

The Inter-American Year of Women: LACCEI Recognizing Successes and Challenges in Gender Equity and Equality in Engineering Education in the Americas

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ABSTRACT

The year 2010 was proclaimed "The InterAmerican Year of Women" (OAS, 2009) by the Organization of American States to especially commemorate the 35th anniversary of the first United Nations' World Conference on Women during the International Women's Year, the 15th anniversary of the last United Nations' World Conference on Women celebrated in Beijing in 1995, and the 10th anniversary of the adoption of the Inter-American Program on the Promotion of Women's Human Rights and Gender Equity and Equality. The goal of the proclamation is to broadly mobilize throughout the Americas an evaluation of successes and challenges in the defense of women's human rights and gender equity and equality, and to strengthen public sensitivity to gender issues. To show solidarity with this proclamation, the Latin American and Caribbean Consortium of Engineering Institution (LACCEI) at their 2010 conference will celebrate the accomplishments of Inter-American women engineers by recognizing distinguished female engineering educators, will identify resources available to recruit and retain women in engineering, and will discuss the challenges faced in the Americas to attain gender equity and equality in this field. This paper provides a summary of the resources, successes and challenges presented in the LACCEI 2010 conference.

Keywords: women, gender equity, advancement for women, engineering education

1. INTRODUCTION

The Executive Committee of the International Commission of Women (CIM, in Spanish: Comisión Nacional de Mujeres) of the Organization of Americas States (OAS) proposed in 2007 that 2010 be proclaimed by the OAS as the Inter-American Year of Women (OAS, 2009) to broadly mobilize throughout the Americas an evaluation of successes and challenges in the defense of women's human rights and gender equity and equality, and to strengthen public sensitivity to gender issues.. There have been four United Nations' World Conferences on Women. The first, during the International Year of Women in 1975 held in Mexico City (UN, 1976), the second in Copenhagen in 1980 (UN, 1980), the third in Nairobi in 1985 (UN, 1986), and the fourth held in Beijing in 1995 (UN, 1996).

The United Nations convened the *Fourth United Nations World Conference on Women: Action for Equality, Development and Peace* in Beijing, China on September 4-5, 1995. The delegates (189 Governments, 5000

representatives from 2,100 non-governmental organizations) approved a Platform for Action aimed at achieving greater equality and opportunity for women, documented in: The Beijing Declaration⁵ and the Beijing Platform for Action (UN, 1996). The conference signaled a clear commitment to international norms and standards of equality between men and women. It found that the issues were global and universal, and that inequality and discrimination against women both in public and private life throughout the world are perpetuated by deeply entrenched attitudes and practices, and that changes in values, attitudes and priorities were required at all levels. To this end, governments, the international community and civil society, including non-governmental organizations and the private sector, were called upon to take strategic action in 12 critical areas of concern (UN, 1996) shown in Table 1.

Table 1. Critical Areas designated by the United Nations Beijing Declaration and Platform for Action

<ol style="list-style-type: none"> 1. The persistent and increasing burden of poverty on women 2. Inequalities and inadequacies in and unequal access to education and training 3. Inequalities and inadequacies in and unequal access to health care and related services 4. Violence against women 5. The effects of armed or other kinds of conflict on women, including those living under foreign occupation 6. Inequality in economic structures and policies, in all forms of productive activities and in access to resources 7. Inequality between men and women in the sharing of power and decision making at all levels 8. Insufficient mechanisms at all levels to promote the advancement of women 9. Lack of respect for and inadequate promotion and protection of the human rights of women 10. Stereotyping of women and inequality in women's access to and participation in all communication systems, especially in the media 11. Gender inequalities in the management of natural resources and in the safeguarding of the environment 12. Persistent discrimination against and violation of the rights of the girl child
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Five years after the Beijing Conference, there was an Ad Hoc Committee of the Whole formed as part of the Twenty-Third Special Session of the United Nations General Assembly (UN, 2000). The United Nations Economic and Social Council Commission on the Status of Women (CSW), formed since 1946, issues reports dedicated exclusively to gender equality and advancement of women, and has published annual, five and ten year reviews and appraisals of the implementation of the Beijing outcomes. This year there will be a 15 year national level, regional level and global review of the implementation of the Beijing Declaration and Platform of Action (UN-CSW, 2010). Women around the world and not-for-profit organizations have organized a Call to Action in support of a United Nations sponsored Fifth World Conference on Women (5WCW, 2010). It does not appear that the UN will organize a World Conference in 2010, but the Beijing+15 CSW54 meeting will take place the 1-12 March 2010 in New York (UN-CSW, 2010; 5WCW, 2010)

In the Beijing Platform for Action, one of the goals pertinent to LACCEI members was

“Diversify vocational and technical training and improve access for and retention of girls and women in education and vocational training in such fields a science, mathematics, engineering, environmental sciences, and technology, information technology and high technology, as well as management training. Actions to be taken: Strategic objective L.4: Eliminate discrimination against girls in education, skills development and training. Action 279 by Governments: Ensure universal and equal access to and completion of primary education by all children and eliminate the existing gap between girls and boys, as stipulated in article 28 of the Convention on the Rights of the Child; similarly, ensure equal access to

secondary education by the year 2005 and equal access to higher education, including vocational and technical education, for all girls and boys, including the disadvantaged and gifted.” (UN, 1996)

To show solidarity with the OAS proclamation of 2010 as the Inter-American Year of Women (OAS, 2009), and in an effort to advance the issues that fall within its mission, the Latin American and Caribbean Consortium of Engineering Institution (LACCEI) at their 2010 conference will celebrate the accomplishments of Inter-American women engineers by recognizing distinguished female engineering educators, will identify resources available to recruit and retain women in engineering, and will discuss the challenges faced in the Americas to attain gender equity and equality in this field. This paper provides a summary of the resources, successes and challenges presented at the LACCEI 2010 conference.

2. STATISTICS ON WOMEN ISSUES

The International Museum of Women (IMOW, 2010) publishes several maps with statistics regarding women issues. As the maps in Figure 1 show, although the data they feature is not current, they show disparity between wages earned by women and men, and the incidents of reported violence against women is a cause for concern in the Americas.

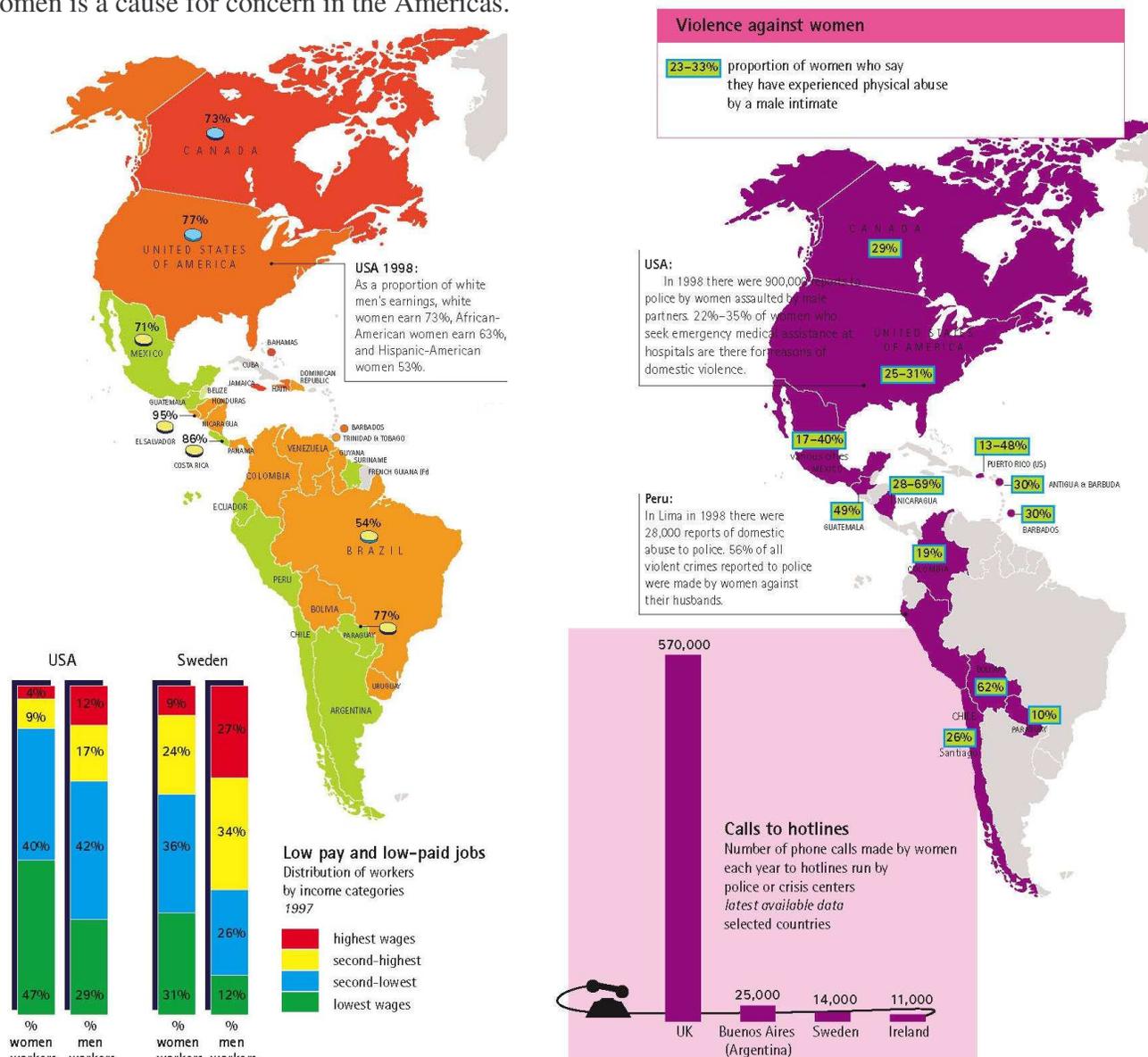


Figure 1. Maps related to gender issues from the International Museum of Women (IMOW, 2010)

Since LACCEI focuses on Engineering Education, this paper will concentrate on the data regarding women in Science, Technology, Engineering and Mathematics (STEM). The United States National Academy of Sciences, National Academy of Engineering and Institute of Medicine published *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Sciences and Engineering* (US-NA, 2007). The importance of attaining equality for women in the STEM disciplines is emphasized by this study:

“The U.S. economy relies on the productivity, entrepreneurship, and creativity of its people. To maintain its scientific and engineering leadership amid increasing economic and educational globalization, the United States must aggressively pursue the innovative capacity of *all* of its people—women and men. Women make up an increasing proportion of science and engineering majors at all institutions, including top programs such as those at the Massachusetts Institute of Technology (MIT) where women make up 51% of its science undergraduates and 35% of its engineering undergraduates. For women to participate to their full potential across all science and engineering fields, they must see a career path that allows them to reach their full intellectual potential. Much remains to be done to achieve that goal.” (US-NA, 2007)

Sandra Day O’Connor, U.S. Supreme Court Justice stated:

“Major American businesses have made clear that the skills needed in today’s increasingly global marketplace can only be developed through exposure to widely diverse people, cultures, ideas, and viewpoints.” (USSP, 2003).

Globalization is challenging the U.S. longstanding scientific pre-eminence and its economic leadership. To retain the competitiveness of the Western Hemisphere, the Americas must address the inequities in gender and ethnic representation in the STEM fields.

Looking at the percentage of science and engineering PhDs awarded to women in the twenty year period 1974-2004, the U.S. National Academies, using data from the National Science 2006 Survey of Earned Doctorates 1974-2004, constructed the summary shown in Figure 2. Note that women in 2004 have attained equality in representation in the Social Sciences and Life Sciences but are still lagging in Physical Science and Engineering. In the top 50 engineering departments in the U.S., women earn one-fourth of the PhD’s granted in Chemical Engineering and 15% in engineering overall (Handelsman et al, 2005). Although women constitute about half of the total workforce in the U.S. and receive half of the degrees in certain scientific fields, they number only one-fifth of the nation’s scientific and technical workers (US-NA, 2007).

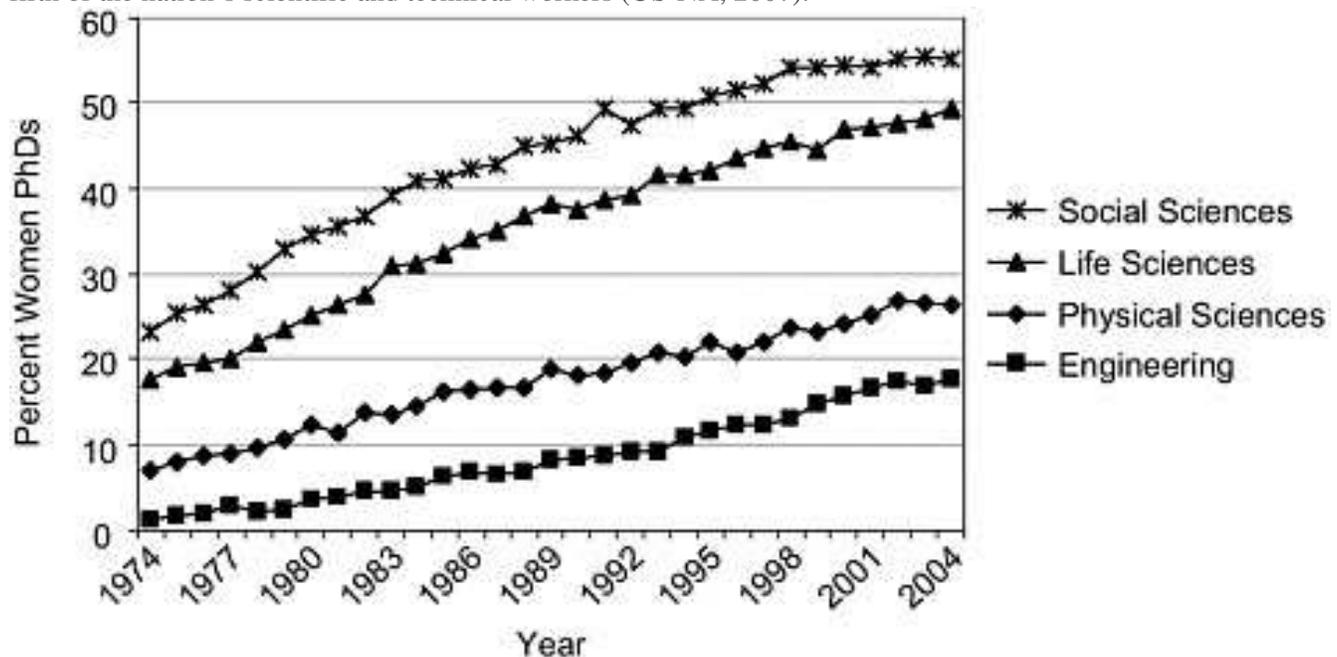


Figure 2. Percentage of science and engineering PhDs awarded to women, 1974-2004 (US-NA, 2007). Source: National Science Foundation (2006). Survey of Earned Doctorates, 1974-2004, Arlington, VA.

The Engineering Workforce Commission of the American Association of Engineering Societies publishes for 60 years enrollment in engineering and technology (AAES-EWC, 2009). The authors compared enrollments in Fall 2008 (the latest available at the time of publication of this article) to Fall 1998 to see the gender trend differences in enrollment, shown in Table 2 (AAES-EWC, 2009; AAES-EWC, 1999). Comparing 1998 to 2008 shows that the total number of women enrolled in engineering disciplines in higher education increased in number from 93,608 to 111,042, showing an 18.6% increase in total women studying engineering; however the number of students in engineering increased from 477,346 to 596,058 so the net change in percentage of women in engineering programs decreased by almost 1 per cent. A ten year comparison shows that the percentage of women in BS engineering programs decreased by 2.19% to 17.53%, in MS engineering programs increased very slightly by 1.49% to 21.60%, and in PhD engineering programs increased by 4.62% to 22.12%. These numbers do not track with the 35% enrollment of women in the MIT program. It is clear that engineering still has far to go to reach equality in representations in the higher education programs.

Table 2. Ten year comparison of women enrolled in engineering disciplines in the U.S.

U.S. Engineering Enrollment 1998 vs. 2008 BS, MS, and PhD							
Degree	Fall 1998 Undergraduate			Fall 2008 Undergraduate			Percent Change Ten Yrs
	Women	All	% of Total	Women	All	% of Total	
BS - Full Time	66,276	329657	20.10%	73046	411345	17.76%	-2.35%
BS - Part Time	6,117	37334	16.38%	4625	31607	14.63%	-1.75%
BS - All	72,393	366991	19.73%	77,671	442952	17.53%	-2.19%
MS - Full Time	8004	38976	20.54%	13199	60169	21.94%	1.40%
MS - Part time	6657	33927	19.62%	7476	35544	21.03%	1.41%
MS - All	14661	72903	20.11%	20675	95713	21.60%	1.49%
PhD - Full Time	5486	30543	17.96%	11307	50261	22.50%	4.54%
PhD - Part time	1068	6909	15.46%	1389	7132	19.48%	4.02%
PhD - All	6554	37452	17.50%	12696	57393	22.12%	4.62%
Total	93,608	477,346	19.61%	111,042	596,058	18.63%	-0.98%

Of concern to many women in choosing a career is the effect of marriage and the presence of young children on their career, unfortunately studies have found that marriage and children “spur the career advancement of men but slow the advantage of women” (Xie and Shauman, 2003). The U.S. National Academies study also summarized a National Science Foundation 2003 survey of women and men doctoral scientists and engineers in tenured or tenure-track positions, where they were asked their gender, marital status and presence of children (US National Academies, 2007). Figure 3 provides the comparison by discipline. On average, 64.4% of women doctoral scientists and engineers in tenure and tenure-track careers are married; compared to 83.4% of men; 42.2% of women have children compared to 50% of men. Although these figures differ by field they have not substantially changed from 1993 to 2003. Figure 4(a) shows in of those women who are married, more women scientists and engineers are married to full-time working spouses (UN Academies, 2007). Figure 4(b) shows that 64% to 81% of women scientists and engineers marry fellow scientists and engineers (UN Academies, 2007).

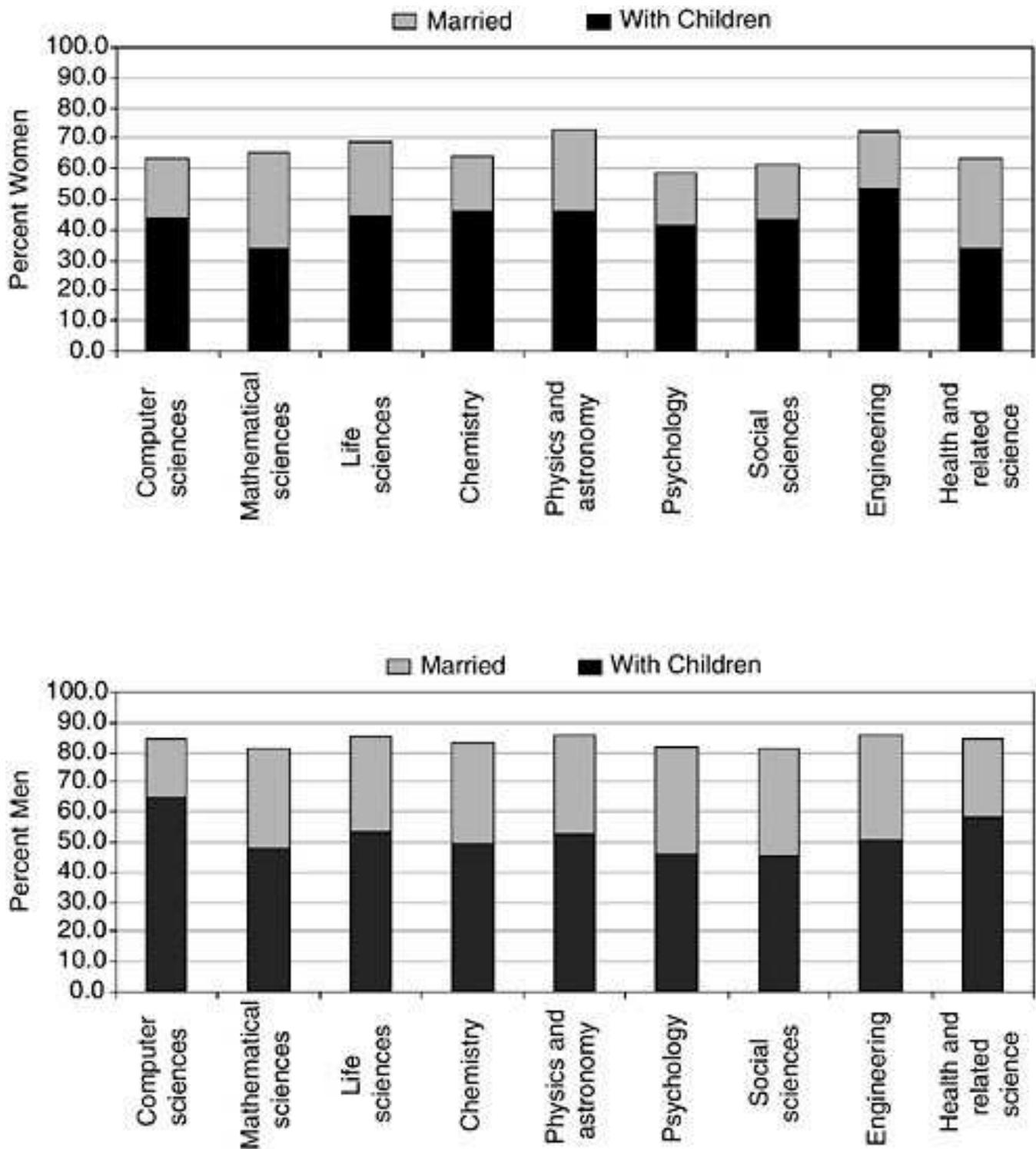


FIGURE 3. Percent of women and men doctoral scientists and engineers in tenured or tenure-track positions, by sex, marital status, and presence of children, 2003 (US-NA, 2007). SOURCE: National Science Foundation (2003). *Survey of Doctorate Recipients, 2003*. Arlington, VA: National Science Foundation.

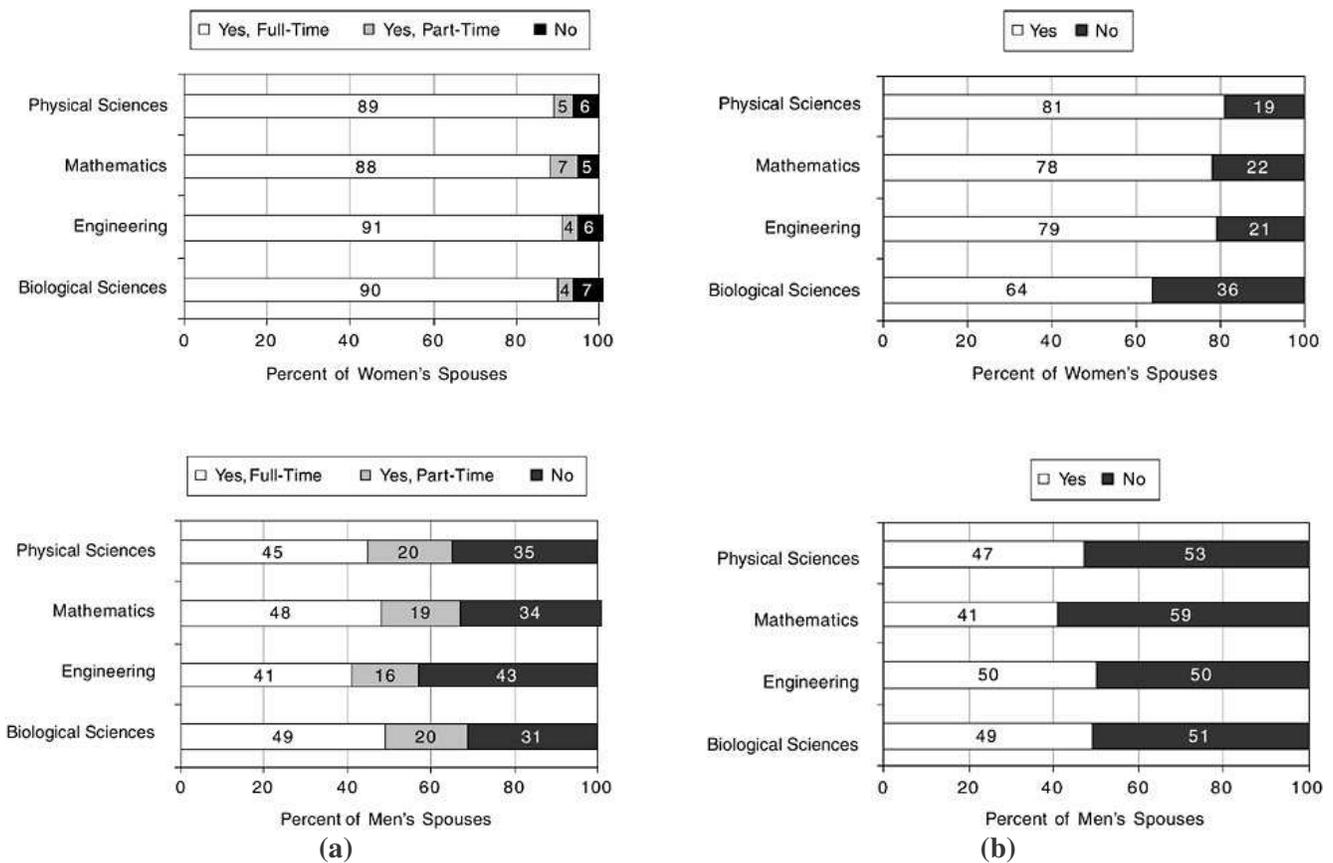


Figure 4. (a) Spousal employment of science and engineering PhDs, 30-44 years old in 1999: Married PhDs. (US National Academies, 2007). (b) FIGURE 5-3 Employment expertise of spouses of science and engineering PhDs, 30-44 years old in 1999: Married PhDs with employed spouses. NOTES: Yes = married to another scientist or engineer; No = not married to another scientist or engineer (US National Academies, 2007). SOURCE: National Science Foundation (1999). *Survey of Doctoral Recipients*. Arlington, VA: National Science Foundation.

The Athena Factor (Hewlett, et al, ,2008) published by the Harvard Business Review studied the career trajectories of women working in the private sector that had Science, Engineering and Technology (SET) credentials. It found that 41% of the SET pipeline in their early career stage are females, and 52% of highly qualified women in SET leave the field. The breaking point appears to be when the SET professional woman is in her mid- to late-30s, ten years into a SET career, when they encounter at the same time serious career hurdles and family pressures (Hewlett , et al, 2005). Women occupy 40% of U.S. managerial positions but only 6% of executive positions in Fortune 500 (Eagly, et al,2009). The Athena report identifies five main reasons for the attrition in SET professional women throughout their careers: hostile macho cultures, severe isolation, mysterious career paths, systems of rewards that emphasize risk taking and extreme work pressures, . Reduction of female attrition by one quarter would add 220,000 qualified professionals to the tight labor market in SET disciplines. The report describes 13 new industry initiatives designed to lower female attrition, such as Alcoa (WOVEN), Johnson & Johnson (Crossing the Finish Line), Microsoft (Mentoring Rings, Cisco (ETIP), General Electric (Restart), Google, Intel, MIT, . IBM and Pfizer. These programs focus. These programs attempt to re-align corporate cultures and re-design career paths to support the needs of SET professional women, taking the perspective that we need to “fix” business, rather than “fix” women.

Some U.S. data for minorities and women are available through the Center for Work Life Policy (see www.worklifepolicy.org). *Creating a Life* (S. A. Hewlett, 2002) identifies creating rich multidimensional lives that contain both career and children as one of the most significant challenges women faced today, its being named one of the ten best books of 2002 by Business Weeks shows its relevancy. Data in *High-Achieving Women* (S. A. Hewlett et al, 2002) supports that professional women have a much more difficult time balancing work and family than was previously thought. *Executive Women and the Myth of Having It All* (S. A. Hewlett, 2002) provides data that shows that demands of ambitious careers, the asymmetries of male-female relationships, and the difficulties of conceiving later in life impact career and family choices for women and underline the need for corporations and government to establish policies that support working parents. The *Sin Fronteras* (Hewlett et al, 2007) research report from the Center for Work Life Policy focused on focused on Latina executives (not necessarily in SET). It identified heritage skill sets that transfer to executive skills: work ethic, collaborative leadership and cultural fluency. It argues that these strengths are either ignored or denied by employees due to negative stereotypes, hampering career progress and increasing attrition risk among Latinas.

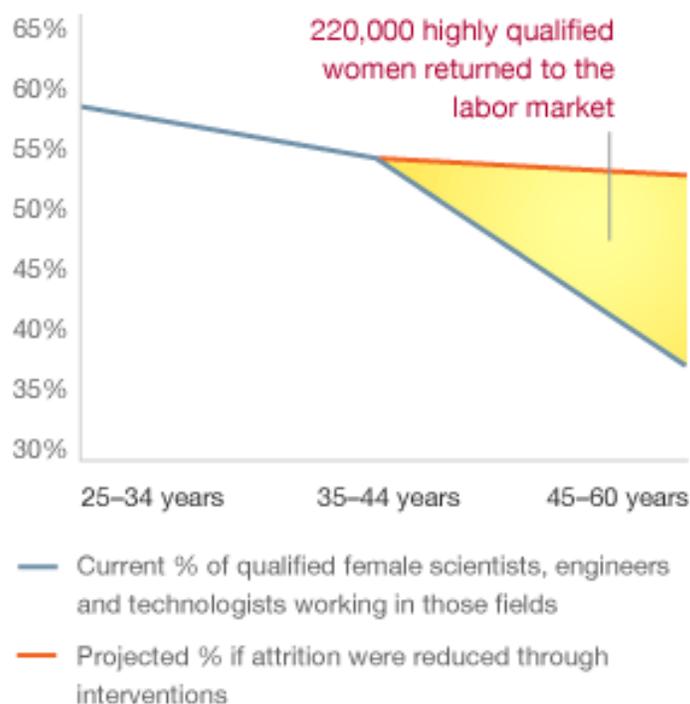


Figure 3. Projected attrition reductions through interventions of female professionals working in SET fields.

Data from focusing on Iberoamerica was dated (Blazquez Graf y Flores, 2005).

3. RESOURCES TO ATTRACT AND RETAIN WOMEN IN ENGINEERING

In 2004, the Minority Division (MIND) of the American Society of Engineering Education (ASEE) launch the MIND Links project to gather and publish links to resources to help recruit and retain underrepresented minorities in engineering. The project has grown to over 750 links, published annually in a paper (_____, 2010). Table 2 and the following sections detail some of the resources listed in the latest MIND Links project.

3.1 RESOURCES TARGETING MINORITIES AND WOMEN

The GE Faculty for the Future program (see <http://www.facultyforthefuture.org>) is a ten year, \$20 million initiative of the GE Foundation and WEPAN to increase the number of women and under-represented minorities faculty in engineering, related sciences and business. It has assisted nearly 200 students, who have earned PhD degrees and accepted faculty positions with over 900 students in the pipeline. The website links a diverse pool of women and under-represented minority candidates from engineering, science, and business with faculty and research positions at universities across the country.

The U.S. National Science Foundation created the ADVANCE program in 2001 to focus on developing centers to increase the participation and advancement of Women in academic Science and Engineering (see http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383). The ADVANCE program has 3 funding areas:

1. Institutional Transformation (IT) – support systemic organizational approaches in higher education that will result in increasing the participation and advancement of women in STEM academic careers,
2. Institutional Transformation Catalyst (IT-Catalyst) – support organizational self-assessment activities that will result in issue identification and resolution of barriers in the recruitment, retention and promotion of women faculty in STEM academics, and
3. Partnerships for Adaptation, Implementation, and Dissemination (PAID) – support the extensibility of materials, tools, research and practices that have been demonstrated as effective in increasing the participation and advancement of women in stem careers.

WEPAN, The Women in Engineering ProActive Network, received an ADVANCE award from the NSF, called ENGAGE (Engaging Students in engineering through Instruction and Mentoring). This is the first year of this 3 year project, which will fund teams and minigrants from 10 universities each year. The grants will focus is training teams on best practices and disseminating them to their institutions: this include 1. improving visual 3D manipulation skills, 2. providing effective mentorship experiences, and 3. providing real world problems in the engineering classes. The first application deadline was October 28, 2009, more information and contact information can be found in the website:

http://www.wepanknowledgecenter.org/c/journal_articles/view_article_content?groupId=1007&articleId=1243&version=1.0&p_1_id=PUB.1.81

The National Alliance for Partnerships in Equity (NAPE, see www.napequity.org), the U.S. association for equity professionals, have several initiatives of interest funded through their Education Foundation:

- **Taking the Road Less Traveled** is an educator’s tool kit containing a CD-ROM to prepare students for nontraditional careers. (see <http://www.napequity.org/page.php?196>)
- **Stem Equity Pipeline** provides training to State Teams that provide Leadership and Professional Development Institutes to middle school, high school and community faculty in STEM or STEM related career and technical education programs, and provides a Virtual Learning Community through its public web-based portal (see www.stemequitypipeline.org). They provide a number of <http://www.stemequitypipeline.org/Resources/OnlineResources/default.aspx>
- **Advocacy Toolkit** (see <http://www.napequity.org/page.php?81>) is provided for NAPE State and Affiliate members

MentorNet (see <http://www.mentornet.net/>) is the E-Mentoring Network for Diversity in Engineering and Science. It has resources and materials to recruit mentors, students and targeted materials for Academic E-Mentoring Recruiting

Engineering Pathways (see <http://www.engineeringpathway.com/>) is a website that lets you search for educational resources by Grade/Audience (K-12, Higher Education, Professional Development and Continuing Education), Keywords and Resource Type. An advanced option allows searches that narrow down by Science and Engineering Disciplines, exact grade level, There are a number of searchable collections of resources and data that have information of interest, these include:

- ACM Women in Computing
- Advances in Engineering Education
- Broadening Participation in Computing (BPC)
- CARES—Community Assessment of Renewable Energy and Sustainability
- Center for Sustainable Engineering
- Engineering and Business for Sustainability
- International Journal of Engineering Education
- Math Forum
- National Library of Virtual Manipulatives for Interactive Math
- NEEDS—National Engineering Education Digital Library System
- Pr2ove-It
- SINAM—Educational Digital Library for the Center for Scalable and Integrated Nanomanufacturing
- TeachEngineering
- Tomorrow's Professor
- VaNTH ERC

3.2 RESEARCH ON WOMEN IN SCIENCE AND ENGINEERING

The National Science Foundation (NSF) provides a demographics figures and tables on women, minorities and persons with disabilities in Science and Engineering at <http://www.nsf.gov/sbe/srs/wmpd/list.htm>. The National Academy of the Sciences Committee on Women in Science and Engineering publishes statistics at <http://www.nsf.gov/sbe/srs/wmpd/list.htm>. A faculty study on gender equity and climate at Research 1 institutions is at http://www7.nationalacademies.org/cwse/gender_faculty_links.html.

The *Journal of Women and Minorities in Science and Engineering* is published by Begell House, Inc., 145 Madison Ave., NY, NY 10016-7892. Phone: 212 725-1999; Fax: 212 213-8368. See <http://www.begellhouse.com>. This journal publishes original, peer-reviewed papers on innovative ideas and programs, scientific studies, and formulation of concepts related to education, recruitment, and retention of underrepresented groups in science and engineering.

The NAE has also developed a web site for girls: <http://www.engineergirl.org/> that contains sections on Why Be An Engineer, Fun Facts, Cool Links, Cool Readings, Great Achievements, and an EngineerGirl Essay Contest <http://www.engineergirl.org/?id=3821>. It also has a site for Women Engineer

WEPAN has developed a web portal for their WEPAN Knowledge Center as an online resource for research, best practices, and professional communities dedicated to advancing all women in engineering. The resources are organized by Research & Reports, Assessment & Practice, Data & Statistics, Policy &

Law, Profiles (Organizations, Programs, Projects, Initiatives and Tools), Cohorts, Resource Type (article, blog, book, etc.), and STEM Disciplines. (see <http://www.wepanknowledgecenter.org/home>)

3.3 NETWORKS FOR WOMEN

The National Academy of Sciences Committee on Women in Science and Engineering keeps a directory of organizations encouraging women in science and engineering. Organized by discipline: <http://www8.nationalacademies.org/cwse/ViewbyDiscipline.asp>; and organized by title: <http://www8.nationalacademies.org/cwse/Viewbytitle.asp>.

Table 2. Engineering, Technology, Science and Mathematics Societies for Women

Professional Organizations for Women	Web link
AAUW American Association of University Women	http://www.aauw.org/
AAWD American Association of Women Dentists	http://www.aawd.org/
AAWR American Association for Women Radiologists	http://www.aawr.org/
ABIWT The Anita Borg Institute for Women and Technology	http://www.iwt.org/ http://www.anitaborg.org/
AMWA American Medical Women's Association	http://www.amwa-doc.org/
ASEE Women in Engineering Division	http://www.csupomona.edu/%7Esparisay/ASEE/WIED/
ASWA American Society of Women Accountants	http://www.aswa.org/
AWC Association for Women in Computing	http://www.awc-hq.org/
AWG Association for Women Geoscientists	http://www.awg.org/
AWID Association for Women Industrial Designers	http://www.core77.com/awid/
AWIS Association for Women in Science	http://www.awis.org/
AWiSE Association of Women in Science and Engineering	http://www.awise.org/
AWM Association for Women in Mathematics	http://www.awm-math.org/
AWP Association for Women in Psychology	http://www.iup.edu/counsl/awpac/
AWMI Association of Women in the Metal Industries	http://www.awmi.com/
AWSS Association of Women Soil Scientists	http://awss.homestead.com/
CWSE Committee on Women in Science and Engineering	http://www7.nationalacademies.org/cwse/
FWE Forum for Women Entrepreneurs	http://www.fwe.org/
IWITTS Institute for Women in Trades, Technology & Science	http://www.iwitts.com/
SCWIST Society for Canadian Women in Science and Technology	http://www.harbour.sfu.ca/scwist/
SWE Society of Women Engineers	http://www.swe.org/
SWEP Society of Women Environmental Professionals	http://www.swepweb.com/
Systems On Line (community for women in computing)	http://www.systems.org/
WAM Women and Mathematics Network	http://www.mystery.com/WAM/network/Index.html
Women in Bio	http://www.womeninbio.org/
WEPAN Women in Engineering Programs and Advocates Network	http://www.wepan.org
Women's Engineering Society (in UK)	http://www.wes.org.uk
WIEC (IEEE Women in Engineering Committee)	http://www.ieee.org/portal/pages/committee/women/
WiSE Women into Science and Engineering	http://www.lib.iastate.edu/spcl/wise/wise.html
WITI Women in Technology International	http://www.witi.com

A closer look at some of the organizations:

- **Association for Women in Computing** – promotes the advancement of women in the computing professions. <http://www.awc-hq.org>
- **Sisters in Science** is an NSF-funded program seeking to increase elementary school girls' interest and achievement in science and mathematics, to create a more positive learning climate for minority school girls

and their families, and to increase parents' understanding of their influence in promoting girls' interest and achievement in science and mathematics. (see <http://www.temple.edu/SIS/>)

- **Society of Women Engineers** – premier organization, have chapters throughout the world. (see <http://www.swe.org/>)
- **Systems Online** – Includes more than 2550 members from 38 countries, maintained by the Anita Borg Institute. It is largest all-female online community of women in computer science and was the original online community specifically designed for women in computing. (see <http://www.iwt.org/systems.html> and <http://www.systems.org/>)
- **WEPAN – Women in Engineering Programs and Advocates Network** – WEPAN's homepage is at <http://www.engr.washington.edu/~wepan/>. It sponsors the project: *MentorNet*, the National Electronic Industrial Mentoring Network for Women in Engineering and Science, available at <http://www.mentornet.net/>
- **WISE Campaign – Women Into Science and Engineering** has initiatives and publications to give girls and women information about opportunities and careers in Science, Engineering and Technology. Their web site is located at <http://www.awise.org/>. Their address is WISE, 22 Old Queen Street, London UK SW1H 9HP. Telephone: 020 7227 8421. Fax: 020 7227 8401. Email: <mailto:wisecampaign@semta.org.uk>
- **WISNET: Women in Science and Engineering Network** – The focus of this group is issues relevant to the education and employment of women in the sciences, mathematics, and engineering. To subscribe, send a message to listserv@UICVM.CC.UIC.EDU, no subject, with the message "subscribe wisenet first_name last_name".
- **WITI: International Network of Women in Technology** – An organization committed to supporting professional development, personal growth and self-improvement for women in science and technology. WITI maintains a substantial Web site called *The WITI Campus* at <http://www.witi.com> and also offers a free electronic newsletter called *The Strategist Online* available at <http://www.witi.com/Center/Offices/WitineWS/Strategist/>. Internet: witi-request@aero.org, gillam@aero.org
- **Women in Engineering Program Advocates Network (WEPAN)** – Founded to provide greater access for women to careers in engineering. Assists colleges and universities to establish innovative programs or expand existing programs. WEPAN includes representatives from industry, government and academia. For more information write: *WEPAN member services, c/o Purdue University, 1284 CIVL Building, Room G293, West Lafayette, IN 479071284. Phone: (317) 494-5387. Fax: (317) 496-1349. Email: /wiep@ecn.purdue.edu*
- **Women in Mathematics Information Server** – is an activity of the Mathematical Association of America Committee for the Participation of Women. Useful links can be found at <http://www.mystery.com/WAM/network/Index.html>. for events such as Women Count Conference, Mathematics Awareness Week, Expanding Your Horizons in Science and Mathematics, Math Options, Sonia Kovalevsky Days and other events sponsored by MAA and other organizations, as well as other useful resources.
- **WOMUNSCI - Women Undergraduates in Science** – WOMen UNdergraduates in SCIENCE is a mailing list for discussing increasing participation of undergraduate women in science. Membership is open to college science educators and administrators (of both genders) and women undergraduates interested in science. To subscribe to WOMUNSCI, send mail to majordomo@cs.umass.edu with *subscribe womunsci your-email-address-here (your-name-here)* in the body of the message, the subject line is ignored.

4. HOW WILL LACCEI CELEBRATE THE INTER-AMERICAN YEAR OF WOMEN?

In this Inter-American Year of Women, what can LACCEI held in the celebration and call to action?

- LACCEI will register as a non-profit organization with the OAS to take a more active role in government policy making through participation in OAS meetings, and register with the CIM the planned LACCEI conference gender related track as part of the official OAS celebration of 2010 as the Inter-American Year of Women.
- The LACCEI Academic Merit medal will be awarded to an exemplar woman engineer who has reached the pinnacle in engineering education and academia. Chemical Engineer Lueny Morell

taught for many years in University of Puerto Rico Mayagüez, where she developed with two other universities the concept and implementation of Learning Factories, for which she won the United States National Academies Gordon Award. She is a leader in industry, working for Hewlett Packard Laboratories' Strategy and Innovation Office, while she leads as President of the International Federation of Engineering Education Society (IFEES, see www.ifees.net). In recognition of her contributions to engineering education curricular reform, her global leadership role in engineering education, and for her being an exemplar role model for women engineers, Engineer Morell will receive the LACCEI highest award this Inter-American Year of Women.

- Honor other distinguished women engineer leaders and hold a distinguished panel to discuss what initiatives LACCEI should support in that area.
- Create a taskforce or Women in Science and Engineering (WISE) council within LACCEI to follow up and report on the initiatives.
- Organize a workshop or session on the NSF ADVANCE funded program outcomes, the WEPAN Knowledge Center, and the WEPAN ENGAGE project.
- Identify and make visible Latin America and the Caribbean initiatives addressing gender issues and their results.
- The Executive Board of LACCEI will be asked to officially endorse the 5WCW initiative to ask the United Nation to sponsor the 5th World Conference on Women to follow up on the 1995 Beijing Platform of Action.

5. CONCLUSIONS

Data on the internet regarding women in engineering in the Western Hemisphere focuses on the United States. One study was found (Blazquez Graf y Flores, 2005) that studied gender and science and technology. There is a need to study gender issues in SET disciplines across the Hemisphere to increase the pipeline and retention of professional women in these fields.

In Engineering Education societies the leadership this year happens to have many women leader in top positions:

- Lueny Morell, President of International Federation of Engineering Education (2008-2010),
- Renata Engel, President Elect of the American Society of Engineering Education. (2010-2011)
- Cristina Amon, Founding Chari of the Global Engineering Deans Council (2008-2009)
- Anette Kolmos, President of SEFI - Société Européenne pour la Formation des Ingénieurs (2009-2011)
- Francoise Come, Secretary General of SEFI
- Maria M. Larrondo Petrie, Executive Director of LACCEI

With the new spirit of collaboration between IFEES at the global level, and Engineering for the Americas at the Hemispheric level, it is hoped that the leaders will make diversity in engineering a high priority initiative. The OAS declaration of 2010 as the year of the InterAmerican Year of the Woman is a good start to bring attention and momentum to begin Hemispheric initiatives in this diversity.

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