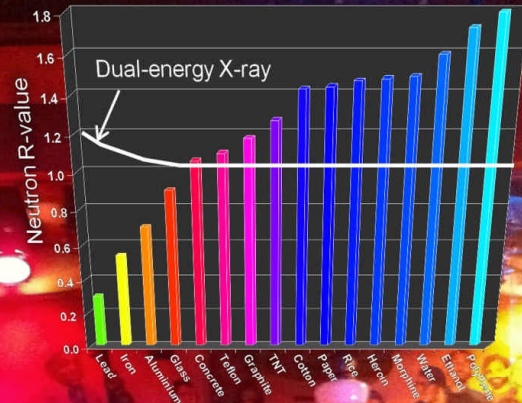
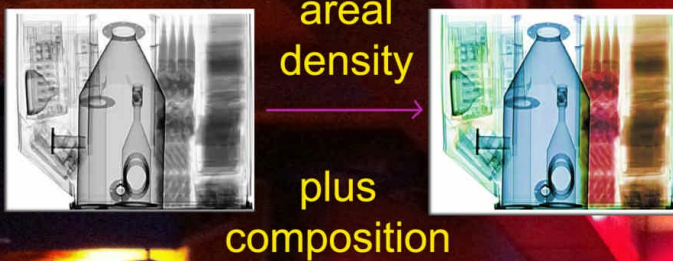


IRPS BULLETIN

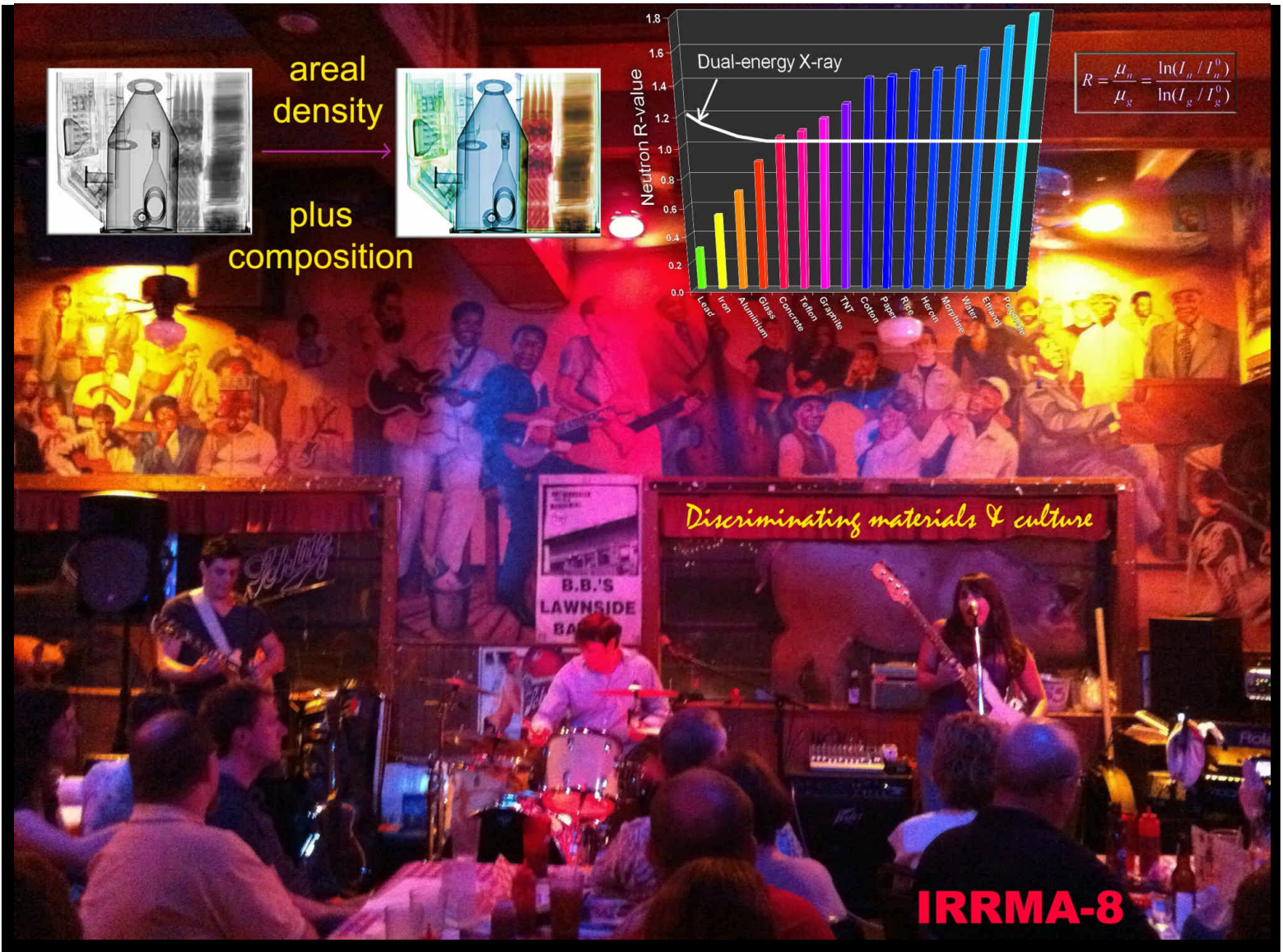
Newsletter of the International Radiation Physics Society

Vol 25 Nos 2/3

September 2011



$$R = \frac{\mu_n}{\mu_g} = \frac{\ln(I_n / I_n^0)}{\ln(I_g / I_g^0)}$$



The offerings of the Eighth Topical Meeting on Industrial Radiation and Radioisotope Measurement Applications (IRRMA-8) ranged from improved detection of threats in cargo using neutron-based material discrimination [see for example Cutmore, N., Liu Y. and Tickner, J. "Development and commercialisation of a fast-neutron/X-ray cargo scanner", Proc. 2010 IEEE Int. Conf. On Technologies for Homeland Security, pp 330-336] to discriminating Kansas City blues music and barbeque. For an overview of this recent international radiation physics conference, please see the summary within on page 11

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MEMBERSHIP PAYMENT INFORMATION ON PAGE 14

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Editorial

There is the expression "bad news travels fast" - presumably, the faster it travels, the worse the news - but as we go to press we learn from CERN of v 's putatively traveling faster than the speed of light! Perhaps no information is therefore being transmitted, but if confirmed by subsequent experiments, we might wonder what this portends for our field, already shaken recently by doubts about supersymmetry fed by other experiments at CERN, specifically the LHC, that have not turned up expected evidence for super-symmetric particles that theory predicts should have been observable. And all this comes on the heels of reports just last year from an international collaboration headed by the Max Planck Institute for Quantum Optics in Garching, Germany about a possible reduction of the proton radius that some had speculated might be a consequence of supersymmetry.

None of this is bad news, of course, unless one is too heavily vested in any particular understanding of physical law or impatient with the exacting process of experimental verification that is the hallmark of science. In a time of contracting budgets, such patience could understandably wear thin among political leaders and the public at large. As practitioners, teachers, and advocates of research, however, we appreciate how present understandings are contingent on past investments. So while committed to articulating and defending the fruits of past research, in today's world we should expect to navigate shifting priorities and choices for future investments. Two contributions to this issue of the IRPS Bulletin, from Suprakash Roy and Ladislav Musilek with Marie Dufkova, explore this topic *vis a vis* prospects for nuclear power generation following the devastating earthquake and tsunami in Japan six months ago. Also in this issue, we are pleased to present contributions by Mohamed Gomaa, on radiation physics-related happenings in the Middle East and an ICRP report on tissue reactions to radiation, and a summary report on IRRMA-8 by Bill Dunn. We thank these contributors for their efforts and, of course, invite your comments, contributions and suggestions for future content!

Finally, we would like to direct your attention to the preliminary slate for the 2012 election of IRPS officers, presented here on p. 13, and encourage you to consider running for office! Instructions for petitioning the Nomination Committee for inclusion on the election slate appear at the top of p. 13.

Ron Tosh and Larry Hudson

M. A. Gomaa

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News from the Arab World : April - June, 2011

Events in April, 2011 :

- The Egyptian Scientific Professional syndicate held a seminar in April 2011

Events in May, 2011 :

- The Arab Atomic Energy Agency issued the Arabic version of ICRP-105 (Radiation Protection in Medicine)
- Egyptian Nuclear Physics Association Held a Seminar on 17 May 2011.
- Two Fukushima Seminars were held in Cairo in order to inform participants about the nuclear disaster
- UNSCEAR held its 58th session in Vienna from 23 to 27 May 2011
- A safety culture workshop was held in Lebanon
- A radiation protection workshop was held in Kuwait
- A memo of understanding was signed between Kuwait Ministry of Health and Atomic Energy Authority of Egypt dealing with training in the field of medical response in cases of radiation accidents internationally.
- ICRP issued a statement dealing with revised dose limits for the lens of the eye. This statement is attached to the following page for the interest of readers.

Events in June, 2011 :

- Two workshops were held in June 2011

../ICRP Statement

Statement on Tissue Reactions

Approved by the Commission on April 21, 2011

- (1) The Commission issued new recommendations on radiological protection in 2007 (ICRP, 2007), which formally replaced the Commission's 1990 Recommendations (ICRP, 1991a). The revised recommendations included consideration of the detriment arising from non-cancer effects of radiation on health. These effects, previously called deterministic effects, are now referred to as tissue reactions because it is increasingly recognised that some of these effects are not determined solely at the time of irradiation but can be modified after radiation exposure. Previously, the Commission had reviewed various aspects of non-cancer health effects of low linear-energy-transfer (LET) ionising radiation in *Publication 41* (ICRP, 1984), high LET radiation in *Publication 58* (ICRP, 1990), the skin in *Publication 59* (ICRP, 1991b), and the skin and the eye in *Publication 85* (ICRP, 2000).
- (2) The Commission has now reviewed recent epidemiological evidence suggesting that there are some tissue reaction effects, particularly those with very late manifestation, where threshold doses are or might be lower than previously considered. For the lens of the eye, the threshold in absorbed dose is now considered to be 0.5 Gy.
- (3) For occupational exposure in planned exposure situations the Commission now recommends an equivalent dose limit for the lens of the eye of 20 mSv in year, averaged over defined periods of 5 years, with no single year exceeding 50 mSv.
- (4) Although uncertainty remains, medical practitioners should be made aware that the absorbed dose threshold for circulatory disease may be as low as 0.5 Gy to the heart or brain. Doses to patients of this magnitude could be reached during some complex interventional procedures, and therefore particular emphasis should be placed on optimisation in these circumstances.
- (5) The Commission continues to recommend that optimisation of protection be applied in all exposure situations and for all categories of exposure. With the recent evidence, the Commission further emphasises that protection should be optimised not only for whole body exposures, but also for exposures to specific tissues, particularly the lens of the eye, and to the heart and the cerebrovascular system.

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What Lessons We Learnt from Japan Crisis

*An editorial by Professor Roy, reprinted with permission from
Science and Culture Vol.77, May-June 2011 issue, p.163.*

I respect Japan and admire their citizens not because of their electronics or automobiles, their *shinkansen* (bullet train) or highways, their airports or punctuality, not because of their recovery from the ravages of World War II to the second largest economy of the world (in 2010 China moved up to this position), but for their courage and pragmatism to accept nuclear power as a major energy source despite the devastation and havoc caused by the twin nuclear bomb attacks on Hiroshima and Nagasaki in 1945. Ironically, the effects of the bomb became a red herring to several countries, including India, to avoid anything labelled 'nuclear'. There is something intriguing about a people, the only deliberate victims of a nuclear explosion, to embrace the source of all malice and tame and use it for the economic prosperity of the country.

Earthquakes are not new to Japan—it has experienced several in the past and survived, and has evolved their building code to withstand tremors. The recent (March 11, 2011) earthquake measuring 9.0 on the Richter scale followed by a 20 foot tsunami which smouldered the reactors at the Fukushima Dai-ichi nuclear power station is however a completely different kind of situation, not faced by Japan before. There is no reason to suspect either the technological capabilities or the technical

feats of Japan when one notices that not a single skyscraper has been ruined by earthquake in the last one hundred years. The current calamity has raised several doubts about the safety of nuclear reactors, but has also triggered serious debate about the future of energy production without nuclear power. With increasing emphasis globally on the production of clean energy (without carbon dioxide emission), with our limited resources of fossil fuels and with our limited technological capabilities to produce energy by solar, wind or hydro-electric means, is it possible to meet our present and future needs without going nuclear? According to an estimate, if nuclear power were abandoned today and replaced by other existing technologies in proportion to their current usage, the world would emit an extra 2 billion tonnes of carbon dioxide every year. The question is whether we can afford this extra emission throwing aside environmental issues or shall we continue generating power from nuclear plants with added emphasis on safety regulations.

This episode, like all accidents, is a lesson for scientists to understand that there is no room for complacency when expecting the unexpected, and gives the community a chance to introspect, analyse, understand and lead to new innovations. The earthquake has generated a huge volume of high-quality

data which is an opportunity for seismologists and geophysicists to understand the mysteries of a mosaic of fault lines along the Pacific Rim. According to the National Institute of Geophysics and Volcanology in Italy, the earthquake released an amount of energy that is sufficient to shift the planet's axis by about 10 cm. The United States Geological Survey estimated the coastline shift of Japan's main island, Honshu, by eight feet.

History reminds that accidents help us to rectify, to improve the system from its defects but not to discard it totally, to invent and innovate a better and alternate system before declaring it obsolete. And nuclear reactor technology is no exception. New reactors after Three Mile Island and Chernobyl accidents come equipped with passive safety systems that operate without human intervention, reducing the risk of human error. Scientists are working now to devise safety systems in which reliable natural physical phenomena due to gravity, convection, condensation etc. will take care of the emergencies even if the operators flee during the accident. AP1000 reactors under construction by Westinghouse are equipped with huge emergency water reservoirs above the reactor vessel so that in case the reactor's cooling system fails, the valves holding the water will open and most reliable natural force of gravity will take care of the situation to pour the water down to cool the containment vessel. Immediately convection another reliable natural force sets in to send the steam to go up to be cooled at the roof, condensed and came back as water again. The plan is to have an amount of water in the reservoir to last for three days, after which diesel-operated pumps set in to supply water from nearby water pool. Such advanced passive systems are now being incorporated in future

reactors in China, India and in the US. In fact it is expected that the reactor with such passive systems will be 'go-live' in China in 2013. Researches are going on to invent radically new technology to have safer reactors. Ideal nuclear reactors needs to be, in the language of nuclear engineers, 'walk-away safe', which means that there will be no melt-down of the core, no fire in the spent-fuel rods and no emission of radioactivity even when there was power cut or other eventualities and the operators fled the site.

The safety features that we have talked about are all related to future nuclear plants. The relevant question is what could be done for the existing older reactors. These reactors require more careful vigilance, to include modifications and changes (retrofitting) where possible and stricter regulatory norms in reissuing licences and shutdown in case of vulnerable reactors. It is time to negotiate the safety features of old reactors.

Reactor risk modelling is like financial risk modelling. In spite of historical data being available, it is difficult and often foolhardy to predict a rare event (such as a huge market fall) and its timing with accuracy. Sometimes even the wildest imagination fails to predict risk, as there are more things in heaven and earth than are dreamt of in our philosophy. New York's World Trade Centre had been built with steel frames to withstand the effect of a massive fire, but its architects could not have imagined the possibility of a full-blown deliberate impact of jetliners on the Twin Towers. Again, sometimes all possible events cannot be taken into account for practical reasons. I doubt current high-rise buildings are being constructed to survive an airplane assault, even though nuclear reactors currently

withstand the impact of a jetliner. Having said this, one needs to realize that no technology is hundred per cent safe and *absolute* technological security is a dangerous myth.

In democracies like India, people do not really know how to respond to a complicated and intricate subject like nuclear energy. The conventional wisdom on a controversial technology is usually framed by the politicians and the media, and the common reaction is to err on the side of status quo, thus rejecting new technology without assessing it properly. A case in point is the attempt to introduce computerisation about four decades ago. The bogeyman used to sway the public against computerisation was that it would lead to a loss of jobs, as computers and robots would replace human labour overnight. And while there may have been an initial reduction in manpower in the interest of operational efficiency, that courageous decision laid the foundation for India's ascent to global software prowess which has had the additional benefit of ushering in IT jobs, computer training centres and prosperity within the reach of the common man. In a similar manner, a much-needed dialogue is required today between policy makers and a conscientious public to assess what needs to be done in the field of nuclear energy. Those who are in

a mood to reject the nuclear energy option must enumerate carbon-free alternatives at this stage, while those who are bent in favour of nuclear energy need to convince others of the degree of safety in modern nuclear plants by explaining the inherent safety features in today's designs.

In my opinion, Japan's tragedy has given us a chance to reassess our current safety measures and improve upon the safety standards of all nuclear activities. Locations of future nuclear reactors need to be assessed in terms of the seismic activities near the site. Further research needs to be undertaken to invent radically new technology to have safer reactors. If we assume that the risk factor of each reactor in any location is equal, then simple logic dictates that lesser the number of reactors lesser is the risk. Judgement in optimising the number of reactors and control of enthusiastic proliferation is also an important factor to be considered. Emphasis on research in production and commercialization of alternate green energy sources should be strengthened to obtain green energy at a competitive price and scale. Until that happens, it will be foolish to live as if nuclear energy has not been discovered lending credence to the adage "whoever invented the term 'fool-proof' underestimated the ingenuity of fools".

Ladislav Musilek

ICTU Prague, Faculty of Nuclear Sciences and Physical Engineering, Czech Republic
with

Marie Dufkova

Czech Power Company CEZ, Prague, Czech Republic

The earthquake, the tsunami and the subsequent Fukushima accident in March 2011 have influenced the general view on nuclear power production in most parts of the world. In fact, thousands of human victims were caused by the earthquake and the tsunami and not by the Fukushima accident. The power plant was probably the least dangerous place in the impacted area for a person to be on March 11th. Nevertheless, the accident has had distinctly negative influence on the acceptance of nuclear power plants by the public.

We will deal here with the impact of the accident and how it has been "processed" by the mass media in the region of Central and Eastern Europe. Public opinion surveys on this issue are very incomplete. Some of the available data has been obtained from an extensive survey carried out in 24 countries, including Hungary and Poland, in May 2011 by IPSOS, an independent survey-based research company. Other data have been obtained from national surveys.

The Czech Ministry of Industry and Trade recently expressed strong support for strengthening the nuclear power industry, potentially raising its share of the energy mix to 80% in the next 50 years. More than 70% of the population are convinced that nuclear power plants can cover a substantial proportion of the electric power that will be needed in the country in future. Although this proportion has dropped by 11% in comparison with the situation before Fukushima, it remains quite high. About 58% of the population agrees with increasing the proportion of nuclear power in the energy

mix, and 60% are against closing down nuclear power production in the course of the next few decades. By contrast, only 37% of people believe that wind power can play an important role in the future, while 46% believe in biomass. Acceptance of nuclear power increases with level of education and with the size of the settlement in which the respondent lives. It is also somewhat gender-dependent, men being more pro-nuclear than women.

Public opinion in this matter is totally different in the Czech Republic and in neighbouring Germany and Austria. In the Czech Republic, opinion has not been greatly influenced by political allegiances or by the support given to local anti-nuclear activists, especially from Austria. According to information provided by the reputable technical bulletin Technik, based on the official web pages of the Upper Austrian Land Government, the Austrian government awarded EUR 430 797 in grants to eleven anti-nuclear associations, eight of which were based in the Czech Republic.

A survey in Bulgaria has also shown quite strong support for nuclear power. Bulgaria is preparing the construction of a new power plant in Belene. The plans have support from at least 64% of the population, who think that the plant should be built as soon as possible. 43% of the population say that they have not been influenced in this opinion by Fukushima, while 37% now have more doubts.

Similarly, support for constructing new units of the Mochovce nuclear power plant in Slovakia

has decreased, but it still remains higher than 50%. Poland, which until now has had no nuclear power plants, but has plans to join the nuclear community, is in a similar position: about 57 % of the population supports the plans to introduce nuclear power plants. Hungary, with a nuclear power plant in Paks, now has only 41% support for nuclear power. The situation has also worsened in traditionally pro-nuclear Latvia.

Another consequence of the Fukushima accident is that the European Union decided in March 2011 to apply stress tests to its nuclear power plants to see how they would respond to earthquakes and other calamities. It should be said that this decision was mainly in response to public fear of radiation leaking from the plants. These tests consist of computer simulations of how the facilities would stand up to various natural disasters, including earthquakes and tsunamis. The test scenarios will differ, depending on the types of natural catastrophes that could occur in the location of the power plant. They include an evaluation of the available preventive and mitigating measures, based on the philosophy of protection in depth : initiating events, subsequent loss of safety features, managing severe accidents. The tests are voluntary for member states, since the EU is not competent to making binding

decisions on energy matters. However, there is a consensus among the member states that they will take part, and that all 143 nuclear power plants throughout the EU will be tested. This will involve stress tests on all nuclear power plants in Central and Eastern Europe.

The evaluation for the Dukovany and Temelin nuclear power plants in the Czech Republic is still in progress, but all chapters of the evaluation reports have been prepared. It has been confirmed that there are no risks of a type that would require immediate action to be taken. The final report will be delivered by the owner of the plants (the Czech Power Company) to the Czech atomic energy authority (i.e. to the State Office for Nuclear Safety) by the end of October 2011, and to the European Commission by the end of the year. The conclusions for the EU as a whole will be published by the middle of 2012.

The Fukushima accident has certainly influenced the views of the public on nuclear power, all over the world. However, in those countries where raising anti-nuclear fears is not a weapon in the political game, it seems that Fukushima will not greatly influence the future of power production. The Central and Eastern European countries seem likely to continue with their nuclear power programmes.

**NPP Temelín,
Czech Republic**



IRRMA-8

Report by William L Dunn

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The Eighth Topical Meeting on Industrial Radiation and Radioisotope Measurement Applications (IRRMA-8) was held from 26 June to 1 July 2011. The IRRMA-8 conference was preceded by a three-day Workshop on Detection of Ionizing Radiation, from 24 to 26 June, and a two-day meeting of the Council of the International Radiation Physics Society (IRPS), on 25 and 26 June. All three events were held at the Marriott Country Club Plaza Hotel (shown at right) in Kansas City, Missouri (USA). IRRMA-8 was sponsored by

the Kansas State University (KSU) College of Engineering,
the KSU Department of Mechanical and Nuclear Engineering,
the KSU Radiation Measurement Applications Laboratory,
the Center for Engineering Applications of Radioisotopes at North Carolina State University, and
the International Radiation Physics Society.

There were four exhibitors: Canberra, ORTEC, QUESTA, LLC, and XIA. The approximately 135 attendees came from 23 countries.



Dr. David Bradley, Technical Program Chair, put together a wonderful program that included the following invited talks (in order of presentation).

Speaker	Institution	Title
Robin P. Gardner	North Carolina State University	On the Inverse Spectral Analysis Problem for Nuclear Threat Cargo Monitoring
Ed Morton	Rapiscan Systems	Security Screening with Ionising Radiation
Thomas Booth	Los Alamos National Laboratory	Common Misconceptions in Monte Carlo Particle Transport
Brad Roscoe	Schlumberger-Doll Research	Tools and Methods in Nuclear Well Logging
Jorge Fernandez	University of Bologna	Deterministic and Monte Carlo Codes for Multiple Scattering Photon Transport
Richard Hugtenburg	Swansea University	Monte Carlo Modeling of Radiotherapy Acute and Late Effects in Radiation Therapy
Guillaume Potdevin	Technical University Munich	Biomedical X-Ray Imaging Using Phase and Dark Field Contrast
Patrick Regan n	University of Surrey	From RISING at GSI to the DESPEC Fast-Timing Project at FAIR: The New Nuclear Spectroscopy of the Most Exotic Isotopes
Christian Brönnimann	Dectris, Ltd.	Single Photon Counting X-Ray Detectors for Scientific and Industrial Applications
Ladislav Musilek	Czech Technical University in Prague	X-Ray Fluorescence in Investigations of Cultural Relics and Archaeological Finds
Dudley Creagh ¹	University of Canberra	The Application of Neutron Technology to the Study of Objects of Cultural Heritage Significance
Geoffrey Harding	Morpho Detections Germany	X-Ray Diffraction Imaging with the Multiple Inverse Fan Beam Topology: Principles, Practice and Potential for Security Screening

¹ Dr. Creagh was unable to attend; his presentation was given by Dr. William Dunn.

../Continued

IRRMA-8 (Continued)

Over 80 contributed oral presentations and over 90 poster presentations were accepted. A total of 181 Abstracts were published in the Schedule and Abstract Book. It is gratifying to report that a significant number of student and early-career individuals attended, 12 of whom were provided financial assistance by IRPS.

The meeting began with a Reception at the Marriott Hotel. The first day consisted of plenary sessions on Threat Detection, Monte Carlo Methods, Prompt Gamma Neutron Activation Analysis, and Radiation Applications in Biology and Medicine. On the second day, there were plenary, parallel, and poster sessions. On Wednesday, most participants enjoyed a trip to Manhattan, KS (the “Little Apple”). First, they stopped at the Konza Prairie Reserve, where those attending also were able to see a small herd of bison (photo 2) and enjoy a meal of both local and east-coast barbecue. Those attending then went to Kansas State University, where they were welcomed by the President of the University, Dr. Kirk Shultz, and the Dean of Engineering, Dr. John English. A representative of the Eisenhower Museum presented an interesting historical review of President Dwight Eisenhower’s terms, during which he gave the “Atoms for Peace” talk to the United Nations. This speech is often credited with initiating formation of the International Atomic Energy Agency.



A dramatic view of the Bloch Building at the Nelson-Atkins Museum is shown at left below and a photograph of the head table at the conference banquet is shown below right.



On Thursday, both oral and poster presentations were given after which a banquet was held at the Nelson-Atkins Museum, only a short walk from the Conference hotel (see photos above). At the banquet, it was announced that the next IRRMA will be hosted by the Polytechnic University of Valencia, in Valencia Spain, with Prof. Jose Rodenas as General Chair. The Conference ended on Friday, 1 July, with a closing luncheon. The IRRMA-8 Proceedings will be published in the International Journal *Applied Radiation and Isotopes*.

Preliminary Election Slate

Members,

Election time is drawing near. It is our intention that the final slate should appear in the next issue of the Bulletin along with statements from the candidates. The slate of candidates proposed by the Nomination Committee is given below. The bylaws allow for candidates to petition in order to be listed on the ballot. The candidate must be a full member in good standing. The procedure is to send a petition signed by ten full members of the Society (in good standing), together with a statement of consent from the candidate, to the Nomination Committee contacts (contact details below) by December 16, 2011.

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North East Asia :	Wu Ziyu (<i>P.R. China</i>)
South East Asia :	Suprakash C. Roy (<i>India</i>)
Australasia :	Christopher Chantler (<i>Australia</i>)
North America :	Larry Hudson (<i>U.S.A.</i>)
South and Central America:	Marcelo Rubio (<i>Argentina</i>)

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Avnet Sood (*U.S.A.*)
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Isabel Lopes (*Portugal*)
Francesc Salvat (*Spain*)
Rupa Sarkar (*India*)

Chair of Advisory Board (as per Constitution)

Odair Goncalves

Nomination Committee contacts :

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Coventry CV4 7AL, U.K

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New Memberships, Membership Renewals

Membership form for new members, and details for payments by cheque for new and renewing members are on the back page of this journal and information for payment by credit card is given above.

If you are unsure when your renewal is due, contact

Elaine Ryan

email: elaine.ryan@sydney.edu.au

2012



4th - 8th February, 2012

10th International Conference of Nuclear Sciences and Applications

Second Announcement

ESNSA - The Egyptian Society of Nuclear Sciences and Applications

The Egyptian Atomic Energy Authority
Sinai University
Quseir-Marsa alam, Egypt

Full information and registration form on following page ..

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Cairo, Egypt

Tel : 002-0101116525 **Email :** esnsa22012@yahoo.com

Website : <http://www.esnsa.com>

Conference Information on following pages

Second Announcement

10th INTERNATIONAL CONFERENCE OF NUCLEAR SCIENCES AND APPLICATIONS



The Egyptian Society of Nuclear Sciences and Applications

(ESNSA)

Member of the International Nuclear Societies
Council (INSC)

The Egyptian Atomic Energy Authority (EAEA)

Sinai University

(4-8) February, 2012
Quseir- Marsa Alam, Egypt

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CONFERENCE TOPICS

- **Nuclear Sciences:**
Physics, Chemistry, Plasma, Radio & Radiation
Chemistry, Radiobiology, Nuclear Medicine, Education
.....etc.
- **Reactors and Accelerators :**
Operations, Utilizations, Radioisotope Production,
Reactor Engineering, Decommissioning..... etc.
- **Material Sciences & Technology:**
Nuclear Materials, New & Advanced Materials,
Polymers, Nano-Materials, Hydrometallurgyetc.
- **Environmental:**
Natural Radioactivity, TE-NORM, Environmental
Pollution, Isotope hydrology, Waste Management, Geo-
Engineering.....etc.
- **Nuclear Safety & Radiation Protection:**
Legislation, Risk Assessment, Safeguards, Management
of Nuclear Accidents, Dosimetry, Health physics ...etc.
- **Radiation Sciences in Medicine , Agriculture ,
Biology & Industry:**
Medical Radiation Biology, Biotechnology, Microbiology,
Biophysics, Radiation in Agriculture, Diagnosis, Therapy
and Radiation Processing etc.
- **Nuclear Analytical Techniques:**
Advanced Techniques, Activation Analysis, Separation
Techniques, Speciation, Trace & Ultra Trace Methods
.....etc.

ADVISORY COMMITTEE

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- H. Rateb, Sinai University, Egypt.
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- S. El- Takriti, Arab Atomic Agency, Syria.
- K. Saad, Qatar University, Qatar.
- M.K. Shaat, AEA, Egypt.
- I. El- Osery, NPPA, Egypt.

PUBLICATION

The papers will be refereed and published in a special issue of the "Arab Journal of Nuclear Sciences and Applications periodical". Abstracts of scientific contributions to be submitted at September 2011. The complete manuscript to be submitted by 15 October 2011, written according to the periodical instructions.

INVITATION

The Egyptian Society of Nuclear Sciences and Applications (ESNSA) organizes an international conference every four years that deals with current research activities in the field of nuclear sciences and applications. The conference aims at providing a forum for exchanging knowledge in the interdisciplinary fields of nuclear sciences and their applications.

The Egyptian Atomic Energy Authority and Sinai university share and cooperate with ESNSA in the execution of the present conference. Special attentions are considered for research related to Sinai development in different fields.

The scientific activities of the conference will include keynote presentations by international and national recognized scientists to highlight recent progress in nuclear sciences, as well as contributed papers dealing with the ongoing research. Issues of public concern, human health, the environment, developmental programs will be addressed, and the promotion of peaceful applications of nuclear sciences using nuclear techniques. The conference sessions will also include panel discussions, technical presentations on certain nuclear applications and Sinai development.

REGISTRATION FEES

600 Euro For Non Resident Participants.

1000 L.E For Egyptian Nuclear Society Members.

1200 L.E For Non Nuclear Egyptian Society Members.

Registration Fees are payable to:

“Conference of Nuclear Sciences and Applications Account No: 37/430/1/8 Bank Misr, Garden City Branch”, 2 Ahmad Ragheb St., Garden City, Cairo, Egypt.

CORRESPONDENCE

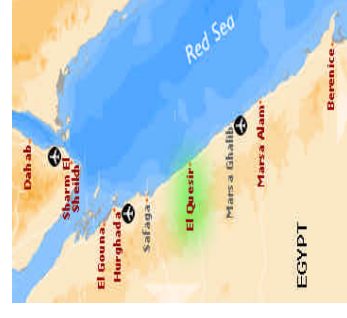
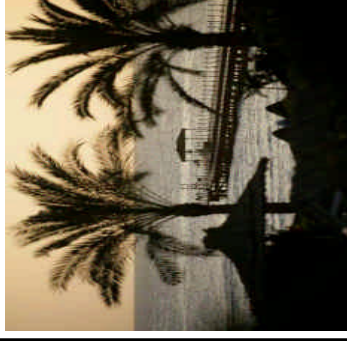
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VENUE

Flamenco Resort

Red Sea- Quseir- Marsa Alam, Egypt

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 will be in Salvador, 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. M.J. Farquharson, (IRPS Secretary),
Department of Medical Physics and Applied Radiation Sciences
McMaster University, Main Street West, Hamilton, Ontario, Canada.
Phone : 001 905 525 9140 ext 23021 email: farquhm@mcmaster.ca

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):

../Continued

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
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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 :

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(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, 346 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, (IRPS Treasurer), 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.

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

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