



C3E Connection

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••• *Clean Energy ♦ Education ♦ Empowerment* •••

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Links to Check Out

The American Association of University Women (AAUW) published a report entitled "Why So Few?" that profiles eight research findings on barriers to women's participation in STEM fields.

<http://www.aauw.org/learn/research/whysfew.cfm>

AAUW promotes the following activities to improve girls' achievement in STEM fields and increase the number of women choosing these fields.

<http://www.aauw.org/learn/research/upload/STEMrecommendations.pdf>

President Obama launched the Council for Women and Girls in 2009 to establish a coordinated Federal response to issues that particularly impact the lives of women and girls.

<http://www.whitehouse.gov/administration/eop/cwg/>

NSF awards "ADVANCE" grants to increase the participation and advancement of women in academic science and engineering careers.

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383

Sally Ride hosts science festivals for 5th to 8th grade girls.

<https://www.sallyridescience.com/festivals>

The goal of "Change the Conversation" is to improve public understanding of engineering.

http://www.nap.edu/catalog.php?record_id=12187

C3E Activities

Participating governments (Australia, Denmark, Mexico, Norway, South Africa, United Arab Emirates, United Kingdom, and United States) are involved in *a*) creating fellowships / scholarships to support women pursuing energy-technology related studies at the university or graduate level; *b*) establishing exchanges for young women with research interests in renewable energy technology; and *c*) facilitating internships for young women in the summer of 2011, hosted by private sector firms and matched with strong female mentors.

C3E also includes a network of leaders from the public, private, non-profit, and academic sectors who support advocacy, research, scholarships, hands-on training, funding, and networking opportunities to prepare and inspire young women to enter and thrive in STEM fields. C3E Network participants have pledged many types of commitments, from highlighting female role models to creating hands-on activities for young girls.

Ongoing activities include:

- Filming and featuring women in clean energy fields on online / TV outlets (Earth Day Network);
- Designing pilot projects and expanding Young Women's Conferences at DOE's national labs (Princeton Plasma Physics Lab);
- Expanding the number of women invited as reviewers and committee members at national research forums (Maxine Savitz, National Academy of Engineering);
- Speaking publicly about the importance of getting more women involved in the clean energy sector (Ginger Lew at APEC, Betty Shanahan at the World Federation of Engineering Organizations event in Argentina, Kristina Johnson in several public places);
- Sponsoring events on women, climate, and clean energy at the Conference of the Parties 16 in Cancun (Earth Day Network and UN Foundation);
- Assessing government programs for opportunities to expand energy components or female enrollment (Ellen Ochoa at NASA);
- Working with national girls' organizations to create clean energy projects (Natalie Givans, Booz Allen / Girl Scouts);
- Expanding mentoring programs and online mentoring platforms with an eye for clean energy and women (Simil Raghavan, Engineer Girl and Natalie Givans, Booz Allen); etc.

We always encourage new commitments and activities to promote the advancement of women in the clean energy sector!

The goal of C3E is to ensure that women play an active role in the clean energy revolution and contribute to the creation of new technologies. To achieve this vision requires closing the gender gap in science, technology, engineering, and mathematics (STEM) education.

Interview with Miesha Brooks, High School Intern contributing to C3E



Miesha Brooks,
Contributing high school intern

Miesha is a junior at Don Bosco Cristo Rey High School in Washington, DC. As part of her school's work study program, she interns at the Department of Energy (DOE). Amanda Quiñones, who oversees the interns, explains more about the program: "The Don Bosco Corporate Work Study Program provides talented high school students opportunities to gain life skills through on-the-job training. Committed students, like Miesha, have contributed greatly to the efficiency of our office. We are lucky to have such a great group of students."

One of Miesha's internship responsibilities is to conduct research for C3E on women and underrepresented groups in STEM fields. C3E's Acting Director, Laura Bacon, recently informed Miesha's supervisors about her high-quality work: "Miesha just sent me her preliminary research work on women and underrepresented groups in STEM. It is excellent work, and I'm extremely impressed and pleased! Her research skills far exceed what I'd expect from someone in high school, and she also summarized each study she found in a really concise and helpful way."

For more on Miesha, please read our interview with her below:

Who are your role models?

My Mom is definitely my main role model. She's persistent and never lets circumstances or people hold her back from what she wants to do with her life. I look up to her character.

What do you like most about your high school?

Don Bosco Cristo Rey's sole purpose for being built is to help urban teens get to college. My school is nearly a freebie if you're planning for college. The teacher-student ratio is great if you need one-on-one time to figure out something difficult taught in class or learn about picking a college.

What have you learned while interning at DOE?

From working in the Office of Minority Economic Impact, I've learned that there are a lot of grants and scholarships to help a multitude of college-bound teens.

What has surprised you about DOE and this internship?

What really shocked me about the internship is my increased interest in engineering. I love science, but at a young age I subconsciously started believing that engineering was either working under a car or staring at a board with numbers for the rest of your life. That's where I—and many of my peers—eliminated engineering from my list of interests. It wasn't until I came to intern here that I realized that I was ill-informed. I learned designing and building your own mechanical creations looked, to my disbelief, fun. My curiosity for this somewhat elusive subject began to grow, and I soon found out that engineering can help a lot of people, which is one of the main things I want to do with my life.

What do you want to be when you grow up, and why?

When I grow up I want to be an art therapist, a writer, and I've been pondering having a backup in mechanical engineering. With my affection for art and psychology, art therapy was an obvious choice for me. It combines my art and psychology skills with my willingness to help people. As for writing, I've been writing stories and poems since age nine. Writing has been like air to me: I need it, enjoy it, and can't think of living without it. No matter what great things I achieve in life, I'll always refer to myself as a writer. With mechanical engineering, I could combine my creativity and ability to see little details and see the big picture. The country could use engineers who think creatively, not just solemn math lovers who think in straight lines. Also, there's a lower chance you'll be laid off in engineering. With all the news on lay-offs, it's a smart move to get a back-up career just in case.

In your opinion, what can teachers and programs do to prepare and inspire more underrepresented minorities, including girls, for STEM fields?

In my opinion, teachers should first inform their students that engineering is not about being perfect at numbers or being covered head-to-toe in car oil. Students need to know that you can apply your creativity and what you know from past experiences. Students also don't have to be the number-one test taker in the school or have a brain equal to a state-of-the-art calculator. Most of all, what they truly need is encouragement. Of the kids I've met, they were repelled away from STEM right in the classroom. Teachers can have more hands-on projects to make

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Interview with Miesha Brooks

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students realize that they are actually doing society a favor.

Anything else you'd like to add?

From what I've researched in STEM, most children start with an attraction to sciences. It's new to them and they're curious enough to pursue it. However, after a while, many minorities and girls begin to acknowledge the bias and stereotypes; at that young age, they are easily propelled away. They won't hang on and pursue sciences that they associate with a "chilliness" that will make them feel inferior. Instead they begin to look at other things and become less interested in STEM. By the time they're picking majors for college, it's probably too late. For those who stick through and began to major in STEM fields, they begin to truly see how certain students are treated better and with more focus from the professor. This causes them to feel hurt or indifferent, and drop STEM fields from there.

Do you have any advice for middle school or junior high school students?

Take whatever you complain about most often, to go out and do something about it. "You have absolutely no right to complain if you don't plan to do something about it" was the best advice my mom has ever given me and now I pass it on to you. The world needs more people who know how to spot a problem, think of an idea to solve it, and implement it. Whether it's the way your school is run, or the way people that some groups of people are treated differently, you can do something about it. Age, race, religion, and gender have no setbacks when you're this kind of person. Usually it takes youth to stand up and say what needs to be done then work towards it.

C3E Participant Profile: Natalie M. Givans, Senior Vice President, Booz Allen Hamilton

Natalie M. Givans,
Senior Vice President, Booz Allen Hamilton

Education:

B.S. degree in Electrical Engineering, MIT
M.S. degree in Electrical Engineering,
Johns Hopkins

Institutional Affiliations:

Chair, Armed Forces Communications
and Electronics Association (AFCEA)
International Board of Directors
President, MIT Class of 1984
Booz Allen Sponsor, MIT Industrial
Liaison Program
Advisor, George Mason University
C4I Center
Board Member, Corporate Partnership
Council for the Society of Women
Engineers
Women's Advisory Board Member, Girl
Scouts of the Nations Capital

Recent Awards:

2010 Engineer of the Year by the District
of Columbia Council of Engineering and
Architectural Studies
2010 Harold E. Lobdell '17 Distinguished
Service Award

Natalie Givans is a founding member of C3E. Givans is currently Senior Vice President at Booz Allen Hamilton, focused on Cybersecurity for the firm's Civil Market, including Health, Energy, and Environment.

A committed leader, mentor, and engineer, Givans attended C3E's inaugural launch dinner, and was inspired to contribute ideas and action to C3E. Afterward, she remarked: "I was honored to be invited to the dinner, and very impressed with what this Initiative is trying to do and the caliber of women involved." Givans is active in initiatives and networks focused on STEM, K-12, and helping women select and thrive in the fields associated with STEM. She is passionate about making a difference and works to leverage these connections to improve the climate for young women entering the technology fields and specifically in energy, environment, and sustainability.

As for her commitments to C3E, they are bold and plentiful. One pledge involves an organization that she and another MIT alumnus founded: the Energy, Environment, and Sustainability Committee of the MIT alumni association. Under the C3E banner, she hopes to create more mentorship and career guidance opportunities through this group for MIT grads considering entering the clean energy sector.

Givans has mentored beyond Booz Allen with two formal mentoring organizations, MentorNet and the Department of Labor's GEM-SET, who focus on women and underrepresented minorities as protégés. As part of her C3E commitment, she hopes to facilitate the creation of a "clean energy" group

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Natalie M. Givans

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within both of those mentoring programs to connect professional leaders with young women in high school and college interested in the clean energy sector.

Another C3E project Givans hopes to accomplish is to work with the Girl Scouts to develop a clean energy

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- Natalie M. Givans

component of the Girl Scouts' curriculum, perhaps to be piloted in the Nation's Capital. Givans serves on the Women's Advisory Board of the Girl Scouts of the Nations Capital, and thus has been helpful in facilitating the connection between C3E and Girl Scouts.

Finally, Givans has shared news of C3E with her broad professional networks, and is prepared to enlist them when C3E seeks further support and partnership. She is working with Booz Allen's Community Partnerships and Philanthropy leadership to further expand C3E's reach in the global community.

C3E thanks Givans for her enthusiastic support!

DOE Lab Spotlight: Science Ed at Argonne National Lab



Argonne National Lab is known for its world-class research facilities. For over two decades, Argonne has also invested in promoting the advancement of women and girls in science and engineering fields. Understanding that girls have high scientific aptitude, but that interest, confidence, and understanding about science careers often wanes as they grow older, Argonne's

Science Ed at Argonne

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educational requirements is presented. Ample time is allowed for participants to meet the speakers and learn first-hand about the rewards for women in science."

**Introduce a Girl to Engineering Day (IGED)**

IGED was introduced by Debby Quock, Computer Scientist at Argonne. IGED is celebrating its 10th year. This conference has traditionally hosted approximately 50 middle-school girls each year, however this year organizers plan to increase that number by more than 50 percent. The focus of this day is to demonstrate the many aspects of engineering and science, utilizing interactive and hands-on presentations and tours, and illustrate how these can be rewarding careers for women. Students are paired with Argonne engineers and scientists who mentor them throughout the day and provide an opportunity for small-group conversation.



Students also have an opportunity to meet like-minded peers, helping them to discover that their interest in science and engineering is shared by many other girls in their age group.

Slots for the conference are limited; last year, Argonne received more than 200 applications for its 50 slots. As a result of this overwhelming interest and the desire not to let any of these girls miss out, the organizing committee extended IGED into a second "overflow" event, held on a Saturday, where approximately 100 girls, accompanied by their parents, came for half a day to Argonne. Dr. Kawtar Hafidi, physicist at Argonne, WIST Program Initiator, and recipient of DOE Office of Science's Outstanding Mentor Award for 2010 said of the "overflow" IGED event: "This is a new experience where parents and children get to be introduced to science careers. It was a very exciting time." Depending on the response and number applications received for this year's event, there are plans to offer this event again to 8th grade girls who will not have the opportunity to participate next year.

Congratulations to WIST on their 20th anniversary!

Profile:

INCREASE: A Model to Increase Access to DOE User Facilities



The Interdisciplinary Consortium for Research and Educational Access in Science and Engineering (INCREASE) is an organization that promotes research and education in Historically Black Colleges and Universities (HBCUs) and other Minority-Serving Institutions (MSIs).

Founded in 2007 and based at Hampton University, the consortium is increasing member faculty utilization of national user facilities - starting with the National Synchrotron Light Source (NSLS) at Brookhaven National Laboratory (BNL) - and facilitating education and research training, especially for members of groups underrepresented in science and engineering research at national facilities, such as African-Americans, Hispanics, and women. INCREASE is a direct outcome of the Faculty and Students Team Program (FaST) managed by the Office of Educational Programs (OEP) at BNL for the Department of Energy (DOE) - Office of Workforce Development for Teacher and Scientists in conjunction with the National Science Foundation.

INCREASE is a multi-campus and interdisciplinary consortium including approximately 44 science and

engineering faculty participants from 26 MSIs and other strategic university partners. That explains INCREASE's origin at BNL NSLS: synchrotron light sources are vital and state-of-the-art research facilities useful in almost all science and engineering fields.

Besides the relationship with NSLS, INCREASE is building collaborations with the Center for Functional Nanomaterials at BNL and other sites to facilitate the technical and logistical training that will enable faculty members to become regular independent users of these national research facilities. The goal is to expand the program across the DOE complex. Dr. Florence Etop, an African-American female and Assistant Professor of Physics at Virginia State University, stated at a recent INCREASE workshop "most faculty at MSIs don't necessarily have the research capabilities at their home institutions to conduct their experiments. However, INCREASE creates access to world-class facilities such as those at BNL that our schools can't afford to conduct cutting-edge science." Dr. Michele Manuel, a Hispanic-American female scientist from the University of Florida indicated "I was able to become a user of the CFN/NSLS at BNL by attending the 2010 INCREASE-CFN Workshop." These are some of the female professors that make up INCREASE and the consortium is recruiting female science and engineering faculty members to participate in every area of research. The group is also exploring research and education projects with other agencies, including NASA, NSF, and the Nuclear Regulatory Commission.



INCREASE has coordinated three successful National Synchrotron Light Source (NSLS)-sponsored workshops, and is sponsoring another Center for Functional Nanomaterials (CFN) workshop at BNL in January 2011 (details for the CFN and other future events will be posted at the consortium's website). This past summer, during a very productive workshop at BNL's NSLS, the group agreed on an initial research and education focus: energy storage.

Participants at the same meeting also elected its Executive Committee, Dr. Eric J. Sheppard of Hampton University is the Chair of INCREASE, Dr. Sekazi K. Mtingwa of MIT and the African Laser Center is the Vice Chair, and Dr. Stephen U. Egarievwe of Alabama A&M is the Secretary. Dr. Gabriel Gwanmesia of Delaware State University was elected as the Research Programs Coordinator and Dr. Joe Omojola of Southern University was elected as the Education Programs Coordinator.

The consortium's partnership with BNL's NSLS and OEP has led to the successful evolution of the group. In particular, Dr. Chi-Chang Kao, former director of NSLS, and Kenneth White and Noel Blackburn of OEP have been steady supporters from the start. The Executive Committee works particularly closely with OEP and the FaST

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INCREASE

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program has been a major connection between INCREASE members and BNL.

The consortium also acknowledges that recent workshops have received funding from a NSF HBCU-UP grant at Southern University, New Orleans, thanks to the Education Programs Coordinator, Dr. Omojola.

For more information about INCREASE, please go to:
<http://www.increaseonline.org>

Photos courtesy of Brookhaven National Laboratory

Statistics

All statistics taken from the "Why So Few?" (2010) report of the American Association of University Women (<http://www.aauw.org/learn/research/whysofew.cfm>)

In a poll of young people ages 8–17 by the American Society for Quality (2009), 24 percent of boys but only 5 percent of girls said they were interested in an engineering career (p. 21).

Although women are the majority of college students, they are far less likely than their male peers to plan to major in a STEM field (p. 5).

According to the National Science Foundation (2009), over 20 percent of male freshmen planned to major in engineering, computer science, or the physical sciences, compared with only about 5 percent of female freshmen (p. 7).

In the mid-1980s women earned 36 percent of the bachelor's degrees in computer science; by 2006 that number had dropped to 20 percent (p. 11).

Well-documented gender differences exist in the value that women and men place on doing work that contributes to society, with women more likely than men to prefer work with a clear social purpose (Jozefowicz et al., 1993; Konrad et al., 2000; Margolis et al., 2002; Lubinski & Benbow, 2006; Eccles, 2006, in AAUW, p. 22).

National Science Foundation

Each year, NSF supports approximately 200,000 scientists, engineers, educators and students at universities, laboratories and field sites all over the world. As NSF puts it, their support ranges "from Alaska to Alabama to Africa to Antarctica"!

NSF is divided into seven directorates that support science and engineering research and education:

1. Biological Sciences
2. Computer and Information Science and Engineering
3. Engineering
4. Geosciences
5. Mathematics and Physical Sciences
6. Social, Behavioral and Economic Sciences
7. Education and Human Resources

The following sites might be of interest to C3E participants seeking NSF funding:

Homepage for NSF's division for Research on Learning in Formal and Informal Settings (DRL):
<http://nsf.gov/div/index.jsp?div=DRL>

Informal Science Education (ISE): <http://www.nsf.gov/pubs/2010/nsf10565/nsf10565.pdf>

Cooperative Activity with Department of Energy Programs for Education and Human Resource Development:
http://nsf.gov/funding/pgm_summ.jsp?pims_id=5632&org=DRL&from=home

Solicitation for Research on Gender in Science and Engineering (GSE): <http://nsf.gov/pubs/2010/nsf10516/nsf10516.pdf>.

Graduate Education (DGE): <http://nsf.gov/div/index.jsp?div=DGE>

Undergraduate Education (DUE): <http://nsf.gov/div/index.jsp?div=DUE>

Human Resources Development (HRD): <http://nsf.gov/div/index.jsp?div=HRD>