IOP | Institute of Physics
Women in Physics Group

NEWSLETTER No 18
February 2014

Welcome notes from the WIPG Chair

Hello and welcome to the latest edition of the Women in Physics Group newsletter.

After several years of working as secretary to the group committee, I was honoured to be voted in as chair at the last AGM. I wish Dr Dawn Leslie, the previous chair, all the best in her future beyond the role – I know she has plenty at Brunel University to keep her busy! I am ably assisted by Miss Karla Herpoldt (Secretary) and Dr Joanne Cole (Treasurer), as well as the many other able and enthusiastic members of the group. A warm welcome is also due to Prof Eithne McCabe (Trinity College Dublin) who recently joined the committee, and warm congratulations to Dr Josephine Coltman who whose attendance at group meetings has been interrupted - somewhat wonderfully - by the arrival of her baby girl.

It is great that the group has so much positive news to report, which I hope you will be encouraged in reading. Good news can sometimes be in scarce supply. The recent House of Commons Science and Technology Select Committee report on 'Women in Scientific Careers' followed on from the Business, Innovation and Skills Committee's report on 'Women in the Workplace' last year, which highlighted the continuing under-representation of women in careers related to science, technology, engineering and maths. The 'Women in Scientific Careers' report reiterated that there is still much to be done in undermining cultural perceptions that science is not 'for girls' and supporting women who pursue science at every stage of their careers. The lack of progress over recent decades in both regards is somewhat depressing, but I am heartened by the efforts of both committees to highlight the issues that persist and bring them once more to attention of policy makers. In its concluding remarks, the report also stated that more action is required to understand and counter the factors which hamper women in entering and succeeding in science, and I wholeheartedly concur. The Women in Physics Group, alongside other organisations with similar aims, will continue to be part of this movement for change. It's long overdue.

Dr Heather Williams MIPEM MInstP

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WIPG Website:
http://wip.iop.org

IOP Carers Fund

As an IOP member you can apply for a grant of up to £250 to help you attend physics-related meetings, events or conferences that you might not otherwise be able to go to because you care for someone else.

Visit the web page for more information:
https://www.iop.org/about/grants/

For your Diary 2014

Showcasing women's careers in physics - for undergraduate students.
Niels Bohr Common room, Schuster Laboratory, University of Manchester.
March 5th 2 - 5 p.m
For further information contact:
p.browning@manchester.ac.uk

Getting to know our group members...

I am Silvia Peruch, PhD student at King's College London in the Experimental Biophysics and Nanotechnology group (EBN).

I joined King's two years ago after completing my BcS and Masters in Physics at the University of Padova, Italy. I first approached plasmonics during my Erasmus year abroad, when I had the chance to work in the Centre for Plasmonics and Metamaterials at Imperial College. The term 'plasmonics' refers to the science and technology dealing with manipulation of electromagnetic signals by coherent coupling of photons to free electron oscillations at the interface between a conductor and a dielectric.

My PhD is part of a collaboration between King's College, Imperial College and Queen's University Belfast, a project called Active Plasmonics (http://www.activeplasmonics.org/index.php), that aims to realise active circuitry components based on plasmonic systems. The research programme is funded by the Engineering and Physical Sciences Research Council and also supported by INTEL, Seagate, Ericsson, Oxonica, IMEC and the National Physics Laboratory. The striking advantage of all optical information processing is the substantially higher bandwith and lower losses compared to current electronic circuitry. Driving light with plasmons not only gives the possibility to reduce the size of optical waveguides, modulators and switch to subwavelength scales, but also to obtain ultrafast behaviors.

The research of the EBN group, which now counts 40 members, is centered around three overarching themes: functional nanoparticles, nano and bio imaging and nanophotonics and plasmonics. The group combines expertise in nanofabrication, advanced imaging techniques and numerical modeling. My area of expertise is the numerical modeling and characterization of plasmonic nanostructures, in particular metamaterials.

I have also taken part in a European project, PLAISIR (PLASmonic Innovative Sensing in the IR, http://www.plaisir-project.eu/) which ended in January 2013. In this case, the focus was on the use of plasmonic nanostructures for fast, compact, highly sensitive chemical detection in the infrared, a key spectral region for biological molecules.

My experience as a student in the UK could not have been more rewarding. I have the chance to work in an interdisciplinary and collaborative environment at the cutting-edge of photonics and materials modelling research which offers an opportunity to build networks of contacts which can help with the research and finding a job after my PhD. The constant feedback from the advisory board of the projects is also extremely useful in order to maintain a solid connection with the commercial potential of our research.

The EBN group hosts weekly seminars given by members of the group or external speakers in order to keep each other updated on the developments made. Moreover, together with the computational modeling group of the Physics department, external speakers are invited to weekly 'Physics at the Nanoscale' seminars, which span material modeling, characterization and fabrication. Many very fruitful collaborations, in my case for example with Lille's University (info conference 2012, San Sebastian, 'Si-nanorod-based plasmonic metamaterials modeling and experiment'), started in this context. This is why we are always looking forward to hosting the contribution of other researchers in the field of nanophotonics and material modeling.

Silvia Peruch

WIPG Committee 2013

Chair
Dr Heather Williams MInstP

Secretary
Miss Karla-Luise Herpoldt AMInstP

Treasurer
Dr Joanne Cole MInstP

Ordinary Members
Dr Philippa Browning FInstP
Dr Josephine Coltman CPhys MInstP
Professor Helen Gleeson OBE CPhys FInstP
Dr Dawn Leslie CPhys MInstP
Professor Averil Macdonald CPhys FInstP
Professor Eithne McCabe CPhys FInstP
Miss Amy Preece MInstP
Dr Francisca Wheeler MBE CPhys FInstP

Co-Opted
Mrs Ann Marks MBE CPhys FInstP

EPS Emily Noether Distinction for Women in Physics

The Emily Noether Distinction was established by the European Physical Society (EPS), in February 2013, to enhance the recognition of noteworthy women physicists with a strong connection to Europe through nationality or work. The distinction is awarded twice a year for excellence in research and mentoring in order to:

- bring noteworthy women physicists to the wider attention of the scientific community, policy makers and the general public;

- identify role models that will help to attract women to a career in physics.

The scope includes personal achievements in areas such as research, education, outreach and industry.

The Distinction consists of a diploma, accompanied by an interview to be published in an EPS publication.

Nomination Process

Nominations may be submitted to the EPS Secretariat at any time:
S.Loskill@eps.org

To submit an eligible nomination, the nominator provides the following information:
• Nominator's name, institution, and email
• Nominee's name, institution, and email
• Nominee's CV
• 1-3 paragraphs about nominee and why the nominee is worthy of the Award.

Receipt of a nomination will simply be acknowledged and there will be no further communication with the nominator, whose identity will not be revealed. The charter can be downloaded at:
http://c.ymcdn.com/sites/www.eps.org/resource/resmgr/distinctions/EPS_NoetherAward_Charter.pdf

Nominations may be submitted by any full member of the EPS although nominees do not need to be EPS members.

Amalie Emily Noether (1882 to 1935) was an influential German mathematician known for her groundbreaking contributions to abstract algebra and theoretical physics.

Key to our Universe: Henrietta Leavitt's 1908 Discovery

Prof. Pangratios Papacosta
Science and Mathematics Dept
Columbia College Chicago

Here is an extract from Professor Papacosta's article on Henrietta Leavit, which will be available from the History of Physics Group's website:
http://www.iop.org/activity/groups/subject/hp/

"Henrietta Swan Leavitt (1869 - 1921), was a member of the photographic photometry department at the Harvard College Observatory and she made her discovery from photographs of the Small Magellanic Clouds. The director of HCO was Edward Pickering under whose name Henrietta's discovery was published in 1912. She proposed that the longer the period of brightness oscillation of a Cepheid the larger its intrinsic luminosity was. Therefore a Cepheid star whose periodicity is known could be used as a standard candle and measure astronomical distances - even distances beyond our galaxy."

Congratulations to the 2012 Very Early Career Award runner up, Chiara Mingarelli. She has won a Marie Curie International Outgoing Fellowship.

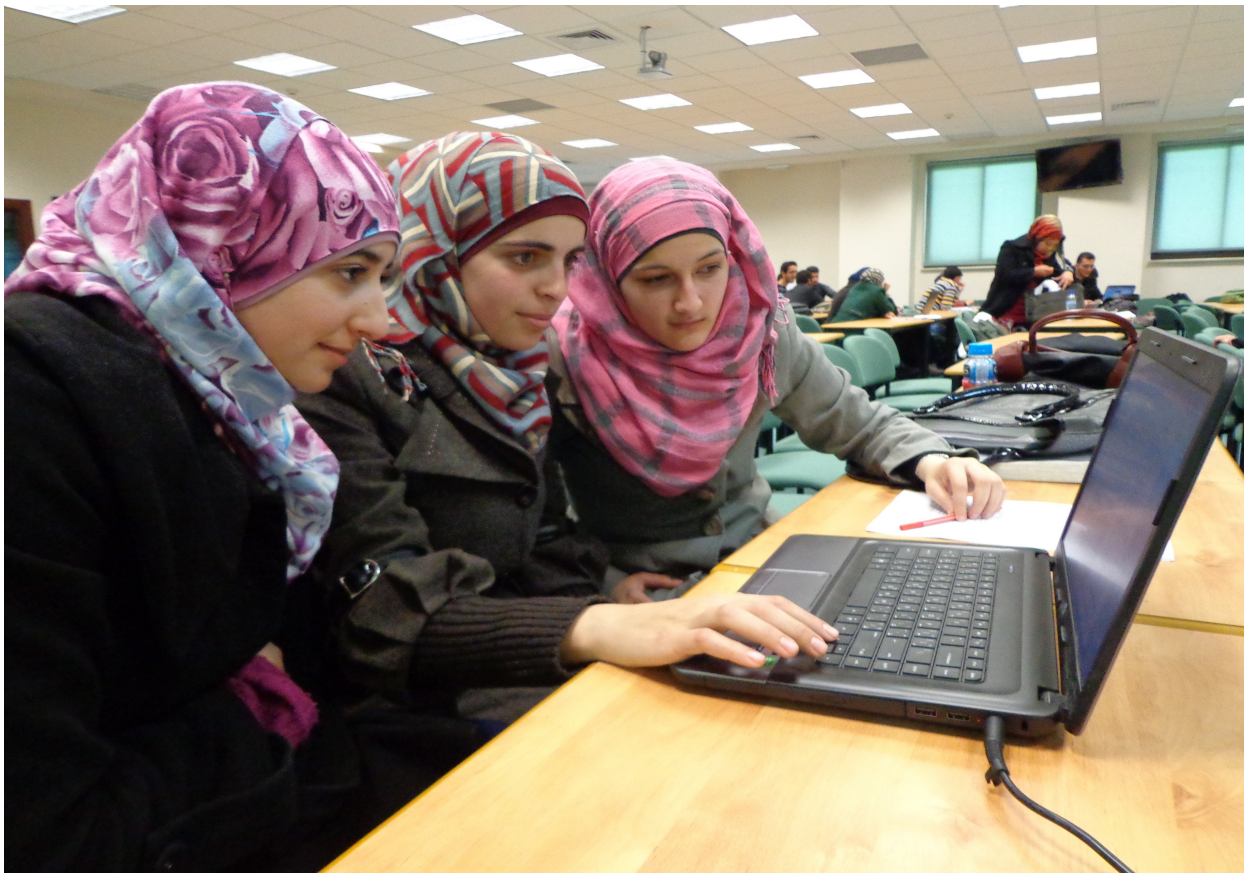
During the two year outgoing phase Chiara will hold a joint appointment at Caltech and NASA's Jet Propulsion Laboratory (where she will be carrying out supermassive black hole simulations, and searching for gravitational waves with pulsar timing arrays). Upon her return to Europe, she will be hosted by the Max Planck Institute for Radio Astronomy in Bonn.

Chiara has expressed her thanks to the IoP, and specifically the Women in Physics Group, for their continued support in these, the very early stages of her career.

Women in Physics in Palestine

In Spring 2012 we at the International Centre for Theoretical Physics (ICTP) ran an experimental particle physics outreach project at three of the top universities in the West Bank, Palestine, to reach out to physics undergraduates and master students who have no direct interaction with researchers in this field. The idea was to motivate and engage the students with current scientific research, providing role models of Palestinians working abroad in the field, and show them that physics was not just about reading textbooks and doing problems, but that it's a very exciting and active field.

The first morning at An-Najah University, Nablus, to my joyful surprise we were standing in front of an audience consisting of approximately 80% women. At lunch, before the afternoon hands on session, I spoke to our local organizer Professor Sami Jaber. He informed me that women have indeed dominated the physics degree program for some years now. We saw the same phenomena during our day at Al-Quds University, and again at our final visit to Birzeit University. In fact this dominance of women studying physics is not isolated to Palestine, I saw a similar demographic working in Egypt and Algeria and it is documented as a trend in the Arab World.



Dr. Wafaa Khater, a phenomenologist, is the chairperson for the department for Physics at Birzeit University, and the sole female faculty member there. In fact all the Universities have one or less female faculty members. Why are there so many female students and so few faculty members? Wafaa talked to me in detail about women in Palestine and their career prospects. Women in Palestine, she tells me, traditionally have the social responsibility of looking after the house and children. They are, however, very much encouraged to study at university, in fact Palestine has one of the highest rates of tertiary educated women in the Arab World. But then traditionally they are expected to get married and not continue education or work, and if they do work, in general only secretarial or primary or high school teaching careers are the socially acceptable paths. Studying abroad, including taking part in summer schools or enrolling in master or PhD programs, also is often not welcomed within traditional society, due to the opposition to Palestinian women travelling and living on her own.

Women in Physics in Palestine Continued...

In addition women in science in Palestine face the same issues as those in the west. They may be discriminated against due to their gender, and also their decision to get married and have children is often not supported by their current or prospective employers.

There are also issues affecting both males and females in science in many developing countries worldwide. When there is conflict and deteriorating development, scientific research gets hit the hardest. Inadequate funding is the underlining problem in developing post-graduate programs in physics and research equipment and centers. This is a shame for science, as it fails to exploit a large untapped potential of both male and female scientists who posses the ability and motivation to go into research but do not have the opportunity in their home country. Those who wish to continue in research must do abroad, thus perpetuating the brain drain.

Furthermore Palestine suffers from the additional problem of living under occupation, causing issues such as day to day travel restrictions, international travel restrictions, and in the past the closure of universities.

Due to the current situation in physics in Palestine many males choose not to read the sciences due to lack of future job opportunities. These issues must be addressed. Attracting women to sciences and especially physics in the West has been, and still is a struggle. But in Palestine and much of the Arab World women freely choose it over other subjects simply because they enjoy it. This is very encouraging.

Despite these obstacles, there are young Palestinian women doing some great work in physics, and social norms are changing. Palestinians such as Mazuza Ghneimat, a graduate of Al-Quds University and now a diploma student at the ICTP, Hadil Abualrob, a graduate of An-Najah University currently studying for her PhD at the French Synchrotron SOLEIL at the University of Paris Sud XI, and Arwa Bannoura, a graduate of Birzeit University currently studying for her PhD on the ATLAS Experiment at Wuppertal

University, are a few of the new generation of women physicists activity studying or working in research. And there are successful Palestinian women in physics elsewhere in US and Europe.

Dr Wafaa Khater is also a fantastic role model for these students and works hard to encourage them to continue their studies and show them opportunities in physics. We need more role models such as these to inspire young women in Palestine to go into research, and the universities require funding and more cooperation with the international community in order to grow their research at home to beat the brain drain. Finally employers and funding agencies need to be flexible, to allow female scientists to teach and do research at university in Palestine, while respecting their home life.

Dr. Kate Shaw, Post-doctoral fellow at The International Centre for Theoretical Physics (ICTP), Visiting lecturer at Birzeit University

In line with the Institute of Physics on-going programme for getting more girls into physics, the IoP Ireland and the School of Mathematics and Physics at Queen's University Belfast are organizing the first Women in Physics – Ireland day to take place on the 19th of March 2014.

The event is aimed at female physics students from girls taking their physics A-levels through to Ph.D. students doing physics research.

This celebration of women in physics will take place in the Whitla Hall at Queen's University Belfast and will be free of charge to all participants. The programme includes invited talks on popular science and careers in Physics, with Professor Jocelyn Bell-Burnell giving the first talk. There will also be a Seagate sponsored Science Fair where the participants will do hands-on experiments and see physics demonstrations as well as opportunities for the participants of all levels to present posters. Postgraduate students are invited to submit abstracts to give talks on the popular science level about their own research. More information can be found on www.facebook.com/womeninphysicsdayireland .

Miryam Arredondo-Arechavala and Solveig Felton, Queen's University Belfast

Fabulous Physics

The first Fabulous Physics event was held at Loreto College, Manchester on Monday 28th October, as part of the Manchester Science Festival, to promote the uptake of Physics and Engineering by girls.

Just over 50 girls from across the North West took part in physics workshops provided by The Ogden Trust, the Institute of Physics, Christie's Hospital, AMEC and the Universities of Manchester, Salford, Lancaster, and Liverpool John-Moores. The afternoon started with a lecture on 'Liquid Crystals: amazing materials for technology, biology and the future' by guest speaker Prof. Helen Gleeson, from the School of Physics and Astronomy at Mancheser University. Prof. Gleeson explained the physics behind the fascinating world of liquid crystals and their application in the real world. The girls, working in groups, then went to three workshops each over the rest of the day. The activities included exploring iridescence through make-up and butterflies, building simple motors, using physics in nuclear medicine, astrophysics, investigating the properties of light, quantum computing, understanding biophysics, creating mini-lava lamps and rainbows on a plate and learning to work as a team. The day closed with a lecture on the 'Physics of the Sun' by Prof. Philippa Browning, Jodrell Bank Centre for Astrophysics, University of Manchester. The talk offered great insight in to the mysterious fourth state of matter 'plasma' and its many applications in our everyday life. It was obvious from the many excellent questions from the girls that they were both intrigued and enthused by the topic. The feedback from the event has been overwhelmingly positive and many students have said that it had encouraged them to consider studying physics at A level.

The event was organised by Yasmin Andrew at Loreto College and would not be possible without sponsorship from The Ogden Trust and contributions from all the workshop hosts, the Loreto College Physics Department and the Institute of Physics. Next year's event is already in the early planning stages and we look forward to welcoming even more girls.

Yasmin Andrew, Loreto College, Manchester

Very Early Career Woman Physicist of the Year

I'm delighted to have been awarded the Very Early Career Women in Physics Prize. I have recently submitted my PhD at the University of Edinburgh. During my PhD I studied colloids, (micron-sized particles), dispersed in liquid crystals. Liquid crystals are a phase of matter between a liquid and a solid; they flow like liquids but have a degree of order. This order results in striking textures and unique properties for use in applications such as flat panel displays (LCDs) and sensors. The key feature of liquid crystals is that they are extremely sensitive to external influences such as temperature and electric fields.

I add colloids to liquid crystals to create composite materials. Colloids can create defects in the ordered phase and new, anisotropic, particle-particle interactions are induced. The competing energy and length scales in the systems lead to exciting new physics. For example, the position of colloids at an interface between an LC and a normal fluid is controlled by the balance between the size of the colloids and the spacing of the defects inherent in the liquid crystal. I collaborate extensively with colleagues who create large computer models of these materials: by combining our efforts we are able to gain a fuller understanding of these complex systems.

During the first two years of my PhD, I led the outreach programme for the Scottish doctoral training centre in condensed matter physics (CM-DTC). The programme was entirely student run. Our aim was to generate as much excitement around the research in condensed matter as there is around particle physics. We stated small, running workshops for visiting school groups and a high school science club. By the second year we had developed sufficient activities to run two weekends of workshops in the National Museum of Scotland which were a great success.

In latter years, I've focused on a slightly different audience, presenting my research in the form of stand-up comedy on the Edinburgh Fringe with Bright Club Scotland. I've also started a collaboration with a chef to create a show based on the physics of food. This is linked to my post-doc position researching food emulsions at the Rowett Institute, University of Aberdeen.

Between May and August this year I was able to practise my communication skills on a completely different group of people. I worked for the Parliamentary Office of Science and Technology (POST). I wrote a four page briefing note for parliamentarians on Autonomous Road Vehicles. Explaining complex scientific ideas to this audience was an exciting new challenge and I enjoyed having the opportunity to interview experts in order to research the note.

I'm extremely pleased to have won this award. I'm grateful to my Supervisor Paul Clegg for his support throughout my PhD and to Juho Lintuvuori for our collaboration. I'd also like to thank all the DTC students who took part so enthusiastically in the outreach activities.

Anne Claire Pawsey

Very Early Career Award Ceremony 2013

Narrowly missing out on the top spot were Alice Taylor, (University of Oxford), Stephanie Walton (Imperial College London) and Rachel White (also at Imperial College London). We wish all our finalists the best of luck for the future.

The Women in Physics Group gratefully acknowledges Shell, who once again sponsored this award. The award is given annually to a young woman physicist who shows excellence in scientific work as well as in outreach activities. To be eligible you must have gained your first degree in physics within the last five years and be an inspirational role model for women in physics. Further details of this year's prize will follow shortly.

SAPGERIC
Structural Change Promoting Gender Equality in Research Organisations

SAPGERIC Conference, Vilnius, Lithuania

The SAPGERIC conference 'Structural Change Promoting Gender Equality in Research Organisations' was held in Vilnius, Lithuania, from 21 -22 November 2013, under the auspices of the Lithuanian Presidency to the EU council. There was an impressive speaker list and over 200 participants, from across Europe, including the European Commission who provided financial support. Delegates were welcomed by the President of the Republic of Lithuania, H. E. Dalia Grybauskaitė, who has a science background herself. Please see the conference website http://www.sapgeric.eu2013.vu.lt/ for more information.

WIPG is a member of the European Platform of Women Scientists (EPWS) which is a network of networks across Europe. See http://www.epws.org/. The chair of the SAPGERIC International Organising Committee was Prof. Dalia Šatkovskienė, of Vilnius University, who is a Member of the EPWS Board of Administration, and the EPWS Executive were also members of the committee.

In her keynote speech Ms Máire Geoghegan-Quinn, the European Commissioner for Research, Innovation and Science, stated that gender balance produces higher quality research and joint efforts are essential if gender equality in research is to be attained. The Norwegian State Secretary for Education and Research, Bjørn Haugstads, stated that equity between women and men is a fundamental right and it is also a necessary condition for economic growth and greater social cohesion.

Speakers made it clear that European research continues to suffer due to considerable loss and inefficient use of highly skilled women and discussion points included: identifying the core problems that obstruct positive change, sharing good practices and specific measures to rectify the current imbalance in gender equality. It was agreed that cultural change is needed and top level support is required.

The conference concluded that it is time to move from 'Fix the Women' solutions to 'Fix the Institutions'. To this end a series of recommendations from the conference to the EU Council and stakeholders has been drawn up and can be downloaded from the SAPGERIC website at http://www.sapgeric.eu2013.vu.lt/recommendations/
Please do visit the website and add your signature, if you would like to show your support for these recommendations.

The conference was a great success and I would like to congratulate all who organised it.

Ann Marks,
EPWS Board of Administration