DETAILED WORKSHOP SCHEDULE

I. GENDER STUDIES Chair: L. Meza-Montes, Room BA 202

Date	Time	Speaker	Title
August 6	16:00-17:30	Eden Hennessey *Wilfrid Laurier University, Waterloo*	Equity and Education: Examining Gendered Stigma in Science
August 7	9:45-11:15	Anitha Kurup, *National Institute of Advanced Studies, India*	A Comparative study of women scientists and engineers: Experiences in India and the US; Impressions from the field
August 8	9:30-11:00	P. Shastri, *Indian Institute of Astrophysics, India,* L. Meza-Montes*, Benemérita Universidad Autónoma de Puebla, Mexico*	Towards Gender Equity through Policy: Characterising the Social Impact of Interventions

II. PHYSICS EDUCATION Chairs: Renee Horton, Marina Milner-Bolotin, Room BA 208

Date	Time	Speaker	Title
August 6	16:00-16:30	Ann Marks *University of Liverpool, UK*	Closing doors: Exploring gender and subject choice in schools
August 6	16:30-17:00	Fu-Jen Kao *The Physical Society of ROC, Taiwan*	On how to interact with male colleagues, a male's point of view
August 6	17:00-17:30	Discussions	
August 7	09:45-10:05	Monika Raharti, *Center for Young Scientist, Indonesia*	Nurturing Asia-Pacific female scientists through scientific events
August 7	10:05-10:25	Chandralekha Singh, *University of Pittsburg, US*	Assessing gender differences in students' understanding of magnetism
August 7	10:25-10:45	Eilish Mcloughlin *Dublin City University, Ireland*	Teaching, learning and assessing inquiry based science education
August 8	10:45-11:15	Discussion	
August 8	09:30-10:00	Marina Milner-Bolotin *UBC, Canada*	Helping physics teacher-candidates develop questioning skills through innovative technology use
August 8	10:00-10:20	Discussion	
August 8	10:20-11:00	Renee Horton, *USA* and Ching Ray, *China*	Recommendations and Conclusions

III. IMPROVING THE WORKPLACE Chair Gillian Butcher, BA 209

Date	Time	Speaker	Title
August 6	16:00-16:05	Gillian Butcher *University of Leicester, UK*	Introduction
August 6	16:05-16:25	Melanie Campbell *University of Waterloo, Canada*	Improving workplace environment improves it for everyone
August 6	16:25-16:45	Brian Fulton *University of York, UK*	The Juno Project of the UK Institute of Physics: addressing gender issues in university physics departments
August 7	16:45-17:30	Discussions/Conclusions	
August 7	09:45-09:50	Igle Gledhill *CSIR, South Africa*	Introduction
August 7	09:50-10:10	Akira Ejiri *University of Tokyo, Japan*	Analysis of office/laboratory staying hour and home working hour of Japanese scientists and engineers
August 7	10:10-10:30	Anne Cox *Eckerd College, USA*	Combating isolation: Building mutual mentoring alliances
August 7	10:30-10:50	Seema Ubale, *Dharampeth MP Deo College of Science, India*	A study of status of women in physics in Nagpur
August 7	10:50-11:15	Discussions/Conclusions	
August 8	09:30-09:35	Gillian Butcher *University of Leicester, UK*	Introduction
August 8	09:35-09:50	Igle Gledhill *CSIR, South Africa*	Attractiveness of the physics environment for women
August 8	09:50-10:20	Discussion	
August 8	10:20-11:00	Conclusion and Recommendations	

IV. PROFESSIONAL DEVELOPMENT & LEADERSHIP Chair Manling Sui, Jin-Hee Yoon Room BA 210

Date	Time	Speaker	Title
August 6	16:00-16:25	Kae Nemoto, *National Institute of Informatics, Japan*	Continued engagement in promotion on women in physics
August 6	16:25-16:50	Yongah Park *Korea Institute of S&T Evaluation and Planning*	The national status of gender issue in KOREA and introducing gender summit
August 6	16:50-17:15	Beth. A. Cunningham *AAPT, USA*	Can physics disciplinary societies make a difference in the success of women in physics?
August 6	17:15-17:30	Discussion	
August 7	09:45-10:10	Nicola Wilkin *University of Birmingham, UK*	The Aurora leadership program
August 7	10:10-10:35	Cherrill M. Spencer *SLAC, USA*	Expanding girls' horizon in science, maths, engineering: A successful strategy since 1976
August 7	10:35-11:00	Cathy Foley *CSIRO, Australia*	Can you have it all? Making it work for you
August 7	11:00-11:15	Discussion, Chairs: Manling Sui and Xia Guo	
August 8	9:30-9:55	Shaoping Zhu, *Institute of Applied Physics and Computational Mathematics, China*	Inspiration from the Analects of Confucius
August 8	9:55-10:20	Susan K. Blessing, Florida *State University, USA*	The conferences for undergraduate women in physics
August 8	10:20-10:40	Discussion, Chairs: Manling Sui and Jin-Hee Yoon	
August 8	10:40 - 11:00	Recommendations and Conclusions Chairs: Manling Sui and Jin-Hee Yoon	

V. CULTURAL PERCEPTION AND BIAS/SCIENCE PRACTICE AND ETHICS Chairs: Silvia Ponce Dawson & Kwek Leong Chuan, Room BA 211

Date	Time	Speaker	Title
August 6	16:00-16:30	Casey Tesfaye, *AIP, US*	Global Survey of Physicists
August 6	16:30-17:30	JG Lin *Taiwan*, V. Pierron-Bohnes *France*	Round table discussion on cultural perception and bias
August 7	09:45-10:15	Silvina Ponce Dawson *University of Buenos Aires, Argentina*	Science practice and ethics
August 7	10:15-11:15	Discussions	
August 7	09:30-11:00	Discussion and Recommendations	

WORKSHOPS

I. GENDER STUDIES

Chair: Lilia. Meza-Montes
Instituto de Física, Benemérita Universidad Autónoma de Puebla, México, lilia@ifuap.buap.mx

This workshop will cover several themes on gender issues. The first session, conducted by Eden Hennessey, is designed to inspire critical analysis of the challenges faced by women in science-based educational programs and careers. In particular, it will focus on methods to increase gender equity in the post- secondary educational context, and it will also incorporate empirical research findings from the first Laurier Centre for Women in Science Residence Learning Community (WinS RLC i.e., a residential floor consisting of only female students in STEM) to illuminate the experiences of young female science students. During the second session, Anitha Kurup, on the other hand, will present results from studies of the STEM profession at the post-PhD stage and the leaky pipeline, that compare and contrast the experiences of women scientists and engineers in two countries, India and the USA. The key themes include work-life balance, structure and dynamics of formal spaces in S&T institutions and therole of mentors among others. The last session, by Prajval Shastri and Lilia Meza-Montes will be devoted to discuss policy initiatives to promote gender parity, with examples primarily from India and Latin America. The intent of this session is to initiate participatory dialogue that can result in formulating social science investigations to assess specific questions on social impact of policy.

EQUITY AND EDUCATION: EXAMINING GENDERED STIGMA IN SCIENCE

Eden Hennessey
Wilfrid Laurier University, Waterloo, ON, Canada

This workshop is designed to inspire critical analysis of the challenges faced by women in science-based educational programs and careers. In particular, the workshop will focus on methods to increase gender equity in the post-secondary educational context. Although women in Canadian post-secondary institutions now outnumber men (Turcotte, 2011), certain scientific fields remain male-dominated. Research shows that women in STEM (i.e., science, technology, engineering and mathematics) continue to report subtle and overt gender discrimination (Stout et al., 2011). Not surprisingly then, more women than men transfer out of science-based educational programs, which contributes to the cycle of fewer women in STEM programs and careers. As such, this workshop will challenge societal notions of what scientists 'look like' and to broaden understanding of why gender discrimination in STEM continues.

Through a combination of presentation and interactive discussion, the workshop will contain interesting trivia and information on the challenges faced by women in science. The workshop will also incorporate empirical research findings from the first Laurier Centre for Women in Science Residence Learning Community (WinS RLC i.e., a residential floor consisting of only female students in STEM) to illuminate the experiences of young female science students.

Data were collected from the community's residents using qualitative and quantitative methods. First-year female science students (N = 20) completed measures of self-esteem, social belongingness, academic motivation, stress, coping, and system justification. In addition to these measures, participants also completed semi-structured interviews about their experiences. Results indicated that the WinS RLC positively affected academic outcomes; however, findings also showed that residents experienced gender discrimination. Thus, future research must continue to examine ways to reduce the negative impact of gender discrimination in STEM programs in order to increase gender equity in post-secondary education.

A COMPARATIVE STUDY OF WOMEN SCIENTISTS AND ENGINEERS: EXPERIENCES IN INDIA AND THE US; IMPRESSIONS FROM THE FIELD

Anitha Kurup
School of Social Sciences, National Institute of Advanced Studies Indian Institute of Science Campus Bangalore, India bkanitha@gmail.com

The number of women pursuing a career in academia after earning a PhD in science and engineering remains disproportionately low. Research studies in India and the US have concentrated on the drop out of women in science at the high school and undergraduate levels, paying less attention to women who

drop out after obtaining a PhD. In an attempt to understand the leaky pipeline of women scientists and engineers after a PhD, the following study was undertaken. The study consisted of two phases. Phase I focused on women scientists and engineers in India. A total of 312 women scientists and engineers and 161 men scientists and engineers were surveyed online and over the telephone. For comparison purposes, a similar study was carried out in the University of California system during 2011-2012. The workshop will focus on the impressions from the field drawing on key themes that compare and contrast the experiences of women scientists and engineers in the two countries. The key themes include work-life balance, Structure and dynamics of formal spaces in S&T institutions, role of mentors among others.

TOWARDS GENDER EQUITY THROUGH POLICY:
CHARACTERISING THE SOCIAL IMPACT OF INTERVENTIONS

P. Shastri[1], L. Meza-Montes[2]
[1]Indian Institute of Astrophysics, India, prajval.shastri@gmail.com, [2]Instituto de Física, Benemérita Universidad Autónoma de Puebla, México, lilia@ifuap.buap.mx

The last several years have seen heightened debate about the persisting stark gender gap in physics practice. There has also been gradual institutional and governmental recognition world-wide that gender parity is required to achieve excellence and maximise scientific productivity, which has resulted in policy interventions of several kinds. While there is consensus that the goals ought to be long-term, and some policy interventions do indeed promote the required cultural change, others might actually hinder it. The time is ripe to evaluate policies world-wide that promote gender equity in physics from the point of view of their long-term social impact. Several examples, mainly from India and Latin America will be discussed. This session will be highly participatory, with the intent to formulate specific questions that need to be asked, and social science studies to address them, in order to inform future policy.

INTERVENTIONS TOWARDS GENDER EQUITY IN PHYSICS:
SEEDING OR HINDERING CULTURAL CHANGE?

P. Shastri
Indian Institute of Astrophysics, India, prajval.shastri@gmail.com;

The last several years have seen heightened debate about the persisting stark gender gap in physics. In India, acceptance of the problem among physics practitioners is limited, but governmental policy does reflect the recognition that gender parity is required to achieve excellence and maximise scientific productivity. The time appears ripe now to critically evaluate the initiatives undertaken so far, especially in the context of the desire for long- term cultural change in mindsets which is required for gender equity. While some interventions do promote such cultural change, others might actually hinder it.

II. PHYSICS EDUCATION

Chairs: Renee Horton[1] and Marina Milner-Bolotin[2]
[1]NASA Michoud Assembly Facility New Orleans, USA; [2]University of British Columbia, Vancouver, Canada

ASSESSING GENDER DIFFERENCES IN STUDENTS' UNDERSTANDING OF MAGNETISM

Chandralekha Singh and Jing Li
Department of Physics and Astronomy, University of Pittsburgh, USA

We investigate gender differences in introductory physics students' difficulties with concepts related to magnetism using a multiple-choice survey whose reliability and validity have been substantiated earlier. The controlled study included impact of stereotype threat, e.g., by asking students in some classes to explicitly write things related to their gender before working on the magnetism survey. We also conducted individual interviews with a subset of students to get a better understanding of the rationale behind their responses. We will discuss the results from both the algebra-based and calculus-based introductory physics courses and conclude with some possible reasons for these differences.
We thank the National Science Foundation for support.

TEACHING, LEARNING AND ASSESSING INQUIRY BASED SCIENCE EDUCATION

Eilish McLoughlin, Odilla Finlayson, Paul van Kampen, Sarah Brady and Deirdre McCabe.
CASTeL, School of Physical Sciences, Dublin City University, Dublin 9, Ireland

During the period 2008-2014, the EC funded several large scale projects in Science Education, on the basis of the findings of the EC Rocard Report. All these projects were aimed at the introduction and broader use of Inquiry Based Science Education (IBSE) through enriching the skills of teachers, by delivering appropriate teacher education programs at both initial teacher training as well as for continual professional development. This presentation will report on experiences gained from coordinating two pan-European projects, ESTABLISH (2010-2013) and SAILS (2012-2015), which have been funded under the EU Seventh Framework programme. The aim of these two projects was to support science teachers in the use and dissemination of Inquiry based approaches in their own classrooms with students aged 12-18 years.

Many IBSE resources and models for teacher education in IBSE have been developed through projects arising from national and international programmes, including the European Science and Technology in Action Building Links with Industry, School and Home (ESTABLISH) project. This project collaboration has developed 18 substantial IBSE teaching and learning units that form the core aspect of ESTABLISH IBSE teacher education programmes, for both in-service and pre-service teachers. These materials and programmes have been trialled and implemented across 11 European countries and support teachers in using IBSE methods in the classroom. A particular focus of this project was to engage with policy makers and scientific and industrial community in developing these resources.

The recent trend across the EU towards competence-based teaching and learning and a learning outcome approach, has resulted in significant changes occurring at school curricula level in traditional subject areas such as physics (science). These curricula are now being treated in more engaging cross-curricular ways, with greater emphasis being placed on developing skills and positive attitudes towards science alongside knowledge. Therefore, a key starting point for the Strategies for Assessment of Inquiry-based Learning in Science (SAILS) project was to review the key skills and competencies desirable for young people in the 21st Century as identified by different international sources and to map these against those developed through IBSE. The Framework for 21st Century learning was used as a basis for identifying key 21st century skills and competencies and those that can be developed through scientific inquiry and the mapping of these inquiry skills under this framework's learning and innovation skills, Creativity and Innovation, Critical Thinking and Problem Solving and Communication and Collaboration, will be presented. The overall objective of the SAILS project is to support teachers in developing assessment strategies and techniques that help them to assess these important inquiry skills that are so difficult to capture under traditional exam conditions. The on-going work of the SAILS project is to further develop and enhance resources developed by the ESTABLISH project and other such projects, specifically through the addition of assessment strategies and items and to use these teacher education programmes. In particular, the SAILS project aims to prepare teachers not only to be able to teach through IBSE, but also to be confident and competent in the assessment of their students' learning. Through this unified approach of implementing these multiple components for

transforming classroom practice, i.e. teacher education, curriculum and assessment around IBSE pedagogy, a sustainable model for IBSE will be achieved.

The outcomes and experiences gained from coordinating these two pan-European projects will be presented and the lessons learnt in teaching, learning and assessing inquiry will be discussed along with the impact of these IBSE projects across Europe.

HELPING PHYSICS TEACHER-CANDIDATES DEVELOP QUESTIONING SKILLS THROUGH INNOVATIVE TECHNOLOGY USE

Marina Milner-Bolotin, Heather Fisher and Alexandra MacDonald
University of British Columbia, Vancouver, Canada

Active learning pedagogies, such as Peer Instruction (PI), have been found to be effective in undergraduate physics teaching. However, they are still rare in secondary schools and in physics teacher education programs. One of the reasons for that is physics teachers' lack of experience in asking effective conceptual STEM questions and underestimating their pedagogical value. Thus research-based multiple-choice conceptual questions in STEM teacher education are still underutilized. In this study Peer Instruction pedagogy was supplemented by the use of a collaborative online system – PeerWise (PW) (peerwise.cs.auckland.ac.nz) to help teacher-candidates develop these skills. In addition, a special STEM resource of conceptual multiple-choice questions (http://scienceres-edcp-educ.sites.olt.ubc.ca/) was developed and used in STEM methods courses. We report on the effects of a research-based technology-enhanced physics methods course on teacher-candidates' content and pedagogical knowledge, on their attitudes about active learning, and on willingness and ability to implement active learning pedagogy during their practicum.

III. IMPROVING THE WORKPLACE ENVIRONMENT FOR WOMEN

Chairs: Igle Gledhill[1], Gillian Butcher[2]
[1]Council for Scientific and Industrial Research, South Africa, [2]University of Leicester, UK

The ideal workplace is one in which women and men can work to their potential and are respected and recognised for their contribution. But what are the conditions that would create this environment and how can we achieve this?

In this workshop we will hear from selected speakers about initiatives taking place in their country, both broad ranging and specific. We will also discuss some of the less tangible aspects of the environment such as unconscious bias. There will be discussion time in each session to allow all workshop participants the chance to share the best practice in their region.

The aim will be to produce guidelines on recommended best practice to improve the workplace environment for women physicists, considering how individuals, women's working groups, employers, professional bodies and funding agencies can each contribute.

IMPROVING THE WORKPLACE FOR WOMEN IMPROVES IT FOR EVERYONE

Melanie Campbell
Dept of Physics and Astronomy & School of Optometry and Vision Science, University of Waterloo, Waterloo, Canada

Prof. Campbell was the first female graduate student in her PhD program of study at the Australian National University and the first to negotiate a maternity leave while in Australia on a CSIRO postdoctoral fellowship. She was a University Research Fellow with funding from Canada's NSERC. As such, she negotiated the first maternity leave taken in that program. In the following years she lobbied for parental leaves and .stop the clock policies., both locally at the University of Waterloo and nationally as a member of NSERC's Scholarship and Fellowships Policy committee. She will also discuss other equity initiatives which improve the workplace for women and all other members of the university community: including spousal appointments and best practices in hiring.

THE JUNO PROJECT OF THE UK INSTITUTE OF PHYSICS: ADDRESSING GENDER ISSUES IN UNIVERSITY PHYSICS DEPARTMENTS

Brian Fulton
Physics Department, University of York, York, UK

Th Institute of Physics IoP) in the UK is the national body for the physics community. The Institute's Project JUNO is an award scheme that recognises and rewards higher education physics departments that are working to address the under-representation of women at all levels of physics academia. The IoP Diversity Team works closely with departments to support them in gaining this recognition, providing data for national comparison, running workshops, and providing bespoke advice. There are three levels of engagement with Project Juno; Supporter, Practitioner and Champion. As a Supporter, physics departments endorse the five principles set out in the Code of Practice. Practitioner status requires the department to demonstrate that its Juno journey is well underway and an initial evidence-based action plan demonstrating how the department aims to achieve Champion status is created. As a Champion, physics departments are confirmed to have met the five principles set out. There are currently 10 Champion departments, 11 Practitioners and 25 Supporters across the UK and Ireland. Over the past six years, the proportions of female physics staff in the UK have risen: the proportion of professors who were female rose from 5% to 9%, senior lecturers/lecturers who were female rose from 14.8 to 19% and researchers who were female rose from 17% to 19%.

ANALYSIS OF OFFICE/LABORATORY STAYING HOUR AND HOME WORKING HOUR OF JAPANESE SCIENTISTS AND ENGINEERS

Akira Ejiri
Graduate School of Frontier Sciences, University of Tokyo, Tokyo, Japan

Recently, work-life balance (WLB) is becoming an important issue. However, for the case of researchers, it is not easy to keep the work and life balance, because longer working hours are thought be inevitable to get better research record and better position and larger budget. As a result, most of researchers are reluctant to keep WLB. The third questionnaire for scientists and engineers was carried

out in 2012 [1], and status of Japanese scientists and engineers were analyzed and reported. In this report, a part of the data (i.e., data of 3,570 answerers from three societies, including the physical society of Japan) was reanalyzed from the viewpoint of WLB. In particular, office/laboratory staying hour and home working hour were analyzed and dependences on various factors were investigated. It should be noted that nearly 90% are researcher or educator, and the ratio of engineer is 5% in the answerers. Figure 1 shows the effect of family for men and women in a two-dimensional space. These effects are stronger for women than for men. The hours are also affected by the field of expertise, age, affiliation and so on. For example, life science requires longer office/lab hours, and those who work in a private university spend longer hours than the others. In addition to the hours, employment style (i.e., the ratio of permanent position), the factors to choose scientific job are analyzed. It was found that women are more affected by her family and relatives than men.

[1] Japan inter-soc. liaison assoc. committee for promoting equal participation of men and women in science and engineering, "Third questionnaire for scientists and engineers from the viewpoint of equal participation of men and women" Aug. 2013.
http://www.djrenrakukai.org/doc_pdf/2013/3rd_enq/3rd_enq_report130918.pdf

COMBATING ISOLATION: BUILDING MUTUAL MENTORING ALLIANCES

Anne J Cox
Physics, Eckerd College, Florida, US

Women physicists can often feel isolated at work. This talk will discuss a particular project, supported by a grant through the ADVANCE program of the National Science Foundation (US government funding), aimed at combating isolation through mentoring networks. I will discuss how we organized our alliance, what contributed to its success, some of the outcomes, and how it might be implemented in other contexts.

A STUDY OF STATUS OF WOMEN IN PHYSICS IN NAGPUR

Seema Ubale
Dharampeth M.P.Deo Memorial Science College, Nagpur, India

The Science and Technology Policy (2003) statement of Government of India clearly envisages a vision "To promote the empowerment of women in all Science and Technology activities and ensure their full and equal participation". Networking plays an important role in fulfilling these goals. A small and local network of 'Women in Physics in Nagpur' was launched in July 2013 with about 10-15 members. A Google group named 'Women in Physics Nagpur' was also launched which is being managed by one of the authors. The main aim of the network was to set collective goals towards a vision for Indian Women Physicists. The group will work for a judicious mix of small and big science for future progress. The present paper reports the findings of a study undertaken about the status of Women in Physics in Nagpur city. A survey of the women professionals with Physics background in Government sector, Public sector, Banking sector, Insurance sector, Software sector, Education sector, Politics sector and Research sector was undertaken for generation data on the progress of Women in Physics. The study also aims to deliberately increase networking of Women in Physics in the sense of collaborations at a local and micro level across all sectors of Nagpur. The RTM Nagpur University data of number of girls graduating with physics is also correlated with the career choices of Women in Physics. The study was carried out with a carefully designed questionnaire. The primary data that has been generated through the present study will be widely publicized for the benefit of Women in Physics.

ATTRACTIVENESS OF THE PHYSICS WORK ENVIRONMENT FOR WOMEN

Igle Gledhill
Council for Scientific and Industrial Research,, South Africa

The work environment includes some issues which affect women in particular, and many which affect all people who depend upon that environment. I'll summarise major issues highlighted in an old but useful study of improving effectiveness in research institutes, and cite a few of the data in the Global Survey of Physicists and in the Benchmark study performed in South Africa in this context. These include some of the well-known top issues: personal safety, fairness, a safe environment in which to raise concerns, and similar topics. Many points – such as staying in business, excellence, good governance, and a passion for science – form a vision shared by women and men, but some of the barriers that women encounter

appear to be invisible. I'll explore these in the context of the gender schema, a set of hypotheses which affect our expectations of other people, with a brief reference to the fact that studying such schemas assists us in building diversity across many minorities encountered in the workplace. Some useful concepts will be briefly covered, such as accumulated advantage and disadvantage, and those internal struggles which have been recognised and named, such as the imposter syndrome, the two-body problem, and the Dean's Dilemma. I hope to conduct a short workshop to uncover and communicate other well-defined, frequently-faced experiences, to build on the previous speakers' comments, and make the conceptual vocabulary available to our Working Groups and Teams in building environments that are better for us all.

IV. PROFESSIONAL DEVELOPMENT AND LEADERSHIP

Chairs: Manling Sui[1], Xia Guo[1], Jin-Hee Yoon[2]
[1]Beijing University of Technology, China, [2]Inha University, Korea

CONTINUED ENGAGEMENT IN PROMOTION IN PHYSICS

Kae Nemoto
National Institute of Informatics, 2-1-2 Hitotsubashi, Chiyoda-ku, Tokyo 101-8430, Japan

It is probably fair to say that the situation of the gender imbalance in physics has improved over the last two decades. Some countries have shown rapid changes, and some have been rather slow in change, however it is clear that the numbers, such as the ratio of female researchers and the number of professors, have been improving, creating a trend of linear increase. For a long time, we could only see isolated cases of outstanding female figures in physics here and there in the history, now we have the trend, the linear increase. It sounds promising; only the problem is the ratio of the linear growth. It is, of course, inevitable and has to be the case that the such a growth eventually will be saturated at a certain point, when the balance of gender is established. However, in this case, in many countries unfortunately it is far from such a equilibrium point, and the linear growth is almost flat in some countries, Japan is typical among them. This enlightens two factors: the trend and the speed. It has been definitely improving, though the improvement is rather too small to see significant changes in our life time. In my talk, I would like to focus on facts behind this and discuss possible ways forwards.

Each countries have different trends and problems, however the slow linear growth is almost the universal trend over the globe. In this talk, I aim to initiate discussions on how we can understand and improve the situation we are facing, highlighting pairs of complementary factors: universal and local, social and personal, and expectation and deviation. For instance, Japan is one of the countries failing to show sufficient improvements. Japan has been historically a male-dominated society, and for long years it failed to acknowledge the imbalance of gender in workforce as a social problem. Japan is also known to be mono-culture, and being a closed society makes any changes difficult. When the gender imbalance in Japan is discussed, it tends to end up with the Japanese “unique culture” argument. Japanese culture prevents women to do physics..., is that so? Isn’t it so special to have a history of male-dominant society around the world? In many cases, we can see similar problems in other countries, in different degrees and through different aspects. What can we learn from the case study of Japan.

One of such universal problems is lack of women leadership. A TED talk by Sheryl Sandberg, Facebook CEO was symbolic to re-capture how few women are involved in decision making at the top of each sector.[1] In academia, the situation could be worse. How many university presidents or vice chancellors are women. How many nobel prizes were sent to female researchers. How many large grants are given to female PIs, and how many large grant applications by female PI have failed. Why do we fail to convey talented women to these leading positions? The first observation in my talk is deeply related to this: a lack of a delivery system.

The lack of the delivery system is deeply related to a lack of social expectations. Of course, social expectations differ from a county to another, or a region to a region. The details of social expectations are different, yet they rather commonly fail to convince women to pursue leadership. Social expectations kick in at the very early stage of our lives, hence this is related the process of education, which is not necessarily school systems, note scientific education at school. People consciously and unconsciously expect other people to behave. Our conscious and unconscious views implement unseen barriers to prevent young people to pursue particular directions based on gender difference. This indicates that there are many so-called glass celling in many different stages., which also suggests that the long-term commitment is necessary for promotion of women in physics.

We also consider the norms in certain professions. It is probably not too wrong to assume that we, humans, are in some extent designed to accept the standard views. When the community is so unbalanced, the standard views naturally tend to be unbalanced, however how unbalanced would not be noticed by the members of the community. This could be a serious problem for women in physics, in particular for female leadership, simply because the factors to be influential in the physics community are not purely physics. As science is a human activities, the physics community cannot be exempted from human factors, physics is only one factor. Though the education we learn to be a professional physicist, but what if that is already hugely unbiassed?

How capable is the physical society to accept deviation which diversity would give? The more society is closed, the firmer the standard expectations are established, hence the less ground to

accommodate different ideas and opinions deviated from the main stream. Sometimes we have to think it away from the reality we know both consciously and unconsciously.

To consider these factors and how to overcome them, brain science might give us a hint.[2] By all means, I don't intend to give scientific statements. The point I would like to emphasise is that we, physicists, should use our analytical minds and skills to understand and improve our problems in our community. This approach could initiate further scientific analysis, and will present different solutions complementary to the governmental policies and strategies. In the last few decades, the government in many countries has places new policies and systems to address gender imbalance, and some improvement has been seen in many sectors. In physics, these efforts are not necessarily successful, and we should seek more efficient approaches. Letting us take the problems with our scientific hands, scientific approaches may give new directions in the long standing issues.

[1] http://www.ted.com/talks/sheryl_sandberg_why_we_have_too_few_women_leaders
[2] Temple Grandin and Catherine Johnson, Animals in Translation, 2005, and also see the references cited within.

THE NATIONAL STATUS OF GENDER ISSUES IN KOREA AND INTRODUCING GENDER SUMMIT

Youngah Park
Korea Institute of S&T Evaluation and Planning, Korea

The first female president Geunhye Park of South Korea and the Prime Minister Angela Dorothea Merkel of Germany, are globally famous female leaders. Not just in politics, it has been an issue how we should make the most of the female work force in science as they are dynamically participating in various field playing major roles. In order to innovate science and technology that lead to economic development, greater emphasis has been made that the female work force in science should be more encouraged in participating in economic activities. Recently, the concept of 'gender innovation' such as the recognition of female's different pattern from that of male and the influence of that recognition, is receiving more interest in addition to gender equality issues. This presentation will introduce the gender issues highly recognized in South Korea and explore the ways to get it more activated.

Among the many different issues regarding gender, Equity, Participation, Diversity and Cognition can be the main factors that can be discussed when considering the situation of South Korea. In terms of equity, gender budgeting is currently being operated in Korea linking the policy and budget. As long as participation is concerned, opportunities for female work force, their participation in economic activities and fostering them on S&T area are mainly discussed. When it comes to diversity, providing female work force with a variety of opportunities in many fields while encouraging them to be outstanding leaders are discussed. While these three issues have been actively on the agenda for quite some time, cognition is the one recently brought up. As the importance of cognition is being increased, it is being regarded as a policy, which means that R&D is to be proceeded taking gender into consideration.

When the policies work properly and efficiently considering the gender issues including the 4 factors mentioned above, the innovation of S&T driven by both genders should be stimulated. Also it is crucial that these issues are shared and considered in a global perspective through constructing a global network and different countries working together. There will be 'Gender Summit 2015' in Seoul under the theme of 'Better Science for Better World' which will foster these collaborative activities. The history of 'Gender Summit' and introduction of 'Gender Summit 2015 in Seoul' will be presented. Based on the presentation, it is expected that the concept of 'gender innovation' is better understood and most female workers as well as the workforce in science can be encouraged to actively participate in economic activities and become the leaders in major areas of the society.

CAN PHYSICS DISCIPLINARY SOCIETIES MAKE A DIFFERENCE IN THE SUCCESS OF WOMEN IN PHYSICS?

Beth A. Cunningham
American Association of Physics Teachers

The number of women earning physics degrees in the United States over the last 20 years has steadily increased to around 20% of all Bachelor's, Master's, and PhD's earned. This increase can be partially attributed to efforts made by physics departments and faculty. In addition, physics disciplinary societies have created a number of initiatives to increase the number, persistence, and success of women in the U.S., focusing on the programs, conferences, and activities that these organizations offer. The American Association of Physics Teachers (AAPT) offers a number of activities and programs to support women in

physics. These include childcare grants for attendees of AAPT national meetings to support care for children during conferences, a committee devoted to issues of women in physics, and workshops and talks at national meetings on women in physics including gender issues in the classroom. Finally, AAPT has performed an inventory of women in leadership roles, awards, plenary speakers, and editorial boards to evaluate the current status in the Association and assess whether current practices and policies need to be revised. A summary of these AAPT activities will be outlined in this poster. Suggestions for other efforts by professional societies to increase the number of women in physics, including those going into the teaching profession, will be included.

THE AURORA LEADERSHIP PROGRAMME

Nicola Wilkin
School of Physics & Astronomy, University of Birmingham, UK

This innovative and new programme for 2013 within the United Kingdom aims to support women in the early stages of their career as they develop themselves for future leadership roles in higher education.

The programme, which is women-only has five one-day modules covering understanding the sector; developing leadership behaviours; growing confidence and a leadership identity and building networks and support processes.

Having been sponsored by the University of Birmingham to participate, I will discuss its benefits and possible improvements, including contributions from: other participants; role models; Senior University management and the organizers, the Leadership Foundation.
http://www.lfhe.ac.uk/en/programmes-events/you/aurora/index.cfm

EXPANDING GIRLS' HORIZONS IN PHYSICS AND OTHER SCIENCES: A SUCCESSFUL STRATEGY SINCE 1976

Cherrill M. Spencer
Emeritus Member of Board of Directors of the Expanding Your Horizons Network and
Emeritus Magnet Engineer at the SLAC National Accelerator Laboratory, USA

For the past 40 years the USA's Expanding Your Horizons Network (EYH/N) has been encouraging young women aged 12 to 18 years to pursue careers in science, technology, engineering and mathematics (STEM). Believing that early intervention is a key step in attracting and nurturing scientific talent, the EYH Network continues to build and disseminate its flagship program: annual Expanding Your Horizons in Science, Mathematics and Engineering Conferences (EYH) for girls only. Since the first EYH, held in California in 1976, the Network has held over 2500 EYH conferences across the United States and in 8 other countries, reaching over 900,000 young women with the message that careers in science, mathematics, and engineering can be rewarding and are attainable by them.

In order for young women to move towards and achieve STEM careers, they need to be motivated and prepared, starting during the critical ages of 12 to 16. An EYH conference is a low-cost strategy, organized by a local volunteer committee with these characteristics: the attendees are only girls and they take part in hands-on STEM activities (including physics) lead by women scientists, engineers and mathematicians who work in their local community and act as role models; the conference takes place on a Saturday on a local college campus. The hands-on activities are designed to provide enjoyment and promote confidence in STEM subjects; the STEM role models speak to the girls about the need to take science and maths classes in high school in order to proceed to a college education in a STEM subject, they describe to the girls how much they enjoy the technical work they are doing, they explain that STEM jobs pay well and contribute to society. The girls discover that normal women with regular lives can be scientists or engineers and you don’t need to be a genius.

As role models, the women workshop leaders are charged to share the excitement of their work through related hand-on activities. These hands-on workshops are the "bread and butter" of every EYH Conference and the key to their success. The key factor is that the learning is "hands-on”, the girls are active participants; as EYH surveys and related literature prove, involvement in hands-on activities has a more lasting effect than passive listening. The workshop titles are preferably intriguing, e.g. one archaeology workshop is entitled "Archeologists will DATE any old thing"; two physics workshops are called "Electrons at Work and Play"; and "Jelly Waveguides".

The EYH Network staff provides technical assistance and conference organization materials to EYH conference site committees, committees primarily composed of volunteers. The Network staff actively encourages new sites to start EYH conferences, and this EYH strategy works well all over the world to motivate girls to consider a STEM career - EYHs have happened and been enjoyed in Australia,

Ireland, Italy, Japan, Malaysia, Singapore, Switzerland, Thailand and in 33 states in the USA. The EYH/N is eager to help EYH conferences start in other countries besides the USA. This talk will describe a typical EYH conference, how to put one on in your home town and how the EYH Network will help you in various ways.

CAN YOU HAVE IT ALL? MAKING IT WORK FOR YOU

Cathy Foley
CSIRO, P.O. Box 218, Lindfield NSW 2070 Australia

This presentation will consider the career path of women in science and how you can be a woman and a scientist with a flourishing career. I will present some practical ways that help women to manage all the things that are expected of them and also how to position themselves to be successful in their career.

INSPIRATION FROM THE ANALECTS OF CONFUCIUS

Shao-ping Zhu
Institute of Applied Physics and Computational Mathematics, P. O. Box 8009, Beijing 100088, P. R. China

Once discussing the professional development and leadership, I always connect it with some words, such as team, group and institution. Team, group or institution, I think, are the boundary conditions for discussion of professional development and leadership because most of us is a staff of one institution or a member of a research group. As a member of a group or a team, we hope to have a good professional development and to play key roles in the team. As a leader of team or group, everyone hopes that the team becomes better and better under his leading. How can we achieve these aspirations.

Confucius was living from 551 B.C. to 479 B.C. and is a great thinker and philosopher. The analects of Confucius named LunYu records Confucius's ideas and point of view on life, human nature and so on. Some remarks given in the analects of Confucius, I think, are beneficial to discussing professional development and leadership. In this presentation, I shall introduce some remarks from the analects of Confucius. Also, we shall give brief introduction on the present status of inertial confinement fusion research in China.

THE CONFERENCES FOR UNDERGRADUATE WOMEN IN PHYSICS

Susan K. Blessing
Florida State University and the American Physical Society, USA

The American Physical Society Conferences for Undergraduate Women in Physics (CUWiP) are the continuation of a grass-roots collaborative effort that began in 2006. The goals of the conferences are to increase retention and improve career outcomes of undergraduate women in physics. I will describe the conferences, including organization and participant response, and encourage other countries to host similar programs for their undergraduate women.

BUILDING BRIDGES FOR WOMEN PARTICIPATION IN PHYSICS, ZAMBIA

Lister Mulindwa Kaziya
University of Zambia, Lusaka, Zambia

My name is Lister Mulindwa Kaziya (Mrs.); I was the first ever indigenous female to have completed a Bachelor's Degree in Physics in Zambia, I proceeded to do Post- Graduate Diploma in Condensed Matter Physics at the International Center for Theoretical Physics in Italy upon completion, I carried on to pursue a Master of Science Degree in Material Science (Physics) at Trent University in Canada. Upon graduation I was offered a lecturing position at the University of Zambia where I am currently.

In contributing to the development and growth of Physics in Zambia, I was profiled in the Building Bridges programme in Zambia by Forum for African Women Education in Zambia (FAWEZA) which was the programme for women who have excelled in different spheres of academic and social cycles. Further I held motivational talks to young school girls about Physics and encouraged them to take physics as a career path.

Physics in Zambia is a male dominated field simply because of the so many challenges arising from cultural and social barriers. Before I obtained my Bachelor's Degree in Physics, Physics was a no goal area for women but I stood as an example to many other young women and proved that, "Physics

Knows no Gender". With the right support we can excel and wake the giant in women participation in Science and more especially Physics. After I graduated and having had such motivational talks we have seen slow but positive steps of the Zambian Women taking up Physics as a career path.

From the conference, I would like to continue with motivational talks about physics careers in Zambia and worldwide and inspire even more by undertaking a PHD in Physics should an opportunity arise.

V. CULTURAL PERCEPTION AND BIAS / SCIENCE PRACTICE AND ETHICS

Chairs: Kwek Leong Chuan[a] and Silvina Ponce Dawson[b]
[a]*Centre for Quantum Technologies, Singapore;* [b]*Universidad de Buenos Aires, Argentina*

This workshop will address two separate issues both from a general perspective and in relation with the activity and development of women physicists. The first session of the workshop will be devoted to Cultural Perception and Bias and the second session to Science Practice and Ethics. During the third session we will summarize the themes discussed in the first two sessions and elaborate a series of recommendations to be presented at the General Assembly of ICWIP14.

(i) CULTURAL PERCEPTION AND BIAS

Culture permeates all human activities. Although science is supposed to be objective and to have a quantitative method that can be accurately replicated across laboratories and countries, the everyday life of scientists is directly affected by the local environment where it is performed. Differences in cultural perception affect female scientists more directly because the advancement of the women agenda has started at different moments and proceeded at different paces in different countries. In this session Rachel Ivie from AIP will present the results of the International Survey of Physicists analyzed by region. This presentation will be followed by a round-table with the participation of JG Lin from Taiwan and V. Pierron-Bohnes from France. The session will then be open for the discussion of all workshop participants. In this way we will to exchange a variety of experiences, learn from the differences and elaborate on ideas that can improve the situation of women physicists all over the world.

(ii) SCIENCE PRACTICE AND ETHICS

The frequency with which scientists incur in some sort of scientific misconduct is a matter of controversy. A review of the biomedical literature by Fang et al shows that over all retracted papers as of May, 2012, “67% of retractions were attributable to misconduct, including fraud or suspected fraud (43.4%), duplicate publication (14.2%), and plagiarism (9.8%)”. Some of these inappropriate behaviors might be triggered by the increasing competition among scientists that is, in turn, related to the lack of enough funds for a growing scientific community. The “publish or perish” culture required to be successful in academia can clearly conflict with the objectivity of research. In fact, as shown by D. Fanelli (2010), publication pressures increase scientific bias. A recent study by Fang et al (2013) has shown that female scientists are less likely to commit fraud than their male counterparts. This behavior is correlated with other observations that show that men are more likely to break social rules and take risks than women. Understanding why this happens might give hints on how to change science practice. In this breakout session we will present some of these recent results and will discuss ways in which the practice of science may be changed so as to minimize scientific misconduct.

F. C. Fang R. G. Steen, and A. Casadevall (2012) Misconduct accounts for the majority of retracted scientific publications, Proc Natl Acad Sci, doi:10.1073/pnas.1212247109
F. C. Fang, J. W. Bennett and A. Casadevall (2013) Observation: Males Are Overrepresented among Life Science Researchers Committing Scientific Misconduct, mBio 4:1, e00640-12, doi:10.1128/mBio.00640-12; Fanelli D (2009) How Many Scientists Fabricate and Falsify Research? A Systematic Review and Meta-Analysis of Survey Data. PLoS ONE 4(5): e5738. doi:10.1371/journal.pone.0005738
Fanelli D (2010) Do Pressures to Publish Increase Scientists' Bias? An Empirical
Support from US States Data. PLoS ONE 5(4): e10271.
doi: 10.1371/journal.pone.001027