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## Message from the President



I traveled to Ghana in February and attended the funeral services for Professor Francis Allotey, who served two terms as IUPAP Vice-President at Large. A state funeral was held on February 23rd in the Fore-court of the State House in the county's capital city Accra, The President of the Republic of Ghana was in attendance, as were several past presidents of the country, members of parliament and numerous other dignitaries. There were also members of the international community in attendance, including representatives of international scientific organizations. Honor guards were posted and ceremoniously changed during the service which lasted from 7am to 11:30 am. This formal and solemn state funeral was a moving tribute to Professor Allotey from his home country and the international community.

On February 24th, I attended the public memorial service in Saltpond – the town where Professor Allotey was born, and the final funeral rites in the Catholic Cemetery in Saltpond. I also attended the Thanksgiving Service on February 25th, which was a Mass and Family Gathering in the St. John's Catholic Church in Saltpond.

While I was in Ghana I visited the Ghana Academy of Arts and Sciences and met with Professor Aba Bentil Andam, the President of the Academy. I also traveled to Cape Coast where I met with the Provost and faculty members in the University of Cape Coast Physics Department. I was shown the Lasers and Fiber Optics Center, and while there I had an opportunity to talk with some of the graduate students who were eager to show me their research projects.

Prof. Allotey was a pioneer in promoting physics throughout Africa. Although South Africa was a founding member of IUPAP in 1922, other African countries became members of IUPAP much later in the 20th and 21st centuries. The IUPAP Commission on Physics for Development (C13), which is mandated to help improve the conditions for physics and physicists in developing countries, was established in 1981.

Several articles in this Newsletter reflect growing IUPAP involvement with physics in Africa and other developing regions. The articles "LAAMP ON THE MOVE" and "THE AFRICAN SCHOOL FOR ELECTRONIC STRUCTURE METHODS AND APPLICATIONS(ASESMA)", discuss major multi-year projects in which IUPAP has played critical roles. The article on the 2017 IUPAP YOUNG SCIENTIST PRIZE IN MEDICAL PHYSICS (AC4) describes the work of a medical physicist who is a lecturer on a campus in Ghana.

More IUPAP efforts connected with science in developing regions are being developed in collaboration with other international partners. Some of these will be discussed in future Newsletters.

### Kennedy Reed

President, International Union of Pure and Applied Physics  
For the Executive Council of the International Union of Pure and Applied Physics

## Russian Spectrometer "NUCLEON" sheds New Light on Cosmic Ray Energy Spectrum

The NUCLEON spectrometer, designed to measure the spectra of cosmic ray nuclei with an excellent charge resolution in the energy range from 1 TeV to 1 PeV, was launched on December 28, 2014. It follows a Sun-synchronous orbit with 97° degrees inclination, and flies at a mean altitude of 475 km. During three years of operation NUCLEON observatory has measured energy spectra of dominant primary cosmic-ray nuclei: protons, He, C, O, etc. and some secondary nuclei. The spectra are measured by two different methods – a calorimetric one, and a new kinematic method named KLEM. Preliminary spectra of protons from NUCLEON together with data from other experiments are shown in the Figure.1.

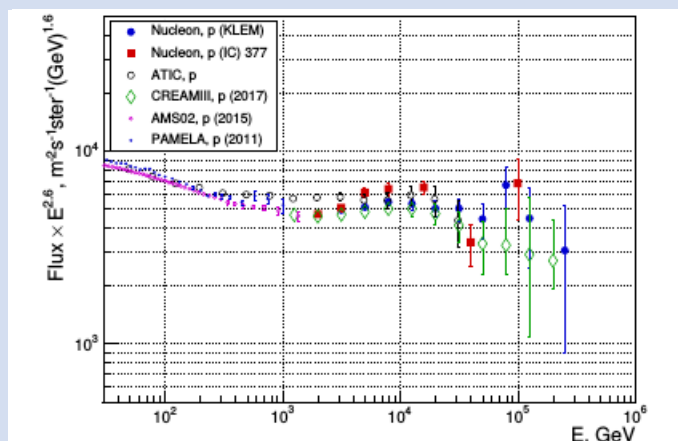


Figure.1. Preliminary spectra of Protons from NUCLEON with data from other experiments

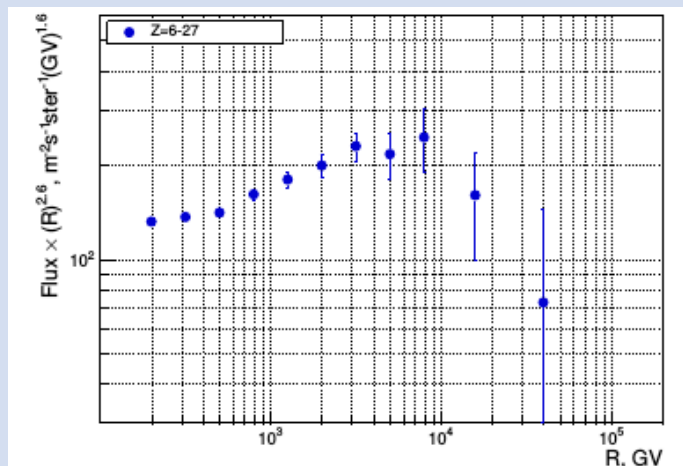


Figure.2. The combined spectrum of all nuclei with charges  $Z=6-27$  measured by the NUCLEON

A new interesting feature observed by NUCLEON, is a break in spectrum near 10 TeV for protons and 20 TeV for He nuclei. Thus, these breaks in spectra occur at the same magnetic rigidity of 10 TV. The NUCLEON is the first instrument to measure the spectra of heavy nuclei (carbon and beyond) at magnetic rigidities higher than 10 TV. The combined spectrum of all nuclei with charges  $Z=6-27$  measured by the NUCLEON is shown in Figure.2.

A clear break in the spectrum of heavy nuclei is also seen at a rigidity 10 TV as well. Thus, implying a universal character of this break in the spectra of all nuclei. This new phenomenon is reminiscent of the well-known spectral break called “knee” around 3 PeV in the all-particle spectrum of cosmic rays. The observed spectral break at 10 TV could imply existence of an upper limit on the energy, that the sources are capable of accelerating the cosmic rays in this energy region.

## LAAMP on the Move

**Sekazi K. Mtingwa** (TriSEED Consultants (USA) and IUPAP), **Sandro Scandolo** (ICTP (Italy) and IUPAP) and **Michele Zema** (University of Pavia (Italy) and IUCr)

LAAMP is off and running! It is the acronym for *Lightsources for Africa, the Americas and Middle East Project* (See the website at [laamp.iucr.org](http://laamp.iucr.org)). After being given the green light in late January 2017 to commence implementing, a € 300,000 ICSU (International Council for Science) grant was approved, to enhance Advanced Light Source (AdLS) science and crystallography in Africa, the Caribbean, Mexico, and Middle East. LAAMP immediately began implementing its major objectives. They consist of the following tasks:

**Task 1.** Develop a **Strategic Plan** for each region to grow and enhance its AdLS and crystallography user communities.

**Task 2.** Establish a **Colloquium Programme** for each region to recruit new AdLS and crystallography users and to advertise LAAMP projects via invited talks at targeted venues. Also, launch a series of new IUCr-UNESCO OpenLabs, which is a network of operational crystallography laboratories in developing countries aimed at increasing the access to, and utilization of, crystallography in all regions of the world.

**Task 3.** Publish an **Informational Brochure** that describes AdLSs, crystallography, and the many fields that they impact.

**Task 4.** Facilitate **researchers' visits** to AdLS and crystallography facilities.

**Task 5.** Convene a **meeting at UNESCO** to present the regions' *Strategic Plans* and define the charge for more detailed *Business Plans* that include feasibility studies of constructing AdLSs in regions where they do not yet exist.

To accomplish these objectives, IUPAP and IUCr are taking the lead in partnership with ten world AdLSs and over fifteen international organizations, including the Association of Asia Pacific Physical Societies, European Physical Society, Mexican Physical Society, UNESCO, TWAS, ICSU Regional Offices, and ICTP. Leading the charge for LAAMP is its Executive Committee, consisting of the authors, with Scandolo serving as Chair during 2017, succeeded by Mtingwa. They work closely with the Budget

Manager, Maitri Bobba, who manages the IUPAP Secretariat in Singapore. Much of the on-the-ground work is performed by the AdLS Usage and Strategic Plan Committees in each of the four regions, chaired by Simon Connell (University of Johannesburg) for Africa, Carlos Cabrera (University of Puerto Rico at Río Piedras) for the Caribbean, Matías Moreno (Universidad Nacional Autónoma de México) for Mexico, and Özgül Öztürk (Universität Siegen, originally from Turkey) for the Middle East. Currently, LAAMP's activities are being expanded to include Southeast Asia and the name of the initiative is changing to *Lightsources for Africa, the Americas, Asia and Middle East Project (LAAAMP)*.

## Progress to Date

The first element of **Task 1** is the development of a database of AdLS and crystallography users in the regions. Lawrence Norris in the USA has developed a survey of instrumentation availability and usage, which can be accessed on the LAAMP Website. Once completed, the database will form the basis for the development of a *Strategic Plan* in each region that will describe the present state of AdLS and crystallographic sciences in the region and short-, medium- and long-term goals for enhancing them. This will lead to the development of more detailed **Business Plans**, which will include studying the possibility of constructing an AdLS in each region if one does not already exist there. The experience of SESAME will be crucial for such studies.

**Task 2** is being fully implemented. Prosper Ngabonziza, who is an AdLS user, employed at the Max-Planck-Institute for Solid State Research, spent several days in his hometown of Kigali, Rwanda. He gave Colloquium presentations at AIMS-Rwanda and at the ICTP-affiliated East African Institute for Fundamental Research, which is located in the College of Science and Technology (CST) at the University of Rwanda (UR). In addition to interacting with many students who were excited about the possibility of training at AdLSs under the LAAMP initiative, Ngabonziza held discussions with a number of top university and government officials, including UR's Deputy Vice-Chancellor for Academic Affairs and Research, the Principal of its CST and the Director-General for Science, Technology and Research in the



LAAMP Colloquium presentation by Prof. Diego G. Lamas at the OpenLab Inaugural Ceremonies in San José, Costa Rica, 4 December 2017

Rwandan Ministry of Education. Rwanda has been making tremendous strides in science and technology in recent years and it will be important for LAAMP to follow up on the doors that Ngabonziza was able to open.

LAAMP established its first *OpenLab* in San José, Costa Rica from 4-9 December 2017, led by one of the authors (Zema), with approximately 80 students in attendance. There was a Colloquium on the first day, introduced by one of the authors (Zema) and given by Diego G. Lamas from Universidad Nacional del Comahue in Argentina on *Técnicas de luz sincrotrón para caracterización avanzada de materiales*. The Director of Scientific and Technological Development of Costa Rica's Ministry of Science and Technology; the Director of the Natural Science sector from UNESCO's Office for Costa Rica, El Salvador, Honduras, Nicaragua and Panama; the President of the National Research Council; and top officials from local universities and other academic institutions were among those attending the Colloquium and providing welcomes. Starting on the second day, the students were split into two courses, one on single crystal diffraction and the other on powder diffraction. Many countries, especially from throughout Central America, were represented.

Other LAAMP events held during 2017 were:

1. Two LAAMP Kick-Off events during the *24th Congress and General Assembly of the IUCr* (Hyderabad, India, 21-28 August 2017) organized by one of the authors (Zema) and the *29th IUPAP General Assembly* (São Paulo, Brazil, 11-13 October 2017) organized by another author (Scandolo)

2. A thematic session entitled "*Light Sources and Crystallographic Sciences for Sustainable Development*", proposed and sponsored by LAAMP in collaboration with UNESCO, at the *World Science Forum 2017*, Jordan, 7-11 November 2017, with the LAAMP lead being one of the authors (Zema) who partnered with UNESCO's Juste Jean-Paul Ngome Abiaga from its Division of Science Policy and Capacity-Building. Another author (Mtingwa) co-chaired the session and was among the speakers.

For **Task 3**, a 24-page LAAMP Brochure entitled *Advanced Light Sources and Crystallography: Tools of Discovery and Innovation*, has undergone its first printing of 500 copies in addition to being posted on the LAAMP and partner organizations' websites. The Editor is Ernie Malamud, a retired researcher from Fermilab and

the University of Nevada in Reno, who has extensive experience producing high quality publications, including one for the American Physical Society entitled *Accelerators and Beams, Tools of Discovery and Innovation*, which is currently in its 4th Edition. After receiving feedback from the initial printing, Malamud will proceed to a much larger printing and distribution during 2018. Moreover, Spanish and French versions will be made available later this year.

**Task 4** also has enjoyed tremendous success. The first *Call for Applications* for Faculty-Student (FAST) teams, consisting of one faculty and one graduate student to spend two months at participating AdLSs, was closed on 21 April 2017. To be eligible, the applicants had to have less than a year's experience in conducting research at an AdLS. Each of the four regions was awarded grants for two teams each, for a total of eight teams, namely 16 individual grants of approximately € 2,000 each, mainly for airline travel expenses, which were arranged through Eleonora Crotta and Serena Fanni at ICTP. The host AdLSs provided all lodging and meal expenses which were not covered by the LAAMP grant. All visits were successfully completed. In particular, the ESRF published an interesting newsletter article about its FAST team visitors that has a link on the LAAMP Website. A new *Call for Applications* for 2018 FAST Teams ended on 15 November 2017 and the new awardees have been announced on the LAAMP website. They consist of a total of 16 FAST Teams, or 32 individual grantees. With the current expansion of LAAMP to Southeast Asia, a *Call for Applications* soon will be issued for three new FAST Teams from that region.

Finally for **Task 5**, discussions have begun with UNESCO to convene a meeting in December 2019 at UNESCO Headquarters in Paris consisting of the LAAMP team; Ministers of Science, Technology, Health, Education, Energy and Natural Resources; representatives from each region's research community; and other international stakeholders and interested parties. The purpose of the meeting will be to present the *Strategic Plan* for each region; set the charge for more detailed *Business Plans* with short-, medium- and long-term goals, including the charge to ascertain the feasibility of constructing an AdLS in each region that does not have one; and finalize a roadmap for moving the *Business Plan* forward.

Much has been accomplished, but we have just begun!

## Women in Physics: IUPAP actions and commitment for a more inclusive practice of the discipline

**Silvina Ponce Dawson** (IUPAP Vice-President at Large and Gender Champion) and **Gillian Butcher** (Chair, IUPAP Working Group on Women in Physics)

This year, on February 11th we celebrated the International Day of Women and Girls in Science for the third time. The IUPAP Working Group on Women in Physics, WG5, chose February 11th as the International Women in Physics Day as well. The motivations for having such a day, which was endorsed by the 28th IUPAP General Assembly in 2014, are similar to those that led the United Nations to establish the International Day of Women and Girls in Science. Namely, to highlight the contributions of women in Physics and other areas of Science, Technology and Mathematics (STEM), to bring awareness on the existence of various forms of gender bias, to revert stereotypes in the public perception of scientists in general and of physicists in particular and to attract more children, especially girls, to scientific careers. As an active partner of the project entitled “A Global Approach to the Gender Gap in Mathematical and Natural Sciences: how to measure it, how to reduce it?” (<https://icsugendergapinscience.org/>) that is currently funded by the International Council of Science (ICSU), WG5 encouraged the participation in the campaign launched by the Organization for Women in Science for the Developing World (OWSD), by portraying stories of female physicists and physics students on social networks. The Working Group is planning to fully launch the International Women in Physics Day in 2019, the year that marks the 20th anniversary of the IUPAP General Assembly that decided on the group’s creation. In preparation for this, the group is planning to open a competition for the design of a logo to identify the Day. A redesign of its web page adding new capabilities is also being planned. By then the group expects that the “Waterloo Charter”, the declaration of principles that it has been working on, will be finalized and adopted by the IUPAP.

Twenty years might seem like a very long period and, in fact, many changes were introduced over this time. The pioneering decision of the IUPAP brought the issue up front, promoted the collection of quantifiable data on the situation of women physicists both within countries and on a global scale and was, both directly and indirectly involved in the organization of numerous activities to help reduce the gender gap in physics. Most importantly it helped in the creation of a network of national working groups covering more than 60 countries, not all of them members of IUPAP, which allows a fast and effective interaction for various purposes. In spite of the progress, the imbalance between women and men in physics is still large. At the 29th IUPAP General Assembly, a review on the situation at international conferences held under the auspices of IUPAP, was presented. According to data collected by former IUPAP Vice-President and Gender Champion, Alinka Lépine-Szily of Brazil, the global average of female participation in IUPAP events held between 2015 and 2017 was 17% among conference members, 18% among committee participants and 17% among invited speakers. These data came from 65 international conferences held in the 18 physics areas covered by IUPAP. A comparison between regions led to quite surprising results. For example, Europe occupied the worst position with respect to the fraction of women in committees (~13%) and invited speakers (17%). The fractions in South America, on the other hand, were above 22%. It is important to note that during that period there were 31 IUPAP-sponsored conferences in Europe and 34 in the rest of the world. The Assembly then decided to set a target of 20% for the presence of women among members of advisory committees and asked organizers to ensure the increase in the



The Working Group on Women in Physics

female proportion of invited speakers. It also established, as a recommendation for all affiliated national institutions, that the 20% target be achieved. It also defined that meetings with female participation of less than 10% would not be accepted and that organizers would be given a few weeks to adjust their numbers accordingly. Apart from the situation at IUPAP sponsored conferences, the reference research on gender imbalance in the physics community has been, so far, the global survey conducted between 2009 and 2010 by the Center for Statistical Research of the American Institute of Physics (AIP). The lack of more current data is about to change with the survey that will be launched in 2018 within the framework of the ICSU funded project mentioned before. IUPAP is an active participant of this project that will also produce data on publication patterns and lists of good practice and will generate recommendations for policy changes.

Recently, there has been a lot of press about the “Me too” and “Time’s Up” campaigns that started in the USA but then extended to other countries. Within these campaigns most media attention was focused onto cases of sexual harassment and abuse that occurred in the movie industry. This does not mean that other human activities are free from these behaviors that mostly affect women. The occurrence of various scandals in the sciences, in particular, prompted the US National Science Foundation (NSF) to require that any institution receiving funds from NSF should be

informed about cases of sexual harassment committed by any participant of an NSF funded project. The NSF also expects institutions to have clear standards to prevent harassment and to report problems. In this regard the step taken by the IUPAP concerning IUPAP sponsored conferences is very important. As it is now stated on its web page, the IUPAP requires that a specific statement be included on the website and all other publications related to the conference. The statement reads: *“It is the policy of the International Union of Pure and Applied Physics (IUPAP) that all participants in Union activities will enjoy an environment which encourages the free expression and exchange of scientific ideas, and is free from all forms of discrimination, harassment, and retaliation. The conference organizers will name an advisor who will consult with those who have suffered from harassment and who will suggest ways of redressing their problems, and an advisor who will counsel those accused of harassment. The conference organizers may, after due consideration, take such action they deem appropriate, including warning or expulsion from the conference without refund.”*

Nobody is to blame for the persistent imbalance between women and men in our field. We should and can all collaborate and participate very actively to make the practice of physics a more inclusive endeavor.

## The African School for Electronic Structure Methods and Applications (ASESMA)

Nithaya Chetty and Richard M. Martin

ASESMA is a series of workshops held every two years in different sub-Saharan countries, designed to foster a collaborative network for research and higher education in Africa. The core guiding principle is that computation makes it possible for world-class research to be done with modest investment, and it is an essential part of education for the future. There is tremendous goodwill of scientists world-wide and there is great potential in the young people of Africa who only need the opportunities to take part in the global community of science.

The focus of ASESMA, is computational methods and applications of electronic structure, chosen because it is an important field that is narrow enough to build up a network for joint work and collaboration, yet broad enough to span the range from fundamental physics to applications in materials science, chemistry, biology and many other fields. In each workshop, participants learn the basic theory and computational methods with hands-on computing, and each participant is involved in a project in an area of current research. The main applications are to materials crucial for many areas of technology, such as solar energy, that are relevant for Africa.

A novel aspect of ASESMA is the involvement of mentors who are often young experienced people at the advanced stages of their doctoral degrees or postdoctoral fellows, who are excited to be a part of a team that is making a difference in Africa. Now, there is more expertise developing in Africa and the mentors form a community of young researchers from Africa and other regions.

The below table summarises some of the statistics for the 5 schools held between 2008 and 2016. There are opportunities for active participants to return to build their expertise, develop networks, and help the younger people. There are now active groups in Cameroon, Republic of Congo, Ghana, Kenya, Nigeria and South Africa.

Total number of participations (counting multiple times for some participants)	194 (~39 in each school)
Total number of individual participants	171
Number of women	22
Number of African countries	18
Number who participated more than once	21
Number of Lecturers	35 (13 from Africa)
Number of Mentors	24 (10 from Africa)
Papers published or accepted in refereed journals by participants after attending ASESMA (7 with multiple ASESMA authors)	124

**Table:** Statistics for 2008-2016 (5 schools)

ASESMA has shown that it is possible to build a network in a particular scientific area across sub-Saharan Africa with world-class research on a relatively low budget. It already is expanding to involve more chemistry and materials science, and the next school to be held in Ethiopia later this year will be an introduction to biological systems. These are steps toward fulfilling the vision of building African Networks for Computational Materials and Biological Sciences. The greatest asset is the commitment of the lecturers and mentors, the teamwork of the local organisers and the idealism of the participants who rank amongst the brightest of young minds from Africa, many of whom come from impoverished backgrounds but still dare to reach for the stars. This is an inspiring story for all who get involved.

An important need now is funding for research, attending workshops, and short visits to international institutions that are all essential for scientists to participate fully in the global community.

Endorsement by IUPAP for 10 years has been invaluable in providing the long-term stability needed for such a program, and it opened the doors for getting funding from other sources. This is a joint mission of the Commissions on Physics Development (C13), Computational Physics (C20), Physics Education (C14) and the Structure and Dynamics of Condensed Matter (C10). It could not have happened without the leadership of people like Jim Gubernatis, Kennedy Reed and the late Peter Borchers. The main support for ASESMA has been the ICTP that is instrumental in administering and managing ASESMA. Members of the ICTP

are main developers of the open source Quantum Espresso codes that form the cornerstone of the work of ASESMA, and many of the developers have been intimately involved in teaching and mentoring at the School. The success of ASESMA is due to the lecturers and mentors, drawn from across the world including Africa, and the support by organisations that include IUPAP, US Liaison Committee for IUPAP, ICTP, NSF, NITheP, APS, Thomas Young Centre, MARVEL, and the Beijing Computational Science Research Centre.



Participants of the 2016 ASESMA Meeting in Ghana

## Single Emitters in Wide Bandgap Semiconductors

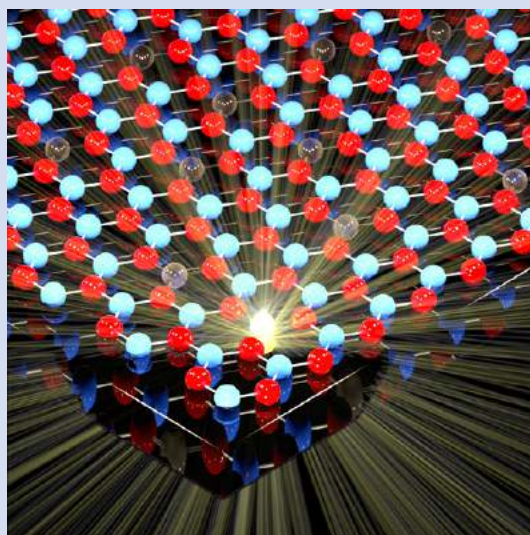
**Dr. Igor Aharonovich** (2017 C17 YSP winner)

Photonic technologies revolutionized many aspects of our daily lives. Spanning from ultra bright LEDs and lasers, optical communications that power the internet to novel biomarkers for imaging and sensing in health and diagnostics. A new research frontline is, engineering non classical – quantum light sources, also known as single photon emitters (SPEs). These emitters are in the heart of many quantum technologies as information carriers for secured communications, quantum nodes and building blocks for quantum metrology and quantum repeaters.

My research is focused on developing new (SPE). There are many criterion for an ideal SPE, including low multiphoton events, brightness and polarization. Over the last few years my lab has been focusing on studying defects in wide band gap materials – such as diamond, silicon carbide and gallium nitride. We have identified and investigated many sources that emit in the visible as well as in the infrared spectral range. More recently, we embarked on studying emitters in 2D materials, namely, hexagonal boron nitride (hBN). hBN is a wide bandgap material that can be exfoliated into a single monolayer. Identifying SPEs in a monolayer is advantageous as it eliminates scattering, internal reflection and offers promising attributes for integration with plasmonic and photonic cavities.

Currently, the group is focused on exploring these defects in 2D materials and implementing them in new modalities, such as,

super resolution imaging or non linear optics. In the near future, we aim to realize a fully integrated quantum photonic chip based solely on a wideband gap material hosting a high performance quantum emitter.



*hBN single defect glass rays*

## IUPAP YOUNG SCIENTIST PRIZES

### 2017 IUPAP YOUNG SCIENTIST PRIZE IN MEDICAL PHYSICS (AC4)



**Abdul Nashirudeen Mumuni**

*“For his outstanding contribution to the advancement of quantitative Magnetic Resonance Spectroscopy techniques in studies of brain metabolism.”*

Dr. Abdul Nashirudeen MUMUNI is a Lecturer of Medical Physics and Biostatistics in the Department of Biomedical Laboratory Sciences, School of Allied Health Sciences (SAHS) of the Tamale campus of the University for Development Studies (UDS), Ghana. Dr. Mumuni holds a BSc (First Class Honors) Degree in Applied Physics with Environmental Science from the UDS, an MSc (with Commendation) in Medical Physics Computing from the University of Aberdeen, UK under the CSFP/ACU Scholarship Award, and a PhD in

Clinical Physics with specialization in Neuroimaging and Psychological Medicine from the University of Glasgow, UK under the joint Scholarship Award from the Scottish Imaging Network: A Platform for Scientific Excellence (SINAPSE, UK), the University of Glasgow and the Sackler Institute for Psychological Research.

Dr. Mumuni represents the SAHS-UDS on the Ghana-Norway Collaboration in Medical Physics and Radiography Education Project (NORPART), which is a research and capacity building initiative between Ghana and Norway.

Dr. Mumuni's PhD research focused on the development of novel techniques of in-vivo acquisition and quantitation of single-voxel magnetic resonance spectroscopy data from the human brain. His PhD work resulted in eight peer reviewed journal articles and over ten conference abstracts presented at both national and international conferences.

Dr. Mumuni's current research focuses on the in-vivo applications of medical imaging techniques, particularly Magnetic Resonance Imaging and Spectroscopy, X-ray imaging, and Computed Tomographic imaging, in quantitative studies. He also has research interest in the areas of Applied Mathematics and Physics.

Dr. Mumuni has developed and submitted a 4-year curriculum in BSc Medical Imaging Technology (BSc MIT) to the Allied Health Professions Council and the National Council for Tertiary Education for approval; the programme is planned to commence in the 2018/2019 academic year following approval and accreditation. He also plans to mount other related programmes in Medical Physics including postgraduate studies later, after the commencement of the BSc MIT programme.

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## ADDITIONAL CONFERENCE REPORTS 2017

**29th Texas Symposium on Relativistic Astrophysics (29-TEXAS)**, held in Cape Town, South Africa from 03/12/2017 - 08/12/2017 showcased new results on the first detection of a joint gravitational wave and gamma ray burst detection (GW170817). The IUPAP support allowed for many students and postdocs from developing countries to attend the conference.



**XII Latin American Symposium on Nuclear Physics and Applications (XII LASNPA + WON-NURT 2017)** Workshop on Nuclear Physics and Nuclear Related Techniques, held in Havana, Cuba from 23/10/2017 - 27/10/2017, had the results of the Q-weak experiment at the Thomas Jefferson National Accelerator Facility being presented at the conference. The experiment performed the most precise measurement of the parity-violating electron-proton scattering asymmetry at low momentum transfer, resulting in the first direct determination of the weak charge of the proton and the most precise value of the weak mixing angle, for the first time measured in a semi-leptonic reaction.



**GIREP-ICPE-EPEC 2017** held in Dublin, Ireland, from 03/07/2017 - 07/07/2017, included two invited symposia organized through international cooperation. The Symposium on International perspectives of women in physics was in cooperation with the IUPAP Working Group (WG5) Women in Physics and the last session of the conference was a live-link up symposium hosted by AAPT colleagues on Flipping the Physics Classroom. The conference programme also included a focus on Physics in Low to Middle Income countries and the Institute of Physics hosted a pre-conference workshop for Teachers of Physics with a dedicated day for teacher contributions.



**International Conference on Inertial Fusion and Science Applications (IFSA)** held in Saint Malo (France) from 11/09/2017 - 15/09/2017 focused its scientific program to mark the impressive results obtained on the NIF, with a record neutron yield of  $2 \times 10^{16}$  obtained. All thanks to the use of a high-density carbon ablator, the thorough understanding of the basic phenomena involved (parametric and hydro-instabilities) and by the growing interest of the community in laboratory astrophysics. One of the Teller medals was awarded at the conference to Paul Drake, one of the pioneers of this topic.





**International Conference on Phenomena in Ionized Gases (ICPIG)**, held in Estoril, Portugal from 09/07/2017 - 14/07/2017 highlighted that the phenomenon in Ionised gases was the growing importance along with the applications of atmospheric plasmas. Several plenary lectures reported research related to topics, such as Unified theory of the streamer initiated gas breakdown (M. Cernak), VUV Radiation from streamers (A. Neuber), Surface and volume kinetics of molecules in air depollution processes (A. Rousseau) and Microwave plasma applied for synthesis of 2D nanostructures (E. Tatarova).



**Quark Matter 2017 (QM 2017)** held in Chicago, Illinois, USA from 05/02/2017 - 11/02/2017 highlighted the advances in theory and results from experimental studies of heavy ion collisions. Hydrodynamic behaviour of the quark-gluon plasma was tested by a suite of identified particle flow results. Surprising new findings were presented for the evolution of charge-separation signal observed at RHIC and LHC. The exploration of hard probes has seen an explosion of novel methods and observables advancing the understanding of jet quenching phenomena. Theory highlights included improvements in the modeling of the early pre-equilibrium stage of the collisions. Impressive advances have been made in the determination of QGP parameters from Bayesian analysis and comprehensive heavy ion collision modeling. The IUPAP funds allowed the organisers to provide travel support for 12 participants from Developing/Disadvantaged countries, provide child-care support for female participants with young children, and support for student attendees.



## UPCOMING SUPPORTED CONFERENCES (APRIL–JUNE 2018)

**10–13 April 2018** San Carlos de Bariloche, Argentina  
**XXIII Latin American Symposium on Solid State Physics (SLAFES 2018)**

**9–10 May 2018** Quy Nhon, Vietnam  
**Science for Development (SFD 2018)**

**14–18 May 2018** Vienna, Austria  
**International Conference on Precision Physics of Simple Atomic Systems (PSAS 2018)**

**21–25 May 2018** Nagoya, Japan  
**20th International Symposium on Very High Cosmic Ray Interactions (ISVHECRI 2018)**

**3–8 June 2018** Praha, Czech Republic  
**World Congress on Medical Physics & Biomedical Engineering (WCMP-BE 2018)**

**4–8 June 2018** Vancouver, Canada  
**International Congress on Plasma Physics (ICPP 2018)**

**4–9 June 2018** Heidelberg  
**XXVIII Conference on Neutrino Physics and Astrophysics (NEUTRINO 2018)**

**4–9 June 2018** Bologna, Italy  
**Large Hydron Collider Physics Conference (LHCP 2018)**

**11–15 June 2018** Bristol, UK  
**Unifying Concepts in Glass Physics (UCGP 2018)**

**17–30 June 2018** Addis Ababa, Ethiopia  
**African School on Electronic Structure: Methods and Applications (ASESMA 2018)**

**24–29 June 2018** Italy  
**15th International Symposium on Nuclei in the Cosmos (XV-NIC 2018)**

**24 June–14 July 2018** Namibia  
**The African School of Fundamental Physics and Applications (ASFPA 2018)**

**25 June–31 July 2018** Tokyo, Japan  
**International Symposium on Quantum Fluids and Solids (QFS2018)**

## UPCOMING ENDORSED CONFERENCES (APRIL–JUNE 2018)

**1–4 May 2018** Krakow, Poland  
**Conference of Middle-European Cooperation in Statistical Physics, the 43 edition (MECO-43)**

**7–10 May 2018** Trieste, Italy  
**Dynamics and thermodynamics of interacting systems from classical to quantum (DTISCQ 2018)**