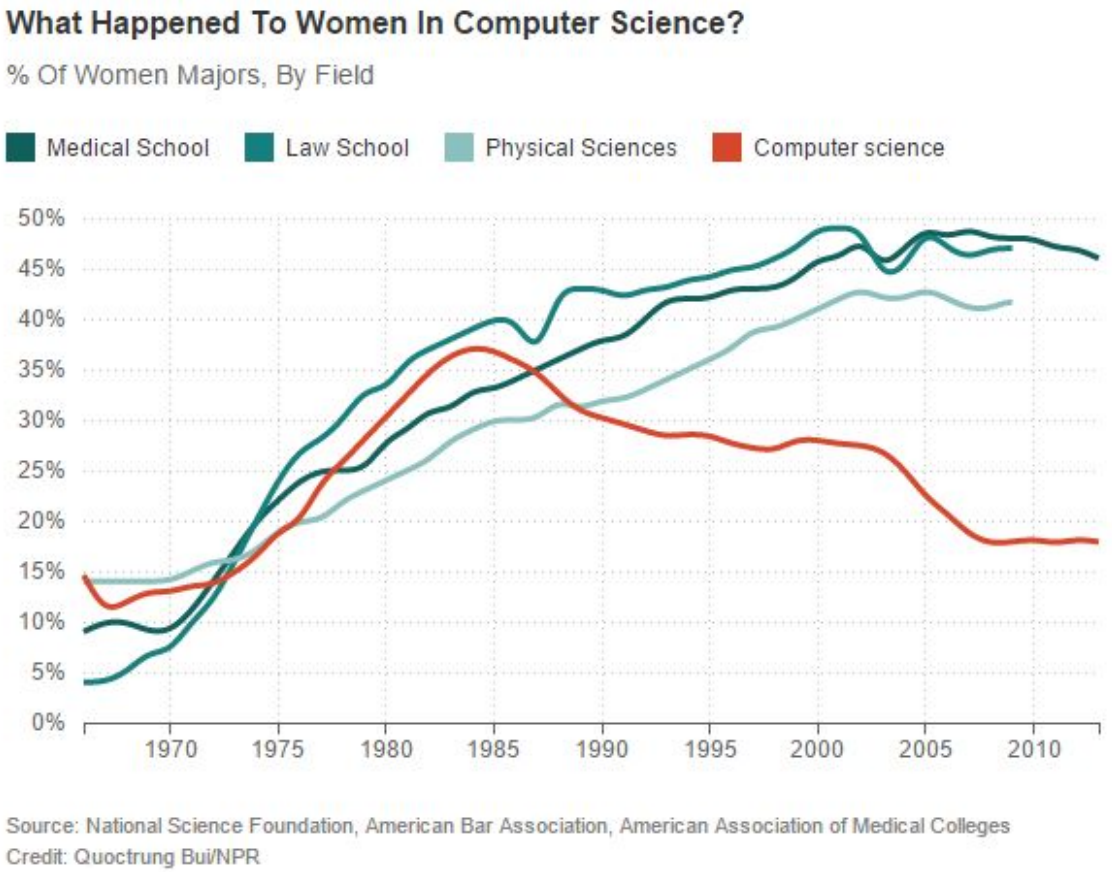
Gender trends in higher education



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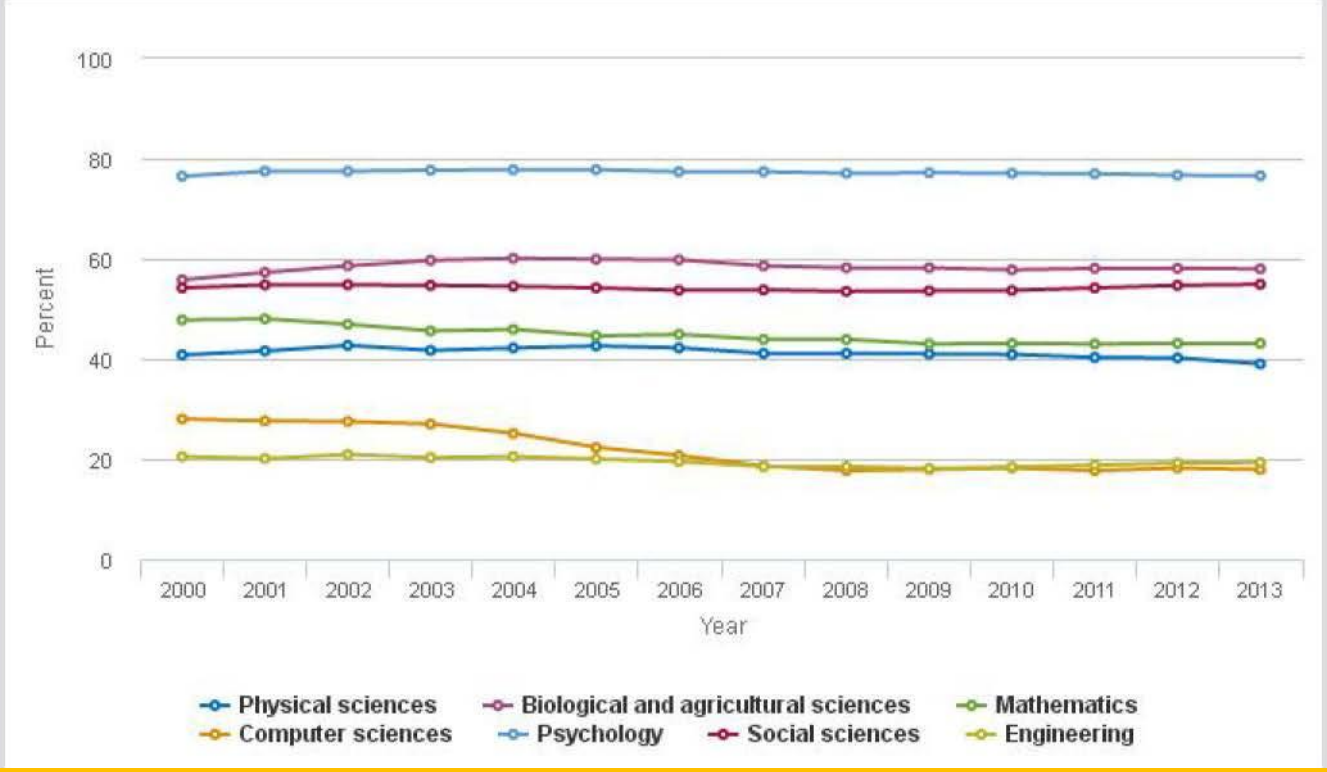
Gender trends in higher education

National Science Board | **Science & Engineering Indicators 2016**

Figure 2-16

Women's share of S&E bachelor's degrees, by field: 2000–13



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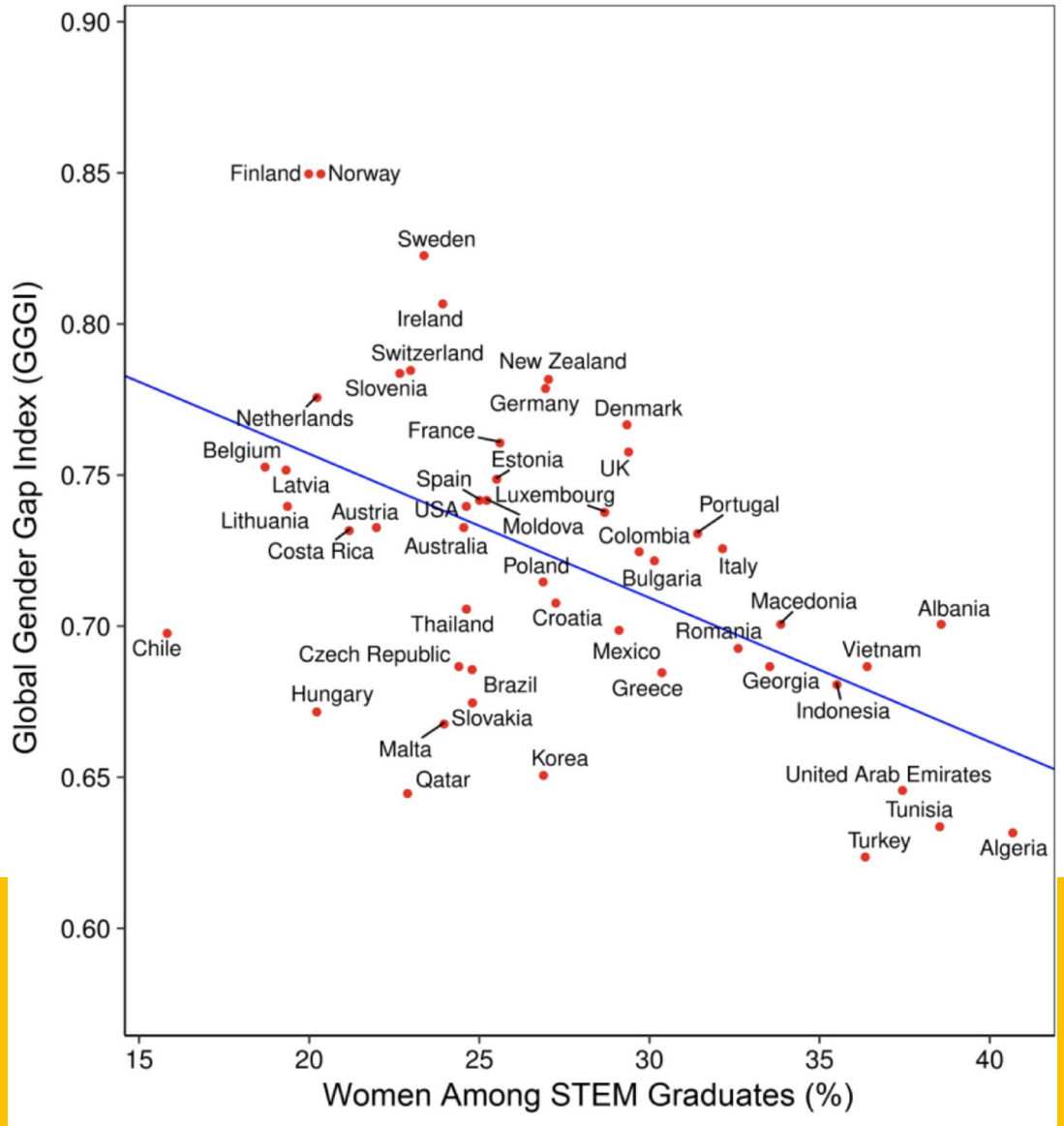
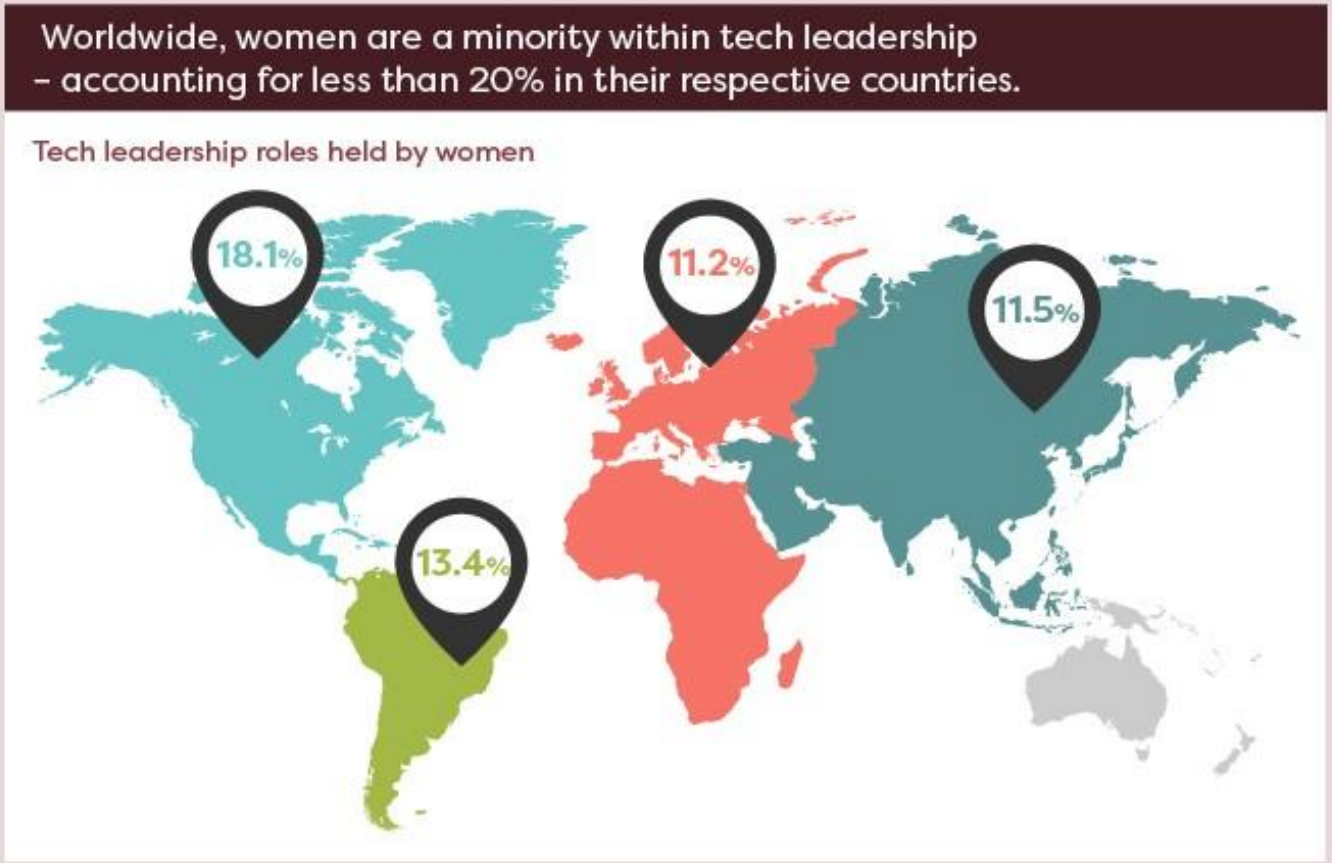
Gender trends globally



Gender trends globally



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What happened in the mid-80s?

- *"By 1967, **there were so many female programmers that Cosmopolitan magazine published an article about "The Computer Girls,"** accompanied by pictures of beehived women at work on computers that evoked the control deck of the U.S.S. Enterprise. The story noted that women could make $20,000 a year doing this work (or more than $150,000 in today's money). **It was the rare white-collar occupation in which women could thrive.** Nearly every other highly trained professional field admitted few women; even women with math degrees had limited options: teaching high school math or doing rote calculations at insurance firms."*

- **If we want** to pinpoint a moment when women began to be forced out of programming, we can look at one year: 1984. **A decade earlier, a study revealed that the numbers of men and women who expressed an interest in coding as a career were equal.** Men were more likely to enroll in computer-science programs, but women's participation rose steadily and rapidly through the late '70s until, **by the 1983-84 academic year, 37.1** percent of all students graduating with degrees in computer and information sciences were women.

What happened in the mid-80s?

- The personal computer, the PC became a household item
  - The college entry playing field was no longer level
  - Boys were more than twice as likely to have been given one by their parents and they most often **put it in a son's room, not a daughter's**
  - Sons also tended to have what amounted to an "internship" relationship with fathers, working through Basic-language manuals with them, receiving encouragement from them; the same wasn't true for daughters.
  - At school, girls got the same message: Computers were for boys - ignored and talked over in class
  - If you hadn't already been coding obsessively for years, you didn't belong, **however it turned out that having prior experience is not a great predictor of academic success**
  - Women became isolated since so few women in classes
- Silicon Valley emerged with largely white, male leaders
- Hollywood was putting out that computers were a male domain
  - In hit movies like "Revenge of the Nerds", "Weird Science", "Tron", "WarGames", and others, the computer nerds were nearly always young white men

Why don’t more women go into and stay in IT?

- Women aren’t encouraged by family, teachers, peers
- Women are socialized to feel that they can’t fail and that they have to achieve perfection, so when their code doesn’t run, women often feel discouraged about their own abilities
- If someone stays in the major, it’s usually because they have strong peer connections
- Some women leave not because they’re not capable, but it’s typically because they have this idea that CS does not contribute to the social good, and they want to help people
- A paradoxical finding is that even when men’s and women’s achievements are similar, women typically have lower confidence in their programming abilities than men
- One factor is society’s portrayal of programmers, especially in media — think “Mr. Robot” and “Silicon Valley.” “Programming is seen as something that’s overtly masculine and geeky.

So what can we do to change this?

- Encourage girls and young women to go into the field
- Mentor them
- Create a supportive environment - many women leave the field due to sexism, culture, unequal pay
- Help create a professional network
- Women leaders help women
- Be a male advocate - most leaders are male
- Enter the WINS program...

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WOMEN IN IT NETWORKING AT SC (WINS)

- The Women in IT Networking at SC (WINS) program is a three-year program funded by the National Science Foundation*
- Was developed for addressing the prevalent gender gap that exists in Information Technology (IT), particularly in the fields of network engineering and high-performance computing (HPC).
- Collaborative project managed by: University Corporation for Atmospheric Research (UCAR), Energy Sciences Network (ESnet) and Keystone Initiative for Network Based Education and Research (KINBER).
- It was originally introduced as a pilot program** in November 2015 at the SC15 conference in Austin, Texas, and has funded volunteers for SC16, SC17, SC18, and will fund SC19.

*** NSF 2016 grant #ACI-1640987**

**** NSF 2015 grant #ACI-1440642**

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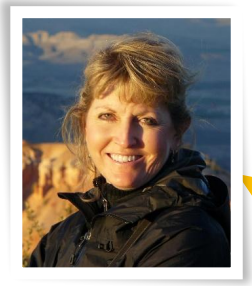
WOMEN IN NETWORKING AT SC (WINS) - TEAM



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Kate Mace, Jason Zurawski & Lauren Rotman - ESnet/DOE

Rasha El-Jaroudi - UT Austin

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WOMEN IN IT NETWORKING AT SC (WINS)

- Enables 5-8 women per year to participate in SCinet, a unique, hands-on experience in building an operational and research network from the ground up for the annual SuperComputing Conference
  - Selected by a committee of experts and rigorously reviewed and evaluated
- SCinet provides an ideal professional development opportunity for engineers and technologists looking for direct access to the most cutting-edge network hardware and software.
  - SC great partner and very supportive of inclusivity and increasing diversity
- Gives the opportunity to work side by side with the world's leading network and software engineers, and the top network technology vendors.
- Funds WINS participants to attend conferences to raise awareness of SCinet, diversity issues in IT and for professional development.

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SCINET:
THE FASTEST NETWORK CONNECTING THE FASTEST COMPUTERS

SC18 Statistics

- 4.15 Tbps of bandwidth
- 350 Wireless access points
- 225 Volunteers from ~140 organizations
- 40 Contributing organization providing $48M in donated hardware/software
- 1 year to design, 1 week to build, 24 hours to tear down

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WINS PROGRAM GOALS

- Expand the skillsets, professional network and communications skills, including public speaking, for the participants.
- Provide technical training that is applicable and valuable to the participants' home institution.
- Increase the diversity in the SCinet volunteer pool.
- Raise awareness of the issue of fewer women in IT.
- Gather program information, including candidate metrics and SCinet surveys (mentors and participants), to better understand gender diversity in the network engineering community and use the information to develop a sustainable program.
- Have been awarded a supplemental grant to design a sustainable program.

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WINS Sustainability

- The goals of the supplemental period of the grant are to:
  - Implement the organizational structure for the long-term business model for WINS
  - Identify possible long-term host organization(s) for the program
  - Continue the WINS volunteer program for SC19 while testing out different funding mechanisms

WINS Sustainability Challenges

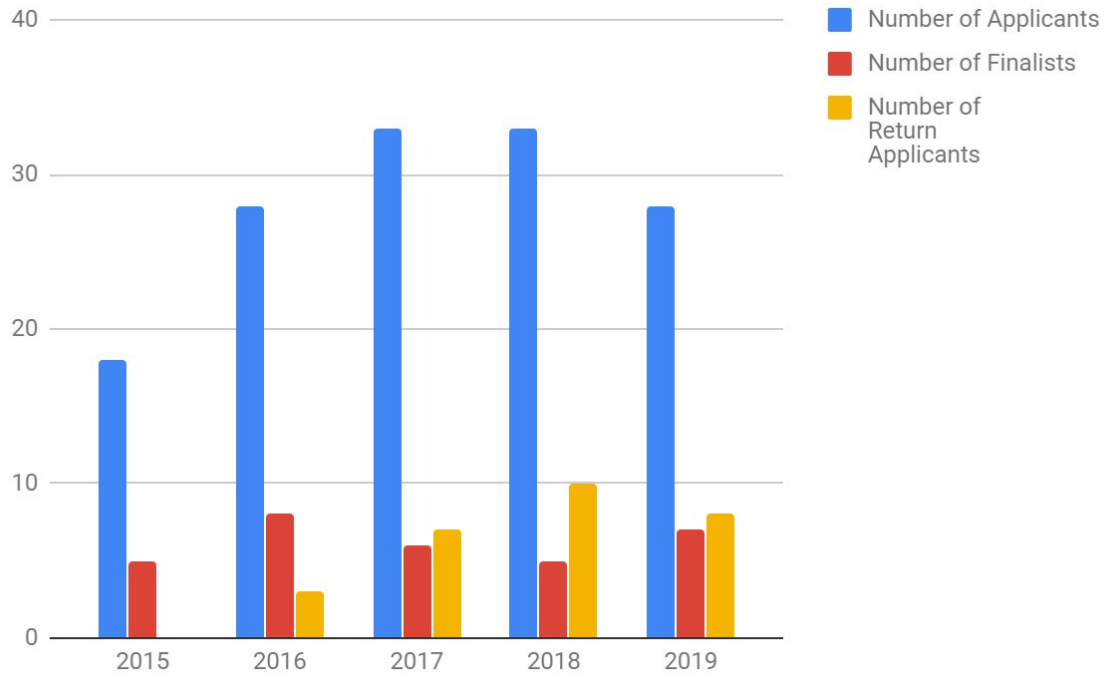
- How to effectively scale the program, taking both new and returning WINS volunteers into account
  - Provide both the necessary financial and managerial support
  - SCinet management and mentors must be able to integrate the volunteers into the teams
  - Administrative support for travel, budget management, report-out scheduling
  - SCinet boots-on the ground support
  - Project manager - current support is provided by the WINS management team but not directly funded

Applicants

Since the program started in 2015, we have received over 140 applications from 37 states (DE, HI, NE, NJ new)

WINS APPLICANTS & FINALISTS

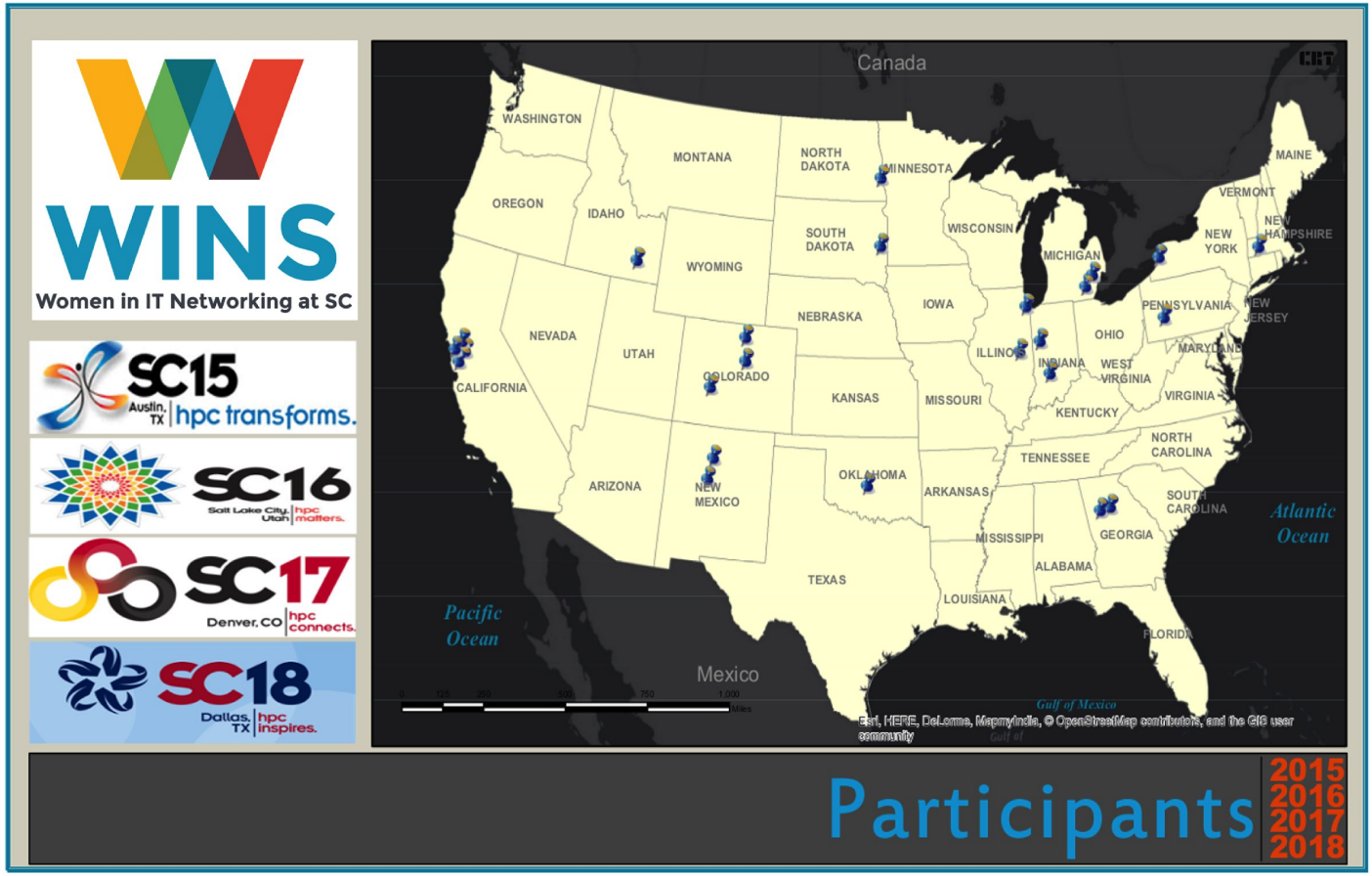
- WINS has funded 24 women to participate in SCinet since the program's inception in 2015*
- For SC19 six returning WINS volunteers have ascended to leadership roles within SCinet including: **4 Team Leads & 2 Deputy Team Leads**
- WINS plans to award 7 women for SC19



*SC15 volunteers and SC16 returning volunteers funded through Rocky Mountain Cyberinfrastructure Mentoring and Outreach Alliance

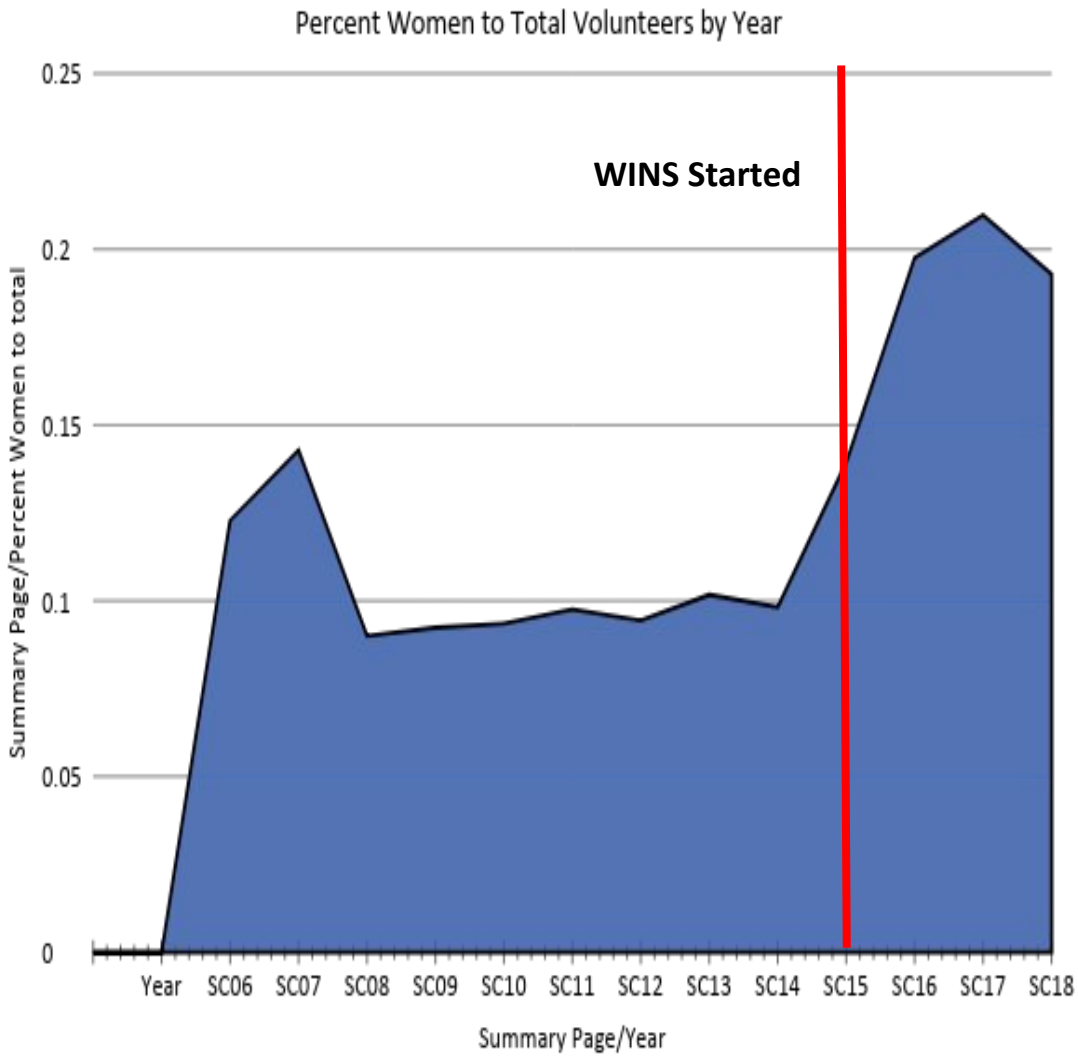
Finalists

Finalists come from 17 states and from a range of organizations including: universities, DoE labs and research and education networks.



Impact on SCinet

- The percentage of women participating in SCinet has increased significantly since the program started in 2015, both in the number of women participating and the percentage of women on SCinet in general.
- In 2007, 15 of the 105 volunteers were women, the largest group until 2015. In 2015, 17 of the 122 volunteers were women. In 2018, 44 of the 228 volunteers were women, with 15 of them from the WINS program.
- 37.5% of WINS volunteers have returned at least once.



BENEFITS OF THE WINS PROGRAM

For the participant:

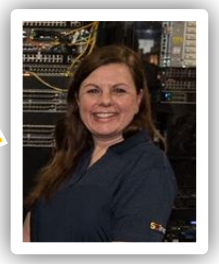
- ✓ Experience with different types of equipment, including some that is experimental.
- ✓ Working with other professionals.
- ✓ Working and spending time with a team of female professionals.
- ✓ Working with a team that is supportive and welcoming.
- ✓ Making professional contacts.
- ✓ Attending the SuperComputing conference and seeing groundbreaking research.

For the home institution:

- ✓ Attend and contribute to high-profile conference.
- ✓ Receive mentoring from industry professionals.
- ✓ Represent and promote your home institution to the outside world.
- ✓ Real-world exposure to new and different challenges.
- ✓ Bring back experience and ideas to team members.
- ✓ Increase diversity in the networking field.

WINS SCINET EXPERIENCE

"Having so many other people that I can **connect** with is my favorite part." — Kalyvaki



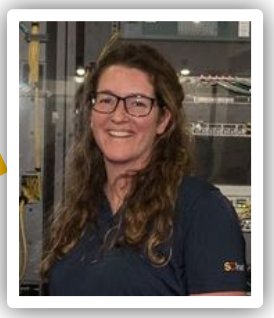
"I definitely see that there are very few women in our field. It's not just the technical aspects, but the people who are working there [Scinet]. You're extending your **professional contacts** and there's also a great opportunity to **learn**." — Jareen

"Working on SCinet meant a **proof to myself that I can do the work**. I didn't expect the environment to be so **relaxed, welcoming, and mentoring for women**. I think some of us may have a very different experience in our daily work environments—it should be like SC all the time, but unfortunately, there is still a long way to go." — Toledano

"I thought I had an idea about the amount of work that went into building and running SCinet, but I really didn't! It's an enormous task with so many moving parts. **No one was in it for personal gain; it was the epitome of teamwork.**" — Sajdak.

"The hands-on experience has definitely **boosted my confidence** to try new vendors, features, and technologies in my home institution." — Arya

"It's been great to talk to other people that do the same thing that I do and it's been really great to ask a lot of questions and **learn things, without having Google do it or watch a YouTube video**." — Robinson



Take away:
Small efforts, funding, and programs can make a BIG difference!

THANK YOU!

For more information about the WINS program:
http://women-in-networking.net/