SWE14

The Annual Conference for Women Engineers

+ICWES 16

A GLOBAL EXCHANGE FOR CHANGE

[October 23 - 25, 2014] Los Angeles, California, USA

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SWE AWARDS BANQUET 2014

Society of Women Engineers

International Network of Women Engineers and Scientists

building a better future worldwide

TONIGHT'S PROGRAM

ACHIEVEMENT AWARD RECEPTION
(IMMEDIATELY PRIOR TO BANQUET)

RECEPTION SPONSOR REMARKS
BOOZ ALLEN HAMILTON
GLOBALFOUNDRIES

WELCOME AND **INTRODUCTION**

DINNER

BANQUET SPONSOR REMARKS
LOCKHEED MARTIN CORPORATION

INWES LIFETIME ACHIEVEMENT AWARD PRESENTATION

SWE AWARD PRESENTATIONS
RODNEY D. CHIPP MEMORIAL AWARDS
SWE DISTINGUISHED NEW ENGINEER AWARDS
EMERGING LEADER AWARDS
DISTINGUISHED ENGINEERING EDUCATOR AWARD
PRISM AWARDS
MOU PRESENTATION
GLOBAL LEADERSHIP AWARDS
SUZANNE JENNICHES UPWARD MOBILITY AWARD
ENDOWED BY NORTHROP GRUMMAN CORPORATION
FELLOWS

KEYNOTE
ACHIEVEMENT AWARD RECIPIENT:
FRANCES MAZZE HURWITZ, PH.D.

CLOSING REMARKS

WELCOME TO THE 2014 SWE AWARDS BANQUET

Here in L.A. during **WE14+ICWES16** we are holding the world's largest exchange for change for women in engineering, technology and science. Tonight we will highlight and celebrate our peers who have had significant accomplishments in their ongoing efforts to create change around the globe.

From innovative new professionals to the prestigious 2014 SWE Achievement Award and INWES Lifetime Achievement Award, we are honored to bestow an impressive spectrum of accolades upon the women and men assembled at this distinguished event. And to increase our opportunity to showcase accomplishment, **SWE is pleased to add two new awards this year:**

- The GLOBAL LEADERSHIP AWARD to honor those who serve as role models to women engineers and have worked in and led an internationally based engineering, scientific or technology-focused business or organization
- The PRISM AWARD to recognize women who have charted their own paths in the STEM fields

Each honoree has worked to establish a voice and a place for women in engineering, technology and science—their accomplishments help SWE and INWES continue to demonstrate the value of diversity.

We congratulate all of this year's award recipients and honorees—each of you joins a legacy of innovative leaders who make a difference in lives around the world. Thank you for serving as role models for future generations of women engineers, technologists and scientists.

INDIVIDUAL **AWARD RECIPIENTS**

ACHIEVEMENT AWARD

Frances Mazze Hurwitz, Ph.D.
NASA Glenn Research Center

CITATION: For pioneering work in the development of materials suited for space exploration, for exceptional team leadership across disciplines, and for opening the way to a more equitable work environment.

SUZANNE JENNICHES UPWARD MOBILITY AWARD

ENDOWED BY NORTHROP GRUMMAN CORPORATION

Janeen Judah
Chevron

CITATION: For an exceptional career spanning multiple disciplines, often in pioneering roles, and for leveraging her influence into unceasing advocacy for women in engineering.

RODNEY D. CHIPP MEMORIAL AWARD

Nicholas (Nick) C. Bell, Ph.D.
General Motors

CITATION: For career-long mentoring of women engineering students and interns, and for enthusiastic engagement in programs that encourage professional development of women in engineering and technology.

RODNEY D. CHIPP MEMORIAL AWARD

Gene Fraser
Northrop Grumman Corporation

CITATION: For lasting and significant contributions to the advancement of women in engineering through personal mentoring throughout his career, and the founding of the Women in Leadership Program.

DISTINGUISHED ENGINEERING EDUCATOR

Karen A. Thole, Ph.D.
The Pennsylvania State University

CITATION: For visionary leadership and far-reaching influence as a researcher, role model, teacher, and mentor who effectively inspires young women to pursue STEM careers.

GLOBAL LEADERSHIP AWARD NEW

Rita Bowser
Westinghouse Electric Company

CITATION: For advancing the world's nuclear safety culture, exceptional leadership in the aftermath of crisis, and dedication to developing the potential of aspiring engineers.

GLOBAL LEADERSHIP AWARD NEW

Anne Coté
Kimberly-Clark Corporation

CITATION: For lighting the path to global leadership roles for women across cultures and continents, and for deep, generational impact on present and future leaders.

GLOBAL LEADERSHIP AWARD NEW

Suzanne R. Davidson
The Boeing Company

CITATION: For groundbreaking contributions to Ethernet and LAN technology; fostering authenticity and openness among diverse, global teams; and encouraging colleagues to fulfill their potential.

PRISM AWARD NEW

Cindy Hoover
Spirit AeroSystems Inc.

CITATION: For blazing a trail of technical and personal success for women engineers to follow, and for reaching out to women professionals across industries.

PRISM AWARD NEW

Emily L. Howard, Ph.D.
The Boeing Company

CITATION: For modeling a groundbreaking career that applies a deep understanding of human behavior and cognition to technical advances in defense, aerospace, and security.

INDIVIDUAL **AWARD RECIPIENTS**

PRISM AWARD (NEW)

Carol J. Weber
Caterpillar Inc.

CITATION: For engineering accomplishments in a wide range of cutting-edge technologies; for serving as a role model; and for mentoring, coaching, and guiding many young engineers and professionals.

EMERGING LEADER

Angela Ahmad
BGE, an Exelon Company

CITATION: For technical skill and leadership; for a flexible, fearless approach to challenges while achieving stellar safety records; and for being a role model to youth from underserved communities.

EMERGING LEADER

Jennifer A. Brooks
Caterpillar Inc.

CITATION: For creative technical leadership that improves design, streamlines production, and reduces costs; and for enthusiastic outreach to young people and the community.

EMERGING LEADER

Kristi Christensen
Deere & Company

CITATION: For passionate commitment to both the company's mission and her co-workers, for inspiring cross-functional teamwork, and for achieving outstanding process improvements on the factory floor.

EMERGING LEADER

Dianna Genton
Huntington Ingalls Industries

CITATION: For applying exceptional technical and analytical skills to complex problems and for outstanding contributions to both ship and space launch vehicle design.

EMERGING LEADER

Zohra Hemani
Northrop Grumman Corporation

CITATION: For bridging engineering and business through technical skill and strategic thinking and for delivering industry-changing new technology in geospatial and big data processing and analysis.

EMERGING LEADER

Laura M. Major
The Charles Stark Draper Laboratory Inc.

CITATION: For a contributive career in a breakthrough engineering discipline and for dedicated efforts to teach girls about science and engineering.

EMERGING LEADER

Jessica McElman
Naval Surface Warfare Center, Carderock Division

CITATION: For strong, dependable leadership in both electrical engineering research and work-force development and for steadfast commitment to recruiting exceptional women engineers.

EMERGING LEADER

Tara L. Rossman
Caterpillar Inc.

CITATION: For technical excellence and leading by example; for demonstrating a strong work ethic, perseverance, and treating others with respect in both professional life and community service.

EMERGING LEADER

Patricia Walker
Medtronic Inc.

CITATION: For expertise and creative problem solving in biomedical engineering and for business and community leadership informed by integrity, commitment, and generosity.

INDIVIDUAL **AWARD RECIPIENTS**

EMERGING LEADER

Erika Williams
John Deere

CITATION: For demonstrated technical and managerial successes in process management, and for maintaining a thoughtful, balanced perspective in her profession and as a dedicated community volunteer.

SWE DISTINGUISHED NEW ENGINEER

Carrie Ballester
Lockheed Martin Corporation

CITATION: For outstanding technical ability and leadership contributing to the success of critical defense programs, and for enthuasiasm and dedication in support of SWE.

SWE DISTINGUISHED NEW ENGINEER

Cybil Boss, P.E.
URS Corporation

CITATION: For expertise in environmental engineering, and for consistently delivering results above expectations, both professionally and at all levels of the Society.

SWE DISTINGUISHED NEW ENGINEER

Britta Jost
Caterpillar Inc.

CITATION: For inspiring others and leading by example, and for an ability to bring people together on the job, in SWE, and in the community.

SWE DISTINGUISHED NEW ENGINEER

Stacy Lueneburg
Continental Automotive Systems

CITATION: For expertise in mechanical engineering, for working effectively across cultures, and for contributions to the Society of Women Engineers and the community.

SWE DISTINGUISHED NEW ENGINEER

Lisa M. Rimpf
The Babcock & Wilcox Company

CITATION: For accomplishments in chemical engineering and SWE leadership, especially at the region level, and for tireless efforts to engage young women in engineering.

SWE DISTINGUISHED NEW ENGINEER

Stephanie R. Salas-Snyder
Intel Corporation

CITATION: For problem-solving abilities and expertise in human factors and biomedical engineering, and for contributions to SWE and the next generation of women engineers.

SWE DISTINGUISHED NEW ENGINEER

Jessica Teachworth
Lockheed Martin Corporation

CITATION: For technical and programmatic excellence in her profession, for being a role model, and for mentoring SWE's future leaders.

SWE DISTINGUISHED NEW ENGINEER

Erin M. Wakefield
Intel Corporation

CITATION: For successfully meeting new challenges in computer engineering and for sharing her technical, management, and people skills with SWE and in the community.

SWE DISTINGUISHED NEW ENGINEER

Abigail Wendt, P.E.
Magellan Midstream Partners, L.P.

CITATION: For outstanding technical skills and commitment to the development of women engineers through inspired mentoring in the workplace and within SWE, locally and regionally.

INDIVIDUAL **AWARD RECIPIENTS**

SWE DISTINGUISHED NEW ENGINEER

Lauren Wolf
The Boeing Company

CITATION: For accomplishments in human factors and industrial engineering; for tireless support of SWE's mentoring mission, especially among university students; and for outreach to youth.

FELLOW GRADE

Alma Martinez Fallon
Newport News Shipbuilding, a Division of Huntington Ingalls Industries

CITATION: For excellent engineering leadership, for opening the way for SWE to have a stronger voice in public policy, and for honoring the lives and careers of women and minorities.

FELLOW GRADE

Betty Irish
Comfort Systems USA Southwest

CITATION: For an exemplary and versatile technical career, for significant contributions to the mission and goals of SWE, and for increasing public awareness of engineering.

FELLOW GRADE

Diana Lyn Joch
Northrop Grumman Corporation

CITATION: For high-impact contributions to SWE, and for sharing her outstanding work ethic, team-building skills, and IT expertise with her profession and her community.

FELLOW GRADE

Silvia Karlsson, P.E.
General Motors

CITATION: For career-long dedication to SWE, for technical leadership that promotes diversity and inclusion, and for reaching out to the next generation of women engineers.

FELLOW GRADE

Helen O. Patricia
Kennametal Inc.

CITATION: For enduring service to SWE, for applying sound engineering principles to manufacturing and quality operations, and for being an outstanding role model for women in STEM professions.

FELLOW GRADE

Catherine Pieronek
University of Notre Dame

CITATION: For dedication to the SWE mission, for a lasting and positive impact on engineering education, and for illuminating public discourse on gender equity in STEM fields.

INWES LIFETIME ACHIEVEMENT AWARD

Monique Frize, Ph.D., P.Eng.
Carleton University

CITATION: For significant accomplishments in the area of engineering and computer science; in encouraging women to study science, technology, engineering, and mathematics disciplines; and through continual guidance and support helping INWES to become a more effective organization around the world.

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A GLOBAL EXCHANGE FOR CHANGE

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$$H = z + \frac{p}{\rho g} + \frac{v^2}{2g} = h + \frac{v^2}{2g},$$

ICWES CONFERENCE PROGRAM AND GUIDE

October 23 - 25, 2014

Society of Women Engineers

International Network of Women Engineers and Scientists

...building a better future worldwide

INSPIRING A GLOBAL EXCHANGE FOR CHANGE: REMEMBERING THE EARLY DAYS OF ICWES

(l to r) Delegates Templa, Sandy Shavitz, Jacqueline Juillard, Kadyhova, Sally Fly, Filativa, and Zepler hold a welcome sign in the registration area at the first International Conference of Women Engineers and Scientists in 1964 in New York City, New York.

It's hard to imagine, but it's been 50 years since ICWES1. I attended representing Ireland, sponsored by the Irish Institution of Engineers and chosen because I was the only civil engineer available in Ireland in a skirt! I had the most wonderful time as SWE members spoiled me.

In 1967 I was a member of the tours sub-committee for ICWES2 at the University of Cambridge. While the tours of Scotland and England seemed abandoned, 35, mostly American delegates, opted for the Irish tour. I accompanied them around Ireland to see Dublin, Cork, the Blarney Stone, Killarney ... we even took in a tour of Guinness where they gave us lunch, as did many other industries.

During the first ICWES in 1964, I was a young widow with five kids as my husband had died in 1961 at the age of 33. I now have 10 grandchildren and eight great-grandchildren, and will be 87 in November. My son Richard's wife, Brid Walshe, is a delegate to ICWES16, along with some other women engineers from her pharmaceutical industry firm, AbbVie, in Cork, Ireland. There are other delegates from the same firm in Sligo and Chicago.

Congrats on the 50th anniversary of ICWES and every success to the conference.

Much love
Catherine E. Walshe
Cork, Ireland

INWES International Network of Women Engineers and Scientists
. . . building a better future worldwide

Message from INWES President

On behalf of the board of directors of INWES, I would like to express my heartfelt welcome to all the participants of ICWES16. I would like to thank the efforts of our host organization SWE and ICWES Chair, Gail Mattson and their committee members for putting together, all INWES members and everyone who have shown their interest and support to the activities of INWES.

The International Network of Women Engineers and Scientists (INWES) is an international network body serving as an NGO, as a partner of UNESCO. INWES was created with the vision "To build a better future worldwide, through the full and effective participation of women and girls in all aspects of Science, Technology, Engineering and Mathematics (STEM.)". INWES oversees the triennial meeting ICWES conferences, and the regional conferences in the years when there is no ICWES, and runs regional network such Asia Pacific Nation Network (APNN) from 2011 and is preparing African network.

The International Conference for Women Engineers and Scientists (ICWES) has been held every three years in various parts of the world for supporting women in engineering and science. ICWES15 was held successfully in 2011 in Adelaide, Australia. We gather again after three years under the theme, "global exchange for change" in the global city of Los Angeles with the annual conference of SWE, WE14, where about 7000 women are expected to participate. We are sure to experience bidirectional "diversity". International members will experience well organized SWE spirit and SWE members will feel many unique efforts and cultures of women in STEM worldwide.

We are also excited because ICWES16 celebrates the 50th year since the first ICWES in 1964. It is very meaningful that ICWES returns to the USA after 50 years, again being hosted by SWE. The INWES board is planning to celebrate the half centennial of ICWES by archiving the documents of ICWES "herstory". At ICWES16, we will share our experiences, our passions, times, energies and ideas and care for each other and learn from one another, which will empower us as Women Scientists and Engineers.

We hope this world becomes safer by being faithful to the basics.
We hope this world is more peaceful by pursuing collaboration rather than competition.
We hope this world is sustainable by producing new knowledge.
We hope this world is gender equal place by straightening the crooked things.
We hope this world is rich for keep next generations growing for their life by sharing our resources.

I look forward that we all will be inspired at ICWES16 by opening our hearts and reaching hands out and enjoy the City of Angels.

Sincerely yours,

K. J. Lee

Kong-Joo Lee, Ph.D.

President, INWES

Celebrating 50 Years of ICWES

In conjunction with the 1964 World's Fair, the first global gathering of women engineers and scientists took place 50 years ago in New York City. Spearheaded by the Society of Women Engineers, it set in motion a movement that for the next five decades kept the spirit of that first event alive, with participants meeting in approximately three-year intervals, inspiring successive generations of women, and giving birth to a new organization.

By Sandra Guy, SWE Contributor

Today, female entrepreneurs, especially those in technology, seize headlines in major magazines and newspapers for their ingenuity, resourcefulness, planning smarts, and leadership strategies. The same skills, multiplied several-fold, applied 50 years ago when SWE leaders and members put together a historic meeting of women engineers and scientists from across the globe — with no Internet, no apps, no smartphones, no online travel reservations, and with hard-and-fast borders and Cold War suspicions.

Written correspondence took place on typewritten letters sent via the postal service, and people talked in person or on rotary telephones plugged into the wall. Personal long-distance phone calls were a rarity and a luxury, and required operator assistance to reach overseas.

Imagine being part of a coterie of women engineers and scientists seeking to connect with others throughout the world, and to organize and meet in the first formal international gathering.

Setting the stage

The effort started four years before the conference took place, according to historic SWE reports. The conference's delegates and registration committee sought out eligible delegates by sending letters to embassies, ministers of education, engineering schools, engineering technical societies, business and professional women's clubs, and university women's associations worldwide.

The conference organizers, who started with only 40 names of women outside of the United States, did their homework and ultimately sent out 5,000 letters to international sources and developed a list of 6,000 possible U.S. delegates. The list of 6,000 was put on IBM "punched" cards for future reference, and included educators, guidance counselors, women's societies, deans of engineering schools, SWE contact lists, and companies that employed significant numbers of women engineers.

In addition to the challenges of finding one another and establishing communication, a host of financial and logistical problems had to be solved. Imagine a determined group of women moving ahead despite these issues, and in their spare time, laying the groundwork for the First International Conference of Women Engineers and Scientists, otherwise known as ICWES I. The historic conference took place June 15-21, 1964, in New York City, then-headquarters of the Society of Women Engineers.

SWE itself was only 14 years old, with fewer than 800 members in 16 professional sections, so the then-fledgling organization enjoyed a big boost by being able to pull off such a feat — even obtaining recognition from President Lyndon B. Johnson, *The New York Times*, and leaders at the World's Fair in New York. Indeed, members of SWE's New York Section came up with the idea to host the Society's national convention, as it was called at the time, and ultimately, the international gathering, concurrent with the 1964 World's Fair.

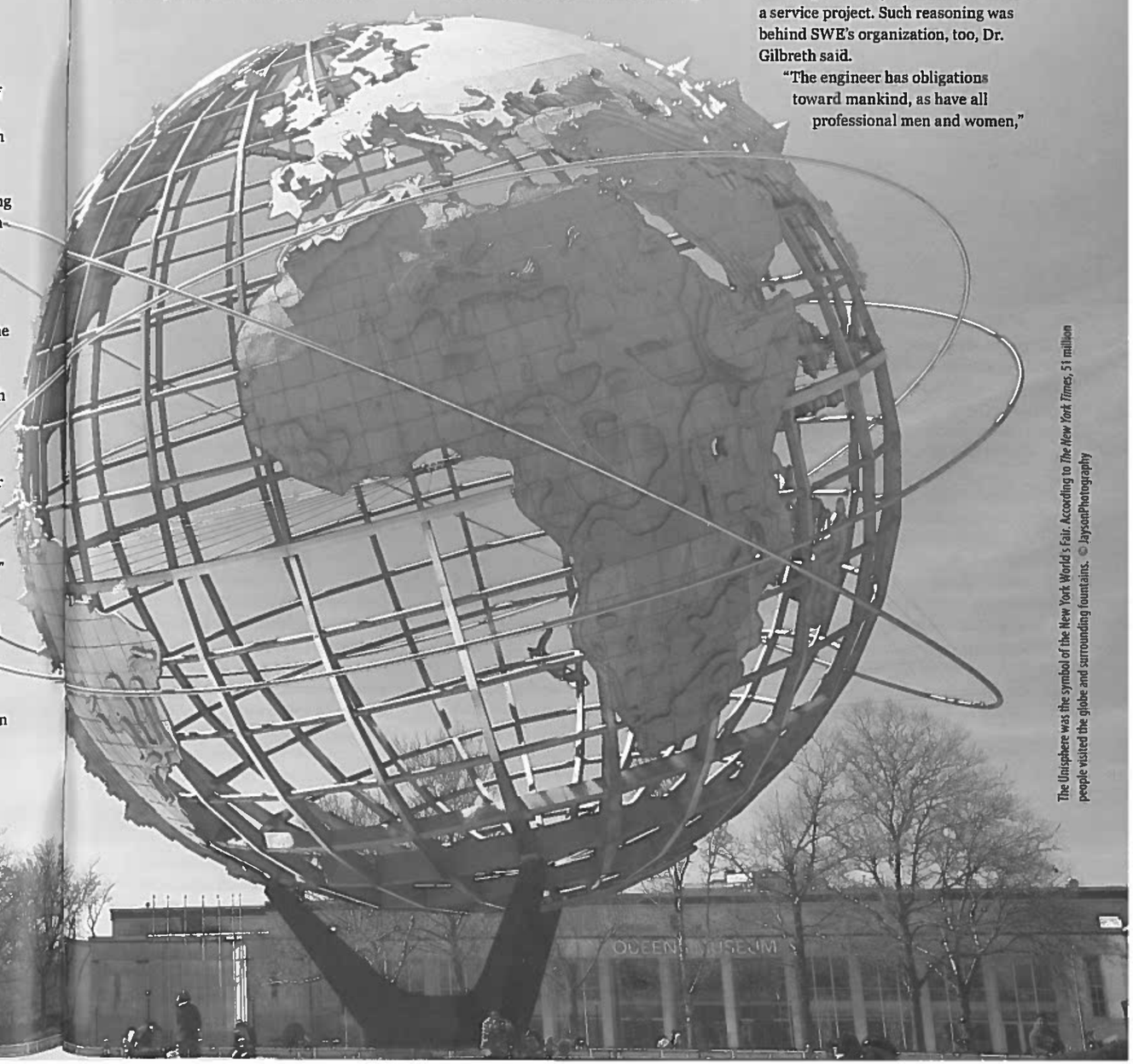
An inspiring keynote

The keynote speaker — Lillian Moller Gilbreth, Ph.D. — proved a hugely moving role model. Dr. Gilbreth, a psychologist and industrial engineer, was known as the "first lady of engineering," the mother of modern management, and the first American engineer to put together ideas based on psychology and scientific management, according to historic records. She also was one of the first working female engineers to earn a Ph.D., and the first person to earn a Ph.D. in industrial psychology. The mother of 13 children — 11 of whom lived to adulthood — she was the mother in the popular book, *Cheaper by the Dozen*.

Alva Matthews Solomon, who chaired the hospitality committee at ICWES I, told SWE Oral History Project interviewer Lauren Kata in a May 14, 2003, interview that she (Solomon) was "just so thrilled" to pick up Dr. Gilbreth from the airport and drive her to the hotel for the conference. Solomon said she considered Dr. Gilbreth and SWE's officers amazing leaders. "They really saw that SWE had an important role to play in educating women and giving them a place to share thoughts, and maybe even to use for networking," Solomon said in the interview. The role models she met proved influential, as Solomon went on to earn a Ph.D. at Columbia University and became the 1971 SWE Achievement Award recipient.

In her keynote address, Dr. Gilbreth noted that this first international conference focused on the future — specifically, the future needs of the world and how female engineers could address those needs. The conference resulted from SWE members' analytical reasoning that they should spearhead the event as a service project. Such reasoning was behind SWE's organization, too, Dr. Gilbreth said.

"The engineer has obligations toward mankind, as have all professional men and women,"



The Unisphere was the symbol of the New York World's Fair. According to *The New York Times*, 51 million people visited the globe and surrounding fountains. © JaysonPhotography

ICWES Locations

1964	New York City, United States (hosted by SWE)
1967	Cambridge, England
1971	Turin, Italy
1975	Krakow, Poland
1978	Rouen, France
1981	Bombay, India
1984	Washington, D.C., United States (hosted by SWE)
1987	Abidjan, Ivory Coast
1991	Warwick, England
1996	Budapest, Hungary
1999	Chiba, Japan
2002	Ottawa, Canada
2005	Seoul, Korea
2008	Lille, France
2011	Adelaide, Australia
2014	Los Angeles, California, United States (hosted by SWE)

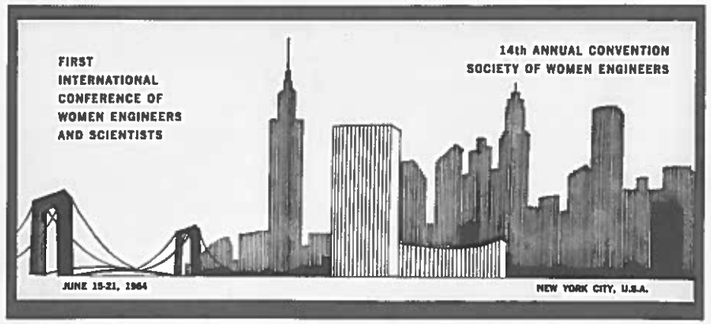
she said. Those include furthering the profession's growth; accept, maintain, and, if possible, raise its standards; and help educate and train its members.

The international conference dovetailed perfectly with SWE's reason for being, Dr. Gilbreth said. "Why women engineers? And why a Society of Women Engineers?" Dr. Gilbreth asked.

"Because the profession needs women, and because they need the opportunities for work that the profession affords," she said. "Because women need the feeling of group solidarity that an organization gives. Because young women need knowledge of engineering, help in being tested, educated, and trained if they have interest and the necessary aptitudes. Because many women, young and old, need the opportunities the profession gives."

Dr. Gilbreth, then 86, described the international conference as "a needed opportunity to think and plan together" and "to recognize and evaluate our likenesses and differences."

"The future demands we utilize both," she said. "If we are to work together effectively, we should recognize that, while each of us is different from every other person, our likenesses are of great



ABOVE: The theme of the conference was "Focus for the Future: Developing Engineering and Scientific Talent." Sessions covered topics on industrial, social, and standard of living needs; reports on the current status of engineers and scientists; and developing engineering and scientific talent.

FACING PAGE: SWE member Alva Matthews Solomon, right, greets Mrs. D.S.K. Leighton of the U.K. Women's Engineering Society at J.F.K. airport. As chair of the reception committee, Solomon reflected on the significance of the first ICWES in an oral history interview conducted more than four decades later.

importance. This applies both to skills and to satisfactions."

As SWE and ICWES celebrate ICWES' 50th anniversary at this year's joint WE14 and ICWES16 conferences Oct. 23-25 in Los Angeles, SWE and INWES leaders say that both organizations today provide valuable networking, career development, public-policy backing, and just-plain-wonderful experiences for women, much as they did at the start — as women continue to battle to make their voices heard in traditionally male-dominated fields.

Exceeding expectations

The grass-roots effort to put the first ICWES conference together garnered impressive results, including big-name recognition, highly regarded speakers from throughout the world, more than 60 papers presented in technical and professional sessions, and once-in-a-lifetime "inside" looks at the World's Fair.

The conference's day at the World's Fair featured a behind-the-scenes tour of General Motors' view of tomorrow and exhibits by the Bell System and General Electric, according to the *SWE Newsletter* of July-August 1964. A boat trip was included in the conference's 44-page program at the last minute, after Ford Motor Co. came through to pay its $2,000 cost, according to a story recounting the ICWES history in the February/March 2002 issue of *SWE Magazine*.

When the delegates gathered at the Federal Pavilion — representatives hailed from 35 nations and all 50 U.S. states — they were welcomed by Seymour Potter, chief engineer of the New York World's Fair Corp., and introduced by Blanche H. Dow, Ph.D., president of the National Association of University Women. Beatrice A. Hicks, the first SWE president, read to the conference a telegram from President Lyndon B. Johnson offering his "best wishes for a successful conference," the newsletter reported. Another account said Lady Bird Johnson also sent a telegram calling it "gratifying" to see women "devoting their great talents and abilities" to such highly technical fields.

Reporters from *The New York Times* and *The New Yorker* covered the conference's events and reported on its atmosphere. Delegates hailed from as far away as Germany, Iran, Ireland, Japan, the Philippines, Switzerland, the U.K., and the U.S.S.R, among others. The registration of 529 people was double the attendance that SWE had anticipated.

The conference wasn't without a few hitches, though, including unscheduled speakers seeking to present their papers. "We felt that arbitrary rejection would have been diplomatically unwise, as the embarrassed delegates would return home and report on their experiences," according to an internal SWE report from the association archives. SWE

reviewed the unexpected contributions, offered help with the English language, and offered on-the-spot translation services for those who couldn't deliver their presentations in English. "We believe that the way this was handled left the delegates with a feeling of pride in their contributions," the write-up said.

Indeed, the sessions were simulcast on closed-circuit TV to overflow audiences, recorded on "magnetic tape," and translated into three languages: French, Spanish, and German.

Outgoing SWE President Aileen Cavanagh didn't shy away from pointing out contentious policy issues of women's pay and technological excess. She said in her opening remarks that the interests of the groups attending the conference included underlying differences. Cavanagh noted the competing interests of the demands for women in engineering and science from government, education, and industry, including a need to stabilize costs and create a strategic work-force reserve by hiring women.

She also warned that "we live in a time when our worth as individuals depends on the ability of the total human race to achieve the maturity of self-recognition and self-discipline." Cavanagh added that "we feel that without that maturity, a blind and undirected pursuit of technology for its own sake could destroy human dignity and thus become a force for evil."

Personal recollections

The conference helped bridge cultural gaps for some attendees. Margaret Ann Pritchard, P.E., F.SWE, and a member of the College of Fellows for the American Society for Engineering Management, was credited in the *SWE Newsletter* with leading a "lively songfest" with Isabel Hardwick, a member-at-large from London, after the World's Fair tours, as the women spontaneously started sharing folk songs from home.

Pritchard recalls spending eight "marvelous" days with an engineer from Japan who was her roommate during the first ICWES conference. Even though she did not know any Japanese and her Japanese counterpart spoke only six words of English, the two became fast friends. Pritchard also appreciated talking with women from other engineering disciplines.

"When you walk into a room and have women from 17 disciplines, all having a cup of tea and chitchatting, it's marvelous," said Pritchard, who is a retired industrial and mechanical engineer. Pritchard came to call upon the women from other disciplines in her consulting work. "I could pick up the phone and call Jeri Ann, and she could give me advice — do this and this and this."

Indeed, Pritchard believes the kinds of basic technical problems that engineers solve — and those addressed at ICWES conferences — can solve the world's problems.

"How are we going to save the earth? Feed ourselves? How are we going to get along on a very fundamental ICWES-

"I think it was quite amazing. ...one phase was having the visiting people connect with the American engineers. So there was one night where there were dinner parties all over the city. And the people from Japan, and the people from Syria, and the people from England, and all the various countries, we loaded them into taxicabs and had them taken to these private homes for the dinners."

– Alva Matthews Solomon, ICWES I Reception Chair

type basis — helping each other solve problems? I believe firmly that the mess the world is in politically, if we go back to solving technically oriented problems, get back to the fundamentals, we'd be a hell of a lot better off," she said.

Carolyn Phillips, P.E. (ret), F.SWE, past SWE president and a current SWE trustee, recalled grasping that women in other parts of the world faced "more significant issues," such as being treated equally and living in a peaceful country.

"I was still kind of 'green around the edges' — all of 24 years old," she said.

Phillips picked up some of her greatest insights while helping set up the meeting and doing grunt work as events got underway. "I was part of our own SWE shuttle service to Kennedy Airport, since we were trying to help keep costs down and be friendly and hospitable to overseas visitors," she said.

"I hadn't had exposure to women from other cultures, and I found it fascinating that they had many of the same concerns — to be treated equally, for their countries to be peaceful, and for their children to get a good education," Phillips said. She was particularly impressed with the notable women engineers of the day, including Hicks and Gilbreth. Phillips said she was excited to meet "these exotic women" and to be part of pulling off such a feat.

Behind the scenes

In addition to SWE's arranging the financing for the conference, some of the women had to work through their governments' bureaucracies for permission to travel and obtain hard-to-get visas for the United States. Then, and for many conferences that followed, ICWES organizers relied on the host country to help fund each event and also helped arrange for travel visas.

SWE obtained a $24,950 grant for the event from the National Science Foundation, as well as funds from industry, The Asia Foundation, and individual SWE members, according to SWE archival documents. A list of printing expenses showed that, of 16 items printed, the costs of 10 were donated, including 500 copies of the press kit, 600 copies of the conference directory, 600 copies of the banquet seating lists, and 12,000 copies of the preamble to the technical program. SWE committee members sent at least 31,00 pieces of mail to plan and publicize the event. The conference's gross expenses totaled $53,000.

SWE also did some impromptu fundraising at its membership meeting following the conference, according to the *SWE Newsletter*. Conference chair Ruth Shafer led an auction that raised more than $100 for SWE and "several hundred" for the next international conference.

"One delegate raised her own bid, and several contributed items for auction — including a lovely ring from Anna Amour (director of Rassegna Technica ENEL, Italy); coins from the Japanese and Indian delegates; dolls from the Bolivian delegate; an inlaid cigarette case from the Syrian delegate; and many more items," according to the newsletter account.

"I think it wasn't possible to do anything else (at that time)," said Sue Bird, who grew up in Coventry, England, and served as president of the U.K. Women's Engineering Society (WES) from 1991-1993. A veteran of many ICWES events as well as a past INWES president, Bird said, "We raised funds, and still do, to be able to bring women from developing countries to the conferences." Following the first conference, organizations volunteered to host each successive ICWES conference, essentially starting from scratch each time to invite delegates, put together funding, and plan the agenda. WES sponsored the second conference, held in 1967 in Cambridge, England.

The first conference succeeded in its goal of providing a global perspective on women in engineering: Reports revealed that 15 percent of the 150 engineering schools then in the United States had no women graduates, yet Norway reported that 10 percent of women there were engaged in engineering work, and countries in Central and South America were encouraged by more women becoming active in engineering and scientific professions. A separate archived report written by Veronica J.K. Milligan, an assistant district engineer at the South

Wales Electricity Board, stated that 1.5 percent of engineers in Iran at that time were women; 5 percent in Turkey and 7.5 percent in Syria.

Global bonds

Just as important as the research and policymaking that the ICWES conference enabled were the relationships the women formed. Phillips said she found valuable mentors and gained practical skills from the early ICWES conferences, such as learning how to be more at ease making presentations. Now, Phillips is a mentor herself and hears how women entering the work force must still fight for acceptance. "There are still issues out there," she said, including the issue of whether women should stay home while

The first day of the conference, June 15, was declared Women Engineers' and Scientists' Day at the New York World's Fair. Conference attendees spent the day, which culminated in a parade of states and roll call of nations at the Federal Pavilion involving ICWES delegates from 35 countries and 47 U.S. states.

their children are young.

A number of women from SWE and other organizations attended ICWES meetings regularly. SWE Past President Isabelle French (see obituary on page 100), as well as other early SWE members now deceased, are on record as having attended at least the first nine events — meaning that for a period of nearly 30 years, these women supported the international exchange at the heart of the ICWES experience. For example, Lee Arnold and Lydia Pickup both attended the 1991 ICWES in Warwick, England, making it their ninth event. Also attending her ninth conference that year was Cicely Thompson from the U.K., who chaired ICWES 2, held in Cambridge, in 1967. A photo from the 1991 ICWES, submitted by Arnold, identified an international contingent that had, in Arnold's words, "attended numerous ICWES."

Kathleen Harer, P.E., F.SWE, served as SWE president in 1987-88. She recalled that her first journey outside of the United States was to the ICWES IV conference in 1975 in Krakow, Poland, where she was surprised at the freedom to take technical and cultural tours. The site was especially intriguing because Poland at that time was behind the Iron Curtain. "It was fascinating to meet engineers from other countries, and to learn how their experiences were the same and different from my own," Harer said. "I was invigorated by it."

Harer, who is retired from NASA, planned her vacations around the ICWES conferences, where she eventually gave presentations and made life-long friends. The experiences broadened Harer's view not only of the world, but of people in general. One particularly illuminating incident took place in 1999, when Harer's niece accompanied her to Japan.

There, Harer was impressed when the imperial princess of Japan, who opened ICWES 11 in Chiba, ordered a delay in her backdrop takedown so she could have a photo taken with Harer's 19-year-old niece. Both behaviors — the graciousness of the princess and her niece's confidence in making the request — gave her pause. "I couldn't imagine myself at age 19 asking to have my photo taken with the princess," Harer said. The only conferences Harer missed were because of the tremendous effort required to deal with the aftermath of the Space Shuttle Challenger explosion.

Bird was amazed by the stories women from other parts of the world would tell. She remembers one ICWES participant from a troubled African country who was not just pleased to be at the meeting, but happy to be alive amid her country's chaos.

"It brings everything into context sometimes," Bird said. "All of a sudden, you have friends from all over the world. I met such great people, I kept on with it."

Bird, who with her husband, Peter, ran an acoustics consultancy, bemoans that there are times she attends ICWES conferences where she hears stories of discrimination and gender bias, and thinks to herself, "I've heard this so many times. When is this going to change?" she said.

Although there is still much work to be done in these areas, Bird said she is encouraged by the young women who are becoming leaders, and realizes a lot has changed.

Ensuring continuity

As successful as the ICWES conferences have been, a group of women decided in 2001 that a steady networking infrastructure needed to be developed to undergird the far-flung conference efforts. After all, the small group of women who had started ICWES were getting older, a few of the founders had died, and those left continued to cobble together from scratch global conferences once every three years.

Monique Frize, Ph.D., a faculty member at the University of Ottawa and the first woman to earn an engineering degree from that school, proposed the network. The recommendation won unanimous support from the ICWES business meeting in which a representative from every member country voted.

"We decided (ICWES) had to have an organization with an address and with continuity," said Dr. Frize, who was elected the network's first president for the 2005-2008 term. The network's name — the International Network of Women Engineers and Scientists (INWES) — came to her while traveling to meet SWE's then-president, Gail Mattson, P.E., F.SWE, to finalize INWES' mandate and mode of operation. Indeed, Dr. Frize credits SWE with providing the necessary moral and financial support to help start INWES.

The INWES founders included Frize, Mattson, Bird, Suzanne Brainard, Ph.D., and Claire Deschênes, Ph.D. Bird served as INWES president from 2008-2011.

INWES is continuing the SWE

and ICWES tradition by serving as a facilitator of regional meetings, where women share their stories and promote one another's successes, said current INWES President Kong-Joo Lee, Ph.D., a biochemist and a professor at the Ewha Womans University College of Pharmacy and Graduate School of Pharmaceutical Sciences in Seoul, South Korea. Dr. Lee earned her Ph.D. in chemistry from Stanford University in Palo Alto, California.

Mattson, SWE past president and a SWE Fellow, was impressed by her first ICWES conference in 2002 in Ottawa, and immediately saw the potential for SWE to share "best practices" with women throughout the world. "Most companies have realized that women engineers really make a difference," she said. "They bring a whole different skill set to working on projects and task teams. That's why corporate sponsors and recruiters have such a big turnout at SWE conferences. I think they are finally realizing that overseas, too, especially in developing countries." ■

From ICWES to INWES *By Sandra Guy*


Monique Frize, Ph.D.
Canada


Claire Deschênes, Ph.D.
Canada


Anna Szemik-Hojniak, Ph.D.
Poland


Kong-Joo Lee, Ph.D.
current INWES President
Korea


Uduakobong Okon
Nigeria


Joan Graf, F.SWE
United States

The 1964 debut of the International Conference of Women Engineers and Scientists (ICWES) proved what its SWE organizers set out to do: Create a living, breathing movement that women throughout the world look to for inspiration today. Indeed, ensuring ICWES' future led SWE's leaders and their international counterparts to set up a networking structure called the International Network of Women Engineers and Scientists (INWES).

The network idea emerged from the realization in 2001 that ICWES was "getting very fragile" and needed a sturdy construction that guaranteed continuity, said Monique Frize, Ph.D., the University of Ottawa professor who served as the first INWES president from 2005-2008. Dr. Frize initially thought that INWES should last only 30 years, and then no longer be needed because ICWES would be such a strong organization on its own accord.

INWES President Kong-Joo Lee, Ph.D., a biochemist and a professor at the Ewha Womans University College of Pharmacy and Graduate School of Pharmaceutical Sciences, in Seoul, South Korea, says INWES and The Association of Korean Woman Scientists and Engineers (www.kwse.or.kr) have supported each other in their work to enhance women's rights.

Dr. Lee was one of the founders of KWSE in 1993. She was among a group of professional women — many of whom worked in the Daejeon (Korea) Science Research Park — who created a network among women in science and engineering. Together, they worked to start a day care center there, promoted science and technology classes in local schools, initiated affirmative action to support and promote women in science, technology, engineering, and mathematics (STEM) fields, and advocated for an employment quota system for women to be employed in STEM positions in the public sector, including public universities and research institutes.

In 2011, KWSE started to organize a regional network under the INWES umbrella — the Asia and Pacific Nation Network (APNN) — and encouraged other regions to do the same. The APNN, who are all INWES members, comprises Korea, Japan, Taiwan, Malaysia, India, Sri Lanka, Australia, Mongolia, New Zealand, Nepal, Pakistan, and Vietnam.

Anna Szemik-Hojniak, Ph.D., a chemistry professor at the University of Wroclaw, Poland, rose from small-town beginnings to study under Nobel-winning scientists, and master subjects such as radiochemistry and molecular photophysics. Dr. Szemik-Hojniak said she was "nicely surprised" to see so many women at the ICWES 10 conference in Budapest in 1996 discuss issues such as discrimination, exclusions, women's careers, human rights, labor codes, women's underrepresentation on the higher rungs of the academic ladder, and related issues.

"What does this (50th ICWES) anniversary mean?" Dr. Szemik-Hojniak said. "It is a victory! In this case, it is the victory of educated women in receiving their own fair rights, the victory of tolerance over chauvinism, reason over stupidity, and, finally, respect for women over their disregard for centuries."

Uduakobong Okon, a member of the INWES board of directors and president of OPAGESTE (Organization for Promoting African Girls in Engineering, Science and Technology Education) in Nigeria, was equally enthusiastic in her description, via email, of the 50th anniversary.

"It's exciting to realize these efforts, such as the INWES Education and Research Institute, in transcending generations and stretching toward the youths and younger women in their educational development," she said. "Indeed, a solid foundation is laid for building a better future for all of STEM."

Claire Deschênes, Ph.D., a professor in mechanical engineering at Université Laval in Quebec City, Canada, and treasurer of the INWES Education and Research Institute, said she is energized when she attends SWE and ICWES conferences because she meets so many interesting women and learns from the problems they encounter and the solutions they create.

Those conversations offer Dr. Deschênes new research insights and ideas on how to reach out to young women and retain the women already in STEM disciplines, she said.

Joan Graf, SWE Fellow, INWES treasurer, and an IT manager at telecom company CenturyLink, learned of INWES when she lived in Denver and was asked to be the group's treasurer. Graf said she was excited to meet women from throughout the world and learn more about other cultures.

Graf noticed that women in some other countries concentrated on activities that encouraged young girls to work together and gain self-esteem. "It's interesting to see that these women's groups realize the girls need self-esteem work first," she said. Graf hopes to see communications improve among women throughout the world, including in countries with limited Internet access, and to improve the still-disappointing behavior that many men show toward tech-savvy women. "That is why the conferences are so valuable. It's exciting for people to see where others have made headway regarding these issues — in addition to the technical topics discussed," she said.

INWES Milestones

In the 12 years since its formation, the International Network of Women Engineers and Scientists has taken decisive steps to fulfill its mission.

By Monique Frize, Ph.D., and Claire Deschênes, Ph.D.

In December 2013, members of the INWES board and guests met at the Korea Institute of Science and Technology - Europe, located in Saarbrücken, Germany.

Several factors fostered the creation of the International Network of Women Engineers and Scientists (INWES) in 2002. The main consideration was the existence of an informal network of women who ensured the organization of the International Conference of Women Engineers and Scientists (ICWES), which has taken place approximately every three years since 1964. This network had no specific address or structure. To ensure the successful continuation of this activity, many women felt that some formalization was needed at this stage.

In addition, UNESCO and its Canadian Commission were concerned about the low participation of women in science and engineering. In the 1990s, Monique Frize, Ph.D., was a member of the Science subcommission at the Canadian Commission for UNESCO, and Claire Deschênes, Ph.D., under the initiative of the Canadian Commission for UNESCO, acted as a member of the scientific committee for the European preparatory event to the World Conference on Science (WCS) held in Bled, Slovenia, in 1998. Dr. Deschênes also joined the Canadian delegation at the WCS in Budapest in 1999, where the "Declaration on Science and the Use of Scientific Knowledge" was adopted. A section of this document reads: "That access to scientific knowledge for peaceful purposes from a very early age is part of the right to education belonging to all men and women, and that science education is essential for human development, for creating endogenous scientific capacity and for having active and informed citizens." Paragraph 90 specifically recommended the creation of an international network of women in science, technology, engineering, and mathematics (STEM).

The creation of INWES was a response to this call. To develop the network, Drs. Frize and Deschênes, and Moyra McDill, Ph.D., invited a group of women involved with ICWES and other potential partnering organizations to a meeting in Merrickville, Canada, in 2001. This meeting was funded by grants from UNESCO and the Canadian Commission for UNESCO.

Attendees were: Aba Andam, Nigeria; Sue Bird and Nicole Rockliff, Ph.D., U.K.; Gloria Bonder, Argentina; Suzanne Brainard, Ph.D., Catherine Didion, Kathleen Harer, P.E., and Gail Mattson, P.E., United States; Renée Clair and Marianne Rodot, France; Mitsuko Kazuno, Ph.D., Japan; Efstratia Zafeiriou, Germany; Claire Deschênes, Ph.D., Colleen Ennett, Ph.D., Hiromi Matsui, Moyra McDill, Ph.D., Eva Rathgeber, Ph.D., and Gisèle Trubey, UNESCO; and Monique Frize, Ph.D., Canada. The vote to create INWES was unanimous. The next step was to present this plan at the ICWES12 business meeting for a formal adoption.

In 2002, during the business meeting at ICWES12 in Ottawa, it was proposed that INWES be created to replace the informal committee; the vote in favor was unanimous. An interim board was elected for three years (2002-2005).

Defining the mission and means

The mission statement defined INWES as an international network focused on supporting women in STEM (science, technology, engineering and mathematics). It was established to:

"Strengthen the capacity of individuals, organisations, and corporations through education and professional development and encourage their increased participation in Science, Technology, Engineering, and Mathematics (STEM) worldwide through an international network of organisations and experts."

Goal: "Build a better future worldwide through the full and effective participation of women and girls in all

The INWES Education and Research Institute (ERI)

In 2007, the three founding members of INWES incorporated the INWES Education and Research Institute (ERI) in Canada, and the institute became a charity organization in 2008. The ERI is a separate organization founded in order to better achieve objectives with regard to funding education in science, technology, engineering, and mathematics (STEM) and to meet the charity status laws of Canada.

The institute became registered as a not-for-profit 501c3 organization through reciprocity by the United States of America Internal Revenue Service in March 2010. The ERI is governed by a board of directors, and activities are planned and administered through committees that include programs, finance, and communications.

The objectives of the institute are to advance education in STEM fields through the following programs:

- Awarding scholarships, bursaries, and grants for students wishing to study in one of these fields
- Carrying out research in both developed and developing countries concerning the fields of science, technology, engineering, and mathematics, as both an educational and career choice and to make the results of that research available to the interested public
- Acting as a resource center and database for information concerning education in these fields and collecting best practices in encouraging students to stay in school through college and university
- Developing and maintaining a website to raise public awareness concerning these fields of study and to make the results of research available to the interested public

aspects of STEM."

Long-term objectives:

- Participate in reaching the United Nations Millennium Goal No. 4: "to promote gender equality and work towards the education of girls and women in all nations, but especially in countries where the disparity between boys and girls is largest."
- Contribute to the economic and social development of countries in transition and developing countries through the full participation of women in STEM.
- Reach a critical mass of women in STEM worldwide.
- Respond to the current need of human resources in STEM and capacity building in STEM fields.
- Reverse the decreasing trend in the number of women entering ICT (information and communications technology) or STEM that western countries have experienced since the turn of the millennium.

Organization and Structure

INWES was incorporated in Canada as a nonprofit, nongovernmental organization (NGO) in April 2003. Originally, three categories of members were defined: associations of women in STEM, corporate members, and individual members for areas of the world where there were no relevant associations.

INWES is run by an elected board of up to 18 directors, of which 12 are from organizational members, three each from corporate members, and three from individual members. The three founding members were Drs. Frize and Deschênes, with Gail Mattson. The election of the first formal board of directors took place in 2005 at ICWES13 in South Korea.

The board of directors generally meets face-to-face at least once a year and holds regular email and virtual conference meetings. The first president was Monique Frize (2005-2008). The second president was Sue Bird (2008-2011), past president of the Women's Engineering Society (WES) in the U.K. She was involved in the organization of ICWES9, and in the formation of INWES. Kong-Joo Lee, Ph.D., is the current INWES president, serving from 2011-2014. A former president of the Association of Korean Woman Scientists and Engineers (KWSE), Dr. Lee was organizing committee chair of ICWES13.

General meetings are held virtually in interim years, and in person at ICWES conferences. INWES is an inclusive multinational organization with 11 geographical regions represented:

- North America
- South and Central America, and the Caribbean
- Western Europe, including Israel and Turkey
- Eastern Europe
- French-speaking Africa
- English-speaking Africa
- Middle East
- Central Asia, including India
- Southeast Asia
- Far East Asia
- Australia and New Zealand

INWES Activities

INWES participates in international economic and social development in the following four ways:

- Disseminates information among INWES members and in civil society
- Fifteen ICWES triennial conferences have been held since 1964, providing continuity and communication
- INWES works with host organization/country on logistics, announcements, publicity
- provides support letters for visas and fundraising

In addition, regional events are held in years between the main triennial conferences whenever possible. The main purpose of regional conferences is to encourage regional participation of women in STEM and connect them to INWES. The workshops are expected to produce long-term outcomes of collaboration, networking, and a staging platform for future initiatives. Connections can be established in areas where women have been more isolated, or have not had much interaction with the network in the past. Such regional meetings have been held in Daejon, Korea, 2003; Nairobi, Kenya, 2004 and 2013; Wroclaw, Poland, 2007; Busan, Korea, 2009; Washington, D.C., U.S.A., 2010; and New Delhi, India, 2012.

Aside from meetings, INWES provides an excellent forum for the exchange of best practices to encourage girls into science and engineering careers. For example, several best practices coming from different members' countries have been shared through INWES newsletters and during the ICWES conferences and regional workshops.

INWES Goal: "Build a better future worldwide through the full and effective participation of women and girls in all aspects of STEM."

INWES fosters the development of associations of women in STEM. To accomplish this, INWES can provide seed money to help create the association through an application and competition process. INWES offers a manual on how to start such an association, and requests annual reports on progress for a period of three years.

INWES encouraged the creation of the following new organizations:

- 2002, in Pakistan, initiator Durdana Habib, INWES director, and Nageen Ainuddin, INWES member
- 2004 in India, initiator Suriya Thevar, Ph.D., INWES director
- 2006 in Zambia, initiator Agnes Mofya, INWES member

In 2009, a regional affiliation of INWES — the Asia and Pacific Nation Network (APNN) — was established in Busan, Korea, to serve as a platform for Asian women scientists, to exchange information among Asian women scientists organizations, develop policies, and assess the current situation in every member country. To strengthen the connection among Asian women scientists, the APNN meeting is held in a different member country each year and publishes post-conference reports. The first APNN meeting was held in Adelaide, Australia, in 2011, and the second one convened in Kuala Lumpur, Malaysia, in 2012. The third was in Taiwan in 2013, with the most recent meeting held in Korea earlier in 2014.

The proposed African Network held a meeting in 2009 in Abidjan, Ivory Coast, where a network structure was proposed. Ongoing discussions with the INWES board are in process to finalize an appropriate structure.

The INWES general secretary worked with members of the Arab Science and Technology Foundation, for the setting up of an Arab network. A European network is currently under review.

WISE India was established in 2010, and is now a member of INWES; it hosted the regional meeting in Delhi in 2012.

Conclusion

The 50th anniversary of ICWES conferences will be celebrated this Oct. 23-25 in Los Angeles at the combined Society of Women Engineers annual conference, called WE14, and the ICWES 16 gathering. The theme of the event is "A Global Exchange for Change."

At the end of 2011, following the ICWES15 gathering in Adelaide, Australia, INWES represented more than 200,000 women through 25 organizations of women in science and engineering, spread across 11 geographical areas of the world. INWES collaboration with existing international, regional, and local organizations aims at reinforcing human and institutional capacities, at promoting science and engineering for young people, and facilitating the access to science and technology for all women in the world. For more information, visit: www.inwes.org and www.inwes-eri.org. ■

Participation at International and Regional Meetings

- INWES participated in the writing of UNESCO's *International Report on Science, Technology, and Gender*, led by Eduardo Martinez-Garcia, Ph.D. (IRSTG 2005). (M. Frize, C. Deschênes).
- Organisation for Economic Co-operation and Development OECD workshops on women and science (C. Deschênes in Nov. 2005, Paris; C. Deschênes, M. Frize, and M. Gratton in Sept. 2006 in Ottawa).
- Launch of the Arab network of women scientists and engineers (Bahrain, Feb. 2005) (S. Bird represented INWES).
- INWES entered in relations of the *operational* type with UNESCO in 2008. With UNESCO changes in categories in 2012, INWES is now listed under consultative status.
- Attendance at the 35th session of the General UNESCO Conference in 2009 and all the meetings of the NGO liaison committee. Representatives of INWES attended the L'Oreal-UNESCO awards in 2010 and 2011 for Women and Science, and the ceremony for the L'Oreal-UNESCO International Fellowship holders.
- UNESCO patronage and financial support was received for delegates from developing countries to attend ICWES14, ICWES15, and for the regional meeting in Nairobi, Kenya, in 2013.
- L'Oreal-UNESCO laureates were welcomed at ICWES conferences, and the head of the Division and Department for Natural Science also took part. The assistant director-general, Gretchen Kalonji, Ph.D., attended ICWES15 as a plenary speaker.
- INWES contributed to the Engineering Report of the Natural Sciences Department.
- INWES developed relations with UNESCO National Commissions in some countries, and received their support for several events.
- INWES members have taken part in conferences and workshops organized by the World Federation of Engineering Organizations (WFEO) and helped to organize some events. These events have taken place in Tunisia, Argentina, Brazil, and Switzerland, among others. INWES has a memorandum of understanding with the women in engineering committee of the WFEO. Monique Frize represented INWES at meetings of the WFEO capacity building committee for poverty eradication in Washington in 2004 and Puerto Rico in 2006. I. Gueye, Frize, M. Moutaud, and Y. Ramos represented INWES in Tunis, Tunisia, at the WFEO conference on women in engineering in 2007.

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TIME	SESSION TRACK	SESSION TITLE	FACILITY	ROOM
TUESDAY • OCTOBER 21, 2014				
8:00 a.m. - 5:00 p.m.	General Information	INWES 2012-2014 Board of Directors Meeting	Westin Hotel	San Bernardino Room
WEDNESDAY • OCTOBER 22, 2014				
8:00 a.m. - 1:00 p.m.	Special Events	INWES 2012-2014 Board of Directors Meeting	Westin Hotel	San Bernardino Room
2:00 - 4:00 p.m.	Special Events	INWES African Regional Network Meeting	LACC	512
THURSDAY • OCTOBER 23, 2014				
10:00 - 10:55 a.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	Changing the Game: Towards Diverse and Inclusive Science, Engineering and Technology Professions	LACC	402A
10:00 - 10:55 a.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	Leading Grassroots Change – a Gender Diversity Action Plan and Key Performance Indicators	LACC	402B
10:00 - 11:40 a.m.	TRACK 1: Innovations, Research and Achievements (Lightning Talks)	Trends in Temperature Extremes in Morocco Evaluation of Napier Grass (Pennisetum Purpureum) Clones for Performance and Tolerance to Napier Stunt Disease in Central Uganda University-Industry Collaboration in Hydraulic Turbines Research, a Successful Story The Most Important Philosophical Problems of Developing of Biotechnology Harmful Cultural Practices Affecting Health of the Rural Akwa Ibom Women	LACC	404B
10:00 - 11:40 a.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems (Lightning Talks)	Initial Study on Nutrient Removal and Lipid Production From Seafood Processing Wastewater by Chlorococcum sp. Isolated from Vietnam Thermo Chemical Characterization and Gasification of Non-Edible Seed Cake Promoting Nigerian Youths' Responsiveness to Renewable Energy Strategies Through School Based Activities Captive Power Generation Using Biomass Gasifier for Village Electrification	LACC	404A
10:00 a.m. - 4:00 p.m.	Posters and International Lounge	ICWES Poster Sessions and International Lounge	LACC	403
11:00 - 11:55 a.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	Surviving Office Politics - A Nigerian Perspective	LACC	402A
11:00 - 11:55 a.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	Women Professional Engineers at Work	LACC	402B
11:45 a.m. - 1:15 p.m.	Special Events	Korean Women's Luncheon	LACC	408A
12:00 - 1:30 p.m.	Special Events	INWES Education and Research Institute Board of Directors Meeting	LACC	401
1:30 - 2:30 p.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems	Solar Electricity 101- Moving Towards Energy Sustainability With Solar	LACC	404A
1:30 - 2:30 p.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	Empowering Women Engineers in the Arab World in Profession and Leadership Positions	LACC	402A

TIME	SESSION TRACK	SESSION TITLE	FACILITY	ROOM
1:30 - 3:10 p.m.	TRACK 1: Innovations, Research and Achievements (Lightning Talks)	Software Engineering Based Model for Mitigating Repetitive Strain Injury (RSI) Among Computer Users Direction of Arrival (DOA) Estimation With Two Element Antennas Implementation of Time Shared Architecture in the Design of Wireless Receiver Effects of HIV/AIDS on the Road Construction Sector: A Case of Ejinja-Bumala Road (C30)-Kenya	LACC	404B
1:30 - 3:10 p.m.	TRACK 3: Attracting, Developing, Promoting and Retaining (Lightning Talks)	Retaining Women in STEM Fields: A Case Study of Dongseo University Managing Cross Cultural Differences in the Engineering and Science Profession Causes of Glass Ceiling and its Effects on Women: Pakistani Perspective Understanding Gender Regimes in the Construction Industry Using New Institutionalism How Do You Tell an Office Full of Engineers That You are Pregnant	LACC	402B
2:45 - 3:45 p.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	The Leadership Challenge – Women in Engineering and Science	LACC	402A
3:20 - 5:00 p.m.	TRACK 1: Innovations, Research and Achievements (Lightning Talks)	Technology Innovations for the Mobile Tutorial Lesson Some Philosophical Problems of Developing and Using Nanotechnology Mongolian Traditional Medicine, The Miracle of Living Water Copper and Zinc Status during Pregnancy and Lactation in South East Nigeria Bio-inspired Sensor Design	LACC	404B
3:20 - 5:00 p.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems (Lightning Talks)	Application of Crude Natural Products from an Indigenous Plant, Phytolacca dodecandra (Endod) to Manage Malaria and Public Health Diseases by Local Women in the Lake Victoria Basin, Kenya Landfills and Waste Dumpsites: The South-Western Nigeria Picture Handling the Feed Challenges of Fish Farmers in Nigeria Strategies to Improve Year-Round Feed Supply in Smallholder Dairy Cattle Production Systems	LACC	404A
3:20 - 5:00 p.m.	TRACK 3: Attracting, Developing, Promoting and Retaining (Lightning Talks)	Surviving the Men's World: Female Engineering Students Industrial Experience in Nigeria How to Be a Successful Entrepreneur: A Case Study of an Engineering Consultancy Firm Capacity Building for Women Entrepreneurs in Nigeria: Implication for Business Education Developing Entrepreneurship and Leadership Qualities in Women Equality in the Engineering Workplace: Exploring the Next Wave of Empowerment Tools	LACC	402B
4:00 - 5:00 p.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	Radioisotopes – From Research to Applied Nuclear Technology, a Growing Field for Women	LACC	402A

TIME	SESSION TRACK	SESSION TITLE	FACILITY	ROOM
FRIDAY • OCTOBER 24, 2014				
10:00 - 11:40 a.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems (Lightning Talks)	Urban Freight Transport in India: Options for Non-Motorized Vehicles for Last Mile Connectivity Protecting Mangroves During Site Development Using Integrated Design and Land improvement Practices Resolving Water Resource Conflicts Among Communities Through Participatory Approaches Integrated Approach to Wetland Protection: A Sure Means For Sustainable Water Supply to Local Communities Around The Lake Victoria Basin, Kenya The Miracle of the Water Hyacinth- A Case Study in Assam	LACC	404A
10:00 - 10:55 a.m.	TRACK 1: Innovations, Research and Achievements	Need for Safety Precaution in Agricultural Production	LACC	402A
10:00 - 10:55 a.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems	Women and Energy: Solar Ideas In Our Kitchen	LACC	402B
10:00 - 10:55 a.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	History and Activities of International Network of Women Engineers and Scientists (INWES)	LACC	404B
10:00 a.m - 12:00 p.m.	Special Events	INWES: Connecting Women in Engineering Program Leader Internationally	LACC	411
10:00 a.m. - 4:00 p.m.	Posters and International Lounge	ICWES Poster Sessions and International Lounge	LACC	403
11:00 - 11:55 a.m.	TRACK 1: Innovations, Research and Achievements	Quality Enhancement Parametres for Buses in India	LACC	402A
11:00 - 11:55 a.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems	Homegrown Technology Development in Africa	LACC	402B
11:00 - 11:55 a.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	Passionate Women in Science and Engineering, Then and Now	LACC	404B
1:30 - 2:30 p.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems	Achieving Reliable Sustainable Solar Power Generation Through the 3DPV Technology	LACC	402B
2:00 - 4:00 p.m.	Special Events	INWES Annual General Meeting [INWES Delegates & INWES Members]	LACC	411
2:45 - 3:45 p.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems	Water Management for Food Security and Improved Income	LACC	402A
2:45 - 3:45 p.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems	Clean Thanjavur Movement – Role of Women Technocrats in Community Based Technology Initiatives for Solid Waste Management	LACC	402B
3:20 - 5:00 p.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems (Lightning Talks)	Development of Biodegradable Films from Locally Available Materials Remediation of Crude Oil Impacted Soil system in Nigeria Using Innovative Indigenous Eco-safe Technology Anaerobic Digestion of Banana Waste Biomimicry Approach to the Living Building in Korea	LACC	404A
3:20 - 5:00 p.m.	TRACK 3: Attracting, Developing, Promoting and Retaining (Lightning Talks)	Reverse Engineering Your Career The Arrow and The Song, of Diversity in Japan Etiquette & Netiquette – In Our Work Places Women in IT Management; Redefining Stereotypes - Case Study Nigeria Scientifically Yours: A Camp Where Girls Explore Opportunities Through Projects and Mentorship	LACC	404B

TIME	SESSION TRACK	SESSION TITLE	FACILITY	ROOM
4:00 - 5:00 p.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems	Technological Empowerment of Fisher Women to Improve the Health & Nutritional Status of the Family in Coastal Areas	LACC	402A
4:00 - 5:00 p.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems	Is Perth, Western Australia, Ready for Car Sharing?	LACC	402B
SATURDAY • OCTOBER 25, 2014				
8:00 a.m. - 1:00 p.m.	Special Events	INWES 2014-2016 Board of Directors Meeting	Westin Hotel	Huntington
10:00 - 10:55 a.m.	TRACK 1: Innovations, Research and Achievements	Innovative Techniques for Verifying Programmable Logic Devices	LACC	402A
10:00 - 10:55 a.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems	Introduction to Traffic Congestion Detection on Indian Roads Using Vehicular Ad-Hoc Networks (VANETs)	LACC	402B
10:00 - 10:55 a.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	Promoting Social Inclusion in Engineering through Conducive Workforce Diversity Policy of SDC	LACC	404B
10:00 a.m. - 12:00 p.m.	TRACK 3: Attracting, Developing, Promoting and Retaining (Lightning Talks)	Explanations and Consequences of UK Women Engineering and Technology University Students Receiving More 'Help' Than Their Male Peers Enhancing Girls' Participation and Performance in Science, Mathematics and Information Technology at Primary Level of Education in Kenya: Intervention Strategies Overcoming Barriers to Girls Science Education in Developing Countries Image on Women Engineers and Scientists	LACC	404A
10:00 a.m. - 4:00 p.m.	Posters and International Lounge	ICWES Poster Sessions and International Lounge	LACC	403
11:00 - 11:55 a.m.	TRACK 1: Innovations, Research and Achievements	Systems Thinking and Requirements Approaches for Innovative Solutions in Science and Engineering	LACC	402A
11:00 - 11:55 a.m.	TRACK 2: New Ideas and Solutions to Contemporary Problems	Driver Behaviour and Psychophysical Characteristics in Indian Traffic Conditions	LACC	402B
11:00 - 11:55 a.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	Power of Engineering: Creating a Sustainable Program to Inspire the Next Generation of Female Engineers	LACC	404B
1:30 - 2:30 p.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	The Outcomes when Industry Fully Finances a Women in Engineering Program at a University!	LACC	402A
1:30 - 2:30 p.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	Mentoring and MentorSET™	LACC	402B
1:30 - 3:10 p.m.	TRACK 3: Attracting, Developing, Promoting and Retaining (Lightning Talks)	Case Study of Girl Power Initiative (GPI) and University of Calabar Girls in STEM Attracting and Developing Girls in STEM: Best Practices of STEM in Nigeria QUT's Women in STEM Initiative – A Cradle to Cradle Approach Women's Engineering Society Story	LACC	404A
2:45 - 3:45 p.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	Gender Issues in Science and Technology for Environmental Sustainability	LACC	402A
2:45 - 3:45 p.m.	TRACK 3: Attracting, Developing, Promoting and Retaining	Returners to Science and Engineering: the Barriers, the Business Case and the Benefits	LACC	402B

TUESDAY, **OCTOBER 21**

INWES 2012-2014 BOARD OF DIRECTORS MEETING
8:00 a.m. - 5:00 p.m.
Westin Hotel, San Bernardino Room

JOINT INWES BOARD OF DIRECTORS AND SWE BOARD OF DIRECTORS DINNER
By Invitation only

WEDNESDAY, **OCTOBER 22**

INWES 2012-2014 BOARD OF DIRECTORS MEETING
8:00 a.m. - 1:00 p.m.
Westin Hotel, San Bernardino Room

INWES AFRICAN REGIONAL NETWORK MEETING
2:00 - 4:00 p.m.
Los Angeles Convention Center, Room 512

THURSDAY, **OCTOBER 23**

KOREAN WOMEN'S LUNCHEON
11:45 a.m. - 1:15 p.m.
Los Angeles Convention Center, 408A

Dr. Han and Dr. Lee are inviting all Korean women attending ICWES16, as well as Korean-American participants of WE14, to join them for lunch to discuss the advancement for women in STEM in the Republic of Korea. There will be a sign-up sheet at the Help Desk in the International Lounge.

INWES EDUCATION AND RESEARCH INSTITUTE BOARD OF DIRECTORS MEETING
12:00 - 1:30 p.m.
Los Angeles Convention Center, 401

The INWES Education and Research Institute (ERI), the charity and not-for-profit entity associated with INWES, will be holding a short meeting during ICWES16. INWES members are welcome to join us if they would like meet the Directors and learn about what the ERI has been doing for the past three years. INWES ERI Annual Reports for 2011, 2012 and 2013 will be available. Bring your own lunch!

TRACK 1:

INNOVATIONS, RESEARCH AND ACHIEVEMENTS IN THE VARIOUS FIELDS OF ENGINEERING, SCIENCE AND TECHNOLOGY
LIGHTNING TALKS
10:00 - 11:40 a.m.
Los Angeles Convention Center, 404B
FACILITATOR: Peggy Layne, Track 1 Chair

TRENDS IN TEMPERATURE EXTREMES IN MOROCCO
LIGHTNING TALK #1

This work analyzes the frequency of warm and cold extreme events in two contrasted Moroccan regions (the Tensift in the semi-arid South, and the Bouregreg in the sub-humid North), and looks at their relationship with climatic indexes. The temperature extremes are defined as the daily data above (below) the 95th (5th) and 99th (1st) percentiles. Results show upward trends in maximum and minimum temperatures of both regions. Trends are larger for minimum temperature, during the warm season, and are mostly significant in coastal stations. Changes in cold events are larger than those for warm events, and the numbers of very cold events decrease significantly in the whole area. The southern region is the most affected with the changes of the temperature regime. A statistical link is observed between extreme events during the summer and the MO while the circulation related to the NAO affect extreme events recorded in Rabat Sale only.

SPEAKER: Kenza Khomsi, Direction de la Météorologie Nationale, Morocco

EVALUATION OF NAPIER GRASS (PENNISETUM PURPUREUM) CLONES FOR PERFORMANCE AND TOLERANCE TO NAPIER STUNT DISEASE IN CENTRAL UGANDA
LIGHTNING TALK #2

Napier grass constitutes 40 to 80% of the forages fed to cattle in smallholder dairy farming systems in Eastern and Central Africa. The productivity of the forage is constrained by Napier Stunt Disease (NSD) threatening the sustainability of smallholder dairying. A study was conducted at the National Crops Resources Research Institute to assess the herbage biomass yield and tolerance to NSD of 22 Napier grass clones acquired from Kenya. Each clone was replicated three times in a CRBD and each plot surrounded by infected Napier grass. The plots were harvested every two months (for five times) for determination of leaf biomass, stem biomass, total biomass and disease severity. Results showed that clones differed significantly ($p < 0.05$) for DMY, disease severity ($P<0.05$) with no significant ($p <0.05$) difference between clones for leaf:stem. Clone 97 had the highest accumulated DMY (46.863±7.708t/ha) whereas 79SN had the lowest (12.505±7.708t/ha). There was a 32.75% decrease in DMY. Clone Kakamega2, 16702, 112 and Kakamega1 that never succumbed to NSD up to the fifth harvest and produced high DMY are recommended for multiplication and dissemination to farmers but there is need to follow their performance for a period longer than one year used in the current study.

SPEAKER: Zainah Nampijja, Makerere University, Uganda

UNIVERSITY-INDUSTRY COLLABORATION IN HYDRAULIC TURBINES RESEARCH, A SUCCESSFUL STORY
LIGHTNING TALK #3

It is well known that hydro-electricity has an important role to play in the production of sustainable and clean energy worldwide. This paper presents an overview of a research program initiated at Laval University, Canada, in 2007. The collaborators participating to the research group founded for the occasion, the Consortium on Hydraulic Machines, are leading companies and utilities involved in hydraulic turbine design or operation. The aim of the research program is to improve the knowledge of hydraulic phenomena in two types of low head hydraulic turbines, a propeller and a bulb. A combination of experimental, numerical and theoretical approaches is employed. Modern experimental techniques are set in place or developed. Specific methods are developed for the analysis and comparison of the experimental data and numerical simulation results. A database, shared between the Consortium partners, is created for future analysis. Ultimately, the developed knowledge will lead to the optimization of power generation low head turbines. Utilities will benefit from more reliable turbines, reduced maintenance downtime, and increased machine life.

SPEAKER: Dr. Claire Deschênes, Laval University, Canada

THE MOST IMPORTANT PHILOSOPHICAL PROBLEMS OF DEVELOPING OF BIOTECHNOLOGY
LIGHTNING TALK #4

Biotechnology - ability to change the nature of man and the transition to the post-human stage of history. Human nature forms and limits the kinds of political regimes, so the technology that changes a person can have negative consequences. Nanotechnology allow you to create self-replicating machines-robots molecular level, capable to uncontrolled breeding and human destruction, their Creator. Can be created biotechnology products: superinsects, new viruses, genetically modified food, giving toxic reactions.

SPEAKERS: Asal Babaeva, The Russian Economic University; After G.V. Plekhanov and Shirin Ablakulova, The Tashkent State Economic University, Uzbekistan

HARMFUL CULTURAL PRACTICES AFFECTING HEALTH OF THE RURAL AKWA IBOM WOMEN
LIGHTNING TALK #5

Most cultural practices have continued to cause lots of harm on health of ignorant practitioners, especially the rural settlers in Akwa Ibom State. Despite the health hazards of these practices, the practitioners continue blindly regarding the fact that the practices were handed down by ancestors. This research therefore aimed at identifying harmful cultural practices prevalent in rural settlements of Akwa Ibom state, finding possible reasons for these practices, determining their harmful effect on health of practitioners as well as offering possible measure to discourage or prevent the perpetuation of these harmful cultural practices. The research instrument used was the questionnaire which were administered to adults who are citizens and others residing in rural area of Akwa Ibom State over 5years. Data collected was analysed in simple percentages. Among other practices 29.3% of respondents attested to prevalence of FGM 22.7% agree that forced and early marriage is practices while 17.3% attested to practice of widowhood rites and inheritance. The outcome shows that female genital mutilation (FGM) was the most prevalent harmful practices in Akwa Ibom State hence some recommendations were made including provision of health education/awareness programs on harmful effects of these practices to rural dwellers.

SPEAKERS: Adiaha Johnny and Enenwan Ukporo, University of Uyo; Boma Edyang, Akwa Ibom State Tourism Board and Joy Eyoh, University of Uyo Teaching Hospital, Nigeria

TRACK 1:

INNOVATIONS, RESEARCH AND ACHIEVEMENTS IN THE VARIOUS FIELDS OF ENGINEERING, SCIENCE AND TECHNOLOGY

LIGHTNING TALKS

1:30 - 3:10 p.m.

Los Angeles Convention Center, 404B

FACILITATOR: Claire Deschênes, INWES ERI, Treasurer

SOFTWARE ENGINEERING BASED MODEL FOR MITIGATING REPETITIVE STRAIN INJURY (RSI) AMONG COMPUTER USERS

LIGHTNING TALK #1

The incorporation of Information and Communication Technology in virtually all facets of human endeavours has fostered the use of computers. This has induced Repetitive Stress Injury (RSI) for continuous and persistent computer users. RSI is an injury of the musculoskeletal and nervous systems that may be caused by repetitive tasks, forceful exertions, vibrations, mechanical compression or awkward positions. The symptoms include extensive back pain, arm pain shoulder pain, waist pain, neck pain and swelling, etc. The Objective of this research is to propose, design and implement a software engineering model capable of enacting RSI force break. A questionnaire based survey was utilized in eliciting information pertaining to RSI from computer users within University of Benin. 300 questionnaires were administered; 260 were filled and returned, out of which 152 reported incidence of symptoms of RSI. A software engineering proactive model capable of enacting RSI involuntarily force break was proposed, designed and implemented using Java Version 6.0. The Software developed, "Save Computer Users" from themselves (SACOU), enacts force break as a result of forced system shut-down when the threshold time period has been exceeded, leaving the users with no choice but to take a break after 60 minutes of computer usage.

SPEAKER: Dr. Veronica Akwukwuma, University of Benin, Benin City, Nigeria

DIRECTION OF ARRIVAL (DOA) ESTIMATION WITH TWO ELEMENT ANTENNAS

LIGHTNING TALK #2

The cost of achieving direction finding is mainly based on the number of antennas that form the array and the complexity of the processing algorithm. In most DOA estimation, multiple antennas in an array are used [1, 2] with complex algorithms, making the whole system complex and expensive [3]. RSSI based algorithm has been proved to be economical [4] and efficient [5]. This paper will be presenting a matlab simulation of two element radiation patterns for four different phases between the elements to produce four different patterns with main lobe at different angles. Steering between these beams, signals from distant points are received by each of these beams with different signal strength values depending on the location of the signal sources and the angle of maximum reception of each beam. The DOA can then be estimated based on the beam with maximum RSS value. Second biggest RSS value will also be used to increase the accuracy of estimation. This can be used in designing a direction finder for location of mobile users for optimum deployment of a picocell within a micro cell.

SPEAKER: Dorathy Abonyi, Enugu State University of Science and Technology, Nigeria

IMPLEMENTATION OF TIME SHARED ARCHITECTURE IN THE DESIGN OF WIRELESS RECEIVER

LIGHTNING TALK #3

Time shared architectures allow reuse of hardware resources of the design as the input data remains valid for multiple clock cycles. The paper presented here describes a practical design problem where the design of a wireless system receiver has to be ported from Xilinx Spartan-3 (having 126 DSP slices) to Xilinx Spartan-6 (having 58 DSP slices). The design specifications for Spartan-3 are; sampling clock: 52.08 ns and circuit clock: 52.08 ns. The implementation of design on Spartan-3 is done using fully dedicated architecture. Since Spartan-6 has less number of DSP slices so the design of wireless receiver is modified by using folding. The design specifications for Spartan-6 are: sampling clock: 52.08ns, circuit clock: 6.5ns and folding factor: 8 (52.08/6.5). Receiver design consists of a digital down converter (DDC), filter, decimator, despreader and burst detector. The technique of folding was implemented for: (i) DDC and the number of DSP slices reduced from 8 to 1, (ii) Filter and number of DSP slices reduced from 8 to 1 (iii) Decimator and number of DSP slices reduced from 30 to 4. Hence with the use of time shared architecture, the design for the wireless receiver was modified and successfully implemented on Spartan-6.

SPEAKER: Sana Habib, Center for Advanced Research in Engineering (CARE), Pakistan

EFFECTS OF HIV/AIDS ON THE ROAD CONSTRUCTION SECTOR: A CASE OF EJINJA-BUMALA ROAD (C30)-KENYA

LIGHTNING TALK #4

HIV remains a global health problem of unprecedented dimensions. Sub-Saharan Africa bears an inordinate share of the global HIV burden. In Kenya, the average HIV prevalence falls between ages 15-49. Observably, road construction workers; engineers, supervisors and laborers are a unique target group in the fight against HIV and AIDS. Often, these are sexually active males under the risk age working in isolated camps away from home.

SPEAKER: Dr. Grace Ngare, Kenyatta University, Kenya

TRACK 1:

INNOVATIONS, RESEARCH AND ACHIEVEMENTS IN THE VARIOUS FIELDS OF ENGINEERING, SCIENCE AND TECHNOLOGY

LIGHTNING TALKS

3:20 - 5:00 p.m.

Los Angeles Convention Center, 404B

FACILITATOR: Margaret Ajibode, INWES Director

TECHNOLOGY INNOVATIONS FOR THE MOBILE TUTORIAL LESSON

LIGHTNING TALK #1

Obligations due to a woman nature, temporal delays, difficulties to rich in certain areas and catastrophes are realities. It becomes important to explore dynamic processes able to improve learning situations between the student and the knowledge to be acquired. This provides school for everyone and avoids early school drop-out. Innovations in the various fields of engineering, science and technology of education, can become good tools in pedagogy, through educative media. It is therefore possible to conceive a lesson which can be followed in the classroom, or outside, allowing the teacher to have an effective and personal follow-up of the student. The ICWES16 is an opportunity to share and discuss about The "Mobile Tutorial Lesson," adapted to innovations while conserving an ordinary classroom. It permits not to destroy the existing educational systems but to offer to the student the opportunity to learn officially, wherever he may be during the academic year.

SPEAKERS: Abamba Mboapfouri Aude, National Advanced School of Post and Telecommunications NASPT, Cameroon

SOME PHILOSOPHICAL PROBLEMS OF DEVELOPING AND USING NANOTECHNOLOGY

LIGHTNING TALK #2

One of the aspects of the specifics of nanotechnology is that it is a high technology of a special kind, which is not only the technology of practical activity, creation of material objects, facing the natural world, but also social technology aimed at the construction of a social world that is expressed in the spectrum of possibilities of its application.

SPEAKER: Nigina Shermuhamedova, The National University of Uzbekistan, Uzbekistan

MONGOLIAN TRADITIONAL MEDICINE, THE MIRACLE OF LIVING WATER

LIGHTNING TALK #3

This talk provides Mongolian's Treasure which is a beautiful tradition, from fresh water springs preserve and maintain the natural balance has been moving around people. Changing river flow, and change the spring sources, plants, animals, the local water scares each washing or washing refrain. Thus, in addition to the use of medical procedures: - Before eating food 1-2 cup water 1 tsp honey and living water drinking weight loss - Drink water after eating gain -No letting food drink water was considered to be healed. And learning to control the amount of food, and includes: Feeding the gastric 2/4 for food and 1/4 for drinks and remaining 1/4 on the food need not be stated. Traditional medicine, waters, divided into 4. Nature, snow, ice, water or rain water best next spring stream that good water they were used in the summer. We use traditional medicine and water in combination with current medical treatment of certain diseases, living water and wisdom is found. Finally, the water is like a mirror of our emotions of motherhood because it represents the entire world and lovingly encourage rational use of water, free water.

SPEAKERS: Dr. Enkhmaa Bat-Ochir, Institute of Medical Education, and Ariunbolor Purvee, Mongolian University of Science and Technology, Mongolia

COPPER AND ZINC STATUS DURING PREGNANCY AND LACTATION IN SOUTH EAST NIGERIA

LIGHTNING TALK #4

Copper and zinc have been shown to be absolutely essential for normal growth, reproduction and lactation. As antioxidant micronutrient minerals, deficiencies have been reported to result in adverse reproductive disorders in developing countries. One hundred and thirty two (132) pregnant and 97 postpartum women attending antenatal and postnatal clinics respectively, of one tertiary and two secondary health care facilities in Enugu, were used as test subjects. Sixty-four (64) apparently healthy, non-pregnant women served as controls. Serum copper and zinc levels during pregnancy and postpartum periods, as well as in the breast milk, were determined by Atomic Absorption Spectrophotometric method. Results revealed that mean serum copper concentrations were significantly increased while zinc decreased ($P<0.05$ each), during pregnancy when compared with non-pregnant controls. In breast milk, copper concentration decreased while zinc increased significantly ($P<0.001$) as lactation progressed. Copper/Zinc ratios were also determined. Fluctuations in the concentrations of copper and zinc during pregnancy and lactation were observed. In view of this, there is need for adequate and balanced micronutrient supplementation during pregnancy and lactation to achieve a healthy maternal and neonatal status. Practitioners and caregivers should thus discourage indiscriminate micro nutrient supplementation.

SPEAKERS: Antoinette Okaka, Nnamdi Azikiwe University, Awka and Fidelis Ejezie, College of Medicine, University of Nigeria, Nsukka, Nigeria

BIO-INSPIRED SENSOR DESIGN

LIGHTNING TALK #5

Sensors are an integral part of many engineered products, systems, and manufacturing processes as they provide feedback, monitoring, safety, and a number of other benefits. Development of sensor technology is an exciting area of research as it spans engineering, science and technology. Nature has evolved and optimized an incredible variety of sensors and adaptive sensing systems for navigation, spatial orientation, prey and object detection, etc., which provide engineers new ideas for improvements to current technology, new sensor technology and potential sensor miniaturization. Not only is nature rich with sensing methods, but also it provides strategies associated with the use of those sensing methods. Adapting features and characteristics of biological systems can significantly advance engineered systems, including sensors, which has resulted in novel designs and improved sensor technology. In this session attendees will learn about the field of bio-inspired design and how it can be applied to the technical field of sensors. Biological sensing methods and strategies, and examples of knowledge transfer processes across the domains will be given. Attendees will walk away with new and transformative ideas for developing innovative sensing technology.

SPEAKER: Dr. Jacquelyn Nagel, James Madison University, USA

TRACK 2:

NEW IDEAS AND SOLUTIONS TO CONTEMPORARY PROBLEMS INCLUDING CLIMATE CHANGE, WATER AND RESOURCE MANAGEMENT, RENEWABLE ENERGY AND SUSTAINABILITY

LIGHTNING TALKS

10:00 - 11:40 a.m.

Los Angeles Convention Center, 404A

FACILITATOR: Jill Tietjen, Track 2 Chair

INITIAL STUDY ON NUTRIENT REMOVAL AND LIPID PRODUCTION FROM SEAFOOD PROCESSING WASTEWATER BY CHLOROCOCCUM SP. ISOLATED FROM VIETNAM

LIGHTNING TALK #1

In the present study, biomass and lipid production of 7 algal species collected from southern Vietnam were investigated. Lipid contents of these algae were found between 13.9% and 31.0%; three species possessing the highest lipid contents included Scenedesmus sp. (31.0%), Chlorococcum sp. (30.6%) and Chlorella sp. (20.8%). Based on both the growth performance and lipid content, Chlorococcum sp. was then selected for investigation of nutrients removal from a seafood processing wastewater. The results showed that Chlorococcum sp. could remove 60.7% of total nitrogen (N) and 54.0% of total phosphorus (P) from the original wastewater and 88.2% of total N and 93.8% of total P, respectively from the primary treated wastewater (the primary treated wastewater differs from the original one by having large particles removed). Biomass production of Chlorococcum sp. in standard medium was 7.5 folds higher than those of the wastewater cultures. However, the lipid contents of the wastewater cultures (35.5% and 32.7% for the primary treated and the original wastewater cultures, respectively) were higher compared with the standard culture (30.6%). These suggest the feasibility of using this algal species for the nutrients removal and the possibility of increasing the lipid production by adjusting the wastewater components.

SPEAKER: Dr. Hanh Tran, Ho Chi Minh International University, Vietnam

THERMO CHEMICAL CHARACTERIZATION AND GASIFICATION OF NON-EDIBLE SEED CAKE

LIGHTNING TALK #2

India has a lot of potential of non-edible oil tree born seeds. The country is endowed with more than 100 species of tree born non edible oil seeds occurring in wild or cultivated sporadically. Most tree borne oil seeds yield about 25% oil and 70% oil cake considering 5% losses in the oil extraction process. India's current bio-diesel technology of choice is the trans-esterification of vegetable oils. Jatropha curcas (Jatropha) and Pongamia pinnata (Karanja) crops had been selected as major source of non-edible oils for production of biodiesel. Considering the future scenario of non-edible oil seed's utilization for biodiesel production, there is a need for efficient utilization of their cakes. There are three options to dispose the cakes one is it could be utilize as fertilizer, second option is as the seed cake as a substrate for biogas generation and the third method is it could be used in thermo chemical conversion process. This paper mainly discusses the non-edible seed cake for thermo chemical characterization using Thermogravimetric analyser and also the Gasification in the portable biomass gasifier. The seed cakes had good volatile matter which gave an attractive potential for energy exploitation through gasification.

SPEAKER: Dr. Poosari Kumaravel Srividhya, Periyar Maniammai University, India

PROMOTING NIGERIAN YOUTHS' RESPONSIVENESS TO RENEWABLE ENERGY STRATEGIES THROUGH SCHOOL BASED ACTIVITIES

LIGHTNING TALK #3

Alternative and renewable energy sources will play a role in meeting future energy demand and this role will to a large extent depend on youths' awareness and responsiveness to global renewable energy strategies. Nigerian youths are not sensitive to environmental problems. Thus, are not responsive to renewable energy strategies. There is therefore need to sensitize the youths on renewable energy strategies and management by adopting activities in schools that may promote youth responsiveness to energy management. Renewable energy is any source that is naturally replenished. Investing in energy management reduces greenhouse emission, saves energy and creates jobs. This study investigated the level of youths' responsiveness to renewable energy strategies and determined the difference in youths' responsiveness based on exposure to renewable energy activities in school. A total of 500 students from various schools in South-South geo-political zone in Nigeria were selected for the study. Data obtained was analyzed using descriptive mean and standard deviation. The study revealed that though the students had low responsiveness to renewable energy strategies, the school activities increased the students' response. It was recommended that schools should expose youths to renewable activities that will inculcate positive response to energy management among Nigerian youths.

SPEAKER: Glory Ofili, Organization for Promoting African Girls in Engineering Science and Technology Education, Nigeria

CAPTIVE POWER GENERATION USING BIOMASS GASIFIER FOR VILLAGE ELECTRIFICATION

LIGHTNING TALK #4

Energy supply is a dominant issue not only in India, but worldwide too. Around 2 billion people rely on biomass in one-way or the other for fuel wood or process heat. When we looked at the usage of biomass it is often used in an inefficient way in the developing countries. The resultant effect is on health, environment, and social well-being. So, the call is loud and clear to make a clean and efficient use of biomass. The immediate perspective is to make available at least bare minimum energy services to the rural poor. The technology, which does this trick convincingly in the remote rural environs, is the biomass gasification. Presently, biomass gasifiers are turning out to be a ready solution to the small energy needs of the sparsely populated rural households located away from the hustle and bustle of big cities and towns. It is not as if, the biomass gasifiers have emerged out of blue just today. These systems have been around for more than a decade now. However this paper discusses the captive power generation for the locally available materials for village electrification.

SPEAKER: Dr. Poosari Kumaravel Srividhya, Periyar Maniammai University, India

TRACK 2:

NEW IDEAS AND SOLUTIONS TO CONTEMPORARY PROBLEMS INCLUDING CLIMATE CHANGE, WATER AND RESOURCE MANAGEMENT, RENEWABLE ENERGY AND SUSTAINABILITY

LECTURE

1:30 - 2:30 p.m.

Los Angeles Convention Center, 404A

FACILITATOR: Joan Graf, INWES Treasurer