Computing Research Association
Annual Report
FY 2014-2015

UNITING INDUSTRY, ACADEMIA, AND GOVERNMENT TO
ADVANCE COMPUTING RESEARCH AND CHANGE THE WORLD

CRA
Computing Research
Association

TABLE OF CONTENTS

OUR MISSION

The mission of the Computing Research Association (CRA) is to enhance innovation by joining with industry, government and academia to strengthen research and advanced education in computing. CRA executes this mission by leading the computing research community, informing policymakers and the public, and facilitating the development of strong, diverse talent in the field.

Founded in 1972, CRA's membership includes more than 200 North American organizations active in computing research: academic departments of computer science and computer engineering, laboratories and centers (industry, government, and academia), and affiliated professional societies (AAAI, ACM, CACS/AIC, IEEE Computer Society, SIAM, and USENIX).
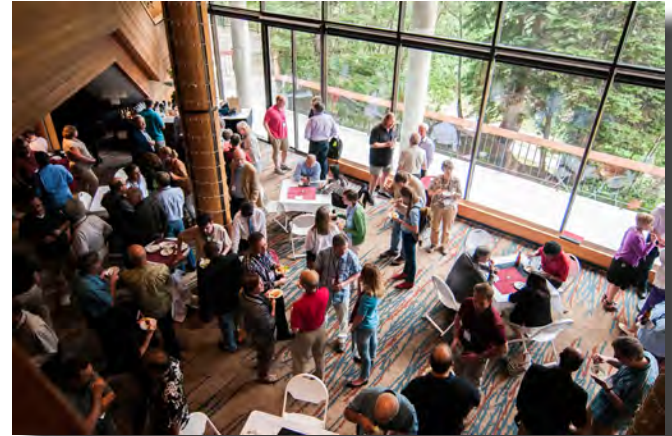
Computing Research Association
1828 L St, NW, Suite 800
Washington, DC 20036

P: 202-234-2111
F: 202-667-1066
E: info@cra.org
W: www.cra.org

MESSAGE FROM THE BOARD CHAIR

I am excited to report that 2014-15 was another successful year for CRA's efforts to strengthen both research and advanced education in computing—we have made substantial progress in our programs while also ending the year on a positive financial note.

The following report gives an excellent overview of CRA's initiatives and activities in our three mission areas of leadership, talent development, and policy during FY 2014-15. These initiatives enhance public and policymaker understanding of the importance of computing, make the case for federal investment in research, and mentor and cultivate individuals in each stage of the pipeline so that more computing researchers can reach their full potential. All of our programs are evaluated regularly in order to ensure their efficacy. But before presenting our external activities, let me briefly describe some internal and administrative activities of 2014-15.

Board of Directors

CRA welcomed four new board members: David Culler (UC Berkeley), Eric de Sturler (Virginia Tech), David Ebert (Purdue), and Lise Getoor (UC Santa Cruz). Culler replaced Jim Kurose, who stepped down to become CISE AD, de Sturler replaced Robert Schreiber as the SIAM representative, Ebert replaced David Bader as the IEEE-CS representative, and Getoor replaced Henry Kautz as the AAAI representative.

New Executive Officers

CRA elected new board officers to serve two-year terms beginning July 1, 2015. Susan Davidson was elected chair. She is the first female to hold this position in CRA history. In addition, Susanne Hambrusch became vice chair, and Greg Morrisett became secretary. The board re-elected Ron Brachman as treasurer. Vice chair Laura Haas and I ended our terms on June 30, 2015.

CRA members elected seven new members to its board of directors: Joel Emer, Stephanie Forrest, Michael Franklin, Greg Hager, Farnam Jahanian, and Vivek Sarkar. Five current board members were re-elected to the CRA board: Sarita Adve, H. V. Jagadish, Margaret Martonosi, Kathryn McKinley, and Greg Morrisett. Their terms run from July 1, 2015 through June 30, 2018. Retiring from the board as of June 30, 2015 are Corinna Cortes, Jeanne Ferrante, Lance Fortnow, Eric Grimson, and myself.

Conference at Snowbird

The leadership of the North American computing research community convened July 20-22, 2014 for the biennial CRA Conference at Snowbird, our flagship conference where the leadership of the computing research community gathers to network and discuss common issues concerning the future of the field. Outstanding speakers and panels addressed issues at the core of CRA's mission, from future research challenges to growing the research pipeline to major issues of policy and government. At this event, the new brand for CRA and its committees was launched.

CRA Awards

Two individuals were recognized by CRA for outstanding service in FY 2014-15.

Ann Quiroz Gates received the A. Nico Habermann Award for being a leader in initiatives that support Hispanics and members of other underrepresented groups in the computing field. She is perhaps best known for leading the Computing Alliance of Hispanic-Serving Institutions (CAHSI), an alliance of 13 institutions whose work has had a large and sustained positive impact on the recruitment, retention, and advancement of Hispanics in computing.

CRA bestowed its Distinguished Service Award to Farnam Jahanian for his outstanding service contributions to the computing research community. Farnam served as NSF Assistant Director for CISE from 2011 to 2014, the highest profile government position for computing research. During his tenure, he fought hard for computing and launched three presidential initiatives: National Robotics Initiative, Big Data Research and Development Initiative, and US Ignite.

CRA Communications

As the impact of CRA's activities are becoming more widely recognized and valued across our industry, we decided to develop a new brand identity that reinforces and amplifies our mission, objectives, and programs. This new brand for CRA and its committees was launched at the 2014 CRA Conference at Snowbird.

Since October 2014, CRA has worked with Caretecher, led by current IT contractor and former CRA employee Kapil Patnaik, to redesign the CRA website. Caretecher is rebuilding the website on a more efficient platform: WordPress Multisite stack. This platform has been very flexible and suits the needs of our organization well (serving at least five different organizational entities). Each committee has the ability to customize its site, and additional sites and features can be added easily as our needs grow.

In February 2015, Caretecher presented the initial HTML version of the site for discussion and review. The site was made available for feedback following the board meeting, and we have considered that feedback in the current design. Getting the new website to a launch-ready state was the main focus of our communication staff, and we made great strides in creating a unified look and feel for the CRA web presence. The new CRA unified website launched shortly after the July 2015 board meeting.

CRA continued to produce *Computing Research News* in its electronic format on a monthly basis (except for July and December). *CRN* was distributed to more than 7,000 subscribers and is available on the CRA website. *CRN* was revamped on the new CRA website, and users now have additional search features and ways to find and sort content. Job posting advertising on the website and *CRN* continued to produce steady revenue.

Participation in our programs is open to everyone with interest and dedication. CRA members and volunteers support:

• Visioning future directions of the field
• Ongoing initiatives that help shape public policy relevant to our community
• Building a strong, diverse pipeline of students into the field
• A broad range of programs to support the careers of researchers at all stages of the pipeline.

J Strother Moore
CRA Board Chair
2013-2015

Gift to CRA Board Chair

At the February 2015 board meeting, CRA Board Chair J Moore was presented with a one-of-a-kind, handmade gift for his term of service as CRA board chair–a custom-built steam engine, which has a unique significance for J. For the gift idea, CRA Executive Director Andrew Bernat drew upon J's history working with steam engines. In high school, J had a job servicing them in an oil refinery. The engine was custom built for J by Andrew Bernat and Philip Wiborg.
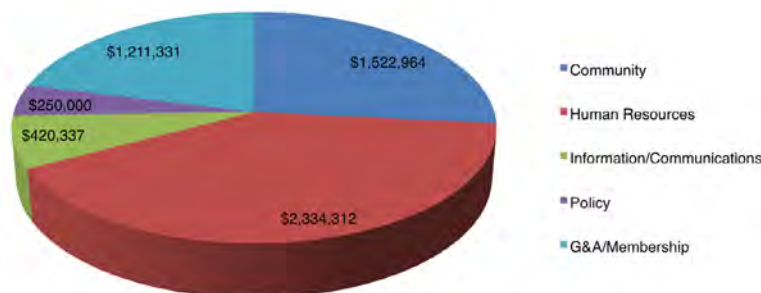
CRA FINANCIAL STATEMENT

JULY 2014-JUNE 2015

INCOME $5,738,944

Income chart values:
- $1,522,964 — Community
- $2,334,312 — Human Resources
- $420,337 — Information/Communications
- $250,000 — Policy
- $1,211,331 — G&A/Membership

EXPENSES $5,248,915

Expenses chart values:
- $257,612 — Community
- $3,089,520 — Human Resources
- $188,188 — Information/Communications
- $256,813 — Policy
- $1,456,782 — G&A/Membership

Statement of Financial Position	
Cash & Accounts Receivable	$4,127,098
Investments	$2,023,585
Total Assets	$6,549,673
Total Liabilities	$1,328,021
Total Net Assets	$5,221,652
Total Unrestricted Net Assets	$4,692,623
Total Temporarily Restricted Net Assets	$529,029

LEADERSHIP

CRA empowers the research community to broaden the scope of computing research and to amplify its impact on society.

2015 Leadership Summit

On February 23, 2015, in Washington, D.C., CRA hosted its annual Computing Leadership Summit for senior leadership of CRA affiliate societies and the National Research Council's Computer Science and Telecommunications Board.

Several engaging sessions provided valuable information on current issues important to the organizations. CRA Director of Government Affairs Peter Harsha explained the implications for science of the president's FY16 federal budget request. Toby Smith, from the Association of American Universities, spoke about how funding for science is being targeted, and what his organization does to defend science funding. Randy Bryant, who was on a rotation at the White House Office of Science and Technology Policy, provided insights and updates about his time in government. Jim Kurose, assistant director of the Directorate of CISE at NSF, gave an update on current and new initiatives and shared how excited he was to take on this new role.

New Best Practices Memo

In spring 2015, the CRA released its latest Best Practices Memo, "Incentivizing Quality and Impact: Evaluating Scholarship in Hiring, Tenure, and Promotion." Distinguishing between quality and quantity is key to promoting the future growth of the computing and information field. The memo advocates adjustments to hiring, promotion, and tenure practices, as well as changes to the publication culture.

"Above all, quality and impact need to be incentivized over quantity… What ultimately should matter when it comes to hiring, tenure, and promotion is the quality of the research."

The recommendations in the report were developed over an 18-month period by the CRA Committee on Best Practices for Hiring, Promotion, and Scholarship, led by Fred B. Schneider (chair) and Batya Friedman (co-chair). The committee conducted interviews in autumn 2013 with more than 75 academic and industry computing and information unit heads to understand the issues and gain insights from practice. Preliminary recommendations were vetted with department chairs and CRA deans at the Snowbird Conference in July 2014.

Computing Community Consortium

The Computing Community Consortium (CCC) was established in fall 2006 through a cooperative agreement between CRA and the National Science Foundation (NSF). CCC is now operating on its second award.

CCC

Computing Community
Consortium

Catalyst

On July 1, 2014, the CCC transitioned out of a startup into a steady state under new leadership, with Greg Hager as the chair and Beth Mynatt as the vice chair.

The CCC continues its mission to catalyze and enable the computing research community by creating visions for the community and then communicating those visions with the community and policymakers. The CCC accomplishes this through the following mechanisms:

Community-Based Visioning Workshops: These workshops are initiated by the community, government agencies, and by the Council to ensure that a broad range of topics are explored that are relevant to national priorities. The workshops held in the time period of this report are listed below. All related workshop reports can be found on the CCC website at http://cra.org/ccc/resources/workshop-reports/.
- Aging in Place Technologies
- Uncertainty in Computation
- BRAIN
- Extensible Distributed Systems
- Computing Visions 2025 (a joint effort with the CISE AC)
- Privacy by Design
- Theoretical Foundations for Social Computing

White papers: As a response to community needs and requests from various federal agencies, the CCC works with community leaders to deliver white papers on specific topics. These white papers have become extremely valuable in quickly generating community input on a topic and properly informing federal agencies. White papers written in the time period of this report are:
- Police Body Worn Cameras
- Autonomous Systems (a series of 8 papers)

Blue Sky Ideas Conference Tracks: In order to help the community realize the importance of out-of-the-box thinking and promote open discourse, the CCC sponsors special tracks at conferences. Conferences that held Blue Sky Ideas Tracks during the time of this report are:
- ACM SIGSOFT International Symposium on the Foundations of Software Engineering (FSE 2014)
- Association for the Advancement of Artificial Intelligence (AAAI) Conference on Artificial Intelligence (AAAI-15)
- Robotics Science and Systems Conference for the 50th Anniversary of Shakey

The Council established task forces and realigns them each July, to ensure that the Council is keeping a pulse on the community and national priorities. For the 2014-15 year, the task forces were:
- Internet of Things/Computing in the Physical World
- Education
- High Performance Computing
- Manufacturing
- Big Data
- Industry Engagement

In addition to catalyzing new visions, the CCC also works to nurture leadership in the community. This is done through the Leadership in Science Policy Institute, co-sponsored with CRA Government Affairs and through the CCC's continued support of postdoctoral researchers in computing, through the Postdoc BP program.

With NSF's backing, the CCC created a program to develop and institutionalize the implementation of best practices for supporting postdocs called the Postdoc Best Practices (Postdoc BP) Program. Three projects began in April 2014 and will continue for three years.

The Postdoc BP program has given grants to three different universities or university groups:
- University of Washington (UW);
- Arizona, composed of Arizona State University (ASU), University of Arizona (U of A), and Northern Arizona University (NAU);

- and NYC ASCENT, composed of Columbia University, New York University (NYU), Cornell University, and The City University of New York (CUNY).

Every group in the Postdoc BP program has a number of important commonalities. Each of the programs has a major focus on career counseling and professional skills development, more than you would see in most traditional post-grad programs. Both the NYC ASCENT and UW programs emphasize the creation of an Individual Development Plan (IDP) and Arizona is looking to add it to its program.

In order to communicate with both the computing research community and policymakers, the CCC continued to publish timely articles on its blog, release Workshop Reports, produce Computing Research in Action videos, and present in multiple different venues (conferences, agency working groups, universities, and more). CCC also launched "Great Innovative Ideas," a new monthly feature on its website, to highlight the research of Blue Sky Award winners.

POLICY

CRA is a trusted source of information—formally and informally—for members of Congress and their staff, as well as the White House and the President's Council of Advisors for Science and Technology.

Government Affairs Committee

The Government Affairs Committee (GAC) serves as the computing community's representatives in Washington, D.C., conveying the importance of federal support for computing research, tracking and influencing science policy relevant to the community, and helping engage members of the community in the policymaking process.

The GAC continued its efforts to make the case for increased funding for fundamental computing research to both Congress and the administration, a case made more challenging by a very constrained federal budget environment. The GAC also led efforts to defend university research from attack from federal policymakers by weighing in with the House Committee on Science, Space, and Technology over the value of research on information diffusion after work in that area was cited by the chair of the committee as a potential example of government waste; and by opposing a reauthorization of federal science agencies that would have gutted support for social, behavioral, and economic science.

As part of its mission to develop a next generation of leaders in the computing research community, the GAC held its third Leadership in Science Policy Institute (LiSPI) on April 27-28 in Washington, D.C. This one-and-a-half day workshop is intended to educate a cadre of computing researchers on how science policy in the U.S. is formulated and how our government works. Participants heard candid and "off the record" views from people who are currently or previously involved in science policy. Thirty-six computer scientists and engineers from 30 different universities and research organizations attended the workshop.

It offered sessions on interacting with federal science agencies, how new initiatives are created within agencies, the role of federal advisory committees, the federal budget process, embedding scientists in non-science agencies, the arguments for supporting research in computing, how to talk to policymakers, and a rather candid discussion from staffers on the House Science, Space, and Technology committee and the Senate Armed Services Committee. LiSPI participants were required to complete both pre- and post-workshop homework assignments.

The GAC also continued to participate in efforts to highlight interesting work in the field supported by the National Science Foundation by sending researchers to the Capitol as part of the Coalition for National Science Funding's Capitol Hill Science Exposition on April 29, 2015. Three robotics students from Johns Hopkins University represented CRA at the exhibition. The students demonstrated their collaborative robot for manufacturing, called CoSTAR. They also demonstrated a virtual reality interface that can be used to more easily program robots by novice, non-technical

users. All three researchers are advised by Greg Hager, professor and chair of the Department of Computer Science at Johns Hopkins University and chair of the Computing Community Consortium; Hager also attended the event and fielded questions.

The GAC sent the CRA Washington Update, which contains policy updates and other relevant news, to members of our Computing Research Advocacy Network. GAC staff also produced an analysis of computing research in the president's FY 2015 Budget Request for the AAAS Guide to R&D in the president's budget book. And the GAC continued to maintain the Computing Research Policy Blog (cra.org/blog/), a resource for science policy news, advocacy, and analysis for the computing community.

The GAC also supported the annual CRA Fall Congressional Fly-In, where representatives from CRA's member institutions travel to Washington, D.C., at their own expense and participate in meetings with their congressional representatives. On September 17, 2014, more than two dozen computing

researchers from across the country came to Washington to make the case for federally supported computing research. The 27 volunteers, traveling from as near as Maryland and New Jersey, and as far away as Utah and Kansas, participated in 60 House and Senate meetings.

Their message to Congress was very simple: Federally supported computing research is vital to the nation's future. Using their own research and individual stories as support, and armed with additional information from CRA, they made "the federal case" for computing to members of Congress and their staff. Just as important as the message they delivered, they also made connections with those who represent them in D.C., with the goal of letting those members now know a little about the expertise and interesting (and important) work that goes on in their districts and states. The fly-in also gave the participants a better sense of their representatives in Congress and created the opportunity for a lasting dialogue on both sides.

CRA
Computing Research
Association

TALENT DEVELOPMENT

CRA cultivates talented computing researchers at every stage of their careers. CRA's programs help undergraduate students, graduate students, postdocs, and early-career and mid-career professionals develop valuable skills that prepare them to achieve success throughout their research careers. CRA analyzes the health of the computing research talent pool and evaluates the effectiveness of intervention programs intended to grow this pool by surveying, comparing, and analyzing computing departments and individuals.

Committee on the Status of Women in Computing Research

CRA-W
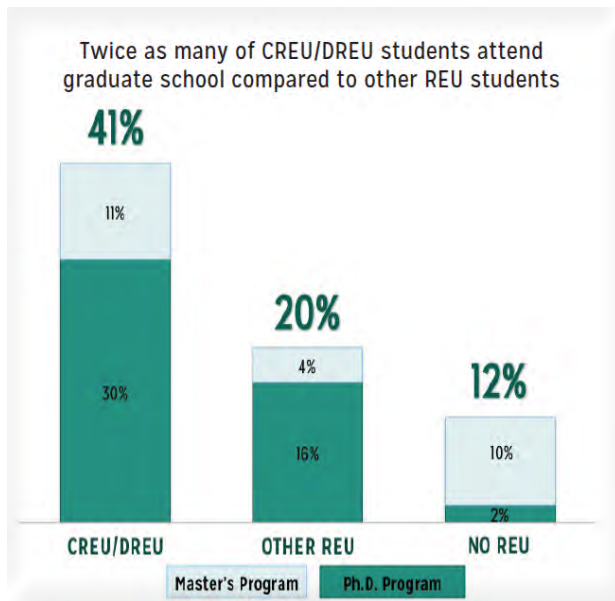Computing Research
Association
Women

CRA-W seeks to accelerate computing innovation by increasing the participation and success of women and other underrepresented groups, including ethnic minorities and persons with disabilities, in computing research. From July 2014 through June 2015, CRA-W programs positively impacted more than 1,150 undergraduates, graduate students, and computing research professionals.

During this period, CRA-W program expenditures exceeded $2 million with financial support coming from NSF, industry, university departments, ACM SIGs, foundations, CRA, and extremely dedicated volunteers. CRA-W programs include Early and Mid Career Mentoring Workshops for research universities (CMW-R), teaching-focused institutions (CMW-E) and research labs (CMW-L), Grad Cohort Workshop, mentoring workshops at Grace Hopper, Scholarships for Women Studying Information Security (SWSIS), and a new Virtual Undergraduate Town Hall series. CRA-W partners with the Coalition to Diversify Computing (CDC) on five additional programs: Distributed REU (DREU), Collaborative REU (CREU), Discipline Specific Workshops (DSW), Distinguished Lecture Series (DLS), and mentoring workshops at the Richard Tapia Celebration of Diversity in Computing Conference.

CRA's Center for Evaluating the Research Pipeline (CERP) evaluates the effectiveness of CRA-W programs. One evaluation of undergraduate computing majors showed that twice as many CREU and DREU participants attend graduate school, compared to students who participated in other REU programs or who did not conduct undergraduate research.

Twice as many of CREU/DREU students attend graduate school compared to other REU students

	41%	20%	12%
Master's Program	11%	4%	10%
Ph.D. Program	30%	16%	2%
	CREU/DREU	OTHER REU	NO REU

During their final year in college, a sample of undergraduate computing majors completed the CRA Center for Evaluating the Research Pipeline (CERP) annual survey for graduating students. The sample contained past participants of the CRA-W/CDC CREU and DREU programs, students who had completed other REUs, and students who had never completed an REU. CREU/DREU participants were significantly more likely to report plans to attend a graduate program in computing in the coming fall, compared to students who had completed a different REU or no REU during college.

In 2015, CRA-W added several specific benefits for CRA members. CRA-W Grad Cohort applicants from CRA member departments are now given priority in the selection process. Additionally, CRA member departments receive the academic version of the CRA-W Grad Cohort Graduating Class document. This document contains information on recent Grad Cohort alums who are nearing graduation and are either M.S. graduate students looking for Ph.D. programs or Ph.D. graduate students looking for faculty positions. Five departments have joined CRA to take advantage of these benefits.

This year is the 25th anniversary of CRA-W, and it is planning to mark the occasion by documenting CRA-W accomplishments on the CRA website and by holding celebrations at the CRA-W board spring meeting, Grad Cohort, and the CRA Conference at Snowbird, followed by a strategic planning meeting including the CRA-W steering committee and emeritus members in the fall.

Nancy Amato and A. J. Brush assumed leadership as CRA-W co-chairs at the fall 2014 steering committee meeting. CRA-W thanks former CRA-W co-chairs Tracy Camp and Kathryn McKinley for their dedication and exceptional service to CRA-W and CRA. The CRA-W board of directors currently has 28 members, all of whom chair a CRA-W program and volunteer considerable time and energy to CRA-W each year.

Center for Evaluating the Research Pipeline

CERP

Computing Research
Association
Evaluation

The CRA's Center for Evaluating the Research Pipeline (CERP) continues to establish itself as a sustainable and reputable research and evaluation center for the computing research community. In May 2015, Burçin Tamer joined the CERP staff as a research scientist.

In the area of data collection, nearly 100 departments are active in the Data Buddies Project. The fall 2014 surveys obtained data from more than twice as many students as the fall 2013 surveys.

During the annual report time period, CERP completed the following papers and presentations:

Papers
- Dasgupta, N. & Stout, J. G. (2014). Girls and Women in Science, Technology, Engineering and Mathematics: STEMing the Tide and Broadening Participation in STEM Careers. Policy Insights from Behavioral and Brain Sciences, 1, 21-29.
- Stout, J. G. & Camp, T. (2014). Now what? Action items from social science research to bridge the gender gap in computing research. SIGCAS Computers in Society: Special Issue on Women in Computing, 44, 5-8.
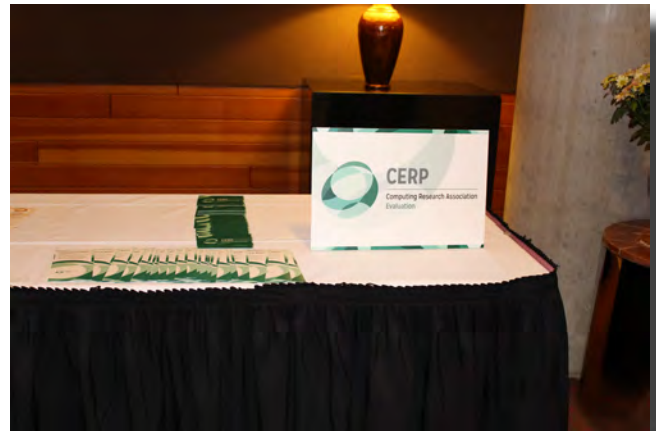
Presentations

- Stout, J. G. (2014, October). It's complicated: Lessons learned from research on women's experiences in STEM. In Challenging Technical Privilege: How Race and Gender Matter. Invited presentation, Massachusetts Institute of Technology, Cambridge, MA.
- Stout, J. G. (2014, August). Understanding women's low representation in STEM fields. Invited presentation at the Augustana College chapter meeting of Sigma Xi, Rock Island, IL.
- Stout, J. G. & Wright, H. (2014, July). CI Fellows Evaluation. In R. Sproull (Chair), Refining the Computer Science Postdoc Experience. Panel presented at the biannual CRA Conference at Snowbird, Snowbird, UT.

CERP staff is primarily funded via the "Alliance" grant (NSF CNS-1246649, PI: Camp) and a social science research grant awarded to the CRA (NSF DUE-1431112, PI: Stout). Secondary support stems from evaluation projects. Future funding will continue to derive primarily from large research grants that utilize Data Buddies data to understand how best to shape education and mentorship practices in order to promote greater diversity in computing. CERP has a long-term goal of conducting project evaluation at a larger scale than is currently the case, given that relying on a multitude of small evaluation projects (<$30k apiece) for support is inefficient and unsustainable.

Coalition to Diversify Computing (CDC)

The CDC is a joint organization of the ACM and CRA. Jamika D. Burge and Manuel A. Pérez-Quiñones continued to be co-chairs of CDC until July 2015 at which time Jeff Forbes and Charles Isbell assumed the role of CDC co-chairs.

Several CDC programs are jointly managed with CRA-W. The CRA-W/ CDC BPC Alliance supports programs such as Collaborative Research Experience for Undergraduates (CREU), Distributed Research Experience for Undergraduates (DREU), Discipline Specific Workshops (DSW), Distinguished Lecture Series (DLS), and Career Mentoring Tracks at both the Grace Hopper Celebration of Women in Computing Conference and the Richard Tapia Celebration of Diversity in Computing Conference.

The CDC helps organize the Richard Tapia Celebration of Diversity in Computing Conference, and has a ratified policy that charges a "repeatable" steering committee that administers the Tapia conference. The CDC also held the Academic Workshop for Underrepresented Assistant & Associate Professors, and Senior Doctoral Students, and began exploring a partnership with the National Action Council for Minorities in Engineering (NACME).

CRA-Deans Group

The CRA-Deans Group was established in an effort to provide leadership and community to emerging and established colleges of computing and interdisciplinary "IT" schools. The CRA-Deans Group meets annually to discuss a range of topics and share their experiences creating independent schools and IT units. Steven Miller is its chair.

Taulbee Survey

CRA conducted the 44th annual Taulbee Survey of Ph.D.-granting computer science (CS), computer engineering (CE), and information (I) departments. The survey documents trends in student enrollment, degree production, employment of graduates, and faculty salaries in Ph.D.-granting departments of CS, CE, and I in the U.S. and Canada.

A vendor, Peerfocus, developed a new Taulbee Survey data entry and reporting software, and the system was installed in fall 2015. The new system provides better security, data validation, analytics, and a new peer group reporting feature. In general, users seem pleased with the new system. Administration of the survey, and communication with the respondents, was improved from previous years because of the superior features in the Peerfocus software.

CRA Surveys Committee Chair Stu Zweben and CRA Director of Statistics and Evaluation Betsy Bizot were awarded a grant from the Sloan Foundation to perform an in-depth analysis of data from the Taulbee Survey and other sources focusing on women's participation in academic computing programs during the past two decades. Analysis was published at the RESPECT Conference and in *Computing Research News.*

After two consecutive years of record Ph.D. production, the number of doctoral degrees produced by the reporting departments declined 2.6 percent, from 1,991 to 1,940. The Taulbee Survey shows a three-year increase of approximately 61 percent in undergraduate enrollment at U.S. CS departments between 2010-11 and 2013-14.

CRA Education Committee

The Education Committee of the CRA (CRA-E) supports CRA's mission to strengthen research and advanced education in computing. CRA-E is focused on developing practices and materials to help departments attract, educate, and retain talented and diverse researchers.

CRA-E has embarked on a number of projects with the mandate to strengthen research and advanced education in computing. The committee has:

- Designed and developed the Conquer website (cra.org/conquer)

for undergraduate students interested in computing research and graduate school and for faculty advisers and research mentors wishing to engage and encourage undergraduates in research and graduate studies. The site is co-sponsored by the CCC, CRA-W, NCWIT, and CDC. CRA-E has focused on increasing awareness of the Conquer website, particularly among non-Taulbee departments.

- Developed a FAQ section for undergraduates and professionals returning to research in graduate school.
- Planned to create short video clips featuring graduate students and recent graduates discussing why they pursue research and what they are investigating.
- Received a NSF grant, "Workshops to Engage Junior Faculty in Undergraduate Research," to support the development and implementation of 4-6 workshops at major research conferences. These workshops will be designed for research-active junior faculty, as well as senior graduate students and postdocs, and provide best practices and resources for engaging undergraduates in research.
- Surveyed faculty to determine their interest in such workshops and their priorities on what should be discussed. The REU best practice workshops were given at:

- ACM SIGGRAPH MIG (Motion in Games), Los Angeles, California, November 2014 (this was the "pilot" offering)
- CSCW 2015 (Computer-Supported Cooperative Work and Social Computing), Vancouver, British Columbia, March 2015
- IEEE ICRA (International Conference on Robotics and Automation), Seattle, Washington, May 2015
- ACM FCRC (Federated Computing Research Conference), Portland, Oregon, June 2015
- Conducted research on the baccalaureate origins of domestic Ph.D. students in computer science.
  - The first study, published in *Computing Research News* in January 2013, used publicly available datasets (e.g., NSF WebCASPAR data) to develop an overview of the baccalaureate origins of U.S. students.
  - The second study, based on more than 7,000 recent graduate application records from a diverse and representative set of 14 participating graduate programs, was presented at the Snowbird session "Recruiting Domestic Students to Ph.D. Programs: From Data to Recommendations." A Viewpoints version of the report was published in *Communications of the ACM* in 2015.

CRA-E manages CRA's Undergraduate Research Award. This program recognizes undergraduate students in North American universities who show outstanding research potential in an area of computing.

The award structure was changed for the 2014-15 competition. CRA-E members felt that students from Ph.D.-granting departments and those from departments not awarding Ph.D.s face very different environments, and in order to increase the number of undergraduates pursuing research, these differences should be recognized. The award now allows departments that grant Ph.D.s in one of the computing fields to nominate up to two male and two female students per year; departments that do not grant Ph.D.s in one of the computing fields may nominate up to one male and one female student per year. There will be up to one female and one male winner from Ph.D.-granting departments and up to one female and one male winner from non-Ph.D.-granting departments.

Emma Harrington (Williams College) was the female awardee from a non-Ph.D.-granting institution, and Urvashi Khandelwal (University of Illinois at Urbana-Champaign) was the female awardee from a Ph.D.-granting institution. Hyunsu Cho (Trinity Collge) was the male awardee from a non-Ph.D.-granting institution, and Danfei Xu (Columbia University) was the male awardee from a Ph.D.-granting institution.

2014-15 MEMBERS

ACADEMIC DEPARTMENTS
The following departments held membership in CRA for all or, in a few cases, part of the period from July 1, 2014 to June 30, 2015.

-A-
Amherst College (CS)
Arizona State University (CSE)
Auburn University (CSSE)

-B-
Binghamton University, SUNY (CS)
Boston College (CS)
Bowling Green State University (CS)
Bradley University (CS)
Brandeis University (CS)
Brown University (CS)
Bryn Mawr College (MCS)
Bucknell University (CS)

-C-
Carnegie Mellon University (CS)
Carnegie Mellon University (ECE)
Case Western Reserve University (EECS)
Clemson University (CS)
Colgate University (CS)
College of Charleston (CS)
College of William & Mary (CS)
Colorado School of Mines (EECS)
Colorado State University (CS)
Columbia University (CS)
Cornell University (CS)

-D-
Dartmouth College (CS)
DePaul University (CDM)
Drexel University (CS)
Duke University (CS)

-E-
Emory University (MCS)

-F-
Florida Institute of Technology (CS)
Florida International University (CS)
Florida State University (CS)

-G-
George Mason University (CS)
George Washington University (CS)
Georgetown University (CS)
Georgia Institute of Technology (CS)
Georgia Institute of Technology (CSE)
Georgia Institute of Technology (IC)
Georgia Southern University (IT)
Georgia State University (CS)
Grinnell College (MCS)

-H-
Harvard University (CS)
Harvey Mudd College (CS)
Hobart and William Smith Colleges (MCS)

-I-
Illinois Institute of Technology (CS)
Indiana University (IC)
Iowa State University (CS)

-J-
Johns Hopkins University (CS)
Johns Hopkins University (SI)
Juniata College (IT & CS)

-K-
Kansas State University (CIS)
Kean University (CS)
Kent State University (CS)

-L-

Lafayette College (CS)
Lehigh University (CSE)
Louisiana Tech University (CS)
Loyola University, Chicago (CS)

-M-

Marquette University (CS)
Massachusetts Institute of Technology (EECS)
Miami University (CS)
Michigan State University (CSE)
Michigan Technological University (CS)
Mississippi State University (CSE)
Montana State University (CS)
Montclair State University (CS)
Mount Holyoke College (CS)

-N-

National University of Singapore (CSIS)
Naval Postgraduate School (CS)
New Jersey Institute of Technology (CCS)
New Mexico State University (CS)
New York University (CS)
North Carolina State University (CS)
North Dakota State University (CSOR)
Northeastern University (CIS)
Northwestern University (EECS)
Nova Southeastern University (CS)

-O-

Oakland University (CSE)
Ohio State University (CSE)
Ohio University (EECS)
Oklahoma State University (CS)
Old Dominion University (CS)
Oregon State University (EECS)

-P-

Pace University (CSIS)
Pennsylvania State University (CSE)
Pennsylvania State University (IST)
Polytechnic University (CIS)
Pomona College (CS)
Portland State University (CS)
Princeton University (CS)
Purdue University (C&IT)
Purdue University (CS)

-R-

Regis University (CIS)
Rensselaer Polytechnic Institute (CS)
Rice University (CS)
Rochester Institute of Technology (CS)
Rutgers University, Busch Campus (CS)

-S-

Saint Louis University (MCS)
Santa Clara University (CSE)
Simon Fraser University (CS)
Southern Methodist University (CSE)
Stanford University (CS)
Stevens Institute of Technology (CS)
Stony Brook University, SUNY (CS)
Swarthmore College (CS)

-T-

Tecnologico de Monterrey, Campus Chihuahua (DTIE)
Texas A&M University (CSE)
Texas A&M University, Corpus Christi (CS)
Texas State University (CS)
Texas Tech University (CS)
Toyota Technological Institute at Chicago (CS)
Tufts University (CS)

-U-

Union College (CS)
University at Albany, SUNY (CI)
University at Buffalo, SUNY (CSE)
University of Alabama, Birmingham (CIS)
University of Alabama, Tuscaloosa (CS)
University of Alberta (CS)
University of Arizona (CS)
University of Arizona (SISTA)
University of Arkansas (CSCE)
University of British Columbia (CS)
University of Calgary (CS)
University of California, Berkeley (EECS)
University of California, Berkeley (IMS)
University of California, Davis (CS)
University of California, Irvine (ICS)
University of California, Los Angeles (CS)
University of California, Riverside (CSE)
University of California, San Diego (CSE)
University of California, Santa Barbara (CS)
University of California, Santa Cruz (CE)

University of California, Santa Cruz (CS)
University of Central Arkansas (CS)
University of Central Florida (EECS)
University of Chicago (CS)
University of Colorado, Boulder (CS)
University of Delaware (CIS)
University of Florida (CISE)
University of Georgia (CS)
University of Hawaii (ICS)
University of Houston (CS)
University of Idaho (CS)
University of Illinois, Chicago (CS)
University of Illinois, Urbana-Champaign (CS)
University of Illinois, Urbana-Champaign (ECE)
University of Iowa (CS)
University of Kansas (EECS)
University of Kentucky (CS)
University of Maryland (CS)
University of Maryland, Baltimore County (CSEE)
University of Maryland, Baltimore County (IS)
University of Massachusetts, Amherst (CS)
University of Massachusetts, Boston (CS)
University of Massachusetts, Lowell (CS)
University of Michigan (EECS)
University of Michigan (I)
University of Michigan, Dearborn (CIS)
University of Minnesota (CSE)
University of Mississippi (CIS)
University of Missouri, Columbia (CS)
University of Missouri, Kansas City (CS)
University of Nebraska, Omaha (CS/IST)
University of Nebraska, Lincoln (CSE)
University of Nevada, Las Vegas (CS)
University of Nevada, Reno (CSE)
University of New Hampshire (CS)
University of New Mexico (CS)
University of New Mexico (ECE)
University of North Carolina at Chapel Hill (CS)
University of North Carolina at Chapel Hill (SILS)
University of North Carolina, Charlotte (IT)
University of North Dakota (CS)
University of North Texas (CSE)
University of Notre Dame (CSE)
University of Oklahoma (CS)
University of Oregon (CIS)

University of Pennsylvania (CIS)
University of Pittsburgh (CS)
University of Pittsburgh (IS)
University of Puget Sound (MCS)
University of Rochester (CS)
University of South Alabama (C)
University of South Carolina (CSE)
University of South Florida (CSE)
University of Southern California (CS)
University of Southern California (EES)
University of Texas, Austin (CS)
University of Texas, Brownsville (ECS)
University of Texas, Dallas (CS)
University of Texas, El Paso (CS)
University of Toronto (CS)
University of Utah (CS)
University of Victoria (CS)
University of Virginia (CS)
University of Washington (CSE)
University of Washington, Bothell (CS)
University of Washington, Tacoma (CSS)
University of Waterloo (CS)
University of Wisconsin, Madison (CS)
University of Wisconsin, Milwaukee (EECS)
University of Wyoming (CS)

-V-

Vanderbilt University (EECS)
Villanova University (CS)
Virginia Tech (CS)

-W-

Wake Forest University (CS)
Washington State University (EECS)
Washington University in St. Louis (CSE)
Wayne State University (CS)
West Virginia University (CSE)
Western Michigan University (CS)
Williams College (CS)
Worcester Polytechnic Institute (CS)
Wright State University (CSE)

-Y-

Yale University (CS)
York University (CSE)

LABS AND CENTERS

Top Contributors
Facebook
Google
IBM Research
Microsoft Research
National Security Agency
Yahoo Labs

FX Palo Alto Laboratory
Hewlett-Packard Company
Intel Corporation
Lawrence Berkeley National Lab
Mitsubishi Electric Research Labs
Oracle Lab
SCI Institute
Two Sigma

AFFLIATED PROFESSIONAL SOCIETIES

Association for the Advancement of Artificial Intelligence
Association for Computing Machinery
Canadian Association for Computer Science
IEEE Computer Society
Society for Industrial and Applied Mathematics
USENIX Association

ASSOCIATE ACADEMIC DEPARTMENTS

Korea Advanced Institute of Science & Technology (CS)

National University of Singapore (CS/IS)

Singapore Management University (IS)

ASSOCIATE LAB

Elsevier

CRA
Computing Research
Association

BOARD OF DIRECTORS
2014-15

Board Officers

J Strother Moore, Chair
University of Texas at Austin

Susan Davidson, Secretary
University of Pennsylvania

Laura Haas, Vice Chair
IBM Research-Almaden

Ronald Brachman, Treasurer
Yahoo Labs

Board Members

Sarita Adve
UIUC

Nancy Amato
Texas A&M University

David Bader
(IEEE-CS representative)
Georgia Institute of Technology

Ken Barker
(CACS/IAC representative)
University of Calgary

Ronald Brachman
Yahoo Labs

Tracy Camp
Colorado School of Mines

Anne Condon
University of British Columbia

Corinna Cortes
Google Inc.

David Culler
University of California-Berkeley

Mary Czerwinski
Microsoft Research

Susan Davidson
University of Pennsylvania

Eric de Sturler
(SIAM representative)
Virginia Tech

David Ebert
(IEEE-CS representative)
Purdue University

Mary Fernández
(ACM representative)
MentorNet

Jean Ferrante
University of California-San Diego

Lance Fortnow
Georgia Institute of Technology

Jean-Luc Gaudiot
(IEEE-CS representative)
University of California-Irvine

Lise Getoor
(AAAI representative)
UC Santa Cruz

Dan Grossman
University of Washington

Eric Grimson
MIT

Laura Haas
IBM Research-Almaden

Gregory Hager
Johns Hopkins University

Brent Hailpern
IBM Research-Almaden

Mary Hall
University of Utah

Susanne Hambrusch
Purdue University

H. V. Jagadish
University of Michigan

Chris Johnson
University of Utah

Henry Kautz
(AAAI representative)
University of Rochester

James Kurose
University of Massachusetts

Margaret Martonosi
Princeton University

Kathryn McKinley
Microsoft Research

J Strother Moore
University of Texas at Austin

Greg Morrisett
Cornell University

Barbara Ryder
Virginia Tech

Fred B. Schneider
Cornell University

Andrew Sears
(ACM representative)
Rochester Institute of Technology

Robert S. Schreiber
(SIAM representative)
Hewlett-Packard

Margo Seltzer
(USENIX representative)
Harvard University

Ellen Zegura
Georgia Institute of Technology

CRA STAFF

Andrew Bernat, Ph.D.
Executive Director

Betsy Bizot, Ph.D.
Director
Statistics and Evaluation

Melissa Borts
Program Associate

Sandra Corbett
Program Associate

Ann Drobnis, Ph.D.
Director
Computing Community Consortium

Peter Harsha
Director
Government Affairs

Sabrina Jacob
Administrator

Brian Mosley
Policy Analyst

Ama Nyame-Mensah
Research Associate
Center for Evaluating the Research Pipeline

Erik Russell
Director
Programs

Shar Steed
Communications Specialist

Jane Stout, Ph.D.
Director
Center for Evaluating the Research Pipeline

Burçin Tamer, Ph.D.
Research Scientist
Center for Evaluating the Reserach Pipeline

Heather Wright
Research Associate
Center for Evaluating the Research Pipeline

Helen Vasaly Wright
Program Associate
Computing Community Consortium

* Above photo also includes Greg Hager (CCC Chair); Ama Nyame-Mensah and Burçin Tamer are not pictured.

COMMITTEES AND JOINT ACTIVITIES

CRA relies on the volunteers that serve on its committees, as well as its professional staff, to carry out its programs. CRA also participates in joint activities with other organizations.

CRA Committees

A. Nico Habermann Award

Center for Evaluating the Research Pipeline

Committee on Best Practices for Hiring, Tenure, and Scholarship

Committee on the Status of Women in Computing Research

Communications

Computing Community Consortium

Conference at Snowbird Organizing Committee

Deans Group

Distinguished Service Award

Education

Elections

Executive

Finance

Government Affairs

Membership

Surveys

Outstanding Undergraduate Researcher Award

CRA Joint Activities

the coalition to diversify computing

national center for women & INFORMATION TECHNOLOGY

COMPUTING IN THE CORE

LIST OF CRA COMMITTEE MEMBERS 2014-15

A. Nico Habermann Award

Anne Condon (University of British Columbia), chair
Jeanne Ferrante (UC San Diego)
Bobby Schnabel (Indiana University)

Center for Evaluating the Research Pipeline (CERP)

Steering Committee:
Jane Stout (CRA), director
Betsy Bizot (CRA)
Tracy Camp (Colorado School of Mines)
Joanne Cohoon (University of Virginia)
Jerlando Jackson (University of Wisconsin, Madison)
Kathryn McKinley (Microsoft Research)

Committee on the Status of Women in Computing Research (CRA-W)

Nancy Amato (Texas A&M University), co-chair
A. J. Bernheim Brush (Microsoft Research), co-chair
Deb Agarwal (Lawrence Berkeley National Laboratory)
Tracy Camp (Colorado School of Mines)
Sheila Castañeda (Clarke University)
Lori Clarke (University of Massachusetts-Amherst)
Joanne Cohoon (University of Virginia)
Andrea Danyluk (Williams College)
Dilma Da Silva (Texas A&M University)
Sandhya Dwarkadas (University of Rochester)
Carla Ellis (Duke University)
Maria Gini (University of Minnesota)
Susanne Hambrusch (Purdue University)
Julia Hirschberg (Columbia University)
Ayanna Howard (Georgia Tech)
Anna Karlin (University of Washington)
Patty Lopez (Intel)
Kathryn McKinley (Microsoft Research, University of Texas at Austin)
Gail Murphy (University of British Columbia)
Lori Pollock (University of Delaware)
Padma Raghavan (Pennsylvania State University)
Susan Rodger (Duke University)
Holly Rushmeier (Yale University)
Amanda Stent (Yahoo Labs)
Rebecca Wright (Rutgers University)

CRA Committee on Best Practices for Hiring, Tenure, and Scholarship

Fred B. Schneider (Cornell University), chair
Batya Friedman (University of Washington), co-chair
Lorenzo Alvisi (University of Texas, Austin)
David Culler (University of California, Berkeley)
Eric Grimson (Massachusetts Institute of Technology)
Mark D. Hill (University of Wisconsin, Madison)
Julia Hirschberg (Columbia University)
Benjamin Kuipers (University of Michigan)
Keith Marzullo (National Science Foundation and University of California, San Diego)
Tamer Özsu (University of Waterloo)
Frank Pfenning (Carnegie Mellon University)
Jennifer Preece (University of Maryland)
Eva Tardos (Cornell University)
Jennifer Widom (Stanford University)
Jeannette Wing (Microsoft Research)
Ellen Zegura (Georgia Tech)

Communications

Mary Fernández (MentorNet), chair
Susan B. Davidson (University of Pennsylvania)
Brent T. Hailpern (IBM Research-Almaden)
Greg Morrisett (Harvard University)

Computing Community Consortium (CCC)

Gregory Hager (Johns Hopkins University), chair
Elizabeth Mynatt (Georgia Institute of Technology), vice chair
Susan Graham (University of California Berkeley) chair emeritus
Lorenzo Alvisi (University of Texas at Austin)
Liz Bradley (University of Colorado-Boulder)
Randal Bryant (Carnegie Mellon University)
Susan Davidson (University of Pennsylvania)
Joseph Evans (University of Kansas)
Limor Fix (Intel)
Mark D. Hill (University of Wisconsin, Madison)
Vasant Honavar (Pennsylvania State University)
Ran Libeskind-Hadas (Harvey Mudd College)
Klara Nahrstedt (University of Illinois at Urbana-Champaign)
Tal Rabin (IBM)
Jennifer Rexford (Princeton University)
Debra Richardson (University of California-Irvine)
Daniela Rus (Massachusetts Institute of Technology)
Shashi Shekhar (University of Minnesota)
Bob Sproull (formerly Oracle)
Ross Whitaker (University of Utah)
Ben Zorn (Microsoft Research)

CRA Deans Group

CRA Deans Leadership:
Steven Miller (Singapore Management University), chair
Gary Marchionini (University of North Carolina at Chapel Hill), secretary
Greg Morrisett (Cornell University), CRA board representative

Distinguished Service Award

Lance Fortnow (Georgia Institute of Technology), chair
Peter Lee (Microsoft Research)
Margaret Martonosi (Princeton University)

Education (CRA-E)

Susanne Hambrusch (Purdue University), co-chair
Ran Libeskind-Hadas (Harvey Mudd College), co-chair
Eric Aaron (Vassar College)
Nancy Amato (Texas A&M, CRA-W, CRA board)
Andrew Bernat (ex officio CRA)
Corinna Cortes (Google Research, CRA board)
Amy Czismar Dalal (Carleton College)
Felicia Doswell (Norfolk State University, NCWIT)
Michael Ernst (University of Washington)
Jeff Forbes (Duke University)
Jean-Luc Gaudiot (UC Irvine, CRA board, IEEE)
Rajiv Gandhi (Rutgers Camden)
Takis Metaxas (Wellesley College)
Lori Pollock (University of Delaware, CRA-W)

Elections

J Strother Moore (University of Texas, Austin), chair
Kathryn McKinley (University of Texas, Austin)
Fred Schneider (Cornell University)

Executive

J Strother Moore (University of Texas, Austin), chair
Laura Haas (IBM Almaden Research Center), vice chair
Ronald Brachman (Yahoo Labs), treasurer
Susan B. Davidson (University of Pennsylvania), secretary
Julia Hirschberg (Columbia University), appointed member

Finance

Ron Brachman (Yahoo Labs), chair
Phil Bernstein (Microsoft Research)
Greg Morrisett (Harvard University)

Government Affairs

Fred Schneider (Cornell University), chair
Ed Lazowska (University of Washington), co-chair
Jeff Vitter (University of Kansas), co-chair
Sarita Adve (University of Illinois)
Annie Antón (Georgia Institute of Technology)
David Bader (Georgia Institute of Technology)
Wayne Bennett (ECEDHA)
George Cybenko (Dartmouth College)
Mary Fernández (MentorNet)
James Foley (Georgia Institute of Technology)
Jeff Hollingsworth (University of Maryland)
Mary Jane Irwin (Pennsylvania State University)
Bob Kahn (CNRI)
Sid Karin (UC San Diego)
John King (University of Michigan)
Dan Reed (University of Iowa)
Bobby Schnabel (Indiana University)
Marc Snir (University of Illinois, Urbana-Champaign)
Eugene H. Spafford (Purdue University)
Valerie Taylor (Texas A&M University)
David Tennenhouse (Microsoft Research)
Jeannette M. Wing (Microsoft Research)

Membership

Sarita Adve (University of Illinois, Urbana-Champaign), co-chair
Mary Czerwinski (Microsoft Research), co-chair

Outstanding Undergraduate Researcher Award

This award is managed by the CRA Education Committee. The 2015 selection committee:
Tom Wexler (Oberlin College), chair
Eric Aaron (Vassar College)
Jeffrey Forbes (Duke University)
James Geller (New Jersey Institute of Technology)
Lori Pollock (University of Delaware)
John Reppy (University of Chicago)
Lydia Tapia (University New Mexico)

Surveys

Stu Zweben (Ohio State University), chair
Carla Brodley (Tufts University)
Susanne Hambrusch (Purdue University)
Valerie Taylor (Texas A&M University)