

IRPS BULLETIN

Newsletter of the International Radiation Physics Society

Vol 27 Nos 2/3

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Editors' Column

Greetings on behalf of your IRPS Council !

The content in this issue of the Bulletin was produced from this group of generous volunteers:

In addition to the normal President's editorial, Ladislav Musílek has also provided a brief review of the 1st International Conference on Dosimetry and its Applications (ICDA-1) which he ably hosted in Prague this past summer. Impressively for a first conference of a series, it enjoyed the participation of 130 persons from 23 countries. Of course additional information and photos (promised to be less surreal than this issue's cover art) are available at the conference web site (<http://icda.fjfi.cvut.cz>).

V. P. for Western Europe, José Ródenas (Spain) has worked very hard to initiate the publicity for the forthcoming 9th International Topical Meeting on Industrial Radiation and Radioisotope Measurement Applications (IRRMA-9; July 2014) for which he is the chair and venue host. Please see these announcements within, noting that abstracts should be submitted before 30 December 2013.

V. P. Central and Eastern Europe, Ines Krajcar Bronić (Croatia) has submitted the first in a series of "spotlights" on persons and institutions from her region, including past and present interactions with IRPS.

Vice President M.A. Gomaa (Egypt) offers an overview of IRPS relevant activities from 2012 and 2013 within his region of Africa and the Middle East. In particular the series of Radiation Physics and Protection Conferences (RP&PC) receive highlight as well as the fourth Regional African Congress of International Radiation Protection Association to be held September 2014 in Rabat, Morocco.

Serving the Council most recently as IRPS Treasurer, Malcolm Cooper has penned a thoughtful article on the current status of women in radiation physics in the United Kingdom. Is there a concern, and what is being done about it?

Finally, we note that the next IRPS Council meeting is being held at NIST (USA) on November 18 and 19, 2013. This is open to all members; for more information contact the Bulletin editors.

As always, we welcome additional content, opinion, and suggestions.

Larry Hudson & Ron Tosh

President's Column

From the Second World War onwards, nuclear physics and its applications have become a matter of extraordinary interest for politicians. It is understandable that politicians should want to be involved in the questions of the use of nuclear weapons, and in dealing with the threat posed by them. However, politicians should not act as arbiters in problems connected with the peaceful use of nuclear energy and nuclear and radiation methods. This should be a matter for scientists, applied scientists, and to some extent also for economists, as not all applications of nuclear physics are economically viable. Unfortunately, there is nowadays a strong influence of politics not only in discussions about the proper energy mix, where the situation is critical, but even sometimes in the application of nuclear science in medicine, industry and similar branches.

Let us for a moment consider nuclear power. Without doubt, the Three Mile Island, Chernobyl and Fukushima accidents sent out a warning that mankind is dealing with a phenomenon that needs to be designed and operated with maximum care. However, there is a warning of another kind from the way that these accidents have been misused by some environmental activists, and from the way that politicians in some countries have become convinced that antinuclear decisions and measures will win votes for them in elections. There has been mindless support for so-called renewable energy sources, mostly wind power and solar power, especially in western and central Europe. This has been based on no detailed analysis of their feasibility, their economic consequences, nor their effect on the load on the electricity grid and on regulation of the power supply. Measures in support of renewable energy have imposed extraordinary expenses and have raised the cost of electric power, both for industry and for households. The outcome has been a decrease in economic competitiveness in those parts of the world where these irrational pressures have been strongest. All this without mentioning, for example, the problems involved in closing down nuclear reactors in Germany and replacing them by traditional fossil fuel-fired power plants. Some revival of interest in nuclear power has been observed in many countries, but the tendency is not yet global. There are still strictly antinuclear islands, fuelled not by scientific analyses but by political interests.

As regards medicine, the position is slightly different. Even Greens who often appear not to be driven by science are aware that diseases do not differentiate between people according to their politics. They are therefore able to tolerate nuclear and radiation methods in medical applications. However, medicine is a battlefield between the powerful pharmaceutical companies, the producers of medical instrumentation, and a range of more or less rational approaches to therapy, and these groupings form pressure groups to influence politicians. Let us take radiotherapy by ion beams as an example. This is a very effective method for some types of cancer, and is sometimes the only effective method that is available. However, it is very expensive. Recent discussions between the management of a newly-built proton therapy center and the managements of the local health insurance companies (it does not matter in which country) have shown that financial considerations and well-targeted lobbying by users of rival therapy methods can delay the opening of a modern center and force it to look for patients from abroad and not from its own country. In the present day world, business and politics are so closely linked that considerations of "good and bad" are being pushed aside by considerations of "profitable and non-profitable".

I will not present more examples of these influences, which have nothing in common with the state of human knowledge, or, in the case of medicine, with humanity. The question of how much it is reasonable to pay for human well-being, and even for human life, remains open. The voice of scientists is usually weak in these cases, but it must make itself heard. The mission of our Society and its members is to move forward the state of the art in fields related to radiation, and also to express scientific and professional opinions on matters of public interest related to the nuclear and radiation sciences and the uses that they are put to. It is clear that we cannot prevent all irrational decisions by the public authorities, or completely change public opinion, but we must consistently speak out from positions based on a rational evaluation and the latest scientific findings. This is one role of our Society that should not be neglected.

Ladislav Musilek

The 1st International Conference on Dosimetry and its Applications (ICDA-1)

The 1st International Conference on Dosimetry and its Applications (ICDA-1) took place in Prague from 23 to 28 June 2013. It was co-organised by the Faculty of Nuclear Sciences and Physical Engineering of the Czech Technical University in Prague and by the International Radiation Physics Society. IRPS has in the past co-organised International Symposia on Radiation Physics together with various institutions all over the world. More recently, it began to co-organise Topical Meetings on Industrial Radiation and Radioisotope Measurement Applications. Both of these conferences are triennial events. Aiming to cover the one "empty" year between these scientific meetings, the IRPS Council accepted the proposal to establish a new triennial series of conferences, devoted to current trends and potential future issues in ionising radiation dosimetry. This means that IRPS will in future take part in organising an international conference every year. The three conferences in the cycle will better cover the whole field of topical issues in research, measuring and utilizing ionising radiation. The objective of these conferences is to bring together scientists, teachers and students from all over the world; from universities, research centres, industry, hospitals and other institutions, to exchange knowledge and to discuss ideas and issues for the future.

The topics of ICDA-1 covered a wide range of dosimetry, from the lowest doses to the dosimetry for radiation technologies. The representation of different areas of dosimetry reflected the high level of current interest in medical and biological applications: papers on dosimetry in medicine and biology dominated the conference. The scientific community responded strongly, despite the limited level of funding for scientific institutions and universities due to the financial difficulties faced by the world economy.

This new series of conferences got off to a good start, with 130 participants from 23 countries, and more than 200 papers.

As the chairman of the Organising Committee, I believe we were able to co-organise a successful and enjoyable scientific programme and social programme. The beautiful historic city of Kutná Hora, the second most important and richest city in the Czech Kingdom in the Middle Ages, was the destination for the conference excursion. Compositions by Robert Schumann, Antonín Dvořák and Ondřej Kukul were performed at the concert in the historic Bethlehem Chapel, which is known from the history of the Hussite movement at the beginning of 15th century. The Bethlehem Chapel nowadays belongs to the Czech Technical University in Prague, and is used for ceremonial and celebratory events.

More detailed information about the conference can be found at the web page <http://icda.fjfi.cvut.cz>, which is still open. The proceedings, with the full texts of the invited lectures and reviewed contributed papers, will enable colleagues who were not able to come to Prague to follow the extensive reflections on the state of the art. Elsevier will publish the proceedings as a separate issue of the journal "Radiation Physics and Chemistry".

Last but not least, I would like to express my thanks to everyone who supported the conference and helped to prepare it. Of course, I also thank all participants for their active participation and for their scientific contribution to the success of the conference. I hope that we will have an opportunity to meet again at ICDA-2 in 2016.

Ladislav Musilek

Chairman of the Organising Committee of ICDA-1

Photographs on following page

At the ICDA-1 Conference :



Vice President's Report - Africa and Middle East

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IRPS Relevant Activities from 2012 and 2013

In 2012, the 11th Radiation Physics and Protection Conference (RP&PC) was held at the Atomic Energy Authority, headquartered at Nasr City, Cairo, Egypt. Please see the Conference photo for the 2012 conference as well as the conference photo for the 10th Radiation Physics and Protection Conference held in 2010 at the same venue.

The next RP&PC conference, the 12th, will be held at the Faculty of Science, South Valley University, Qena, Egypt (100 km from Luxor) in November 2014. See additional information about this conference on the web site: <http://www.rphysp.com>. There one will also find the PowerPoint presentations of the 11th RP&PC conference as well as the invited talks and the contributed papers. Finally, looking far ahead, the 13th RP&CP conference is scheduled for Alexandria, Egypt in November 2016.

Also of note during 2013, the National Network of Radiation Physics (NNRP) held a seminar on the occasion of the second anniversary of the Fukushima nuclear accident. This was held in Cairo on 11 March 2013. Several presentations, including three videos, were presented by Egyptian scientists. Two of the lecturers went to Fukushima in December 2012 to attend the ministerial meeting.

From 2011-2013, several radiological and nuclear emergency training courses were held at the Ministry of Health in Kuwait. The last one was in March 2013 dealing with first responders at nuclear accidents and radiological emergencies.

Three International Commission on Radiological Protection (ICRP) publications were translated into Arabic recently, these are ICRP-111 , ICRP-113 and ICRP-117. These documents were published at the ICRP website in 2013.

The first circular of the 4th IRPA-AFRICA (The Fourth Regional African Congress of the International Radiation Protection Association) was distributed in 2013 and the congress is scheduled for September 2014 in Rabat, Morocco. See additional publicity information elsewhere in this issue.

ICRP is sponsoring the Second International Symposium on the System of Radiological Protection that will be held in will be held in Abu Dhabi, United Arab Emirates from 22 to 24 October 2013. This is highly-recommended for radiological protection professionals worldwide. It is an opportunity to hear about ICRP's recommendations and work, to have your views on this work heard, and to network with radiological protection colleagues from around the world.

Also of note for October 2013, the NUPPAC conference (Conference on Nuclear and Particle Physics) will be held in Aswan (see IRPS Bulletin No. 27, March 2013).

Photographs on following page



Radiation Physics Groups in Croatia

Ines Krajcar Bronić

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Radiation physicists from the region of central and eastern Europe joined the International Radiation Physics Society in its early years. Moreover, dr. Ante Ljubičić from the Ruđer Bošković Institute (RBI), Zagreb, Croatia, served for more than a decade as the IRPS treasurer. He also organized the IRPS-5 symposium in Dubrovnik, Croatia (then still in Yugoslavia), June 10 - 14, 1991. The Proceedings were published in *Nuclear Instruments and Methods in Physics Research A*, 314/2, 1992. Many radiation physicists from Croatia participated also at the following symposia on radiation physics. My intention is to present various groups from the region in the next issues of the Bulletin; in this first report, the focus will be on three groups dealing with radiation physics research from the RBI, www.irb.hr.

The Ruđer Bošković Institute is the largest scientific research centre in Croatia. In the multi-disciplinary environment of the Institute more than 500 researchers and graduate students work on problems in experimental and theoretical physics, chemistry and physics of materials, organic and physical chemistry, biochemistry, molecular biology and medicine, environmental and marine research and computer science. Experimental nuclear physics has been one of the top research activities from the very beginning of RBI, in the 1950's. With time, the scope of the research in this field has broadened, on one side to experimental high energy and particle physics, and on the other side to applications in interdisciplinary research, such as ion beam applications and measurements of low-level radioactivity with an emphasis on carbon-14 and tritium. RBI has also a long experience in development and use of thermo-luminescent (TL) dosimetry in personal dosimetry, environmental dosimetry and in medical applications.

The Laboratory for Ion Beam Interactions (LIBI) performs basic and targeted research on interaction of ion beams with matter, as well as related interdisciplinary research and applications. The group operates the accelerator center consisting of two tandem accelerators and 8 associated experimental beam lines (Fig. 1), this being the largest and most complex experimental facility in Croatia.

The group develops methods to characterize and modify properties of matter, such as *PIXE*, *PIGE*, *RBS*, *ERDA*, *MeV-SIMS*, with emphasis on nanostructure research [1]. Part of the activities are connected to applications of analytic methods in biomedicine, environmental science, as well as on research of cultural heritage objects. Since 2011 and within the EU FP7 project SPIRIT, a network of 11 European accelerator application laboratories, RBI accelerator facility became also a Trans National Access (TNA) provider. Within the TNA scheme, scientists from EU and associated states can apply for beam time at any of the beam lines dedicated to ion beam analysis and materials modification. A home-made state-of-the-art time-of-flight elastic-recoil-detection-analysis spectrometer, which is used for characterisation of thin films, has been recently developed.

The ^{14}C and Tritium Laboratory has been involved with measurements of natural radioactive isotopes ^3H and ^{14}C , and their application in various research fields since 1968. It was the first laboratory of its kind in South East Europe, and has always pursued technological improvements to measurement techniques while establishing itself at the forefront of scientific research in the fields of archaeometry, geochronology, hydrogeology, ecology, and climatology [2].

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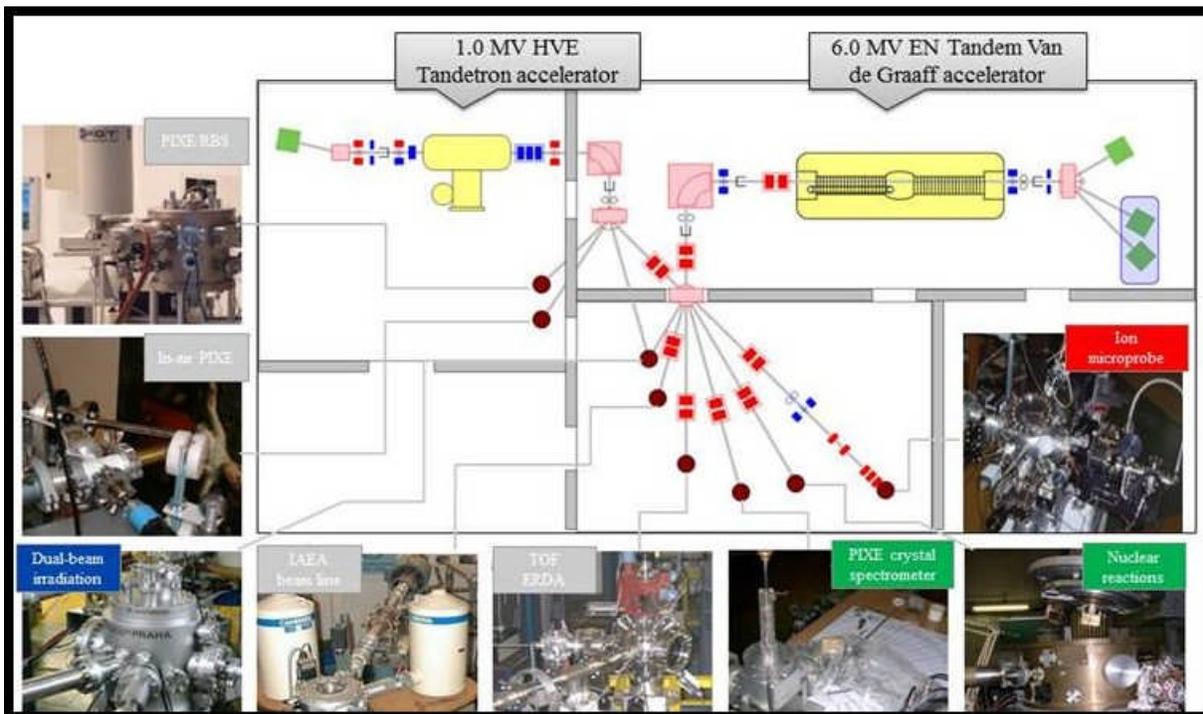


Figure 1. Accelerator center at the Ruđer Bošković Institute and its 8 experimental beam lines.

Recently it introduced graphite preparation from very small (3 mg of carbon) environmental samples for radiocarbon AMS (Accelerator Mass Spectrometry) metrology (Fig. 2)

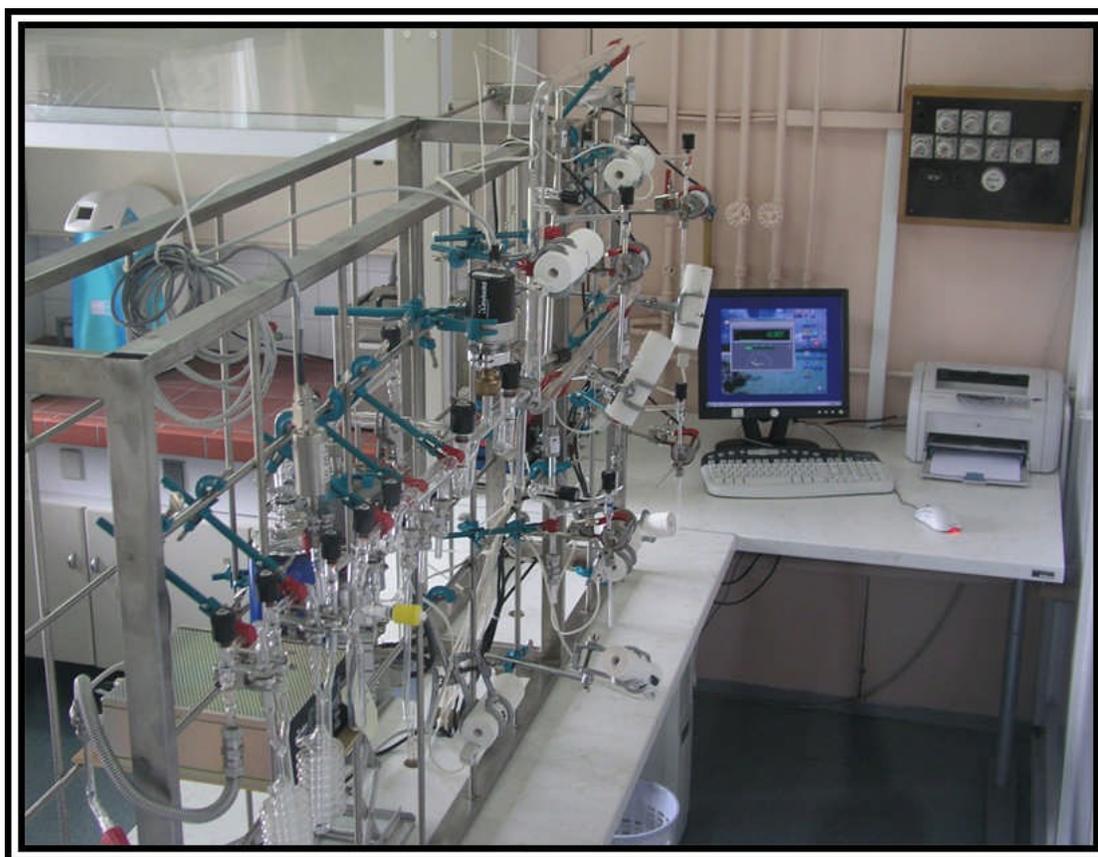


Figure 2. Vacuum lines for preparation of graphite for AMS ^{14}C measurement.

../Continued

The laboratory is also equipped with a system for electrolytic enrichment of water with tritium that enables measurement of very low environmental tritium activities by using Liquid Scintillation Counting (Ultra-low-level LSC Quantulus 1220). The interdisciplinary research covers a broad range of topics, from radiation physics to water chemistry, geochemistry, geochronology, ecology, monitoring of environmental ^{14}C and archaeology. A significant effort is focused on karst environments using various isotopic and geochemical analyses. Finally, the research of interactions between low-energetic radiation and gases and operation of gas detectors has been carried out. The Radiation Chemistry and Dosimetry Laboratory (RCDL) has been actively involved in radiation chemistry, radiation dosimetry and radiation processing. Fundamental studies of the kinetics and mechanisms of reactions of radiation induced reactive species have been carried out. A family of liquid chemical dosimeters has been developed, covering a wide dose, a wide spectrum of radiation qualities and a wide range of radiation energies.

The span of metrological capabilities in dosimetry has been further extended to environmental monitoring and medical and occupational dosimetry by mastering thermo-luminescent and radio-photo-luminescent techniques and by the establishment of a Secondary Standard Dosimetry Laboratory. Research in radiation processing provided the scientific, technical, economic, manpower and legal prerequisites for the technology transfer. The lab is equipped with an irradiation unit consisting of ^{137}Cs and ^{60}Co sources for radiation protection purposes. The ^{60}Co gamma radiation source (Fig. 3) is a part of the panoramic irradiation facility used for research and applications such as radiation processing of food, industrial and medical products and valuable objects of cultural heritage [3]. The RCDL staff measures the natural radiation background at numerous locations in Croatia, as well as the exposure of medical professionals and patients to irradiation in medical uses of radiation.



Figure 3. Panoramic ^{60}Co irradiation facility for radiation processing of food and the study of cultural heritage objects.

1. I. Bogdanović-Radović, M. Buljan, M. Karlušić, N. Skukan, I. Božičević, M. Jakšić, N. Radić, G. Dražič, S. Bernstorff. Conditions for formation of germanium quantum dots in amorphous matrices by MeV ions: Comparison with standard thermal annealing. *Physical Review B - Condensed Matter and Materials Physics* 86 (2012) 165316-1-165316-8.
2. I. Krajcar Bronić, B. Obelić, N. Horvatinčić, J. Barešić, A. Sironić, K. Minichreiter. Radiocarbon application in *environmental science and archaeology in Croatia*. *Nuclear Instruments and Methods in Physics Research A* 619 (2010) 491-496.
3. B. Katušin-Ražem, D. Ražem, M. Braun. Irradiation treatment for the protection and conservation of cultural heritage artefacts in Croatia. *Radiat. Phys. Chem.* 78 (2009) 729-731.

Women in Physics in the UK - where are they ?

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Why are there so few women studying physics or practising as physicists in the United Kingdom and what are we doing about it?

Well, the causes are many and varied but the facts tell a sad story: in England only about 20 % of school students intending to study physics at university are female, although a few more take the subject, for example, as a way of gaining entry into a medical school. This represents a great loss of talent to the physics profession. The problem has been compounded by the relative unpopularity of school teaching to physics graduates who have been able to compete successfully for a broad spectrum of jobs in the numerate professions such as finance, banking, accountancy and insurance as well as in the more traditional research and development outlets (recent years have seen some reversal of this trend with the downturn in the economy - every cloud has a silver lining!). Nonetheless, physics is often taught at school level by a graduate of another discipline who is unlikely to instil the same sense of excitement and authority as a physicist. There is also a feeling amongst pupils that physics is one of the more difficult subjects at school and that it also requires difficult mathematics; indeed many university departments encourage their applicants to take a double dose of mathematics in their portfolio of school leaving exams. Another disincentive is the general lack of perception of what physicists do. There is no obvious "physics industry" and in these days when UK students pay fees of £9,000 per annum the apparent lack of physics-related jobs is of considerable concern to parents if not to the actual students. The fact that there are plenty of jobs outside physics for physicists with good degrees is not widely appreciated. Somewhere amongst these points are some negatives that must weigh more heavily with girls than with boys.

It is even more disappointing to see the attrition that occurs at postgraduate levels with women rarely making up 20 % of physics PhD students or of postdoctoral research assistants and with 5 % to 10 % being a more typical figure for the percentage

of female lecturers and professors. Indeed many Physics departments have no female professors and this lack of women role models at the top of the profession may well put off female potential undergraduates and postgraduates.

The problem clearly begins in the schools and is complex, starting formally with choices made at the age of 14 and informally much earlier in a pupils' schooling. Some university outreach programmes have used women to deliver the outreach whenever possible (placing the burden on this minority of female academic staff) or have focussed on the roles of those few women in science who made it to the top, e.g. Marie Curie in radiation physics, Lise Meitner and the discovery of nuclear fission, Dorothy Hodgkin and the discovery of the structure of insulin and Jocelyn Bell-Burnell for the discovery of pulsars.

At university level the UK Institute of Physics launched the JUNO initiative in 2007 - www.iop.org/policy/diversity/initiatives/juno/ - Juno was the queen of the Roman Gods and the protector of women). The idea behind this scheme is to promote women in Physics by asking university departments to adhere to the following five principles:-

1. Institute a robust organizational framework to deliver equality of opportunity and reward.
2. Develop appointment and selection processes that encourage men and women to apply for academic posts, at all levels.
3. Adopt departmental structures and systems that support and encourage the career progression and promotion of all staff and enable men and women to progress and continue in their careers.
4. Possess departmental structure and management arrangements that are open, inclusive and transparent and encourage the participation of all staff.

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5. Embrace flexible approaches and provisions that enable individuals, at all career levels and life stages, to optimize their contribution to their department and institution.

Physics Departments apply to be either a JUNO Supporter (the entry level), a JUNO Practitioner (judged against principle 1), or a JUNO Champion (judged against all 5 principles). At the moment there are 21 supporters, 11 practitioners and 7 champions from across the Physics departments in the UK and Ireland. Amongst the good practices encouraged by JUNO are: involving women at all stages of filling new posts (writing the job advert and further particulars, being on the shortlisting and interview panels) to ensure that the process is female friendly; scheduling meetings at least in "core hours" (if not around the middle of the day) that are helpful to those with caring responsibilities; use of a work load model that is transparent and seen as fair by the whole department plus promotion processes that are similarly open and transparent; making a real effort to have a significant number of female speakers at departmental colloquia and research group seminars; making considerate arrangements for those returning from maternity or adoption leave - and so on. Generally speaking these moves advantage both men and women: positive discrimination is not on the agenda, but the removal of barriers to the progress of women is very much the objective. The JUNO assessors, who are largely drawn from the "Champion" departments, make site visits to advise departments how to comply with the JUNO principles. They then have to judge the extent to which the above principles are embedded in a candidate department's culture when a formal application is submitted.

The problem of the under-representation of women is certainly felt strongly in physics but is not restricted to the subject. Therefore, with this in mind, another organization - the Equality Challenge Unit, which is funded by the higher education sector's representative bodies and the UK higher education funding bodies, runs the Athena-SWAN award system (<http://www.athenaswan.org.uk>). The Athena SWAN Charter recognises commitment to advancing women's careers in science, technology, engineering, mathematics and medicine (STEMM subjects) in employment in academia.



The beliefs underpinning the Charter are that -

- (a) The advancement of science, technology, engineering, mathematics and medicine is fundamental to quality of life across the globe,
- (b) It is vitally important that women are adequately represented in what has traditionally been, and is still, a male-dominated area,
- (c) Science cannot reach its full potential unless it can benefit from the talents of the whole population, and until women and men can benefit equally from the opportunities it affords.

Athena SWAN considers the high loss rate of women in science as an urgent concern and aims to address gender inequalities, which in turn needs commitment and action at all levels of an organisation. To tackle the unequal representation of women in science requires changing cultures and attitudes across an institution. The Athena SWAN system makes bronze (61 STEMM departments awarded currently), silver (62) and gold (3) awards to departments and faculties. Gold departments, of which there are, as yet, painfully few, are those which are recognised as acting as "beacons" of good practice to the rest of the community. In recent years the universities have grown much keener on achieving Athena SWAN status, especially as various UK research councils have expressed an interest in only funding departments with Athena SWAN status. Understandably this has been a powerful motivation and universities now strongly 'encourage' (a euphemism for 'require') their STEMM departments to gain at least bronze status.

Together JUNO and Athena SWAN are changing the culture of university physics departments (and other science departments in the latter case) but the pipeline problem remains: with only 20 % in the input streams from schools and colleges it is difficult to see female representation rising above this level. However, if it were to rise to this level in the profession at large that would be a 'result'. Hopefully, the greater transparency that these initiatives engender does enhance the working life of men and women equally and will encourage women into the profession that we all enjoy and to continue their careers in it. Perhaps some of these good practices and the principles outlined above are worthy of adoption elsewhere around the globe.

Calendar

2013

20th - 24th October, 2013

NUPPAC' 13
9th Conference on Nuclear and Particle Physics
Aswan, Egypt

Full information on page 25 of the March 2013 Bulletin

Contact : Prof. Dr M.N.H. Comsan

Email : comsanmn@gmail.com Website : <http://www.physicsegypt.org/nuppac13/>

2014

6 - 11 July, 2014

IRRMA-9
9th Industrial Radiation and Radioisotope Measurement
Applications
Valencia, Spain

Contact : irra-9@upv.es

Web Site : <http://irra-9.webs.upv.es>

Full information on following pages 16 - 18

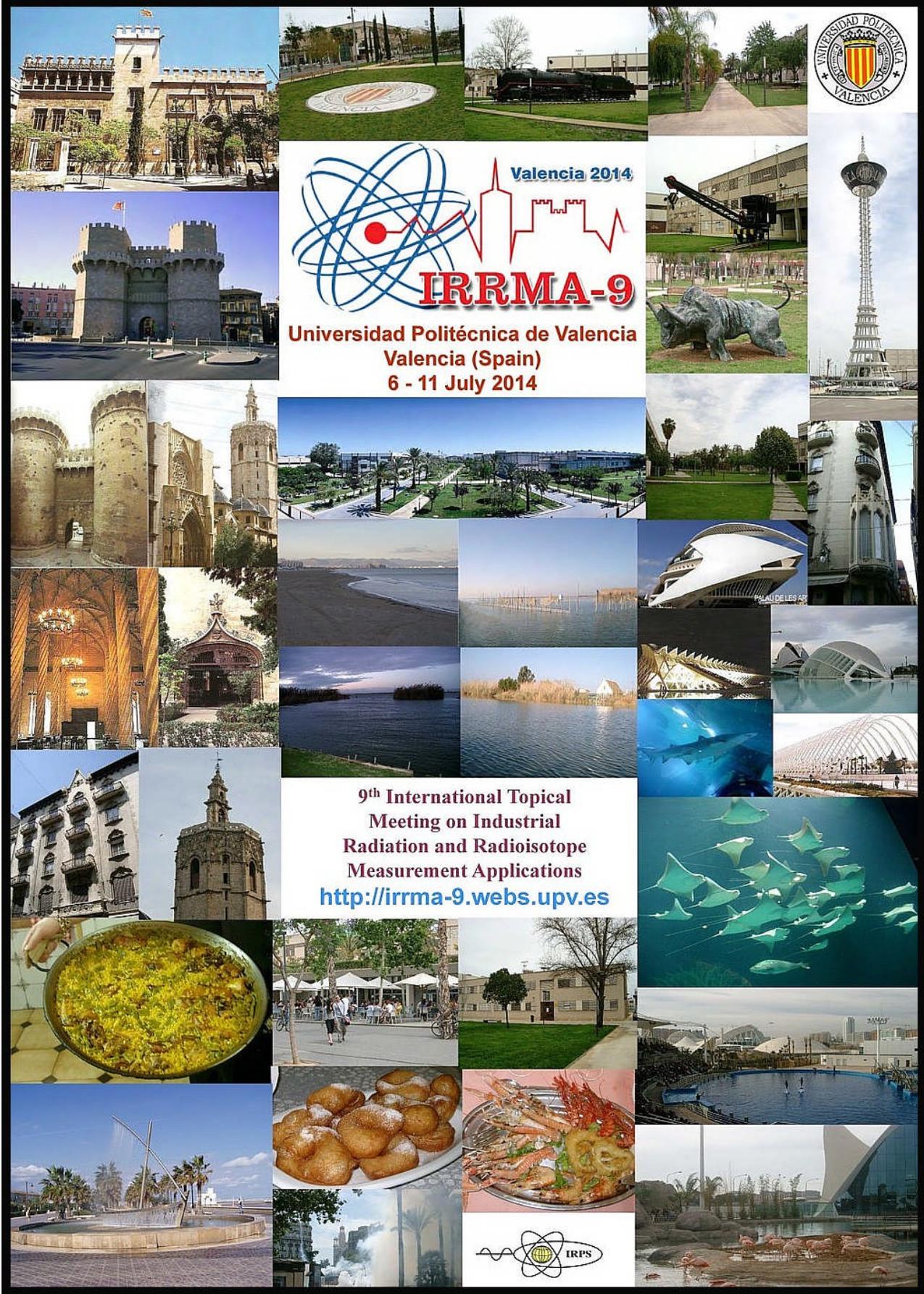
13 – 17 September, 2014

AFRIRPA 04
4th Regional African Congress of International Radiation
Protection Association
Rabat, Morocco

Web Site : <http://www.afrirpa04.com>

First announcement and full information on following pages 19 - 20

Conferences





9th International Topical Meeting on Industrial Radiation and Radioisotope Measurement Applications



**Polytechnic University of Valencia
Valencia (Spain)
6 - 11 July 2014**

Call for papers

The International Topical Meeting on Industrial Radiation and Radioisotope Measurement Applications (**IRRMA**) is a triennial event devoted to current trends and potential future issues involving applications of radiation and radioisotopes. The technical sessions will include invited lectures by leading experts in their fields, oral presentations and posters of contributed papers.

IRRMA-9 is organised by the Polytechnic University of Valencia, in Valencia (Spain).

Interested scientists and engineers are invited to submit paper abstracts (one A-4 page) in the areas listed under “Topics”.

The Technical Programme Committee is entitled to allocate submitted papers to oral or poster sessions according to authors’ wishes and time schedule possibilities of the conference and to refuse papers which are out of the scope of the conference or papers of apparently low quality.

A Book of abstracts will be provided with other conference documentation. The text of papers recommended by the standard refereeing process will be published in conference proceedings in a special issue of an International Journal.

At the conference web page information can be found about abstract submission and other details of the conference like accommodation, travelling, invited speakers, sponsors, etc.:

<http://irrma-9.webs.upv.es>

Check this website frequently as the information about the conference is continually updated.

The Organising Committee can be contacted at

irrma-9@upv.es

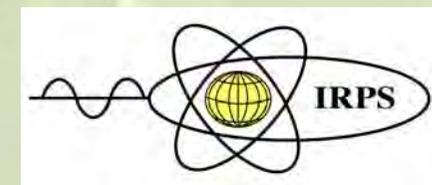
Deadlines

Abstract submission	30 December 2013
Acceptance	12 February 2014
Early registration	31 March 2014
Full text of papers	7 July 2014

Topics

- Industrial Applications of Radiation
- Radiation Sources, Detectors and Measurements for Applications
- Monte Carlo Methods and Applications
- Biological and Medical Applications of Radiation
- Use of Radiation in Environmental Sciences
- Applications to Archaeometry, Art and Cultural Heritage
- Detection of Threat Material and Contraband
- Radiation Effects on Materials
- Emerging Radiation Technologies
- Shielding, Radiation Protection and Dosimetry in Applications
- In Situ Radiotracer Production with Neutron Accelerators

The conference is sponsored by the **International Radiation Physics Society (IRPS)**, who will give two awards for the best oral communication and the best poster presented by students.



Technical Program Committee

Chairman: **José Ródenas**, UPV, Spain
Co-chairman: **William L. Dunn**, KSU, USA
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Organizing Committee

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Rafael Miró, UPV, Spain
José Luis Pitarch, UPV, Spain
Andrea Querol, UPV, Spain

Registration fees (€)

	<u>Early</u>	<u>> 31/03/14</u>
<i>Full participants</i>	550	650
<i>IRPS members</i>	490	590
<i>Students</i>	250	290
<i>Student IRPS members</i>	190	230
<i>Accompanying persons</i>	200	230

The fee covers:

Full participants: programme and book of abstracts, proceedings, coffee breaks, welcome party, conference dinner, conference concert, and excursion.

Students: programme and book of abstracts, proceedings, coffee breaks, welcome party, and conference concert.

Accompanying persons: welcome party, conference concert, excursion, conference dinner, and visits.

Social events

- **Welcome party:** Sunday, 6 July 2014 at 20h.
- **Conference Concert:** Tuesday 8 July 2014 at 20h in the Auditorium of the Fine Arts Faculty (UPV).
- **Conference Excursion:** Wednesday 9 July 2014 (13-18h) Albufera (including lunch and boat trip through the lake).
- **Conference Dinner:** Thursday 10 July 2014.
- **Visits (10-13 h) only for accompanying persons:**
Tuesday 8 July 2014: **Historical centre of Valencia.**
Thursday 10 July 2014: **City of Arts and Sciences (Oceanographic, Hemispheric, Museum of Sciences, Palace of Arts).**



Venue

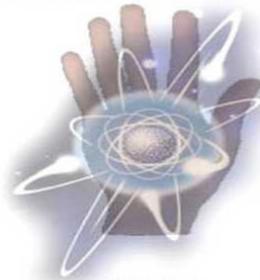


The **IRRMA-9** Meeting will be held at the **Paraninfo** of the UPV (Universidad Politécnica de Valencia), on the Vera Campus, located at the north of the city of Valencia, and surrounded by farmland. Approximately 60 buildings make up a well-organized complex around the Agora, heart of the university life. Up to 108.000 m² of green areas house an open-air sculpture museum.

Valencia is the capital of the “Comunidad Valenciana”. It is located in the middle-east of Spain, on the shore of the **Mediterranean Sea**. The city is the third largest city of Spain. Close to the city you can find many beaches as well as a big lake called “Albufera”.



AFRIRPA04



AMR

Moroccan Radiation Protection Association

www.cnesten.org.ma/amr/



Organize

The Fourth Regional African Congress of International Radiation Protection Association

Main Theme :

Strengthening of radiation protection infrastructures in support to the health sector in Africa

AFRIRPA 04
13-17 September 2014
Rabat - Morocco



First announcement

.../Continued

The Moroccan Association of Radiation Protection (AMR) has the great pleasure to invite you to the 4th African Regional IRPA congress (AFRIRPA04) to be held on 13-17 September 2014 in Rabat, Morocco.

Africa is facing a rapid growth in the use of nuclear techniques in various socio-economic sectors: medicine, industry, agriculture, research & training, etc.

Most of the African countries have now their own nuclear legislation. Scientists and professionals involved in the use of nuclear techniques are aware of a possible misuse of these helpful techniques and their potential harmful effects. Therefore, they have tried to harmonize their activities in the field of radiation protection through the creation of national, regional and international associations.

Medical sector is the most important user of ionizing radiation in Africa. Many hospitals have radiodiagnostic, nuclear medicine, interventional radiology and radiotherapy departments and then a huge part of the population, either professionals or patients are concerned by radiation protection.

The previous Regional IRPA congresses were held in South Africa (2003), Egypt (2007) and Kenya (2010).

Considering the importance of ionizing radiation in the medical sector, AMR and its partners have chosen as main theme for AFRIRPA04: " Strengthening of radiation protection infrastructures in support to the health sector in Africa". Beyond that AFRIRPA04 will also enable scientists and professionals to discuss and exchange their expertise on radiation protection in all fields involving the application of ionizing radiation.

All stakeholders of this congress (international, regional and national associations of radiation protection; physicians; physicists; individuals...) are kindly invited to contribute to this AFRIRPA04 by submitting their abstracts and by an active participation to improve and to enhance the quality of radiation protection in Africa.

In collaboration with (as per July 2013)

- IAEA - International Atomic Energy Agency
- WHO - World Health Organization
- UNSCEAR - United Nations Scientific Committee on The Effects of Atomic Radiations
- IOMP - International Organization of Medical Physics
- FAMPO - Federation of African Medical Physics Organizations
- Egyptian Society of Nuclear Science & Applic., Rad. Prot. Group
- Eastern Africa Association for Radiation Protection
- ANARAP-MAD - Madagascar Radiation Protection Association
- Southern African Radiation Protection Society
- Tunisian Society of Biophysics and Medical Imaging
- Centre National de Radioprotection, Tunisie
- AIGAM - Association des Ingénieurs en Génie Atomique du Maroc
- CNESTEN - Centre National de l'Énergie, des Sciences et Techniques Nucléaires, Maroc
- CNRP – Centre National de Radioprotection, Maroc
- AMPM – Association Marocaine de Physique Médicale

**See Web site:
www.afrirpa04.com
for topics and more
information**

INTERNATIONAL RADIATION PHYSICS SOCIETY

The primary objective of the International Radiation Physics Society (IRPS) is to promote the global exchange and integration of scientific information pertaining to the interdisciplinary subject of radiation physics, including the promotion of (i) theoretical and **experimental research in radiation physics**, (ii) investigation of physical aspects of interactions of radiations with living systems, (iii) education in radiation physics, and (iv) utilization of radiations for peaceful purposes.

The Constitution of the IRPS defines Radiation Physics as "the branch of science which deals with the physical aspects of interactions of radiations (both electromagnetic and particulate) with matter." It thus differs in emphasis both from atomic and nuclear

physics and from radiation biology and medicine, instead focusing on the radiations.

The International Radiation Physics Society (IRPS) was founded in 1985 in Ferrara, Italy at the 3rd International Symposium on Radiation Physics (ISRP-3, 1985), following Symposia in Calcutta, India (ISRP-1, 1974) and in Penang, Malaysia (ISRP-2, 1982). Further Symposia have been held in Sao Paulo, Brazil (ISRP-4, 1988), Dubrovnik, Croatia (ISRP-5, 1991), Rabat, Morocco (ISRP-6, 1994), Jaipur, India (ISRP-7 1997), Prague, Czech Republic (ISRP-8, 2000), Cape Town, South Africa (ISRP-9, 2003), Coimbra, Portugal (ISRP-10, 2006), Australia (ISRP-11, 2009) and ISRP-12 in Rio de Janeiro, Brazil in 2012. The IRPS also sponsors regional Radiation Physics Symposia.

The **IRPS Bulletin** is published quarterly and sent to all IRPS members.

The IRPS Secretariat is : Prof. Jorge E Fernandez (IRPS Secretary),
Universita di Bologna, Laboratorio di Ingegneria Nucleare di Montecuccolino
I-40136 Bologna, Italy

Phone : +39 051 2087 718 Fax: +39 051 2087 747

(These are new phone and fax numbers)

email: jorge.fernandez@unibo.it

The IRPS welcomes your participation in this "global radiation physics family."

INTERNATIONAL RADIATION PHYSICS SOCIETY

Membership Registration Form

1. Name : _____
(First) (Initial) (Last)

2. Date and Place of Birth : _____

3. Business Address : _____

(Post Code) (Country)

Telephone: _____ Email: _____ Fax: _____

4. Current Title or Academic Rank (Please also indicate if Miss, Mrs., or Ms.): _____

5. Field(s) of interest in Radiation Physics (Please attach a list of your publications, if any, in the field):

6. Please list any national or international organization(s) involved in one or more branches of Radiation Physics, of which you are a member, also your status (e.g., student member, member, fellow, emeritus):

7. The IRPS has no entrance fee requirement, only triennial (3-year) membership dues. In view of the IRPS unusually low-cost dues, the one-year dues option has been eliminated (by Council action October 1996), commencing January 1, 1997. Also, dues periods will henceforth be by calendar years, to allow annual dues notices. For new members joining prior to July 1 in a given year, their memberships will be considered to be effective January 1 of that year, otherwise January 1 of the following year. For current members, their dues anniversary dates have been similarly shifted to January 1.

Membership dues (stated in US dollars - circle equivalent-amount sent):

Full Voting Member: 3 years	Student Member: 3 years
Developed country \$75.00	Developed country \$25.00
Developing country \$30.00	Developing country \$10.00

Acceptable modes of IRPS membership dues payment, to start or to continue IRPS membership, are listed below. Please check payment-mode used, enter amount (in currency-type used), and follow instructions in item 8 below. (For currency conversion, please consult newspaper financial pages, at the time of payment). All cheques should be made payable to :

International Radiation Physics Society.

(For payments via credit card - <http://www.irps.net/registration.html>)

- [] (in U.S. dollars, drawn on a U.S. bank): Send to Dr W.L. Dunn, Dept. Mechanical and Nuclear Engineering, Kansas State University, 3002 Rathbone Hall, Manhattan, KS, 66506-5205. U.S.A.

Amount paid (in U.S. dollars) _____

- [] (in U.K. pounds): Send to Prof. Malcolm J. Cooper, Physics Dept., University of Warwick, Coventry, CV4 7AL, U.K.. Bank transfer details:

Account number: 30330701. Bank and Branch code: Barclays, code 20-23-55.

Eurochecks in U.K. pounds, sent to Prof. Cooper, also acceptable.

Amount paid (in U.K. pounds) _____

8. Send this Membership Registration Form **AND** a copy of your bank transfer receipt (or copy of your cheque) to the Membership Co-ordinator:

Dr Elaine Ryan
 Department of Radiation Sciences
 University of Sydney
 75 East Street, (P.O. Box 170)
 Lidcombe, N.S.W. 1825, Australia
 email: elaine.ryan@sydney.edu.au

9.

Signature

Date