

# 2013

## Diversity Fueling Excellence in Research and Innovation: A Roadmap for Action for North America



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- Consejo Nacional de Ciencia y Tecnología, México (CONACYT),
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- The Canadian Institutes of Health Research (CIHR), and
- Portia Ltd in the UK, in Association with the European Commission

### ***Gender Summit 3 – North America Planning Committee***

Isabelle Blain, Vice-President Research Grants and Scholarships, Natural Sciences and Engineering Research Council of Canada (NSERC), Canada

Nancy Cantor, Chancellor, Rutgers University-Newark, USA (former Chancellor and President, Syracuse University)

Janine Austin Clayton, MD, Director, Office of Research on Women's Health (ORWH), National Institutes of Health, USA

Mary Anne Colin, Deputy Director of the Bureau for Cooperation Mexico-European Union in Science, Technology and Innovation, Consejo Nacional de Ciencia y Tecnología, México (CONACYT)

Joy Johnson, Scientific Director of the Institute of Gender and Health (IGH), Canadian Institutes of Health Research (CIHR), Canada

Kelly Mack, Vice President for Undergraduate Science Education and Executive Director, Project Kaleidoscope, Association of American Colleges and Universities, USA

Elizabeth Pollitzer, Director, Portia Ltd – genSET, UK

Betty Shanahan, Executive Director & Chief Executive Officer, Society of Women Engineers (SWE), USA

Jessica Urueta Quiroz, Project Officer, Bureau for Cooperation Mexico-European Union in Science, Technology and Innovation, Consejo Nacional de Ciencia y Tecnología, México (CONACYT)

Wanda E. Ward, Head, Office of International and Integrative Activities, National Science Foundation, USA (Chair)

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# Gender Summit 3 – North America: Highlights and Roadmap

December 2013

## Executive Summary

The rapidly growing global focus on innovation through Research and Development (R&D) and the growth of an increasingly interconnected world economy (NSB 2012) necessitate the development and advancement of a more effective and diverse population of scientists and engineers. A wider and more varied pool of ideas is needed to boost creativity and innovation and to produce better science and better technologies. Gender Summit 3 – North America was the third in a series of Gender Summits, initiated in Europe in 2011, that provided a forum for engaging top-level researchers, policy makers, science and innovation leaders, and other stakeholders in science, technology, engineering, and mathematics (STEM) to address gender issues in research and innovation. The aims of the 3rd Gender Summit, which was held on November 13-15, 2013 in Washington DC, were to: create an innovative, comprehensive, evidence based framework of transformative opportunities in STEM that is responsive to the needs of both women and men; demonstrate quality evidence of how incorporating the gender dimension into STEM research and innovation contributes to excellence and maximizes capacity to address societal challenges; expand and transform the Gender Summit into a global forum for collaborative dialogue; share solutions on how to incorporate the gender dimension in research methods, institutional structures, funding structures and peer review processes; and foster an inclusive cross-disciplinary, multi-sector community of experts to address common gender issues in science.

This Roadmap for Action for North America, which emerged from the participation of a diverse group of national and international experts and stakeholders at the Gender Summit, demonstrates through evidence the need for action, lays out what actions to take with commitment shared among the relevant sectors and organizations to implement them, and serves as a model for developing similar roadmaps in other regions. It is hoped that this roadmap will result in positive and lasting change towards greater diversity in the STEM workforce and leadership and greater inclusion of the “gender dimension” in research content and process.

A consensus on five priority areas for action emerged from the many presentations and discussions through the course of the three-day summit: Policy Context; Research Context: Content; Research Context: Process; Human Capital Development and Advancement; and Multinational Collaboration: Current and Future. These priority areas form the basis for the roadmap to action, which aims to promote diversity of researchers and improve intellectual capacity to spur innovation and produce better science.

### Policy Context

Targeted, broad, and transparent policies that eliminate gender bias and gender discrimination in STEM careers, improve career-life balance, and provide funding support for women in STEM areas are integral to maximizing the role of STEM in society and in maintaining global competitiveness and collaboration. Policies established by key and diverse stakeholders (funding agencies, regulatory agencies, universities, industry, and others) can promote greater diversity in hiring and promotion, ensure greater fairness in peer review and in advancement, and reduce attrition. Although some stakeholders have established gender equity policies with proven benefits, too often accountability measures are nonexistent, or the scope of the policies is too narrow, inadequate, or not sufficiently disseminated to those who implement them or those who would benefit from them.

Key actions proposed include:

- ***Work toward the elimination of gender discrimination in STEM employment practices, funding and support by including gender as part of strategic planning and by focusing on policy enforcement and revision as well as establishing new policies;***
- ***Share successful policies that promote gender equity/equality in STEM; and***
- ***Share specific mechanisms for implementing successful policies with fidelity, precision and accuracy.***

## Research Context: Content

Increased diversity in STEM is critical for better research, new ideas, and an improved knowledge base. Historically STEM research was conducted without much regard for sex (biological differences) or gender (socio-cultural differences between men and women), or the interaction between these and the environmental effects. An implicit assumption was that men and women reacted or responded similarly whether in clinical trials or other research protocols. This assumption produced flawed research results that were potentially wasteful, costly, or harmful. Despite some progress, there is still little discussion of sex or gender in research areas surrounding major societal challenges for the 21<sup>st</sup> century: biomedical, environmental, climate change, food security, and transportation research. Including the “gender dimension”, i.e., sex and gender, in research is critical for the advancement of knowledge and for eliminating the gender bias in study design and results, which can disadvantage both men and women. The resulting sex and gender bias in research limits creativity and is expensive in terms of both human and financial terms.

Key actions proposed include:

- ***Advance scientific knowledge and eliminate gender bias in knowledge production and application through including the gender dimension in study design, analysis and reporting; and***
- ***Incorporate the gender dimension (as well as dimensions of intersectionality related to race, age, and other relevant factors) in exposure regulations (that is regulations relating to environmental exposure to hazardous materials).***

## Research Context: Process

Expanding the variety of people who participate in research leads to a greater richness of ideas about how research problems are defined, prioritized and solved. Different communication styles, problem solving styles, and experiences expand possible intellectual perspectives, diversity of thought, and opportunity for innovation. Improving the research process requires reducing or eliminating bias, increasing interdisciplinarity, increasing emphasis on team work, and recognizing and embracing differences in reasoning, collaboration, and communication styles.

Key actions proposed include:

- ***Promote diversity of thought through adopting common practices and guidelines within and across institutions, establishing checks and balances to identify and reduce bias, and collecting data to monitor outcomes; and***
- ***Transform institutional practices and processes to achieve better and more innovative research cultures through fostering community and belonging and creating threat-free environments.***

## Human Capital Development and Advancement

A diverse STEM workforce, drawing on the ideas and talents of all members of society, is critical for expanding our pool of knowledge in STEM through boosting creativity in research and innovation. Inclusion of all members of society in the scientific research enterprise is necessary not only for equity but because it widens the pool of talent, increases innovation and group performance, and increases business performance. Yet, women are severely underrepresented in many STEM fields, particularly engineering, physics, and computer sciences and they are underrepresented in the highest positions in academia and industry.

University policies for recruitment, hiring, retention, tenure, and promotion are often not gender or race neutral and women faculty, especially women faculty of color, are not tightly integrated into the academic social structures, particularly in STEM disciplines. Eliminating implicit bias, establishing career-life balance policies, and promoting mentoring and networking are proven strategies for increasing diversity, promoting professional development and effectiveness, and enhancing research productivity.

Key actions proposed include:

- ***Increase the diversity of people and ideas at the highest levels of the STEM enterprise by establishing and promoting policies that attract, retain and advance men and women in STEM;***
- ***Develop a world-class STEM talent pool for transformative discoveries, learning and innovating by providing men and women with the same opportunities to do scientific work and have time for family life; and***
- ***Ensure diverse future leadership through cultivating and promoting early and mid-career STEM talent.***

### **Multinational Collaboration: Current and Future**

Collaborative efforts from North America and Europe could strengthen human capital development and mobility, research, and innovation through gender diversity. A collaborative approach would help ensure a sustained strategy of increased support and actions for advancing the gender dimension agenda with greater impact for addressing today's global challenges.

Key actions proposed include:

- ***Develop a jointly-funded and jointly-administered initiative—the Gender-Focused Multi-national Collaboration (GFMC)— involving the US, Europe, Canada, and Mexico that includes the gender dimension in four major areas of the scientific enterprise: human capital development, scientific research and innovation, institutional transformation, and STEM stewardship ;***
- ***Maintain the GS3 Social Network as a vehicle for community building and engagement;***
- ***Partner internationally to advance greater diversity in STEM through future Gender Summits;***
- ***Foster multinational opportunities for other countries to meaningfully participate in/host future Gender Summits;***
- ***Include or make available data with the diversity perspective, such as the Latin America perspective; and***
- ***Promote the participation of other regions of the world.***

For further information on Gender Summit 3 – North America, including a conference report summarizing the results of the conference, the agenda, powerpoints, video recordings, and photos see <http://www.nsf.gov/od/iaa/activities/gendersummit/>.

## **Gender Summit 3 – North America: Highlights and Roadmap**

### **December 2013**

#### **Background**

The rapidly growing global focus on innovation through R&D and the growth of an increasingly interconnected world economy (NSB 2012) necessitate the development and advancement of a diverse population of scientists and engineers. More diverse ideas and perspectives are needed to boost creativity and innovation and produce better science and better products. Gender Summit 3 – North America was the third in a series of Gender Summits initiated in 2011. The Gender Summits provide a forum for engaging top-level researchers, policy makers, science and innovation leaders, and other stakeholders in science, technology, engineering, and mathematics (STEM) to address gender issues in research and innovation. The aims of the 3rd Gender Summit, which was held on November 13-15, 2013 in Washington DC, were to:

- Develop a collective commitment and capacity to strengthen human capital development, research and innovation through diversity, by creating an innovative, comprehensive, and evidence-based framework of transformative opportunities that is responsive to the needs of both women and men;
- Demonstrate quality evidence of how incorporating the gender dimension into STEM research and innovation contribute to excellence and maximize capacity to address societal challenges ;
- Expand and transform the Gender Summit into a global-level forum for collaborative dialogue and activities focused on shaping science and society through the inclusion of the gender dimension in research, innovation, and markets for science knowledge;
- Share solutions on how to incorporate the gender dimension in research methods, institutional structures, funding structures and peer review processes; and
- Maximize national and international capacity to address common and diverse societal challenges by fostering an inclusive community of influential experts—cross-disciplinary, government, industry, academic, and citizen partnerships.

The Gender Summit brought together a diverse group of national and international experts and stakeholders from various sectors and organizations to discuss new perspectives emerging from studies of sex and gender differences and how they create opportunities to be specific about what it means for science to incorporate the “gender dimension,” that is, to show that the study design has taken into account the needs of both women and men as equally important. The benefits are considerable, not only for the quality and outcomes of research, but also for new opportunities to apply research findings to create new markets for science knowledge.

The meeting began on Wednesday with welcoming statements from European leaders and a keynote address by Valerie Jarrett, Senior Advisor to President Barack Obama and Chair of the White House Council on Women and Girls. Dr. Jarrett emphasized the president’s commitment to the issue of women and girls in STEM and the need to increase the number of women in STEM, not just because it is right, or that the President has deemed it a priority, but also because of the power of women to unlock the full potential of our economy. A plenary session followed in which leaders of major science organizations in the US, Europe, Canada, and Mexico addressed the steps being taken by their respective organizations to increase diversity and agreed on the need and value of collaboration to address these issues. In later sessions, STEM leaders from the US, Europe, Mexico and Canada discussed the need for joint policy actions and criteria needed to boost the benefits of diverse and gender-responsive scientific and technical education and access to knowledge. In other sessions, scientists from the US, Europe, Mexico and Canada discussed how consideration of gender issues in research and innovation content can improve knowledge production, application, and reporting, with increased benefits for both science and science policy.

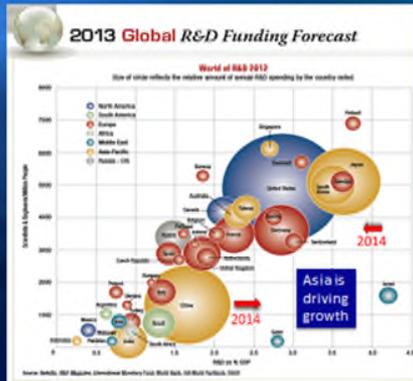
On Thursday and Friday, breakout sessions were organized around two main areas: diversity in participation and the gender dimension in research. Within each of these two areas, sessions presented issues and evidence-based data from a wide variety of disciplines, countries and employers; best practices sessions provided examples, approaches and methods that have already been implemented and could be adopted more widely; and roadmap development sessions built on the evidence available to develop roadmaps for action.

A consensus involving five priority areas for action emerged from the many presentations and discussions throughout the course of the three days of the summit:

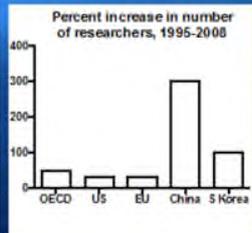
- Policy Context—the need to ensure the elimination of gender discrimination in STEM employment practices, career-life balance, funding and support;
- Research Context: Content—the need to include the “gender dimension” (as well as age, race/ethnicity, socioeconomic status, disability status) in research;
- Research Context: Process—the need to include women’s issues and concerns as they relate to agency practices (e.g., merit review) and decision-making (being aware that there are different perspectives);
- Human Capital Development and Advancement—the need to establish and promote programs and policies designed to encourage and sustain women’s participation in STEM education and employment; and
- Multinational Collaboration: Current and Future—the need to agree to share resources for addressing gender imbalance and to devise forward-looking strategies for a more inclusive scientific enterprise.

These priority areas form the basis for the roadmap to action. The value of this roadmap is most compelling when placed in a global context. See the following three graphics that reflect the urgency of the actions proposed in the roadmap.

### R&D Expenditures and Workforce Growth by Country



### The Global S&E Labor Force is Growing and Moving

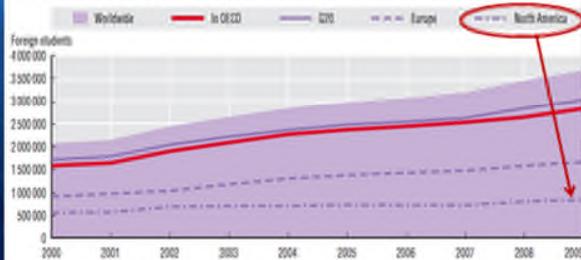


- \* In 2009, 25% of U.S. S&E workers were foreign-born
- \* 42% of doctorate holders in U.S. S&E jobs were foreign-born
- \* US share of global international students dropped from 25% to 20% between 2000-2009
- \* US students disproportionately go to English-speaking countries

Science & Engineering Indicators 2012

### North American Student Mobility is Flat

Figure 1.30. Evolution in the number of students enrolled outside their country of citizenship (2000, 2009)  
 This figure shows the growth of foreign tertiary student enrolment, by regional grouping, over the past nine years.



Source: OECD (2011), Education at a Glance 2011, Table C3.5, available at <http://dx.doi.org/10.1787/888931464543>.

## Diversity Fueling Excellence in Research and Innovation: A Roadmap for Action for North America

A goal of Gender Summit 3 – North America was to devise a Roadmap for Action for North America that would serve as a model for developing similar roadmaps in other regions. The essence of this model is to demonstrate, through evidence, the need for action and then to establish consensus about what actions to take with commitment shared by the relevant sectors and organizations to implement them. It is hoped that this roadmap will result in positive and lasting change toward greater diversity in the STEM workforce and leadership and greater inclusion of the “gender dimension” in research content and process. For further information on Gender Summit 3 – North America, including a conference report summarizing the results of the conference, the agenda, powerpoints, video recordings, and photos see <http://www.nsf.gov/od/iia/activities/gendersummit/>.

### Priority Areas for Action:

#### 1. Policy Context

Targeted, broad, and transparent policies that eliminate gender bias and gender discrimination in STEM careers, improve career-life balance, and provide funding support for women in STEM areas are integral to enhancing the scope of STEM in advancing society and maintaining global competitiveness. Policies established by diverse stakeholders (funding agencies, regulatory agencies, universities, industry, and others) can promote greater diversity in hiring and promotion, ensure greater fairness in peer review and in advancement, and reduce attrition. For example, in the United States vigorous enforcement of Title IX of the US Civil Rights Act (that prohibits discrimination on the basis of sex in any education program or activity receiving federal financial assistance) and its regulatory provisions is critical to the twin goals of creating greater gender diversity in STEM programs and effecting positive change in STEM environments (Manuel 2013). Although some stakeholders have established gender equity policies with proven benefits, too often accountability measures are nonexistent, and the scope of the measures is narrow, inadequate, or not sufficiently disseminated to those who implement them or those who would benefit from them.

Based on the evidence presented, key actions were identified for various stakeholders:

- ***Work toward the elimination of gender discrimination in STEM employment practices, funding and support by including gender as part of strategic planning and by focusing on policy enforcement and revision as well as establishing new policies;***
- ***Share successful policies that promote gender equity in STEM; and***
- ***Share specific mechanisms for implementing successful policies with fidelity, precision and accuracy.***

Short term goals/actions (1-3 years)	Target Stakeholders
Enforce compliance with <b>Title IX</b> of the US Civil Rights Act (that prohibits discrimination on the basis of sex in any education program or activity receiving federal financial assistance) and other gender equality legislation in the US and elsewhere and enable universities to establish institutional structures and organizational practices to facilitate compliance .	Federal agencies and Universities in collaboration with each other
Create <b>partnerships</b> between funding agencies and universities to establish, implement, and disseminate broad and transparent family-friendly policies for faculty, graduate students, and postdocs.	Funding agencies and Universities in collaboration with each other
Establish <b>institution-wide and cross-sector policies</b> ensuring diversity in and training for search, selection, and evaluation committees to reduce bias.	Employers in all sectors in collaboration with each other

Establish institution-wide policies for <b>training peer reviewers</b> to reduce bias, for ensuring diversity in review panels, and for monitoring success rates.	Funding agencies
<b>Medium term goals/actions (3-5 years)</b>	<b>Target Stakeholders</b>
Develop an <b>international network</b> to address emerging international scientific frontiers and international academies to help inform policies related to gender equality.	Funding agencies and Employers in all sectors in collaboration with each other
Strengthen <b>partnerships</b> with networks of public universities and also networks between universities and federal agencies as well as private philanthropic foundations to impact STEM training, and science policy.	Funding agencies, Universities, Industry in collaboration with each other
Create an international model of <b>career-life balance</b> that can be shared.	Funding agencies, Universities, Industry, Other stakeholders in collaboration with each other

## 2. Research Context: Content

Increased diversity in STEM is critical for better research, new ideas, and an improved knowledge base. Historically STEM research was conducted without much regard for sex (biological differences) or gender (socio-cultural differences between men and women), and the interactions between them and the environmental factors. An implicit assumption was that men and women reacted or responded similarly whether in clinical trials or other research protocols. This assumption resulted in flawed research results that were potentially wasteful, costly, or harmful. For example, a recent systematic review of effects of statins in treating cardiovascular disease concluded that statins are safe and effective, but the review did not take into account factors such as race, socioeconomic status and sex that might influence how statins work. A different analysis showed that statins are not necessarily effective in women without previous cardiovascular disease (Phillips 2013).

Despite some progress, there is still little discussion of sex or gender in research, including in areas surrounding major societal challenges for the 21<sup>st</sup> century: biomedical, environmental, climate change, food security, and transportation research. Panelists presented research on the importance of including the gender dimension in these areas.

Biomedical research. In health research, although women have been somewhat equitably included in clinical trials for the past 10 years or so, there is still little consideration or analysis and inadequate reporting of sex or gender differences in biomedical research or in research training leading to adverse health outcomes for men and women.

Environmental research. Presenters stressed the need to promote study designs that combine social, biological and environmental health determinants from the gender perspective. Exposure to environmental pollutants is often linked to social factors such as poverty or biology (for example, the impact exposure has on development of the child’s nervous system) but research and regulations often ignore the interactions among social, biological and environmental health. For example, environmental exposure regulations in the US are based on a “Reference Man” (white, male, low weight), but environmental exposure depends greatly on age and gender (children, girls and women are at greater risk), and exposure has social as well as biological effects.

Climate change. In the field of climate change, studies do not typically incorporate the interrelatedness of natural and social systems, which is necessary to understand how and who are involved in activities that lead to climate change. Further studies do not typically look at the differential impacts of climate change on men and women and how they are mediated by a host of other sociocultural, economic, ecological, and political factors (Goh 2013).

Food security. Including the gender dimension in agricultural and horticultural research can lead to greater food security. In agriculture, men are often assumed to be the head of the household and the landowner. Understanding the property ownership and decision-making of women can lead to better education and better

land use policies. In horticulture, understanding sexual dimorphism in plants can lead to better horticultural practices, for example more effective hybrid seed production (Schulz 2013).

Transportation research. In the transportation field, gender is not always considered in studies evaluating transportation safety, injury/death data, or transportation trends/behaviors. For example, airbags originally designed for a 175 lb. man resulted in airbags that were harmful or useless for much of the population.

Including the “gender dimension”, i.e., sex and gender, in research is critical for the advancement of knowledge and for eliminating the gender bias in research, which disadvantages both men and women. The resulting sex and gender bias in research is expensive in terms of lives, costs, and pain and it limits creativity and innovation.

Based on the evidence presented, key actions were identified for various stakeholders:

- **Advance scientific knowledge and eliminate gender bias in knowledge production and application through including the gender dimension in study design, analysis and reporting.**

Short term goals/actions (1-3 years)	Target Stakeholders
Conduct studies that incorporate gender into each step of the <b>scientific process</b> , which will lead to a greater understanding of gender differences and similarities in research areas. As part of this, researchers should report null findings in sex differences.	Researchers
Generate awareness of the rationale for collecting and including <b>sex-disaggregated data</b> in scientific research in order to start shifting the mind set and producing higher quality scientific results.	Journal editors
Integrate <b>gender studies</b> and results of <b>gendered innovations</b> into the STEM curriculum.	Universities
Medium term goals/actions (3-5 years)	Target Stakeholders
Establish systems for researchers to include the <b>gender dimension in research</b> .	Funding agencies and Universities
Require sex and <b>gender analyses in publications</b> .	Journal editors
Bring current generations of researchers up to date in <b>methods of sex/gender analyses</b> .	Universities
Provide <b>products and systems</b> that incorporate gender.	Industry
In <b>agricultural research</b> , incorporate the gender dimension in household surveys and do not assume that only one person is the landholder and decision maker.	Researchers
Collect gender disaggregated data for programs aimed at enhancing <b>food security</b> through technological change in agriculture, adaptation to climate change etc.	Researchers
Collect and report data on the impacts of <b>climate change</b> on the daily lives of women farmers in Africa, given that extreme weather events are likely impacting the quantity and quality of already scarce drinking water sources.	Researchers
Conduct literature reviews of reports related to incorporating <b>women’s health</b> into curricula (i.e., medicine, baccalaureate nursing, dental, pharmacy, and public health).	Researchers
Create recommendations to address <b>interprofessional learning</b> in women’s health.	Funding agencies
Develop implementation strategies for women’s <b>health curricula</b> .	Funding agencies

Formulate a <b>dissemination</b> plan to share content on women’s health curricula with key stakeholders and education professionals.	Funding agencies
<b>Long term goals/actions (5-10 years)</b>	<b>Target Stakeholders</b>
Develop more robust <b>research methods</b> that identify the mechanisms of sex differences and the interactions of biological and socio-cultural mechanisms to explain sex and gender differences.	Researchers
Perform more conceptual work and collect more data on women’s vulnerability to <b>climate change</b> : in which contexts; which groups of women by age/race/ethnicity; to which environmental risks, when and who are able to be part of the solution/transition; when and who resist environmental solutions.	Researchers
Conduct research on how we can empower <b>women farmers</b> across the world in an increasing globalized agricultural system that promotes larger farms, how can we scale up the numerous successful small scale projects to make sure that a greater portion of women farmers and their families are protected from frequent pesticide exposure in Latin America and Asia.	Researchers
Use their global influence as gatekeepers to <b>improve the standards of living</b> for populations across the world and increase their access to basic needs through fostering partnerships that include different perspectives.	Professional organizations

- ***Incorporate the gender dimension (as well as dimensions of intersectionality related to race, age, and other relevant factors) in exposure regulations (that is regulations relating to environmental exposure to hazardous materials). In some fields, for example environmental research, regulations are based on “reference man”, i.e., white, male, low weight.***

<b>Short term goals/actions (1-3 years)</b>	<b>Target Stakeholders</b>
Gather existing evidence on differences by sex and explore ways to <b>revise regulations</b> to incorporate the gender dimension (as well as race, age, and other relevant factors).	Regulatory agencies
<b>Medium term goals/actions (3-5 years)</b>	<b>Target Stakeholders</b>
Develop methods for combined <b>risk assessment</b> , based on social, biological, and environmental factors.	Researchers
Get rid of the concept of “ <b>reference man</b> ” and base, for example, exposure regulations on risk by gender, age, etc.	Regulatory agencies

### 3. Research Context: Process

Different communication styles, problem-solving styles, and experiences expand possible intellectual perspectives and opportunity for innovation and foster creativity in how research problems are defined, prioritized and solved. Improving diversity in the research process requires reducing or eliminating bias, increasing interdisciplinarity, increasing emphasis on team work, and recognizing and embracing differences in reasoning, collaboration, and communication styles. These changes in the research process require changes in institutional cultures from the outside in (Cantor 2013).

Women are chronically underrepresented in the workplace and experience gender bias as well as unequal institutional practices and policies that inhibit their careers. Further, their underrepresentation reinforces negative perceptions of women, and particularly women of color, exacerbating bias (Schmader 2013, Thomas 2013). Implicit bias as well as male-centric research practices, processes, and cultures, ineffective networks and mentoring, and miscommunication often hinder the participation of women in STEM. Implicit bias is particularly important in peer review as peer review forms the most important component of effective science making. Gender Summit participants argued for the need for more effective, accurate and fair assessment of women and men in science, including their roles and work at different stages of their career and reflecting the needs of different disciplines and cultures.

Greater fairness in the STEM research process can also be promoted through increased awareness of gender differences in communication. Participants argued for the need for more research surrounding questions such as: Do men and women communicate differently? And does the public perceive communication by men and women differently? There is a need for greater and more effective, accurate and unbiased discussion, presentation and communication of gender roles and identities.

Based on the evidence presented, key actions were identified for various stakeholders:

- **Promote diversity of thought through adopting common practices and guidelines within and across institutions, establishing checks and balances to identify and reduce bias, and collecting data to monitor outcomes.**

Short term goals/actions (1-3 years)	Target Stakeholders
Arrange a consultation session at the next Gender Summit where funding agencies present data, describe their <b>bias-mitigating processes</b> , and invite feedback and advice.	Funding agencies
Collect data to monitor outcomes and detect <b>bias</b> .	Universities, Industry, Other employers
Educate to increase <b>awareness of bias</b> .	Funding agencies, Universities, Industry, Other employers
Mitigate <b>bias in peer review</b> .	Funding agencies
Medium term goals/actions (3-5 years)	Target Stakeholders
Conduct research to understand the extent and nature of <b>bias in peer review</b> .	Researchers
Ensure <b>accountability</b> and institute checks and balances to enable compensation for biases.	Universities, Industry, Other employers
Long term goals/actions (5-10 years)	Target Stakeholders
Change the <b>culture of STEM disciplines</b> , by recognizing gender/sex biases, avoiding stereotyping; and paying attention to disparities in cultural, ethnic, and LGBT communities.	Universities, Industry, Other employers
Revise concepts of <b>merit</b> and success through adopting the concept of merit related to opportunity and better recognition of non-traditional types of service (incentivize and legitimize time spent mentoring).	Universities, Industry, Other employers
Ensure meritocratic systems so that women are not judged less able, less deserving, less valuable than men and eliminate the <b>merit gap</b> between men and women in STEM faculty.	Universities, Industry, Other employers

- **Transform institutional practices and processes to achieve better and more innovative research cultures through fostering community and belonging and creating threat-free environments.**

Short term goals/actions (1-3 years)	Target Stakeholders
Conduct research on the influences of social context on <b>male/female interactions</b> and identify the psychological aspects of these interactions.	Researchers
<b>Partner</b> with organizations that have expertise in expanding opportunities for women.	Universities, Industry, Other employers
Promote <b>employee-led initiatives</b> as well as insight groups to provide recommendations to management.	Universities, Industry, Other employers
Conduct research to understand the differences in <b>communication styles</b> that exist between men and women.	Researchers
Support and advocate for <b>interdisciplinary collaboration</b> .	Universities, Industry, Other employers
Medium term goals/actions (3-5 years)	Target Stakeholders
Foster <b>community and belonging</b> and create threat-free environments.	Universities, Industry, Other employers
Develop K-12 efforts to increase diversity in STEM by promoting <b>team-based, problem-based learning environments</b> .	Universities, Industry, Other employers
Institute <b>common practices and guidelines</b> within and across institutions.	Universities, Industry, Other employers
Provide training in recognizing and minimizing <b>cues to threat</b> .	Universities, Industry, Other employers
Empower women to establish <b>boundaries</b> , ask for what they want, and be proactive.	Universities, Industry, Other employers
Long term goals/actions (5-10 years)	Target Stakeholder
Enhance <b>open access</b> of science and data through networking, collaboration, improved technology transfer, access to scholarly publications, worldwide statistics.	Funding agencies
Recognize the <b>merit of broadening participation</b> activities—end siloing of research, teaching and service.	Universities, Industry, Other employers
Revisit and broaden definitions of research and service to allow recognition of a <b>diversity of approaches</b> .	Universities, Industry, Other employers

#### 4. Human Capital Development and Advancement

A diverse STEM workforce, drawing on the ideas and talents of all members of society, is critical for expanding our pool of knowledge in STEM through boosting creativity in research and innovation. Inclusion of all members of society in the scientific research enterprise is necessary not only for equity but because it widens the intellectual capacity, increases innovation and group performance, and leads to better business performance. Yet, women are

severely underrepresented in many STEM fields, particularly in engineering, physics, and computer science and they are in a minority in the highest positions in academia and industry.

University policies for recruitment, hiring, retention, tenure and promotion, and tenure clock are often not gender or race neutral and women faculty, especially women faculty of color, are not tightly integrated into the academic social structures, especially in STEM disciplines. Eliminating implicit bias, establishing career-life balance policies, and promoting mentoring and networking are proven strategies for increasing diversity, promoting professional development and effectiveness, and enhancing research productivity. These strategies, though, need to have broad input, be institution-wide, involve procedures for accountability, and involve administration at the highest levels.

Implicit bias limits women's choices to pursue STEM education and it limits their advancement in STEM careers. Journal editors, employers, tenure committees and advisors may harbor implicit biases of which they may not be aware, but which nevertheless contribute to unequal treatment of men and women. For example, research on implicit bias, in which identical resumes for a lab manager position were randomly assigned male or female names and were then given to science faculty to evaluate, showed that male and female faculty judged a female student to be less competent, less hireable, and the average starting salary offered was \$4,000 less than a male student with the same resume (Handelsman 2013).

Implicit (or explicit) bias has a racial/ethnic dimension as well as a gender dimension. University policies for recruitment, hiring, retention, tenure and promotion are often not gender or race neutral, and women faculty, especially women faculty of color, are not tightly integrated into the academic social structures, especially in STEM disciplines. Research shows that women's likelihood of sexual harassment increases as their level of representation decreases. Women of color report significantly more racial and sexual harassment than any men or white women (Thomas 2013).

In addition to bias, lack of career and life balance often leads early career women, who are at the peak of their childbearing years, to drop out of STEM. The NSF ADVANCE program funds projects that aim to develop systemic approaches to increase the representation and advancement of women in STEM faculty positions at universities. Several examples of ADVANCE awards that implemented career-life balance initiatives were discussed at the summit. At Washington State University, faculty surveys showed that besides child care, the university needed to address other work-life issues such as elder care and back-up care needs and that faculty were not often aware of existing policies. Even though many academic institutions have formalized policies in place for supporting employees through elder care and dependent care responsibilities, information about the policies is not effectively communicated to the departments and the faculty. Career-life balance policies are a great tool to recruit, retain, and advance women faculty in STEM. But, even when career-life balance programs are available for faculty, they are not always available for postdocs or graduate students. Extending career-life balance benefits/programs to postdocs and graduate students would help retain women in the STEM pipeline. Dual career families are also a challenge. The number one reason women refuse an offer of employment is because their partner was not offered an appropriate employment opportunity at the same location (Silver 2013).

Several presentations at the summit noted that to increase diversity in STEM, we need to cultivate and promote future leaders through mentoring and networking. Mentoring is beneficial—thousands of research publications serve as evidence for the importance of and effects of mentorship; and research literature shows that mentoring positively affects satisfaction, persistence, advancement, salary and a sense of belonging. Creating and sustaining networks is also important for professional development and effectiveness. Networking promotes diversity and enhances research productivity. It builds social capital and provides access to tacit knowledge and is important for implementation of diversity objectives in research and innovation policies. The value of networking is proven for both institutions and individuals.

Based on the evidence presented, key actions were identified for various stakeholders:

- ***Increase the diversity of people and ideas at the highest levels of the STEM enterprise by establishing and promoting policies that attract, retain and advance men and women in STEM.***

Short term goals/actions (1-3 years)	Target Stakeholders
Make diversity integral to the whole process of <b>hiring</b> . It has to be included in financial planning. It has to be reflected in the way colleges and departments interact and in the way administrators develop policies.	Universities, Industry, Other employers
<b>Partner</b> with organizations that have expertise in expanding opportunities for women.	Universities, Industry, Other employers
Provide opportunities for acquiring career-enhancing <b>technical competencies</b> .	Industry, Other employers
Expand <b>internship programs</b> in lieu of interviews and use internship programs to help firms achieve their diversity goals.	Industry, Other employers
Ensure that the <b>recruiting team</b> mirrors the types of employees that the employer would like to attract. A diverse set of recruiters will attract a diverse group of hires.	Universities, Industry, Other employers
<b>Cluster hire</b> . Instead of hiring an individual, universities can consider hiring an individual along with someone from their professional network, which makes employees more socially related and thus increases productivity and employee retention.	Universities, Industry, Other employers
Reduce the number of steps required to hire an individual, which will also reduce the amount of bias that goes into the <b>selection process</b> .	Universities, Industry, Other employers
Utilize the dynamics of <b>informal networking</b> in the hiring process. Individuals are more likely to refer someone from their same gender and for positions in their own firms. Thus, encouraging individuals from underrepresented groups to refer job candidates can increase the diversity of a candidate pool.	Universities, Industry, Other employers
Medium term goals/actions (3-5 years)	Target Stakeholders
Collect better <b>statistics</b> on people in early career stages—especially postdocs.	Researchers
Create <b>re-training/re-entry</b> research based schemes for universities to follow.	Funding agencies
Support and advocate for <b>interdisciplinary collaboration</b> .	Funding agencies, Universities
Include diversity in <b>university rankings</b> .	Various ranking entities
Long term goals/actions (5-10 years)	Target Stakeholders
Enhance <b>open access</b> of science and data through networking, collaboration, improved technology transfer, access to scholarly publications, worldwide statistics.	Funding agencies

- **Develop a world-class STEM talent pool for transformative discoveries, learning and innovating by providing men and women with the same opportunities to do scientific work and have time for family life.**

Short term goals/actions (1-3 years)	Target Stakeholders
Improve <b>funding</b> support for early career women and programs that better facilitate career (and life) transitions (e.g., parental leave, benefits, stopping the tenure clock).	Universities, Funding agencies

Promote broad and transparent <b>career-life balance</b> policies within and across institutions.	Funding agencies, Universities, Industry, Other employers
Implement institution-wide <b>dual hire policies</b> , adopt a career services approach to faculty hiring, and utilize existing networks to place partners in local positions.	Universities
<b>Medium term goals/actions (3-5 years)</b>	<b>Target Stakeholders</b>
Develop and implement institution-wide policies that support women at various stages throughout the <b>career path</b> . Understand the issues at every level (e.g., early career, mid-career, late career), prepare women to be successful, involve other experts/partners, appropriate funding and staff, recognize life issues that take time away from the career in addition to or other than childcare (e.g., religion, health) and create ways to transition back.	Universities, Industry, Other employers

- **Ensure diverse future leadership through cultivating and promoting early and mid-career STEM talent.**

<b>Short term goals/actions (1-3 years)</b>	<b>Target Stakeholders</b>
Establish and promote <b>mentorship</b> through, for example, mentoring/coaching circles.	Universities, Industry, Other employers
Identify and implement opportunities for and information on networking and mentorship for <b>early career individuals</b> .	Universities
Adopt networking as standard practice and identify and improve opportunities for <b>networking and mentoring</b> .	Universities, Industry, Other employers
<b>Medium term goals/actions (3-5 years)</b>	<b>Target Stakeholders</b>
Re-invent the professional <b>career path</b> , erase the lock-step of tenure-track, and mainstream flexibility.	Universities
Develop more <b>evidence-based data</b> on networking.	Researchers
<b>Long term goals/actions (5-10 years)</b>	<b>Target Stakeholders</b>
Train the current and next generation of researchers in <b>new methods</b> of sex/gender analysis.	Universities
Expand and accelerate the advancement of women in <b>leadership roles</b> in STEM.	Employers in collaboration with each other

## 5. Multinational Collaboration: Current and Future

Representatives from the US, Europe, Canada and Mexico agreed that Gender Summit 3 was a defining moment for framing a multinational commitment to strengthen human capital development, research, and innovation through gender diversity. Examples of successful transformation of scientific practice and policy were shared that linked to a focus on gender equity and equality. During the summit, national approaches to gender issues were discussed as well as priorities for collaborative actions. The consensus was that a collaborative approach would help ensure a sustained strategy of increased support and actions for advancing the gender dimension agenda with greater impact for addressing today’s global challenges. Additionally, “collaboration is essential if we are to improve the standing of women in science and engineering” (Blain, 2013). The international STEM agencies leveraged the Summit by “working shoulder to shoulder in turning this commitment into tangible results,” such as a draft vision for multinational collaboration and this Roadmap. “The time to work collaboratively to ensure that scientific research is beneficial to women and men, which in turn will be beneficial to society at large, is a

transformative moment for the shifting landscape of the scientific enterprise as reflected in emerging fields of science and demographic changes of the science and engineering workforce” (Ward, 2013). In addition, the collective commitment to “promoting a balanced agenda or a neutral approach will bring huge benefits, not only for the quality and outcomes of research but also for new opportunities to apply our research findings to create new markets for science knowledge” (Ristori, 2013). Thus, the international partners are just “at the starting point of hopefully important achievements” (Tagüeña, 2013).

Initial discussions of ideas and strategies for moving forward are outlined below.

- ***Develop a parallel-funded and parallel-administered initiative—the Gender-Focused Multi-national Collaboration (GFMC) — involving the US, Europe, Canada, and Mexico that includes the gender dimension in four major areas of the scientific enterprise: human capital development, scientific research and innovation, institutional transformation, and STEM stewardship.***

Suggested tracks for funding within existing funding mechanisms are:

- STEM Discovery/Frontier Research with Gender-Driven Interdisciplinary and International Perspectives;
- Human Capital Capabilities for STEM Global Engagement of Women and Girls, including an increase in the number and percentage of women in the science and engineering workforce and leadership development;
- Institutions Partnering in STEM Gender-Focused Research and Outreach; and
- Systems and Processes (and other Infrastructure Components) Targeted for Structural Changes in STEM Gender Diversity, especially balance between family and career and gender-balanced review committees and research meetings.

Integration of the GS3 objectives should be a required strategy within or across the four areas/tracks:

- Incorporation of sex and gender consideration in research, resulting in transformative ideas/new tools;
- Use of an inclusive community of expertise, resulting in inclusive concepts/perspectives and/or increased STEM talent; and
- Maximum networking for research and human capital development capabilities, resulting in structural changes in the STEM infrastructure for improvements in efficiency and inclusion.

Next steps should include:

- Identifying scientific areas of common interests (e.g., food security, climate change);
- Identifying funding stream(s)/funding mechanism(s);
- Expanding GS3 website with lessons learned and research findings relevant to GFMC; and
- Charging a working group to further frame the research and/or workforce development initiative(s) and develop the call for proposals.

- ***Maintain the GS3 Social Network as a vehicle for community building and engagement.***
  - Maintain and enhance the GS3 website;
  - Promote and hold virtual meetings; and
  - Link to the upcoming Gender Summit in Europe and future Gender Summits.
- ***Partner internationally to advance greater diversity in STEM through future Gender Summits.***
  - Collaborate with South Africa on its upcoming Gender Summit;
  - Promote, adapt, and implement the best practices reported at the Gender Summit;
  - Encourage multi-national engagement on gendered research;
  - Display posters and announcements of international work and opportunities that are directly related to the GS3 goals and objectives; and
  - Plan future North-America focused Gender Summit events as a way to monitor progress on the implementation of the Roadmap and update needed future actions.

- ***Foster multinational opportunities for other countries to meaningfully participate in/host future Gender Summits.***
- ***Include or make available data with the diversity perspective, such as the Latin America perspective; and***
- ***Promote the participation of other regions of the world.***

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## Appendix 1. Case studies in which action was successfully taken

### Policy Context

The importance of university policy in increasing gender diversity was demonstrated in Nancy Hopkins' presentation on the Massachusetts Institute of Technology's (MIT's) 1999 Study on the Status of Women Faculty in Science. That groundbreaking study documented the small number of female science faculty at MIT and identified a number of problems they faced, including family-work conflict, inequities in resources and rewards, lack of women in academic leadership, marginalization, and undervaluation. As a result of the study, a number of committees were established at MIT at various levels of the administration to address women faculty issues and later several university positions were created to address women faculty issues. Solutions established by the university included new work-family policies that are monitored for use and impact on promotion rates, monitoring and correcting of inequities in resources and rewards, active recruitment of women for top positions, inclusion of women in the administrative network, goals for retention and recruitment including tracking of hiring data, and educating people to unconscious bias. These efforts have been highly successful. According to a 2011 report, there is no longer bias in hiring, although there is still leakage in the pipeline. Changes in policy at MIT show how involvement of administrators at the highest levels, broad input, data collection, goal setting, monitoring, and education can lead to positive results.

Funding agencies can be instrumental in fostering greater inclusion women in research and of greater inclusion of the gender dimension in research. The Research Council Norway (RCN) instituted new policies in 2008 that were successful in increasing the percentage of women researchers and research leaders. They began asking applicants to the Research Centers of Excellence how they would integrate gender issues in research and how they would stimulate recruitment of women researchers and research leaders. RCN also required that gender perspectives be incorporated as an integral part of the research funded by the Research Council, and assuming all factors equal, that priority be given to projects led by women. They established assessment criteria that include recruitment of women to higher positions in STEM in particular, they require at least 40% women in government boards and committees, they established a committee on gender balance in research, and they established a web-based infoservice on gender issues linked to the committee website. As a result of these efforts, by 2013, they saw increases in the percentage of center leaders, professors/researchers, PhD grantees and postdocs.

Funding agencies can also be instrumental in enabling organizational systems and processes in universities. Brenda Manuel, Associate Administrator for Diversity and Equal Opportunity at the National Aeronautics and Space Administration (NASA) spoke about NASA's efforts in enforcing university compliance with Title IX of the Education Amendments Act of 1972. Title IX ensures equal opportunity regardless of gender in all academic activities. NASA performs Title IX compliance reviews of NASA grant awards to academic institutions. Although most of the institutions they visit are attempting to increase the gender diversity of their programs, their institutional structures and organizational processes aren't always designed to facilitate those efforts. In their compliance reviews, NASA attempts to improve these structures and processes through strengthening the relationship between the universities' Title IX coordinators and STEM program leadership, promoting stronger education and coordination efforts among STEM program faculty and students, and promoting formal and transparent policies and procedures for the university. Manuel cited the need for targeted education, awareness efforts, increased transparency and also structural and systemic change in the approach to STEM education through greater collaboration between stakeholders including universities, K-12, government agencies and advocacy groups. In addition to compliance reviews, NASA promotes greater awareness of the law through two Title IX publications and a website that promotes Promising Practices.

Policy context is also important in industry. Ray Upton of Texas Instruments described how management policies to increase diversity lead to better business results. Texas Instruments is committed to diversity, proactive recruitment and retention, employee-led diversity initiatives, insight groups, mentoring, and close involvement with Catalyst (a nonprofit organization whose mission is to expand opportunities for women in business). To get traction and buy-in from senior leaders, diversity is addressed from the context of achieving the organization's

objectives (i.e., better business results). Hiring strategies focus on diversity of thought, experience and background in order to equip the company for a diverse future set of leaders. The company is also committed to retention. They consider organization to be responsible for creating an environment for the team members to thrive.

### **Research Context: Content**

The importance of incorporating the gender dimension in research was demonstrated by Joel Greenspan's (University of Maryland School of Dentistry) presentation on research on sex and gender differences in pain and analgesia. Studies indicate that women report greater frequency and severity of pain than men, they seek more pain-related health care than men, and they are more likely than men to use analgesics. A number of factors may contribute to these sex differences in pain—genetics, gonadal hormones, immune/inflammatory response, nociceptive processing in the nervous system, mood and emotions, history of trauma, physical abuse, stress and coping profiles, gender roles/social learning. Research on sex/gender differences in pain could improve pain management, but both human and animal studies must include and report differences by sex/gender.

A joint EU/US project (housed at Stanford University) on Gendered Innovations in Science, Health & Medicine, Engineering, and Environment develops practical methods of sex and gender analysis for scientists and engineers and provides case studies as concrete illustrations of how sex and gender analysis leads to innovation. Most research is done in males, sex and gender bias in research is expensive in terms of lives and costs, and it limits scientific creativity, excellence, and benefits to society. The project proposes the following methods: reporting the sex of research subjects, recognizing differences within groups and overlap between groups, analyzing and reporting results by sex, and reporting null findings. Analyzing factors intersecting with sex should involve collecting and reporting data on factors intersecting with sex, such as age, socioeconomic status, ethnicity, co-morbidities, reproductive status, etc. and considering sex in interaction with other factors such as cell types, disease, and other variables such as hormonal, immunological, and environmental factors.

Funding agencies can be important catalysts for gendered research. As reported by Elaine Sierra-Rivera, the National Institutes of Health (NIH)'s peer review process includes policies for gender and diversity groups inclusion. All clinical research funded or supported by NIH must include women, minorities, and children to ensure that sex/gender, race, ethnicity, and age of study participants reflects the population needed to accomplish the scientific goals of the study. If the study population is inadequate, reviewers will consider this a scientific weakness in the study design which will affect the proposal's likelihood of being funded.

### **Research Context: Process**

Toni Schmader of the University of British Columbia reported on gender-bias research aimed at engendering engineering success. The study of men and women engineers in Canada found that for women, negative conversations with men predict negative outcomes but that the perception of gender-inclusive policies are a buffer to stereotype threat. The evidence suggests that reducing gender bias can be accomplished through role models that change stereotypes, policies for climate control—that is creating threat free environments, and fostering community and belonging. Training in recognizing and minimizing cues to threat and accountability are important.

Universities can make structural changes to improve institutional practices and process in order to insure that female and male researchers are treated in the same way and have the same opportunities for advancement. Yoloxóchitl Bustamante Diez of the Nacional Polytechnic Institute (IPN) of Mexico spoke of IPN's initiatives to promote women—including a program aimed at female polytechnic students to present development projects of new products, processes or services in an early stage or with a functional prototype and extension of maternity leave. She also spoke of challenges and proposals including the need for diagnosis of the situation of women in academia and research in the IPN, providing financial support for the publication of research, increased participation of women in the evaluation committees and levels of management and representation, analyzing the need for expansion of child development center services, reviewing the processes of scholarships, attendance at events and incentives for research, and assigning a larger number of students to the researcher training institutional program.

Funding agencies can also be instrumental in reducing bias. Isabelle Blain, Vice President of the Natural Sciences and Engineering Research Council of Canada (NSERC) reported on NSERC's peer review policies and practices. The

aim is to ensure a peer review process free from bias. In 1993, a task force on women in science and engineering made recommendations to reduce the barriers to full participation of women in STEM, including adoption of a policy statement, programs to expand chairs for women in STEM, women faculty awards, and revised policies for peer review, use of funds, and family leave policies. They instituted policies for gender balance in selection and evaluation groups, monitoring success rates and monitoring funding by gender, disaggregated by rank. Future aims are to assess impacts of policies and practices on gender equity, further training on recognizing and reducing bias, maintaining dialogue with academic institutions and the research community, and encouraging researchers to integrate gender dimensions in research and training.

### **Human Capital Development and Advancement**

Universities can be instrumental in developing human capital and promoting advancement. Beth Holloway reported on the creation of a graduate course on gender and leadership at Purdue University's College of Engineering. The course is designed to explore gender diversity in depth and the effects of gender diversity on majority and non-majority populations with respect to leadership positions. Students explore subconscious beliefs, effects of schemas on other's perceptions, intersections of gender and leadership, and the role of gender in the workplace. The aim of the course is to define and identify inclusive leadership and discuss frameworks for gender equity in leadership informed by gender schemas, gendered organizations and gendered communication.

Established university policies are critical for promoting diversity. Patricia Rankin (University of Colorado Boulder) documented the need for creating mentoring networks to advance women in academia. Networking has been shown to be beneficial for both men and women in that social exchange builds social capital through increasing knowledge, especially tacit knowledge. Evidence is mounting that tacit or hidden knowledge is important in enabling people to be successful. Current data suggest that men and women use networks differently and that women have less extensive career networks than men. Creating career networks for women often involves changing perspectives. For example, rather than asking for help being seen as a sign of weakness it could be seen as a need for collaborative efforts to solve problems. Similarly, networking, rather than being seen as "using" people, can be seen as a form of reciprocity. Universities could encourage networking through encouraging attendance at networking events, encouraging faculty to talk to others about their research, connecting people in affiliate departments, making colloquia more accessible, and promoting remote networks to build critical mass and overcome geographical isolation.

## Appendix 2. Major Initiatives in Funding Agencies

### National Science Foundation (USA)

#### **Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers (ADVANCE)**

The goal of the ADVANCE program is to develop systemic approaches to increase the representation and advancement of women in academic STEM careers, thereby contributing to the development of a more diverse science and engineering workforce. ADVANCE also has as its goal to seminally contribute to and inform the general knowledge base on gender equity in the academic STEM disciplines. The ADVANCE program currently supports the following types of projects:

- Institutional Transformation (IT) awards are expected to include innovative and systemic organizational approaches to transform institutions of higher education in ways that will increase the participation and advancement of women in STEM academic careers.;
- IT-Catalyst awards are designed to support historically resource-challenged institutions in their efforts to conduct institutional self-assessment activities (i.e., data collection, data analysis, policy review) in order to identify specific issues in the recruitment, retention and promotion of women faculty in STEM disciplines; and
- Partnerships for Adaptation, Implementation, and Dissemination (PAID) projects are designed to broadly share lessons learned from institutional transformation projects and also to provide information and training about gender in academic careers.

Several funding highlights include:

- The University of Miami (UM)'s SEEDS (Scientists and Engineers Expanding Diversity and Success) initiative has two main objectives: 1) to implement innovative and proven programs for faculty recruitment and retention and 2) to use these to leverage a larger institutional commitment that will assure continuity and permanence of institutional change. UM is establishing a University-level SEEDS office as a focus for diversity programs across all three UM campuses, establishing a Best Practices Committee to assess equity in policies, funding an Interactive Theatre initiative to help educate academic populations in diversity issues, and sponsoring a comprehensive climate survey to identify gender and ethnicity issues at UM.
- In response to the pressing need to engage the full talent of the nation's workforce, the University of Nebraska-Lincoln (UNL) has designed a systematic program to increase the gender diversity of its faculty. ADVANCE-Nebraska aims to increase the number of STEM women on the UNL faculty, increase the retention of women STEM faculty and support their promotion into positions of professional leadership by developing and systematizing institution-wide family-friendly and dual career policies, and conduct innovative research on what network structures best support the success of women STEM faculty, and what factors develop supportive networks. The Office for ADVANCE-Nebraska will coordinate recruitment and retention-enhancing programs, disseminate information to the academic community, and serve as liaison for the many groups engaged in diversity-focused activities on campus. The project will centralize implementation of college-wide Family-Friendly Policies and Flexible Work Arrangements, form a university-wide committee of faculty to increase recruitment of women for faculty positions, form a university-wide committee to increase retention and promotion of all STEM women on campus by familiarizing faculty, chairs, and Tenure & Promotion Committee members with the impact of implicit biases on decision-making processes and strategies to minimize these impacts; and build on opportunities for informal networking on campus through professional development workshops, luncheons with guest speakers, and week-long writing retreats.

The ADVANCE program was cited in a 2012 European publication, *Structural change in research institutions: Enhancing excellence, gender equality and efficiency in research and innovation*, for its leadership role in using a systemic, comprehensive and sustainable approach to enable structural transformation of institutions and the program is being modeled in Europe.

### **Research on Gender in Science and Engineering.**

The Research on Gender in Science and Engineering (GSE) track of the Research on Education and Learning program supports efforts to understand and address gender-based differences in STEM education and workforce participation through education and implementation research that will lead to a larger and more diverse domestic STEM workforce. Typical projects will contribute to the knowledge base addressing gender-related differences in learning and in the educational experiences that affect student interest, performance, and choice of careers; or how pedagogical approaches and teaching styles, curriculum, student services, and institutional culture contribute to causing or closing gender gaps that persist in certain fields.

Several funding highlights include:

- Research at CUNY Baruch College aims to better understand the foundations upon which one's sense of belonging to mathematics is based, and further, to determine whether effort-based sense of belonging can protect females from the negative impact of stereotypes and the culture of "talent" on their intrinsic motivation, achievement, and learning. It focuses on collecting and analyzing data on middle school students to test the hypothesis that increasing students' sense of belonging can protect females from the negative effects of stereotype threat and entity theories of intelligence (for achievement, aspirations, and learning).
- Funding to the Women in Engineering ProActive Network (WEPAN) supports continued development of an online professional community for the Gender in STEM research community. The funding will allow WEPAN to 1) provide a part-time community manager to build relationships within the Gender in STEM community and engage its people in developing showcases, contributing resources, and participating in or leading community groups; 2) explore ways to connect and build the Gender in STEM network of experts with the next generation of researchers and support both diffusion of knowledge as well as formation of research collaborations; 3) develop and implement expanded virtual communication functions identified in Needs Assessment and provide avenues for virtual interactions; and 4) adapt the organizing structure, taxonomy and search functions of the Women in STEM Knowledge Center to meet requirements and interests of an expanded, research-oriented audience.

### **Career-Life Balance (CLB)**

Instituted in 2012, NSF's Career-Life Balance (CLB) Initiative is an ambitious, ten-year initiative that will build on the best of family-friendly practices among individual NSF programs to expand them to activities NSF-wide. This agency-level approach will help attract, retain, and advance graduate students, postdoctoral students, and early-career researchers in STEM fields. This effort will help reduce the rate at which women depart from the STEM workforce. The primary emphasis of NSF's CLB initiative in FY 2012 was focused on opportunities such as dependent-care issues (child birth/adoption and elder care). These issues initially were addressed through NSF's Faculty Early Career Development (CAREER) program, where career-life balance opportunities can help retain a significant fraction of early career STEM talent. In FY 2013, the Foundation extended CLB opportunities through other programs such as the Graduate Research Fellowship and postdoctoral fellowship programs, as well as expanded opportunities such as dual career-hiring through the Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers (ADVANCE) program. Awards were made for 18 ADVANCE dual career supplements and 25 CAREER, Graduate Research Fellowship and postdoctoral fellowship research technician supplements. In FY 2014, NSF continued funding of CLB supplements, made new partnership/outreach efforts with professional organizations to advance the CLB agenda, collaborated with NIH to harmonize language for family-friendly policies, and conducted a preliminary analysis of the first three years of CLB.

Several funding highlights include:

- The department of Chemistry and Biochemistry at the University of Delaware hired a technician for 3 months to provide continuity in lab operation as well as assist in student training during the PI's leave. The PI's grant focuses on the specialized chemistry catalyzed by selenoproteins - a family of enzymes that utilizes the reactive amino acid selenocysteine (Sec). The research requires the preparation of selenoprotein for spectroscopic studies and enzymatic assays. The experienced laboratory technician supported under this supplement has been involved in protein expression and purification and is proficient with methods used to incorporate Sec in proteins, is responsible for preparation of critical components of the research, mostly enzymes necessary for activity assays and those required for protein purification and will be assisting in student training.
- At Georgia Tech, a technician supported as part of a CLB supplemental request will assist the Principal Investigator as she transitions from active service modified duties status back to full time status. Duties will include ordering and maintaining laboratory materials (gels, buffers, plasmids, cell paste, purified protein) and supplies for the project supported by CAREER, as well as coordinating weekly laboratory meetings to ensure full communication among group members in the absence of daily interaction with the PI.

## **Natural Sciences and Engineering Research Council (Canada)**

### **Chairs for Women in Science and Engineering**

#### **Introduction**

The Natural Sciences and Engineering Research Council of Canada (NSERC) Chairs for Women in Science and Engineering Program (CWSE) was launched in 1996. The goal of the program is to increase the participation of women in science and engineering, and to provide role models for women active in, and considering, careers in these fields. NSERC funding must be matched by cash contributions from corporate sponsors.

#### **Objectives of the Chair Program**

Develop, implement, and communicate strategies to raise the level of participation of women in science and engineering as students and as professionals, specifically to:

- Encourage female students in elementary and secondary schools to consider careers in science and engineering;
- Increase the enrolment of women in undergraduate and graduate programs in science and engineering in all Canadian universities and colleges;
- Increase the profile and retention rate of women in science and engineering positions;
- Eliminate barriers for women who wish to pursue careers in science and engineering;
- Promote the integration of female students and professionals both within and outside academia;
- Provide female role models who are accomplished, successful and recognized researchers in science and engineering; and
- Develop and implement a communication and networking strategy to ensure a regional and national impact on opportunities for women in science and engineering.

#### **Terms of Support**

Chairs are tenable at any NSERC-eligible Canadian university within a designated region. Chair holders are approved for a five-year term, renewable for an additional three years if progress is satisfactory and support from the sponsoring organization(s) continues.

NSERC will match cash contributions from sponsoring organizations up to a maximum of \$70,000 per year. These partner contributions may come from industry, government, the university, or any other private or public sector

organizations, communities or individuals. NSERC will also consider matching in-kind contributions consisting of staff time, salaries, equipment, and any other resources provided by the business and industry partners of the Chair.

In addition, NSERC will match university cash contributions up to \$20,000 to support a postdoctoral fellow or research engineer to help chair holders maintain their research activity at a high level during their tenure as a CWSE.

Chair holders are expected to contribute up to 50 percent of their time to the activities of the chair and the remaining time to their professor/researcher activities at the university. The contributions from NSERC and the corporate sponsor(s) can be used to cover part of the chair holder's salary plus the cost of activities associated with the chair. The contributions from NSERC and the corporate sponsor(s) to the salary of the chair holders will be commensurate with the release time from normal teaching and administrative activities granted by the host institutions (e.g., if the candidate proposes to spend 25 percent of her time on chair-related activities, the contributions from NSERC and the sponsor(s) can be used to defray up to 25 percent of her salary; proposals where the host institution pays the candidate's entire salary will be accepted). The university will be responsible for any salary increments over the course of the award due to merit, progression through the ranks and inflation.

If additional funding commitments are secured after a chair has started, NSERC will consider adjusting its level of funding. Requests for additional matching funds (up to the maximum total of \$90,000) should be supported by a full description of the changes that will result from the additional funding and by a revised budget.

### **National Institutes of Health (USA)**

The Office of Research on Women's Health (ORWH), a part of the Office of the Director at the National Institutes of Health (NIH), is a component of the Division of Program Coordination, Planning and Strategic Initiatives. Building upon the legacy of two previous NIH women's health research agenda-setting reports, ORWH released the third NIH Strategic Plan for Women's Health and Sex Differences research in September 2010, titled *Moving into the Future with New Dimensions and Strategies: A Vision for 2020 for Women's Health Research*. <http://orwh.od.nih.gov/research/strategicplan/index.asp>. One of the six major goals of the NIH Strategic Plan for Women's Health and Sex Differences Research is to "Employ innovative strategies to build a well-trained, diverse, and vigorous women's health research workforce".

ORWH's Director, Janine Clayton, M.D. co-chairs the **NIH Working Group on Women in Biomedical Careers** with the NIH Director, Francis Collins, M.D., Ph.D. The Working Group is a trans-NIH effort designed to address barriers for women in biomedical careers, and to promote the sustained advancement of women in biomedical careers. The Working Group collaborates with the NIH Institutes and Centers to promote tangible changes to institutional policies in the NIH intramural and extramural communities.

The Working Group was established in response to a National Academies report, *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering* and is comprised of 7 committees: Committee on Communication and Public Outreach, Committee on Research and Evidence to Promote Women in Scientific Careers, Committee on Extramural Activities and Mentoring Programs, Committee on the NIH Intramural Research Program, Committee on Integration of Women into Bioengineering Fields, Committee on Women of Color in Biomedical Careers, and National Library of Medicine Programs. The committees work together to develop innovative strategies to promote re-entry, recruitment, retention, and sustained advancement of women in biomedical and research careers. The Working Group is committed to making the NIH a model for achieving the highest caliber of science by capitalizing on the perspectives, talents, and energies of a diverse workforce. To view Working Group resources, please visit the Women in Science web site: <http://womeninscience.nih.gov/>.

NIH supports research to identify barriers to advancement for women in biomedical careers, and best practices to address these barriers. In 2009, NIH funded 14 grants to support research on **Causal Factors and Interventions** that affect the careers of women in biomedical and behavioral science and engineering, estimated to total \$16.8 million over four years with support from 11 Institutes and Centers, as well as four Offices within the NIH Office of

the Director. These research projects are on-going. In November 2012, a workshop served as a forum for data presentations by grantees and discussions with NIH leadership. The results of these projects provide valuable insight into the necessary next steps, and will catalyze change within academic institutions. Key themes of focus emerging from this research include:

- Bias is powerful and often unconscious, but it can be mitigated with education;
- Mentor networks can be more effective than mentor dyads;
- Workplace culture affects career satisfaction and performance; and
- Institutional flexibility policies are typically under-recognized and under-used.

To view the Workshop Report please visit: [http://womeninscience.nih.gov/pdf/Causal\\_Factor\\_Summary.pdf](http://womeninscience.nih.gov/pdf/Causal_Factor_Summary.pdf)

The Working Group, with funding from ORWH and the National Institute on Aging, also developed the **Women of Color Research Network (WoCRn)**, a new social media site providing information, mentoring, and career development opportunities for women of color in biomedical careers and for all who support diversity in the scientific workforce. To visit the website: <http://www.wocrn.nih.gov/>

#### **Work/Life Balance Activities of the Working Group include:**

- The pilot Keep the Thread Program, which offers alternative career development schedules to NIH intramural fellows who need accommodations for personal or family reasons
- The leave bank, which provides paid leave to NIH employees who need time off to manage personal illness or family obligations
- Introduction of changes to the biographical sketch section of the NIH grant application, which provide the opportunity for applicants to explain periods of decreased productivity or absence from academia
- Amendment of the application for NIH conference grants to require that applicants describe plans to identify resources for family care at the conference site
- Extension of the tenure-clock for intramural NIH scientists by one year, to accommodate family leave
- Extension of the allowed period of paid parental leave to eight weeks for both NIH intramural trainees and NIH funded-extramural trainees
- The Mid-Atlantic Higher Education Recruitment Consortium, which aids dual-career couples in finding positions near each other

#### **NIH Activities to Enhance a Diverse Workforce:**

The Advisory Committee to the NIH Director provides advice on matters pertinent to NIH's mission and responsibilities in the conduct and support of biomedical communications. The committee has seven working groups that report on the biomedical workforce, diversity in the biomedical workforce and on data and informatics. <http://acd.od.nih.gov/working-groups.htm> . In 2013, NIH released two new funding opportunities (Building Infrastructure Leading to Diversity and the National Research Mentoring Network) that complement ongoing NIH career development activities to enhance a diverse biomedical workforce. <http://commonfund.nih.gov/diversity/Initiatives>.

On January 30, 2014, NIH appointed its first ever Chief Officer for Scientific Workforce Diversity, Hannah Valentine, M.D. Dr. Valentine will lead NIH's effort to diversify the biomedical research workforce by developing a vision and comprehensive strategy to expand recruitment and retention, and promote inclusiveness and equity throughout the biomedical research enterprise.

#### **National Council for Science and Technology CONACYT (Mexico)**

Publication of a Gender issue on the "Science and Development" magazine of CONACYT on June, this year, as a specific action in the short term.

## **European Commission**

### **Science leaders' consensus on the *Recommendations for Action on the Gender Dimension in Science***

In 2010, as part of the EC funded genSET project (led by Portia), a panel of 14 European science leaders met over a period of three months to consider research evidence, share knowledge and experience, and arrive at a consensus view on the gender dimension in science, and on the priorities for gender action in scientific institutions. The main question was How European Science can Benefit from Integrated Action on Gender, which focused on two issues:

- Bringing about greater equality of opportunity and treatment in recruitment and advancement of women and men scientists, and in assessment of their performance and work; and
- Incorporating gender and sex in the research process, in science knowledge making, and in the science value system to improve quality and excellence of scientific endeavors.

In addition to the research evidence provided by 120 studies, the Panel sought advice from world-renowned gender experts, and from representatives of major stakeholder organizations in Europe. The outcome is a consensus report *Recommendations for Action on the Gender Dimension in Science* containing 13 specific, evidence-based recommendations for actions needed to address common gender problems in science and improve science institutions.

### **Gender Summit**

The work of the Science Leaders Panel established the beginning of an important dialogue between gender experts, policy makers, and leaders of scientific institutions. The resources used by the Panel represented only a small part of the gender expertise and knowledge available across Europe. To expand this dialogue, in 2011 Portia, in association with the European Commission, created the Gender Summit to provide a more permanent platform for presenting and reviewing important research evidence and establishing consensus on the actions needed to address gender issues in areas concerning quality and relevance of science.

### **Horizon 2020**

Horizon 2020, 2014-2020, is the latest program in the series of the EU Framework Programs (FP). Past programs, in particular FP5 and FP6 did recognize the need to address gender issues and attempted to encourage projects to include gender actions in work programs. Horizon 2020 departs from these efforts in a number of significant ways. Firstly, it identifies gender as a cross-cutting issue relevant to several areas, including transport, energy, food security, environment, as well as health. It pursues three objectives:

- Fostering gender balance in Horizon 2020 research teams, in order to address the gaps in the participation of women in the Framework Program's projects;
- Ensuring gender balance in decision-making, in order to reach the Commission's target of 40% of the underrepresented sex in panels and groups (50% for advisory Groups); and
- Integrating gender/sex analysis in research and innovation (R&I) content and process to help improve the scientific quality and societal relevance of the produced knowledge, technology and/or innovation.

Another novelty of Horizon 2020 is the inclusion of gender training among the eligible costs of an action. The aim is to help researchers to further develop and share gender expertise in relation to the funded project.

Furthermore, the Commission will monitor the implementation of gender as a cross-cutting issue at various stages in the funding process.

## Appendix 3. Conference Agenda

### **DAY ONE**

#### **Video Addresses from European Leaders**

- **Oldřich Vlasák**, Vice-President of the European Parliament, Europe
- **Marie Geoghegan-Quinn**, Commissioner for Research, Innovation & Science, European Commission, Europe

#### **Keynote Address**

- **Valerie Jarrett**, Senior Advisor to President Barack Obama and Chair of the White House Council on Women and Girls, USA

#### **Plenary Panel: Develop a Collective Commitment to Strengthen Human Capital Development, Research and Innovation through Diversity**

Chair and Summit Overview: **Wanda E. Ward**, PhD, Head, Office of International and Integrative Activities, **National Science Foundation (NSF)**, USA

- **European Commission (EC)**, **Dominique Ristori**, Director General, European Commission Directorate General Joint Research Council, Europe (video)
- **Natural Sciences and Engineering Research Council of Canada (NSERC – CRSNG)**, **Isabelle Blain**, Vice-President, Research Grants and Scholarships Directorate, Canada
- **The National Council for Science and Technology, México (CONACYT)**, **Julia Tagüeña**, PhD, Deputy General Director of Scientific Development, Mexico

#### **Plenary Panel: Develop Joint Policies for Innovation and Partnership in STEM Higher Education as a Means of Widening Access to Knowledge**

Chair: **Patricia Falcone**, PhD, Associate Director, White House Office of Science and Technology Policy, USA

- ***Developing an International Network on Emerging Scientific Frontiers and Addressing Issues of Women in Science in a Global Context***  
**Rita Colwell**, PhD, Chair of Canon US Life Sciences Inc. and Distinguished Professor, University of Maryland and Johns Hopkins University Bloomberg School of Public Health, and former Director of NSF, USA
- ***Partnerships for Wider Access to Quality Higher Education***  
**Phyllis Wise**, PhD, Chancellor, University of Illinois at Urbana-Champaign, USA
- ***Educating for Standards Led Technology Transfer***  
**Rocío Cassaigne Hernández**, Intellectual Property Manager, CIATEQ, Mexico
- ***Building Partnerships to Advance the Educational Experience and Research Opportunities***  
**Allison B. Sekuler**, PhD, Associate Vice-President & Dean, Graduate Studies, Canada Research Chair in Cognitive Neuroscience, Professor of Psychology, Neuroscience & Behavior (PNB), McMaster University, Associate Member, The Brain-Body Institute, Canada

#### **Keynote Address and Lunch**

- ***Introduction of Speaker***  
**Joy Johnson**, PhD, Scientific Director of the Institute of Gender and Health (IGH), Canadian Institutes of Health Research (CIHR), Canada
- ***Keynote speaker***  
**Julie Payette**, MAS, Chief Operating Officer, Montreal Science Centre and Vice-President of Canada Lands Company; Former NASA/CSA Astronaut, Canada

#### **Plenary Panel: Demonstrate Evidence of How Incorporating Sex and Gender Consideration into STEM Research and Innovation Informs Policy**

Chair: **Juan Pedro Lactette**, PhD, Professor, National Autonomous University of Mexico, Co-Chair of the Interamerican Network of the Academies of Science at the Mexican Academy of Sciences, Mexico

- ***Improving the Efficacy of Vaccinations for Women, Men and Children and Consequences for Public Health Policies***  
**Sabra Klein**, PhD, Assistant Professor, Molecular Microbiology and Immunology, Johns Hopkins Bloomberg School of Public Health, USA
- ***The Prevalence of Science-Gender Stereotypes and its Impact on Education and Policy***  
**Brian Nosek**, PhD, Associate Professor, Department of Psychology, University of Virginia, USA
- ***Encouraging Young Women to Study Engineering and Sciences, and Enhancing the Status of Women in the Profession***  
**Ruby Heap**, PhD, Professor, Department of History at the University of Ottawa, Coordinator of the University of Ottawa Women in Engineering Research Group, Canada

## **DAY TWO**

### **Keynote Address**

- ***Introduction of Speaker***  
**Julia Tagüeña**, PhD, Deputy General Director of Scientific Development, The National Council for Science and Technology of Mexico (CONACYT), Mexico
- ***Keynote speaker***  
**Ana María Cetto**, PhD, Professor of the Institute of Physics, and lecturer, Faculty of Sciences, Universidad Nacional Autónoma de México (UNAM), Mexico

Plenary Panel: **Harnessing Gender Dimensions to Address Global Scientific and Societal Challenges**

Chair: **Simone Buitendijk**, PhD, MPH, MD, Vice-Rector Magnificus and member of the Board of the Leiden University; Professor and Chair of Women's and Family Health at the Leiden University Medical Center, Netherlands, Europe

- ***Cross Border Research Collaboration***  
**Subra Suresh**, PhD, President of Carnegie Mellon University, former NSF Director, USA (Video)
- ***Patents for Humanity: Building a Better Modern World***  
**Teresa Stanek Rea**, JD, Deputy Under Secretary of Commerce for Intellectual Property and Deputy Director of the US Patents and Trademark Office, USA
- ***Why Gender Budgeting Empowers Women and Can Boost Economic and Social Development***  
**Janet Stotsky**, PhD, Advisor, Office of Budget and Planning, International Monetary Fund, Europe
- ***Women and Agricultural and Nutritional Knowledge***  
**Amanda Gálvez**, PhD, Professor, Department of Food and Biotechnology, National Autonomous University of Mexico, Mexico

Parallel Sessions: **Stream 1 – Diversity in Participation**

#### **1. Equity for Excellence in Research Teams**

Discussant: **Kellina Craig-Henderson**, PhD, Deputy Division Director, Directorate for Social, Behavioral and Economic Sciences, National Science Foundation, USA

- ***Problem Solving Strategies in the Labs of Female and Male Researchers*** **Kevin Dunbar**, PhD, Professor of Human Development and Quantitative Methodology and Director of Laboratory for Scientific Thinking, Reasoning, & Education, U of Maryland College Park, USA

- ***How Gender Balance of Teams and the Gender of Team Leaders Influences Team Performance***  
**Rosalind Chow**, PhD, Assistant Professor of Organizational Behavior and Theory, Tepper School of Business, Carnegie Mellon University, USA
- ***Balancing Risk Taking by Balancing Gender***  
**James P. Byrnes**, PhD, BS, Department Chair and Professor of Educational Psychology, College of Education, Temple University, USA
- ***Performance and Women's Performance on Boards***  
**Nancy M. Carter**, PhD, Senior Vice President, Research, Catalyst, USA

## **2. Openness and Diversity in Innovation and Collective Problem Solving**

Discussant: **Janet Abbate**, PhD, Associate Professor and Co-Director of Graduate Program in STS

- National Capital Region Campus, Virginia Tech, USA
- ***Task and Compositional Factors in Individual and Group Problem Solving***  
**Stephen M. Fiore**, PhD, Associate Professor of Cognitive Science, University of Central Florida, USA
- ***Innovating Together the New Future of Electronics***  
**Krunali Patel**, MS, Business Manager, Storage Products Group, Texas Instruments (TI), USA
- ***Discovering Markets with the Help of Citizens***  
**Martina Schraudner**, PhD, Head of the Department of Gender and Diversity in Organizations, Technical University Berlin, and Director of Responsible Research and Innovation Unit, Fraunhofer Gesellschaft, Germany, Europe
- ***STEM Women Faculty as Entrepreneurs***  
**Mary Juhas**, PhD, Associate Vice President, Gender Initiatives in STEM, Office of Research, Clinical Professor, Materials Science & Engineering Co-investigator, Project CEOs (Comprehensive Equity at Ohio State), An NSF ADVANCE Program Award, Ohio State University, USA

## **3. Opportunities and Challenges for Women of Color in STEM and Society**

Discussant: **Kelly Mack**, PhD, Vice President for Undergraduate Science Education and Executive Director, Project Kaleidoscope, Association of American Colleges and Universities (AAC&U), USA

- ***Supporting Scholarly Careers of Underrepresented Faculty***  
**Loretta A. Moore**, PhD, Interim Vice President for Research and Federal Relations and Professor, Department of Computer Science, Jackson State University, USA
- ***Social Psychology Research on Women of Color in the STEM Disciplines***  
**Kecia Thomas**, PhD, Professor of Industrial/Organizational Psychology, University of Georgia, Founding Director, Center for Research and Engagement in Diversity, USA
- ***Advancing American Indians in the Sciences***  
**Marigold Linton**, PhD, Director, American Indian Outreach, University of Kansas, USA

## **4. Diversity in Leadership**

Discussant: **Grace Jinliu Wang**, PhD, Division Director, Directorate for Engineering, National Science Foundation, USA

- ***Enhancing Performance and the Position of Women -- a Win-Win Opportunity for University Leaders***  
**Curt Rice**, PhD, Professor, University of Tromsø, Norway, and Netherlands Institute for Advanced Study (NIAS), Netherlands, Europe
- ***The Creation of a Graduate Course***  
**Beth M. Holloway**, PhD Candidate, Director, Women in Engineering Program, Purdue University, USA
- ***Enhancing Academic Performance of Underrepresented Minorities***  
**Joan Y. Reede**, MD, MS, MPH, MBA, Dean for Diversity and Community Partnership, Harvard

Medical School, USA

- ***Germany Gender and Diversity in Teaching – Added Value for Science***  
**Carmen Leicht-Scholten**, PhD, BS, Professor of “Gender and Diversity in Engineering”, Faculty of Civil Engineering, RWTH Aachen University, Germany, Europe

## **5. Diversity and Gatekeepers in STEM Participation**

Discussant: **Carla Fehr**, PhD, Associate Professor, (Wolfe Chair in Scientific and Technological Literacy), Department of Philosophy, University of Waterloo, Canada

- ***Changing Faculty Gender Bias***  
**Jo Handelsman**, PhD, Howard Hughes Medical Institute Professor and Frederick Phineas Rose Professor in the Department of Molecular, Cellular and Developmental Biology, Yale University, USA
- ***Platforms for Engineering Global Development***  
**Madiha El Mehelmy Kotb**, President, The American Society of Mechanical Engineers, Canada/USA
- ***Gatekeepers in Recruiting and Organizational Solutions***  
**Brian Rubineau**, PhD, Assistant Professor, Department of Organizational Behavior, School of Industrial and Labor Relations, Cornell University, USA
- ***Survey of Science Editors’ Policies on Standards for Reporting Gender***  
**Shirin Heidari**, PhD, Executive Editor, Journal of the International AIDS Society and Member of Council and Chair of the Gender Policy Committee, European Association of Science Editors, Europe

## **Keynote Addresses and Lunch**

- ***Introduction of Speaker***  
**Elizabeth Pollitzer**, PhD, Director, Portia Ltd, UK, Europe
- ***Keynote Remarks***  
**Ralph J. Cicerone**, PhD, President, National Academy of Sciences, and Chair, National Research Council, USA
- ***The Future of the Gender Summits***  
**Elizabeth Pollitzer**, PhD, Director, Portia Ltd, UK, Europe
- ***Video Remarks from Africa***  
**Olive Shisana**, PhD, Chief Executive Officer, Human Sciences Research Council (HRSC), South Africa

## **Parallel Roadmap Development Sessions**

### **1. Cultivating and Promoting Future Leaders**

Chair: **Serge Villemure**, Director, Research Grants & Scholarships, Natural Sciences and Engineering Research Council of Canada (NSERC), Canada

Rapporteur: **Jennifer R. Cohen**, PhD, American Association for the Advancement of Science (AAAS) Fellow, Office of International & Integrative Activities, National Science Foundation (NSF), USA

- ***The Value of Mentoring: Impact of Lack of Access to Mentoring for Women***  
**Faye Crosby** PhD, Distinguished Professor of Psychology and Provost of Cowell College, University of California at Santa Cruz, USA
- ***To the Top through the Maze***  
**Simone Buitendijk**, PhD, MPH, MD, Vice-rector Magnificus and member of the Board of the University of Leiden, Netherlands, Professor and Chair of Women’s and Family Health at the Leiden University Medical Center, Netherlands, Europe
- ***Diverse Workforce Leads to Excellence***

**Ray Upton**, Vice President and general manager, Americas Sales and Applications team, Texas Instruments, USA

- ***Leadership Starts Early: The Impact of Role Models***

**Tamara Franz-Odendaal**, PhD, Associate Professor, Mount Saint Vincent University, Halifax, Nova Scotia, Canada

**2. Empowering Voices of Early-Career Scientists**

Chair: **Risa Sargent**, PhD, Associate Professor, Department of Biology, University of Ottawa, Canada

Rapporteur: **Joel Kelly**, PhD, Postdoctoral Research Fellow, University of British Columbia, Canada

- ***The Value and Role of Post-doctoral Periods in Shaping and Securing Sustainable Career Pathways***

**Louise Harvey**, PhD, Postdoctoral Fellow, Douglas Institute Research Centre, Canada

- ***Single Discipline or Interdisciplinary Career Directions: What is Best and Most Practical at Early Career Stage?***

**Ingrid Kuri Alonso**, PhD, Professor of Law and Economics, Latin American and Caribbean Law and Economics Association, Mexico

- ***My Pathway into an Interdisciplinary Research Career***

**Leah Rubin**, PhD, Assistant Professor, Department of Psychiatry, University of Illinois at Chicago, USA

- ***Woman on the Verge: Transitioning from Graduate School to the 'Real World'***

**Anita Melnyk**, PhD Candidate, University of Ottawa

- ***Preparing for a Career in Earth Sciences***

**Kim Cobb**, PhD, Associate Professor, School of Earth and Atmospheric Sciences, Georgia Institute of Technology, USA

- ***Preparing for a Career in Geoscience***

**Alexis K. Ault**, PhD, National Science Foundation (NSF) Postdoctoral Fellow, Department of Geoscience, University of Arizona, USA

**3. Integrating Gender into Research Content and Methods**

Chair: **Julia Tagüeña**, PhD, Deputy General Director of Scientific Development, The National Council on Science and Technology of Mexico (CONACYT), Mexico

Rapporteur: **Sarah Miller**, PhD, American Association for the Advancement of Science (AAAS) Fellow, Directorate for Computer & Information Science & Engineering, National Science Foundation (NSF), USA

- ***Consensus on Studying Sex and Gender Differences in Pain and Analgesia***

**Joel D. Greenspan**, PhD, Professor and Chair of the Department of Neural and Pain Sciences, University of Maryland School of Dentistry, USA

- ***Gendered Innovations: Tools of Sex and Gender Analysis for Research***

**Londa Schiebinger**, PhD, John L. Hinds Professor of History of Science, Stanford University and Director, Gendered Innovations in Science, Health & Medicine, Engineering, and Environment project, USA

- ***Gender, Masculinity and Men's Health***

**John Oliffe**, PhD, Professor, School of Nursing, University of British Columbia, Canada

- ***Institutionalization of Gender Perspective at the University***

**Jennifer Ann Cooper**, PhD, Professor, Postgraduate School of Economics, National Autonomous University of Mexico, Mexico

**4. Improving Career-Life Balance**

Chair: **Elizabeth Pollitzer**, PhD, Director, Portia Ltd, UK, Europe

Rapporteur: **Renetta Tull**, PhD, Associate Vice Provost for Graduate Student Development and

Postdoctoral Affairs at the University of Maryland, USA

- **Career-Life Balance Initiative**  
**Wanda E. Ward**, PhD, Head, Office of International and Integrative Activities, National Science Foundation, USA
- **Do Babies Matter in Science?**  
**Mary Ann Mason**, PhD, Professor and co-director, Center of Economics & Family Security, University of California, Berkeley, School of Law, USA
- **Supporting Academic Women in STEM: The Post-Doc Institute**  
**Cynthia J. Jameson**, PhD, Professor Emerita of Chemistry and Chemical Engineering, University of Illinois-Chicago, USA
- **Positive Climate that Encourages the Recruitment of Females in STEM**  
**Nadia Ghazzali**, PhD, Full Professor, Department of Mathematics and Statistics, Université Laval in Quebec City, Canada

#### 5. Creating and Sustaining Networks

Chair: **Sophie D'Amours**, PhD, Vice Rector, Research and Innovation, Université Laval, Canada  
Rapporteur: **David Proctor**, PhD, American Association for the Advancement of Science (AAAS) Fellow, Office of the Director, Office of Cyberinfrastructure, National Science Foundation (NSF), USA

- **Why Advancing Women Requires Networking**  
**Patricia Rankin**, PhD, Associate Vice Chancellor for Research, Interim Director, Office of Contracts and Grants, University of Colorado, Boulder, USA
- **Networking Workplace Leaders**  
**Stephanie Watts Butler**, PhD, Technology Innovation Manager, Texas Instruments, USA
- **Leveraging Network Data to Support Women STEM Faculty: Recommendations from NJIT ADVANCE**  
**Nancy Steffen-Fluhr**, PhD, Associate Professor, Department of Humanities New Jersey Institute of Technology, Director, Murray Center for Women in Technology, USA
- **Institutionalizing 'Networking 2.0'**  
**Betty Shanahan**, Executive Director & Chief Executive Officer, Society of Women Engineers (SWE), USA

#### 6. Transforming the Role of Gender in STEM and in Communication

Chair: **Shari Graydon**, Communications Consultant and Journalist, Founder of Informed Opinions, Canada

Rapporteur: **Susan Pell**, PhD American Association for the Advancement of Science (AAAS) Fellow, Office of Legislative and Public Affairs, National Science Foundation (NSF), USA

- **Gender and Race in Film and TV Content**  
**Stacey Smith**, PhD, Associate Professor, School of Communication and Journalism, University of Southern California, USA
- **Access and Participation of Women in the Media Industry**  
**Aimée Vega Montiel**, PhD, Professor and the Coordinator of the foreign graduate program of Communication Studies, Universidad Nacional Autónoma de México, Mexico
- **Cultural Diversity & Communications for Men & Women**  
**Catherine Mavriplis**, PhD, NSERC – Pratt & Whitney Canada Chair for Women in Science and Engineering and Associate Professor, Faculty of Engineering, University of Ottawa, Canada
- **The Biases that Bind Us: How Stereotypes Constrain Women's Experience in STEM**  
**Toni Schmader**, PhD, Canada Research Chair in Social Psychology, Professor at University of British Columbia (UBC), Canada

#### 7. Ensuring Inclusive Excellence through Merit/Peer Review

Chair: **Stephen P. Meacham**, PhD, Senior Staff Associate, Office of International and Integrative

Activities, National Science Foundation, USA

Rapporteur: **Frances Bonier**, PhD, Assistant Professor, Queen's University, Canada

- **Merit Review at the National Science Foundation**  
**Kelvin K. Droegemeier**, PhD, Vice President for Research, University of Oklahoma and Vice Chairman, National Science Board, USA (Video)
- **European Peer Review Guide**  
**Pär Omling**, PhD, President, European Science Foundation and vice-President, Science Europe, Europe
- **Peer Review Policies and Practices at NSERC and CIHR**  
**Isabelle Blain**, Vice-President, Research Grants and Scholarships Directorate, Natural Sciences and Engineering Research Council of Canada (NSERC), Canada
- **Policies for Including Women and Minority Groups in Clinical Research**  
**Elaine Sierra-Rivera**, PhD, Scientific Review Officer, Division of Basic and Integrative Biological Sciences, Cancer Etiology Study Section, National Institutes of Health, USA
- **Epistemological Diversity and Procedural Fairness in Peer Review**  
**Michèle Lamont**, PhD, Professor of Sociology and African and African American Studies, Robert I. Goldman Professor of European Studies, Harvard University, USA

#### **8. Enabling Organizational Systems and Processes**

Chair: **Elizabeth Croft**, PhD, Professor and NSERC Chair for Women in Science and Engineering (BC/Yukon Region), University of British Columbia, Canada

Rapporteur: **Emily Grumbling**, PhD, American Association for the Advancement of Science (AAAS) Fellow, Office of the Director, Office of Cyberinfrastructure, National Science Foundation (NSF), USA

- **Recognizing and Removing Barriers: The Lessons from MIT**  
**Nancy Hopkins**, PhD, Amgen, Inc., Professor of Molecular Biology, Massachusetts Institute of Technology (MIT), USA
- **Changing Institutional Cultures from the Outside In: Rewarding Public Scholarship and Cross Sector Collaboration**  
**Nancy Cantor**, PhD, Chancellor, Syracuse University, USA
- **Connecting Women into the Provision of Higher Education and Industrial Development Needs**  
**Yoloxóchitl Bustamante**, Director General, National Polytechnic Institute (IPN), Mexico
- **Title IX and Culture Change: Advancing Gender Diversity in STEM Fields**  
**Brenda R. Manuel**, Esq., Associate Administrator for Diversity and Equal Opportunity, National Aeronautics and Space Administration (NASA), USA

#### **9. Pioneers Trailblazing the Future**

Chair: **Kelly Mack**, PhD, Vice President for Undergraduate Science Education and Executive Director, Project Kaleidoscope, Association of American Colleges and Universities (AAC&U), USA

Rapporteur: **Rosemarie Filart**, MD, MPH, MBA, Office of Research on Women's Health, National Institutes of Health Sciences, USA

- **Title (TBD)**  
**Catherine E. Woteki**, PhD, Under Secretary, Chief Scientist, United States Department of Agriculture, USA
- **WISEST—Women in Scholarship, Engineering, Science and Technology**  
**Margaret-Ann Armour**, PhD, Associate Dean of Science, Diversity, Faculty of Science, University of Alberta, Canada
- **Establishing the First Gender and Medicine Institute**  
**Vera Regitz-Zagrosek**, MD, Director, Institute of Gender in Medicine, Charité - Universitätsmedizin Berlin, Germany, Europe

- **Organization for Women in Science for the Developing World (OWSD)**  
**Mayra de la Torre**, PhD, Full Professor, Department of Food Sciences, the Centro de Investigacion en Alimentacion y Desarrollo A.C. in Sonora, Mexico

#### 10. Creating Bridges with European Funders

Chair: **Inés Sánchez de Madariaga**, Arch., PhD, MSc, Director, Women and Science Unit, Cabinet of the Secretary of State for Research and Innovation, Spain, Europe

Rapporteur: **Anne Pépin**, PhD, Director, Mission for the Place of Women, Centre National de la Recherche Scientifique (CNRS), France, Europe

*A panel of European Funding bodies*

- **European Research Council (ERC)**  
**Isabelle Vernos**, PhD, ICREA Research Professor, Center for Genomic Regulation (CRG, Spain), Member of the European Research Council (ERC) Scientific Council, Europe
- **Research Council of Norway (RCN)**  
**Hans M. Borchgrevink**, MD, Special Adviser, International Staff, The Research Council Norway (RCN), Norway, Europe
- **German Research Foundation (DFG)**  
**Eva Reichwein**, PhD, In-House Counsel, Quality Assurance and Programme Development, Deutsche Forschungsgemeinschaft (DFG), Germany, Europe
- **Research Councils United Kingdom (RCUK)**  
**Rosie Beales**, Senior Policy Manager, Research Careers and Diversity at Research Councils UK, Research Council UK (RCUK), UK, Europe

Plenary Session: **Gender Roadmap for Research and Innovation Systems. Addressing the Needs of Different Stakeholders**

- **Introduction of Speaker**  
**Betty Shanahan**, Executive Director & Chief Executive Officer, Society of Women Engineers (SWE), USA
- **Speaker and Chair**  
**Kim Allen**, Chief Executive Officer, Engineers Canada, Canada
- **Report from Roadmapping Parallel Sessions:**  
Chairs from parallel sessions, report on key conclusions arrived at in their session
- **Looking Forward**  
**Nancy Cantor**, PhD, Chancellor, Syracuse University, USA

#### **DAY THREE**

**Parallel Sessions Stream 2 – The Gender Dimension in the Research Continuum (Basic -> Applied -> Innovation -> Markets)**

##### 1. Health

Discussant: **Adriana Ortiz Ortega**, PhD, National University of Mexico, Mexico

- **Sex, Gender and the Brain**  
**Gillian Einstein**, PhD, Associate Professor of Psychology and Public Health, University of Toronto, Canada
- **New Approaches to Understanding Bacterial Virulence and Improving Future Management of Urinary Tract Infections**  
**Jeffrey Henderson**, PhD, Assistant Professor of Medicine and Molecular Microbiology, Center for Women's Infectious Diseases Research, Division of Infectious Diseases, Washington University School of Medicine, USA
- **Measuring the Health Effects for Gender**  
**Susan Phillips**, MD, Professor, School of Medicine, Queen's University, Kingston, Canada
- **Predictability and Correlation in Human Metrology**  
**Don Adjero**, PhD, Professor & Graduate Coordinator of Computer Science, Department of

Computer Science and Electrical Engineering, West Virginia University, USA

## 2. Environment

Discussant: **Itzá Castañeda**, Senior Gender Adviser, United Nations Development Programme (UNDP), Mexico Country Office, Mexico

- ***Radiation Exposure, Sex and the Reference Man***

**Arjun Makhijani**, PhD, President, Institute for Energy and Environmental Research, Maryland, USA

- ***Gender, Environment and Health***

**Donna Mergler**, PhD, Professor Emerita, Interdisciplinary Research Centre on Biology, Health, Society and Environment, Université du Québec à Montréal, Canada

- ***Impact of Oil Production on the Environment in Mexico***

**Myriam Amezcua Allieri**, PhD, Research Scientist, Mexican Petroleum Institute, Mexico

## 3. Climate Change

Discussant: **Billy M. Williams**, PhD, Director of Science, American Geophysical Union (AGU), USA

- ***Gender Data in Climate Change Research***

**Aaron M. McCright**, PhD, Associate Professor, Lyman Briggs College at Michigan State University, USA

- ***Gender-differentiated Impact of Climate Change***

**Amelia H. X. Goh**, PhD, Associate Knowledge Management Officer in the Environment, Social and Governance Department, International Finance Corporation (IFC), International, USA

- ***Arid Land Management Under Gender Perspective***

**Margarita Velázquez Gutierrez**, Director of the Regional Center for Multidisciplinary Research (CRIM) of National Autonomous University of Mexico, Mexico

## 4. Food Security

Discussant: **Jenna Rapai**, PhD Candidate, Individual Interdisciplinary Studies Program, University of Manitoba, Canada

- ***Gender Equity in the World of Agriculture***

**Annemieke Farenhorst**, PhD, Professor of Soil Science, Faculty of Agricultural and Food Sciences, University of Manitoba, Canada

- ***Maize, Sex, and Feeding the World***

**Burkhard Schulz**, PhD, Professor for Plant Biochemical and Molecular Genetics, Department of Horticulture and Landscape Architecture, Purdue University, USA

- ***Relation Between Women's Ownership of Land and Their Role in Agricultural Decision-Making***

**Carmen Diana Deere**, PhD, Distinguished Professor of Latin American Studies and Food & Resource Economics, University of Florida, USA

## 5. Transportation

Discussant: **Graham Harrison**, PhD, Program Officer, International Science and Engineering, National Science Foundation (NSF), USA

- ***Gender and Safety in Transportation***

**Dipan Bose**, PhD, Road Safety Specialist, Global Road Safety Facility (GRSF), World Bank's Transport Anchor, USA

- ***Car Crashes and Improving Safety for Women and Men***

**Janet Brelin-Fornari**, PhD, Professor of Mechanical Engineering, and Director of the Crash Safety Center, Kettering University, USA

- ***How Equitable is Access to Transportation Options?***

**Catherine Morency**, PhD, Associate Professor, Department of Civil, Geological and Mining Engineering, Polytechnique Montreal, Canada

## Parallel Sessions: Best Practice Training Workshops

### 1. Integrating Gender Dimension into Medical Researcher Training

Moderator: **Janine Clayton**, MD, Director, Office of Research on Women's Health (ORWH), National Institutes of Health (NIH), USA

- ***How Gendered Innovations can be used for training***

**Vera Regitz-Zagrosek**, MD, Director, Institute of Gender in Medicine, Charité - Universitätsmedizin Berlin, Germany, Europe

- ***Measuring the Health Effects of Gender***

**Susan Phillips**, MD, Professor, School of Medicine, Queen's University, Kingston, Canada

- ***Researching Sex Effects in Susceptibility to Cancer***

**Clara Gorodezky Lauferman**, PhD, Professor and Director of the Department of Immunology and Immunogenetics, Instituto de Diagnostico y Referencia Epidemiologicos, México City, Mexico

- ***Promoting Best Practice and Knowledge for More Gender Aware Diagnosing and Treatment***

- **Phyllis E. Greenberger**, MSW, President and Chief Executive Officer, Society for Women's Health Research, USA

***Women's Health Curricula and Interprofessional Collaboration across the Health Professions***

- Commander **Morrissa B. Rice**, MHA, Senior Public Health Analyst, Health Resources and Services Administration, Office of Women's Health, USA

### 2. New Approaches to Career Development Support for Early Stage Female Scientists

Moderator: **Elizabeth Pollitzer**, Director, Portia Ltd, UK, Europe

- ***Best Practices in Mentoring***

**Stacie Geller**, PhD, G. William Arends Professor of Obstetrics and Gynecology, University of Illinois College of Medicine, Director, UIC Center for Research on Women, Director, Gender and the National Center of Excellence in Women's Health, USA

- ***Work-life Integration Toolkit***

**Donna J. Dean**, PhD, Executive Consultant, Past President, Association for Women in Science (AWIS), USA

- ***The Recruitment, Retention and Advancement of Women in STEM Fields***

**Carolyn Emerson**, Project Coordinator, Canadian Coalition for Women in Science, Engineering, Trades and Technology, Canada

- ***Rotation Programs***

**Stacey DelVecchio**, Manager, Caterpillar Inc., and President, Society for Women Engineers, USA

### 3. Making Women in the System Visible

Moderator: **Abigail Forson**, MA, Assistant Director, Institute of Gender and Health (IGH), Canadian Institutes of Health Research (CIHR), Canada

- ***What Works for Women At Work in STEM: Success Strategies for Navigating Careers Shaped by Implicit Bias***

**Joan C. Williams**, JD, MA, Distinguished Professor of Law, UC Hastings Foundation Chair and Director of the Center for WorkLife Law, USA

- ***The Chicago Collaboration for Women in Science Expert Portal***

**Holly Falk-Krzesinski**, PhD, Vice President of Global Academic and Research Relations, Elsevier, USA

- ***Actua National Girls Program – Engaging Girls: The Importance of All-Girls Programs***

*in STEM*

**Virginia Hall**, Director of Operations and Research, Actua, Canada

- ***Learning from Role Models and Scenarios***

**Martina Schraudner**, PhD, Head of the Department of Gender and Diversity in Organizations, Technical University Berlin, and Director of Responsible Research and Innovation Unit, Fraunhofer Gesellschaft, Germany, Europe

4. **Methods of Supporting Career-Life Balance in Institutions**

Moderator: **Kelly Mack**, PhD, Vice President for Undergraduate Science Education and Executive Director, Project Kaleidoscope, Association of American Colleges and Universities (AAC&U), USA

- ***ADVANCE Example: Methods of Supporting Career-Life Integration in Higher Education***

**Gretalyn (Gretal) Leibnitz**, PhD, Director, ADVANCE Implementation Mentors (AIM) Network & Assistant Director, ADVANCE at WSU Excellence in Science and Engineering (EXCELinSE) Center, Washington State University, USA

- ***ADVANCE Example: Institutional Transparency in Leave Policies***

**Patrice McDermott**, PhD, Vice Provost for Faculty Affairs, University of Maryland, USA

- ***ADVANCE Example: University of Rhode Island***

**Barb Silver**, PhD, Research Coordinator, University of Rhode Island Schmidt Labor Research Center, USA

- ***ADVANCE Example: National Postdoc Association***

**Cathee Johnson Phillips**, MA, Executive Director, Foothills Child Advocacy Center, Charlottesville, USA

5. **Fostering Interdisciplinary Careers**

Moderator: **Joan Davis Nagel**, MD, MPH, Medical Officer, Office of Research on Women's Health (ORWH), DPCPSI, National Institutes of Health, USA

- ***Best Practices and Pearls in Interdisciplinary Mentoring from Building Interdisciplinary Research Careers in Women's Health Directors***

**Judy Regensteiner**, PhD, Professor of Medicine, Department of Medicine, University of Colorado School of Medicine; Principal Investigator, NIH Building Interdisciplinary Research Careers in Women's Health; The Judith and Joseph Wagner Chair in Women's Health Research; Director, Center for Women's Health Research, USA

- ***The National BIRCWH program***

**Jeanne-Marie Guise**, MD, MPH, Professor of Obstetrics and Gynecology, Medical Informatics, and Clinical Epidemiology, Principal Investigator, NIH Building Interdisciplinary Research Careers in Women's Health (BIRCWH), Oregon Health and Science University, USA

- ***Collaborative Science: Designing the Future***

**Susan Winter**, PhD, Lecturer and Assistant Program Director, College of Information Studies, University of Maryland, USA

- ***The Emerging Field of the Science of Team Science***

**Stephen M. Fiore**, PhD, Associate Professor of Cognitive Science, University of Central Florida, USA

6. **The NSERC Model: Chairs for Women in Science and Engineering Program**

Moderator: **Serge Villemure**, Director, Research Grants & Scholarships, Natural Sciences and Engineering Research Council of Canada (NSERC), Canada

- ***The Chair for Women in Science and Engineering Program: An Introduction***

**Céline Bérubé**, PhD, Team Leader, Scholarships and Fellowships Division, and Manager, Chairs for Women in Science and Engineering Program, Natural Sciences

- and Engineering Research Council of Canada (NSERC), Canada
- ***A Positive Approach to Opening Up the Gender Diversity Discussion: Non-Threatening Activities for Men and Women, Empowerment for STEM Women and a Positive Communications Campaign***  
**Catherine Mavriplis**, PhD, NSERC-Pratt & Whitney Canada Chair for Women in Science and Engineering and Associate Professor, Faculty of Engineering, University of Ottawa, Canada
  - ***Including First Nations Histories and Time-Honored Traditions in University Science and Engineering Training as Part of Best Practices for Recruitment and Retention***  
**Annemieke Farenhorst**, PhD, Chair for Women in Science and Engineering Prairie region and Professor, Faculty of Agricultural and Food Sciences, University of Manitoba, Canada
  - ***Strategies to Support, Train and Develop Self-Sustained Practices in Outreach Groups, Providing Services and Activities for a Broad Spectrum of Audiences, Ages, and Interests***  
**Elizabeth Croft**, PhD, Professor and NSERC Chair for Women in Science and Engineering (BC/Yukon Region) and Professor, Faculty of Engineering, University of British Columbia, Canada
  - ***Strategies to Enable Girls in Junior and Senior High School to Meet and Interact with Role Models, to Expand Their Limited View of the Science Fields and to Experience Hands-On and Fun Activities***  
**Tamara Franz-Odendaal**, PhD, Associate Professor, Mount Saint Vincent University, Halifax, Nova Scotia, Canada

Full Schedule, Videos and Powerpoints are available at  
[www.gendersummit2013-na.com/index.php/program](http://www.gendersummit2013-na.com/index.php/program).

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