

IRPS BULLETIN

Newsletter of the International Radiation Physics Society

Vol 23 No 2

June 2009

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International Symposium on Radiation Physics

includes workshops on **Advances in
Analytical Techniques**

Conference: 20 – 25 September 2009

Workshops: 26 – 27 September 2009

University of Melbourne

This event is devoted to current trends in radiation physics research, organised by the International Radiation Physics Society (IRPS) and is supported by DEST, the Australian Synchrotron and the Victorian Government.

www.mcmconferences.com/isrp11



The aim of ISRP-11 is to provide a forum for the discussion of developments and applications encompassing, but not limited to:

- A. Processes in radiation physics
- B. Quantitative X-ray and particle analytical techniques
- C. Absorption and fluorescence spectroscopy (XAFS, XANES, Raman...)
- D. Sources and detectors and simulation of radiation transport
- E. Materials Science and applications to minerals, mining and processing
- F. Medical Applications and Biology
- G. Applications to space, earth and environmental sciences
- H. Cultural heritage and art
- I. New technologies and industrial applications

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From the Editors

Dear Colleagues,

In this special issue of the IRPS Bulletin, we highlight the forthcoming 11th symposium of the International Radiation Physics Society (20-25 September 2009) and associated workshop on Advances in Analytical Techniques (26-27 September 2009). This will be held at the University of Melbourne, Australia and many preparations are underway to ensure a cordial and productive meeting. ISRP-11 promises again to bring together international leaders in the field resulting in an impressive range of technical content. We look forward with anticipation to meeting you in Melbourne.

Included in this issue of the Bulletin are publicity and announcements of the symposium that you may share with colleagues.

Also included are listings of the invited symposium lecturers and their topics and photos, as well as preliminary schedules for the symposium and workshop. Additional resources, including travel information, may be found at:

<http://www.mcmconferences.com/isrp11/>.

Finally, this issue includes a Vice-President's report from Bill Dunn, as well as the society's 2009 election ballot as voting is open until September 15, 2009.

All the Best,

Larry Hudson and Ron Tosh



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Web Pages : Shirley McKeown

Contact addresses for the above are listed in the IRPS information on page 1.

Society information, membership application form, and arrangements for payment of membership fees are shown on the back pages of this Bulletin (credit card payments via internet are given below).

Internet Address : <http://www.canberra.edu.au/irps>

(the www.irps.net address no longer connects)

Printing and postage of the Bulletin, and support for the IRPS web pages, are courtesy of the University of Canberra, Canberra, A.C.T, Australia

Election Ballot Form

For all posts, except those of executive councillors, vote for one by marking the appropriate box. For executive councillors, you may vote for up to four candidates who are running for the full six-year term and up to two candidates for three-year slots that have arisen due to vacancies. For all positions you may write in names of other members of the Society and cast your ballot for them.

President (vote for one)

Odair D. Gonçalves (Brazil)

Secretary (vote for one)

Michael J. Farquharson (UK)

Treasurer (vote for one)

Malcolm J. Cooper (UK)

Vice Presidents:

Western Europe (vote for one)

Jorge E. Fernandez (Italy)

Central & Eastern Europe (vote for one)

Ladislav Musílek (Czech Rep.)

F.S.U. (vote for one)

Alexander P. Potylitsyn (Russia)

North America (vote for one)

William L. Dunn (USA)

South & Central America (vote for one)

Marcelo Rubio (Argentina)

South East Asia (vote for one)

Suprakash C. Roy (India)

North East Asia (vote for one)

Wu Ziyu (P.R. China)

Africa & Middle East (vote for one)

Mohamed Gomaa (Egypt)

Australasia (vote for one)

Chris Chantler (Australia)

Executive Councillors:

Six years term (vote for four)

Isabel Lopes (Portugal)
 Francesc Salvat (Spain)
 Larry Hudson (USA)
 P.K. Sarkar (India)

Three years term (vote for two)

Raul Mainardi (Argentina)
 Peter K.N. Yu (Hong Kong)

Please use this ballot to vote. Instructions for return:

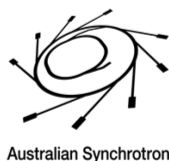
- 1) regular mail: use the double-envelope system (place ballot in a small, unsigned envelope, and enclose the latter in a larger envelope, signing and printing your name and return address on the latter to authenticate your anonymous ballot), and send to:

David Bradley, IRPS Secretary
 Centre for Nuclear and Radiation Physics, Department of Physics, University of Surrey
 Guildford, Surrey GU2 7XH, UK

- 2) electronic submission: scan your completed ballot and email the image to: D.A.Bradley@surrey.ac.uk

Ballots must be received by the Secretary by 15 September, 2009.

The results will be announced at ISRP-11 in Melbourne, Australia, 20 - 25 September, 2009



11th International Symposium on Radiation Physics
20-25 September, 2009, Melbourne

Workshop on Advances in Analytical Techniques
in Geology, Conservation Science, Forensic Science, Border Technology, Biomedical & other Applications
26-27 September, 2009, Melbourne

We have great pleasure in inviting you to attend the upcoming International Symposium on Radiation Physics (ISRP-11) and the associated Workshop on Advances in Analytical Techniques in Geology, Conservation Science, Forensic Science, Border Technology, Biomedical & other Applications. This conference presents a valuable opportunity for the exchange of knowledge, including discussion of development of Australian Synchrotron programs and beamlines, contacts with leaders in the fields and potential research using Australian and overseas synchrotron facilities, accelerator facilities including ANSTO, ANU and CSIRO and the OPAL neutron facility.

Early Bird Registration Closes 30th June - Registration now on-line

<http://www.mcmconferences.com/isrp11/registration.html>

Note the exchange rate makes visits to Australia more affordable!

Accommodation is significantly limited due to a major cultural event in Melbourne, so book early via your registration form!

Call for Abstracts Closes 30th June – Submissions via the website

<http://www.mcmconferences.com/isrp11/abstracts.html>

A small number of bursaries exist for early career researchers. Just register and then submit your abstracts. In the Abstract submission, tick the 'Early Career Researcher' box - i.e. student or first few years post-doc. Then you are automatically considered for the IRPS funds for Early Career Researchers.

Conference topics will be presented in oral and poster format. Oral sessions will include invited and contributed papers. A prize for the best young researcher paper presented orally will be given. Some support will be available for early career researchers.

Conference topics include:

- A. Fundamental Processes in radiation physics
- B. Quantitative X-ray and particle analytical techniques
- C. Absorption and fluorescence spectroscopy (XAFS, XANES, XRF Spectroscopy, Raman, Infrared)
- D. Sources and detectors and simulation of radiation transport
- E. Materials Science and applications to minerals, mining and processing
- F. Medical applications and biology
- G. Applications to space, earth and environmental sciences
- H. Cultural heritage and art
- I. New technologies and industrial applications

Currently accepted invited speakers include:

- Prof. Annemie Adriaens on Stabilisation of Cultural Heritage Objects [H]
- Prof. Isabella Ascone on XAS pharmaceutical applications [F]
- Prof. Liming Chen on high-brightness table-top laser sources for high-energy radiation and advanced medical physics [F]
- Prof. Frank de Groot on the 'interpretation of X-ray absorption' [B]
- Prof. Eric Dooryhée on Cultural Heritage and Art analysis [H]
- Prof. Gordon Drake on the theory of few-electron QED [A]
- Dr Paul Dumas on the application of synchrotron IR in Cultural Heritage and Archeology [H]

- Prof. Martin Feiters on analysis of catalysts and chemical reactive intermediates [C]
- Prof. Ronald Frahm on XFAS Basics [C]
- Prof. Pieter Glatzel on high-accuracy experiments [C]
- Prof. Yves Joly on developments of XANES and quantitative X-ray analytical techniques [B]
- Prof. Don McNaughton on medical imaging [F]
- Prof. John Rehr on developments of XAFS and FEFF for local structural identification [B]
- Dr John Seely on laser-produced X-ray plasmas and spectroscopic diagnostics [D]
- Prof. Andris Stelbovics on electron-atom interactions in radiation physics [A]
- Prof. Soichi Wakatsuki on medical applications and biology [F]

For detailed information on the Program, Call for Papers guidelines and submission form, please go to www.mcmconferences.com/isrp11/

The workshops on Advances in Analytical Techniques in Geology, Conservation Science, Forensic Science, Border Technology, Biomedical & other Applications is shaping up to be an excellent workshop, the speakers and topics currently confirmed are;

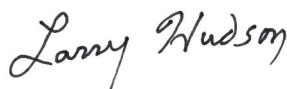
- Ned Blagojevic - Border Technologies
- Christopher Chantler - XERT
- Frank de Groot - Interpretation of X-ray absorption & the CTM4XAS program
- Paul Dumas - Raman & Infrared Spectroscopy in Conservation
- Rob Fitzpatrick - XRF Forensics
- Garry Foran - XAFS Applications
- Ronald Frahm - XAFS Basics
- Daniel Hausermann - Imaging Basics
- Koen Janssens - XANES Applications
- Brendon Kennedy - XRD Basics
- Paul Kirkbride - Sem & Raman in Forensics
- Debbie Lau - XRF Conservation Science
- Peter Lay - XAFS Applications to Biomedical Systems
- Dr L - Imaging in Border Technologies
- Vincent Otieno-Alego - Sem & Raman in Forensics
- Gary Pritchard - XRF Basics
- Liliana Pushkar - Isynchrotron Radiation Infrared
- Mark - Tobin - Isynchrotron Radiation Infrared
- Chanh Tran - Imaging in the Laboratory Context
- Stephen Wilkins - Synchrotron radiation Imaging
- Ken Williams - Raman & Infrared Spectroscopy Basics

The 2009 conference and workshop is organized by the International Radiation Physics Society (IRPS) and supported by the Australian Government's Department of Education Science and Technology, the Australian Synchrotron and the Victorian Government. The meeting is devoted to current trends in the broad area of radiation physics research. It is endorsed by the IUCr Commission on XAFS.

We look forward to welcoming you to ISRP-11 in Melbourne 20-27 September 2009,

Yours Sincerely,





Christopher Chantler, Associate Professor & Reader
Symposium Chair
School of Physics, University of Melbourne

Dudley Creagh, President, IRPS
Larry Hudson, Co-chair, Scientific Program Committee

For further information about the symposium, sponsorship or workshops, please contact the Conference Office at:

Think Business Events
Phone: +61 3 9417 1350
Email: isrp@thinkbusinessevents.com.au

International Symposium on Radiation Physics

includes workshops on Advances
in Analytical Techniques

Conference: 20 – 25 September 2009

Workshops: 26 – 27 September 2009

ISRP-11 will discuss developments and applications in:

- A. Processes in radiation physics
- B. Quantitative X-ray and particle analytical techniques
- C. Absorption and fluorescence spectroscopy (XAFS, XANES, Raman...)
- D. Sources and detectors and simulation of radiation transport
- E. Materials Science and applications to minerals, mining and processing
- F. Medical Applications and Biology
- G. Applications to space, earth and environmental sciences
- H. Cultural heritage and art
- I. New technologies and industrial applications

Plenary speakers include:

Prof. John Rehr on developments of XAFS and FEFF for local structural identification [B]

Prof. Yves Joly on developments of XANES and quantitative X-ray analytical techniques [B]

Prof. Martin Feiters on analysis of catalysts and chemical reactive intermediates [C]

Prof. Pieter Glatzel on high-accuracy experiments [C]

Dr. John Seely on laser-produced X-ray plasmas and spectroscopic diagnostics [D]

Prof. Isabella Ascone on biomedical analysis [F]

Prof. Soichi Wakatsuki on medical applications and biology [F]

Prof. Don McNaughton on medical imaging [F]

Prof. Liming Chen on high-brightness table-top laser sources for high-energy radiation and advanced medical physics [F]

Prof. Eric Dooryhée on Cultural Heritage and Art analysis [H]

Prof. Annemie Adriaens on Stabilisation of Cultural Heritage Objects [H]

www.mcmconferences.com/isrp11



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SCHEDULE FOR ISRP-11 CONFERENCE

SUNDAY 20TH SEPTEMBER	
1700	Welcome Reception - Open for Registration - Law Building Mezzanine
1800	Welcome Reception - Law Building Mezzanine
1900	Close

MONDAY 21ST SEPTEMBER	
TIME	PLENARY SESSION
900	Welcome to ISRP-11 Assoc. Prof. Christopher Chantler
904	Welcome to the IRPS Prof. Dudley Creagh, President, IRPS
909	Welcome to the University [tba]
915	Welcome to Country
930	Characteristic X-ray spectra, neutral atoms and satellites Prof. Moshe Deutsch
1015	MORNING TEA
	A. Processes in radiation physics
1045	Electron-atom interactions; Convergent Close-Coupling Prof Andris Stelbovics
1130	Fundamental experiments and theory Prof. Gordon Drake
1215	Selected Orals 2 x 20 mins each Various
1255	LUNCH
	B. Quantitative X-ray and particle analytical techniques [Condensed Matter]
1400	XAFS, vibrational microscopy Prof John Rehr
1445	XANES and FDMNES Prof Yves Joly
1530	Selected Orals 2 x 20 mins each Various
1610	AFTERNOON TEA
	Parallel Sessions
	A. Processes in radiation physics
	B. Quantitative X-ray and particle analytical techniques
1640	Selected Orals 3 x 20 mins each Selected Orals 3 x 20 mins each
1740	Poster Session
1940	Close

TUESDAY 22ND SEPTEMBER	
TIME	PLENARY SESSION
	C. Absorption and fluorescence spectroscopy (XAFS, XANES, Raman ...)
900	Organometallic catalysts – mixed techniques Prof Martin Feiters
945	High-precision experiments at synchrotrons Prof Pieter Glatzel
1030	MORNING TEA
	C. & D. Sources and detectors and simulation of radiation transport
1100	Computational Modelling Prof. Frank de Groot
1145	Laser-Produced Plasmas and X-Ray Spectroscopic Diagnostics Dr John Seely
1230	Selected Orals 2 x 20 mins each Various
1310	LUNCH
	F. Medical applications and biology
1410	Biomedicine and local order Prof. Isabella Ascone
1455	Synchrotron infrared micro-spectroscopy of cells and tissues- applications to oocyte development and multiple sclerosis animal models. Prof. Don McNaughton
1540	

1625	AFTERNOON TEA	
	Parallel Sessions	
	C. Absorption and fluorescence spectroscopy (XAFS, XANES, Raman...)	D. Sources and detectors and simulation of radiation transport
1700	Selected Orals 2 x 20 mins each	Selected Orals 2 x 20 mins each
1740	Poster Session	
1940	Close	

WEDNESDAY 23RD SEPTEMBER		
TIME	PLENARY SESSION	
900	JARI Award Presentation and Lecture	JARI Award Presentation and Lecture
945	New opportunities at synchrotrons	Prof. Ronald Frahm
1030	MORNING TEA	
1100		Michael Haumann
1145		
1230	Bus Lunch, Synchrotron, Yarra Valley Tour & Healesville Sanctuary tours	
1800	Return, depending upon tour options	

THURSDAY 24TH SEPTEMBER		
TIME	PLENARY SESSION	
	F. Medical applications and biology	
900	Hig-power lasers and biomedical applications	Prof Liming Chen
945		
1030	MORNING TEA	
	Parallel Sessions	
	E. Materials Science and applications to minerals, mining and processing	F. Medical applications and biology
1100	Selected Orals 3 x 20 mins each	Selected Orals 3 x 20 mins each
1200	LUNCH	
	G. Applications to space, earth and environmental sciences	
1300		Prof Paul Dumas
1345		
1430	Selected Orals 2 x 20 mins each	Various
1510	AFTERNOON TEA	
	Parallel Sessions	
	G. Applications to space, earth and environmental sciences	Hot Topics
1540	Selected Orals 3 x 20 mins each	Selected Orals 3 x 20 mins each
1640	Poster Session	
1740	Close	
1900	CONFERENCE DINNER - MELBOURNE MUSEUM	

FRIDAY 25TH SEPTEMBER		
TIME	PLENARY SESSION	
	H. Cultural heritage and art	
900	Cultural heritage and recent breakthroughs	Prof Eric Dooryhee

945	In-situ Electrochemical and SR-XRD Time-resolved Study of Lead Carboxylate Coating for the Protection of Cultural Heritage Artefacts	Prof Annemie Adriaens
1030	MORNING TEA	
	I. New technologies and industrial applications	
1100		
1145		
1230	Selected Orals 2 x 20 mins each	Renishaw, Nuctech
1310	LUNCH	
	F. Medical applications and biology	
1415		Prof. Soichi Wakatsuki
	C. Absorption and fluorescence spectroscopy (XAFS, XANES, Raman...)	
1500		
1545	AFTERNOON TEA	
	Parallel Sessions	
	H. Cultural heritage and art	I. Industrial Forum
1615	Selected Orals 3 x 15 mins each	Selected Orals 4 x 10 mins each
1700	DRINKS	
1800	Close	

ADVANCES IN ANALYTICAL TECHNIQUES
IN
GEOLOGY, CONSERVATION SCIENCE, FORENSIC SCIENCE,
BORDER TECHNOLOGY & ENVIRONMENTAL SCIENCE

SATURDAY 26th SEPTEMBER				
TIME	PLENARY SESSION			
900	XRF BASICS		Gary Pritchard (Pananalytical)	
945	XRD BASICS		Brendan Kennedy (U Sydney)	
1030	MORNING TEA			
1100	XRF CONSERVATION SCIENCE		Debbie Lau (CSIRO)	
1145	XRF FORENSICS		To be confirmed	
1230	LUNCH			
1400	RAMAN & INFRARED SPECTROSCOPY BASICS		Ken Williams (Renishaw)	
1445	SEM & RAMAN in FORENSICS		Vincent Otieno-Alego (AFP/FL)	
1530	AFTERNOON TEA			
	Parallel 1		Parallel 2	
1600	IMAGING BASICS	Daniel Hausermann (AS)	XRD in geochemical applications	To be confirmed
1645	IMAGING in BORDER TECHNOLOGIES	Li (Nuctech)	XAFS APPLICATIONS to biomedical systems*	Peter Lay (U Sydney)
1700-1900	POSTER SESSION & DRINKS			

SUNDAY 27th SEPTEMBER				
TIME	PLENARY SESSION			
900	XAFS Basics		Ronald Frahm (DESY, Germany)	
945	XAFS Applications		Garry Foran (ANBF/AS)	
1030	MORNING TEA			
1100	XERT		Chris Chantler (U Melbourne)	
1145	XANES APPLICATIONS*		Koen Janssens (Antwerp)	
1230	LUNCH			
	Parallel 1		Parallel 2	
1400	RAMAN & INFRARED SPECTROSCOPY in CONSERVATION	Paul Dumas (Soleil)	Border Technologies	Ned Blagojevic (ANSTO)
1445	ISYNCHROTRON RADIATION INFRARED	Mark Tobin (AS) / Liliana Pushkar	Interpretation of X-ray absorption & the CTM4XAS program	Frank de Groot (Utrecht, Netherlands)
1530	AFTERNOON TEA			
1600	IMAGING IN THE LABORATORY CONTEXT*		Chanh Tran (La Trobe)	
1645	SYNCHROTRON RADIATION IMAGING*		Stephen Wilkins (CSIRO)	
1700	Close			

- NOTE THERE WILL BE CERTIFICATES OF ATTENDANCE ISSUED TO ALL ATTENDEES
- SPEAKERS TO STRESS APPLICATIONS IN GEOLOGY, CONSERVATION SCIENCE, FORENSIC SCIENCE.

GUEST SPEAKERS AT THE ISRP-11 CONFERENCE

Further information, including abstracts, can be gained from the ISRP-11 website
<http://www.mcmconferences.com/isrp11/index.html>



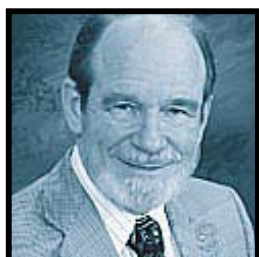
Professor Andris Talis Stelbovics

Andris Stelbovics is Pro Vice-Chancellor of the Faculty of Science and Engineering at Curtin University of Technology. His research interests are mainly in describing few-body scattering processes and providing computationally complete solutions of the Schrödinger equation. In recent years, he has focused on atomic scattering of atoms by electrons/positrons. He completed his PhD at the University of Adelaide. During his career he has had appointments at the University of Münster, Germany, the Flinders University of South Australia and Murdoch University in Western Australia. In 1996, he was awarded the BOAS medal for Physics. He is a Fellow of the Australian Institute of Physics and the American Physical Society.



Professor Dr Annemie Adriaens

Annemie Adriaens graduated with a PhD in Analytical Chemistry in 1993 from the University of Antwerp (Belgium), where she was involved in the optimization of new technologies for inorganic micro and trace analysis. In 2001 she became professor in Analytical Chemistry at Ghent University (Belgium) where she leads the research group "Electrochemistry and Surface Analysis". Research involves, amongst other projects, the use of electrochemical techniques for monitoring and treatment of corroded metallic objects. The experiments are performed using spectroelectrochemistry, allowing the simultaneous treatment/monitoring and analysis of the metal surface. She was chair of COST Action G8 "Non-destructive Analysis and Testing of Museum Objects" (2001-2006) and is vice-chair of COST Action D42 "Chemical Interactions between Cultural Artefacts and Indoor Environment".



Professor Gordon Drake

Gordon W.F. Drake, FRSC is a University Professor of Physics at the University of Windsor, Canada, and the current Editor of Physical Review A. He is a past Chair of the DAMOP Division of the American Physical Society, 1996-7, and a past President of the Canadian Association of Physicists, 2000. He received his B.Sc. degree from McGill University, 1964, M.Sc. from the University of Western Ontario, 1965, and Ph.D. from York University, 1967. He has published 195 refereed research papers, and is widely cited for his high precision calculations for two- and three-electron atoms, including relativistic and quantum electrodynamic effects. He has received numerous prizes and awards for his work, including a Killam Fellowship (1990-92), and the Canadian Association of Physicists Medal for Achievement in Physics, 1994.



Professor Don McNaughton

Don McNaughton is an Australian Professorial Fellow and director of the centre of Biospectroscopy based in the school of chemistry, Monash university. After completing a PhD in microwave spectroscopy of transient species at Monash University and an SERC post doctoral fellowship at Sussex University in transient species and astro-chemistry he was appointed to the academic staff at Monash chemistry in 1988. There he has pursued interests in high resolution infrared spectroscopy and more recently in the area of biospectroscopy. His current major program of research involves developing Raman and infrared micro-spectroscopy and imaging techniques to understand and follow biological processes and disease at a molecular level. Since 2002 this has involved considerable use of IR microscopy beamlines at Daresbury (UK), Singapore, Taiwan, Saskatchewan (Canada) and more recently the Australian synchrotron to study processes in single cells and in tissue. A research program involving the development of high resolution IR and microwave techniques to understand the spectroscopy of astrophysical and atmospheric molecules also makes heavy use of the far-IR beamline at the Australian synchrotron.



Dr Eric Dooryhee

Eric Dooryhee is a Senior Scientist at the Neel Institute (CNRS Grenoble, France). Prior to this appointment in 2001 he was beamline scientist at ID31, Grenoble, France, Associate Scientist at CIRIL, CNRS, Caen, France and undertook post-doctoral work (1988-1989) at SRS Daresbury, UK. His on-going research began in the late 1990's when he pioneered work on archaeological objects using synchrotron X-ray techniques, through a collaborative project with the C2RMF Research Facility at Le Louvre. Since then, there is an increased interest in the study of objects that are part of our cultural heritage. Part of Dr Dooryhee's current research is also concerned with the study of strain and diffusion gradients in epitaxial thin films and superlattices of functional oxides (high-K, ferroelectrics, relaxors). Another of his projects - described as XED, QNS, UV-vis, IR, Raman, molecular modelling - aims at understanding and functionalizing photo-active and chromophore hybrid materials : pigments, optical memories, sensors.



Dr Pieter Glatzel

Pieter Glatzel studied physics at the Universities of Mainz and Hamburg/Germany. During his PhD he worked at the University of California at Davis and the Lawrence Berkeley National Laboratory. After a post-doctoral stay at the University of Utrecht he went to the European Synchrotron Radiation Facility (ESRF) where he is now developing photon-in-photon-out spectroscopies.



Professor John J. Rehr

John J. Rehr received a Ph.D. in Theoretical Condensed Matter Physics from Cornell University in 1972 working with Prof. N. D. Mermin. A NATO postdoctoral fellowship at King's College London (1972-73), and a postdoctoral appointment with Prof. W. Kohn at University of California, San Diego, (1973-1975) followed. In 1975, Rehr joined the Department of Physics at the University of Washington. Rehr has held visiting appointments at Cornell University (1986-88) working with Prof. K. Wilson, and at Lund University (1994) with Prof. Lars Hedin. Rehr is also a Consulting Professor at the Stanford Synchrotron Radiation Lightsource, Co-coordinator of the DOE Computational Materials Science Network, and head of the Theoretical X-ray Beamline of the European Theoretical Spectroscopy Facility (ETSF). Rehr's research specialties are in condensed matter theory, with major interests in excited state electronic structure and the theory of x-ray and electron spectra. His group is especially known for the development of the FEFF codes for x-ray and electron spectra, and was recognized by the International XAFS Society Outstanding Achievement Award in 2006.



Dr John Seely

John Seely is Research Physicist at the Naval Research Laboratory and is Head of the UV and X-Ray Spectroscopy Section. He performs research in the areas of EUV and X-ray spectroscopy of laboratory and solar plasmas with applications to the diagnosis of the plasma properties. His work on laboratory plasmas includes the study of high-resolution EUV and x-ray spectra from laser-produced plasmas, energetic discharges, and tokamak plasmas. His work on solar plasmas includes the analysis of high-resolution spectra and images from the *Hinode*, *SOHO*, *Yohkoh*, and *Skylab* spacecraft. He operates the NRL beamline X24C at the National Synchrotron Light Source, Brookhaven National Laboratory. He is the author or co-author of 230 papers in refereed scientific journals and holds 6 patents in EUV and x-ray technology. He is Fellow of the American Physical Society and the Optical Society of America.



Associate Professor Martin Feiters

Martin Feiters graduated in biochemistry, bio-organic chemistry and food chemistry at the University of Utrecht (The Netherlands). For his PhD he worked on the structure-function relationship of the enzyme lipoxygenase at the University of Utrecht and Chalmers Technical University (Gothenburg, Sweden). He subsequently did postdoctoral work in X-ray absorption spectroscopy at the Daresbury Laboratory and the University of Manchester (UK). He was appointed Associate Professor of Bio-organic Chemistry at the Radboud University, Nijmegen (The Netherlands) in 1989.



Professor Mohamed Gomaa

Professor Mohamed Ahmed Mahmoud Gomaa has been a member of the International Radiation Physics Society since its formation. He is also the Egyptian Representative to UNSCEAR since 1996, a UNSCEAR reporter for the current session, a member of Society of Radiological Protection, a certified Radiation Protection Expert, a member of the Health Physics Society, a member of IRPA International, President of IRPA-Egypt IRPA affiliate society, a member of American Nuclear Society, Project coordinator in Occupational Exposure, a member of WHO (group dealing with global initiatives in radiation safety for health care sittings) as well as a member of the British Institute of Physics. Mohamed also has current connections with Regional Africa, the Arab World and to Egypt in particular. He has also represented Egypt at IAEA activities in radiation protection matters since 1969. His previous memberships include IAEA project coordinator for AFRA medical physics - till 2005, and IRPS Vice President for Africa and Middle East as well as being a candidate for the post of IRPS Vice President for Africa and Middle East (2009-2012).



Dr Paul Dumas

Paul Dumas is a Director of Research, at the CNRS (Centre National Recherche Scientifique) in France, and presently works at the French Synchrotron facility SOLEIL (France). He is a physicist, who works for several years on surface science vibrational spectroscopy. He did a two year post doctoral stay at University of Berkeley (California) with Prof. P.A. Richards. Then, he worked on ideally hydrogen terminated Si(111) surfaces, in close collaboration with Dr. Y. J. Chabal, from ATT Bells Labs. In the 90's, he collaborated closely with G.P. Williams, at the National Synchrotron Light Source, at Brookhaven, to study the far infrared surface modes, and the vibrational dynamics at metallic surfaces, using the synchrotron source. Dr. Dumas initiated also several studies in infrared microscopy using the synchrotron source. He promoted this analytical technique in France, at LURE, where he was responsible for the design and construction of an infrared microscope beamline at LURE, the French National Synchrotron Center, until its closing in December 2003. He has contributed to the design of a synchrotron infrared beamline at ESRF (the European Synchrotron Radiation Facility). Presently, Dr. Dumas is responsible for the design and construction of an infrared beamline at SOLEIL, and in charge of the related-scientific activity and animation. His research program, apart from surface science, includes studies of individual cells in biology, geological inclusions, astrophysics, soft matter and archeology. He is also a member of several scientific advisory committees and program review committees of synchrotron facilities around the world.



Dr Yves Joly

Researcher for 23 years Dr Joly's first efforts lay in the study of surfaces, both experimentally and theoretically, by low energy electron diffraction and low energy positron diffraction. For the last 12 years, his main investigations have been theoretical and computational studies of X-ray Absorption Spectroscopy, especially near to the absorption edges and with anomalous diffraction. In particular, he has developed the FDMNES code (Finite Difference Method for Near Edge Structure) which overcomes the intrinsic limitations of muffin-tin potential codes. This understanding has been applied to the study of oxides, especially relating to charge ordering, orbital ordering and spin ordering, which are not easily amenable to other available techniques. This work has led to many applications both from his group and from other groups which have used this methodology. At the Institut Néel, CNRS and UJF, Grenoble, his present work concerns new theoretical developments in order to include multi-electronic aspects in the photo-absorption process.



Professor Soichi Wakatsuki

Dr Wakatsuki is Director of Photon Factory, a national synchrotron radiation facility, and Structural Biology Center of KEK, Tsukuba, Japan. He will speak on medical applications and biology.



Professor Liming Chen

Prof Liming Chen received his PhD. in Physics in 2000 from the Institute of Physics and lab of Optical Physics, Chinese Academy of Sciences (CAS), Beijing. He will speak on high-brightness table-top laser sources for high-energy radiation and advanced medical physics.

Professor Isabella Ascone

Prof Isabella Ascone will speak on biomedical analysis.

Vice President's Report, North America

William L. Dunn

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Obviously, the situation in North America is not as good as it was when I wrote the last report, about half a year ago. The global recession has created a credit crunch, and this will undoubtedly slow the presumed resurgence of

nuclear power in North America. Also clouding the picture is the change of administrations. The Republican Bush administration openly endorsed nuclear power whereas many are uncertain how the Democratic Obama administration will proceed.

Nevertheless, all news is not bad on that front. Utilities are continuing to request license extensions and plan power uprates of existing plants, and work is progressing on some new plants. For instance, Exelon has requested a 20-year license renewal for the 650-MWe Oyster Creek boiling water reactor, located in New Jersey. Also, the Omaha Public Power District voted, in February 2009, to authorize contracts to make upgrades to raise power by 14% at its existing Fort Calhoun plant in Nebraska. NRC approval will be required before the upgrades can be completed. In addition, the Tennessee Valley Authority is working to finish a new power reactor, Watts Bar-2, in Tennessee. Watts Bar-2 is a Gen 2 reactor whose construction was stopped in 1988, due

at least partially to the reduction in electricity demand. In 2007, TVA approved completion of the unit and construction resumed on October 15, 2007. The reactor is expected to come on-line in 2013. Several other plants in the U.S. are in various stages of licensing.

Many Nuclear Engineering departments in the U.S. are seeing dramatic growth. The U.S. Nuclear Regulatory Commission, recognizing the need for nuclear trained personnel to design, build, operate, and regulate existing and new reactors, has set up competitive programs for faculty development and to encourage students to study nuclear engineering.

As I indicated in my last report, the Kansas State University TRIGA research reactor building was directly hit, on 11 June 2008, by a tornado, which inflicted considerable damage to roof panels on the reactor bay. The reactor itself was unharmed and the fact that the building withstood the tornado as well as it did was actually a public-relations success. The building was temporarily repaired so that intermittent reactor operation could continue. I am happy to report that early this year professional repair of the roof structure was completed and the reactor is now able to operate normally.

Classic Paper Reprint

From time to time The Bulletin may reprint classic papers in radiation physics. In the case of the selection below, the authors did not get everything right, but it was a big step in the right direction; thus is the tortuous path of progress. Here is an introduction of the topic of cosmonucleogenesis from Wikipedia followed by the famous "abg" paper from the Physical Review:

http://en.wikipedia.org/wiki/George_Gamow :

"George Gamow produced an important cosmogony paper with his student Ralph Alpher, which was published as "The Origin of Chemical Elements" (Physical Review, April 1, 1948). This paper became known as the Alpher-Bethe-Gamow theory. (Gamow had added the name of Hans Bethe, listed on the article as "H. Bethe, Cornell University, Ithaca, New York" (who had not had any role in the paper) to make a pun on the first three letters of the Greek alphabet, alpha beta gamma.)

"The paper outlined how the present levels of hydrogen and helium in the universe (which are thought to make up over 99% of all matter) could be largely explained by reactions that occurred during the "big bang". This lent theoretical support to the big bang theory, although it did not explain the presence of elements heavier than helium (this was done later by Fred Hoyle).

In this paper, no estimate of the strength of the present day residual cosmic microwave background radiation (CMB) was made. Shortly thereafter, Ralph Alpher and Robert Herman predicted that the afterglow of the big bang would have cooled down after billions of years, filling the universe with a radiation five degrees above absolute zero.

"Gamow published another paper in the British journal Nature later in 1948, in which he developed equations for the mass and radius of a primordial galaxy (which typically contains about one hundred billion stars, each with a mass comparable with that of the sun).

"Astronomers and scientists did not make any effort to detect this background radiation at that time, due to both a lack of interest and the immaturity of microwave observation. Consequently, Gamow's prediction in support of the big bang was not substantiated until 1964, when Arno Penzias and Robert Wilson made the accidental discovery for which they were awarded the Nobel Prize in physics in 1978. Their work determined that the universe's background radiation was 2.7 degrees above absolute zero, just 2.3 degrees lower than Gamow's 1948 prediction."

The article from Physical Review, Vol 13, No 7 (April 1, 1948) is on the following page :

Letters to the Editor

PUBLICATION of brief reports of important discoveries in physics may be secured by addressing them to this department. The closing date for this department is five weeks prior to the date of issue. No proof will be sent to the authors. The Board of Editors does not hold itself responsible for the opinions expressed by the correspondents. Communications should not exceed 600 words in length.

The Origin of Chemical Elements

R. A. ALPHER*

Applied Physics Laboratory, The Johns Hopkins University,
Silver Spring, Maryland

AND

H. BETHE

Cornell University, Ithaca, New York

AND

G. GAMOW

The George Washington University, Washington, D. C.

February 18, 1948

AS pointed out by one of us,¹ various nuclear species must have originated not as the result of an equilibrium corresponding to a certain temperature and density, but rather as a consequence of a continuous building-up process arrested by a rapid expansion and cooling of the primordial matter. According to this picture, we must imagine the early stage of matter as a highly compressed neutron gas (overheated neutral nuclear fluid) which started decaying into protons and electrons when the gas pressure fell down as the result of universal expansion. The radiative capture of the still remaining neutrons by the newly formed protons must have led first to the formation of deuterium nuclei, and the subsequent neutron captures resulted in the building up of heavier and heavier nuclei. It must be remembered that, due to the comparatively short time allowed for this process,¹ the building up of heavier nuclei must have proceeded just above the upper fringe of the stable elements (short-lived Fermi elements), and the present frequency distribution of various atomic species was attained only somewhat later as the result of adjustment of their electric charges by β -decay.

Thus the observed slope of the abundance curve must not be related to the temperature of the original neutron gas, but rather to the time period permitted by the expansion process. Also, the individual abundances of various nuclear species must depend not so much on their intrinsic stabilities (mass defects) as on the values of their neutron capture cross sections. The equations governing such a building-up process apparently can be written in the form:

$$\frac{dn_i}{dt} = f(t)(\sigma_{i-1}n_{i-1} - \sigma_i n_i) \quad i = 1, 2, \dots, 238, \quad (1)$$

where n_i and σ_i are the relative numbers and capture cross sections for the nuclei of atomic weight i , and where $f(t)$ is a factor characterizing the decrease of the density with time.

We may remark at first that the building-up process was apparently completed when the temperature of the neutron gas was still rather high, since otherwise the observed abundances would have been strongly affected by the resonances in the region of the slow neutrons. According to Hughes,² the neutron capture cross sections of various elements (for neutron energies of about 1 Mev) increase exponentially with atomic number halfway up the periodic system, remaining approximately constant for heavier elements.

Using these cross sections, one finds by integrating Eqs. (1) as shown in Fig. 1 that the relative abundances of various nuclear species decrease rapidly for the lighter elements and remain approximately constant for the elements heavier than silver. In order to fit the calculated curve with the observed abundances³ it is necessary to assume the integral of $\rho_0 dt$ during the building-up period is equal to 5×10^4 g sec./cm³.

On the other hand, according to the relativistic theory of the expanding universe⁴ the density dependence on time is given by $\rho \propto 10^t/\beta$. Since the integral of this expression diverges at $t=0$, it is necessary to assume that the building-up process began at a certain time t_0 , satisfying the relation:

$$\int_{t_0}^{\infty} (10^t/\beta) dt \leq 5 \times 10^4, \quad (2)$$

which gives us $t_0 \leq 20$ sec. and $\rho_0 \leq 2.5 \times 10^6$ g sec./cm³. This result may have two meanings: (a) for the higher densities existing prior to that time the temperature of the neutron gas was so high that no aggregation was taking place, (b) the density of the universe never exceeded the value 2.5×10^6 g sec./cm³ which can possibly be understood if we

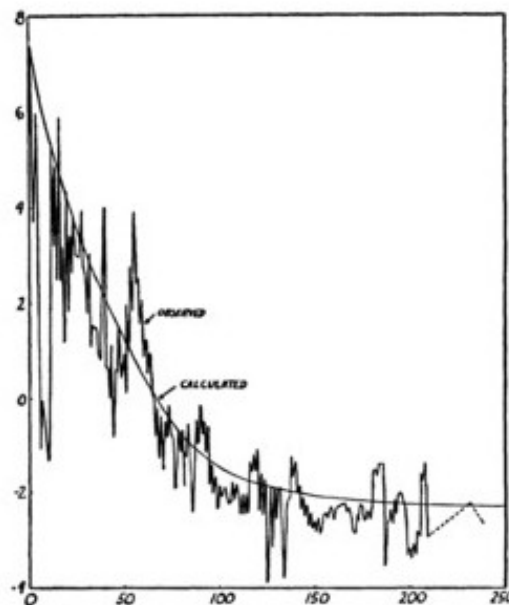


FIG. 1.
Log of relative abundance
Atomic weight

..continued

use the new type of cosmological solutions involving the angular momentum of the expanding universe (spinning universe),⁶

More detailed studies of Eqs. (1) leading to the observed abundance curve and discussion of further consequences will be published by one of us (R. A. Alpher) in due course.

* A portion of the work described in this paper has been supported by the Bureau of Ordnance U. S. Navy, under Contract NOrd-7386.

¹ G. Gamow, *Phys. Rev.* **70**, 572 (1946).

² D. J. Hughes, *Phys. Rev.* **70**, 106(A) (1946).

³ V. M. Goldschmidt, *Geochemische Verteilungsgesetz der Elemente und der Atom-Arten*. IX. (Oslo, Norway, 1938).

⁴ See, for example: R. C. Tolman, *Relativity, Thermodynamics and Cosmology* (Clarendon Press, Oxford, England, 1934).

⁵ G. Gamow, *Nature*, October 19 (1946).

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The IRPS Poster and an accompanying leaflet, describing the activities of the Society, is posted on the website <http://www.canberra.edu.au/irps>. The members of IRPS are encouraged to distribute the poster and the leaflet at their home institutions and at meetings; in correspondence with colleagues and whenever possible, for promoting the Society.

The poster, which originally was designed by Dan Jones, is now the responsibility of Leif Gerward. Suggestions for improving the promotional material are most welcome. Please, send your comments to the e-mail address :

gerward@fysik.dtu.dk

(The poster was included in the December 2007 issue)

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If you have any queries or problems contact :

Professor Malcolm Cooper
Department of Physics, University of Warwick
Coventry CV4 7AL, U.K

email : m.j.cooper@warwick.ac.uk

Calendar

2009

September 21 - 27 : ISRP-11

11th International Symposium on Radiation Physics
University of Melbourne, Melbourne, Australia

For further information :
Chris Chantler : chantler@ph.unimelb.edu.au or David Bradley : d.a.bradley@surrey.ac.uk

Details on pages 4 -15 of this Bulletin

October 12 - 16 : NEUDOS-11

11th Neutron and Ion Dosimetry Symposium
iThemba LABS, Cape Town, South Africa

For further information : Neudos11@tlabs.ac.za

Details on Page 17 of April Bulletin

2010

November 26 - 30 :

10th Radiation Physics and Protection Conference
Al-Menia University, Al-Menia, Egypt

Early Announcement

For further information :

Dr Mohamed Gomaa
Conference Scientific Secretary
3 Ahmed El Zommer St
Nasr City, Cairo, Egypt

Fax : 002-02-22728813

Email : radmedphys@yahoo.com

Web site : www.rphysp.com

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) and ISRP-11 will be in Melbourne, Australia in 2009. 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. D.A. Bradley, (IRPS Secretary),
Centre for Nuclear and Radiation Physics, Department of Physics, School of Electronics and Physical Sciences
University of Surrey, Guildford, Surrey GU2 7XH, U.K.
Phone : +44 1483 683771 email: d.a.bradley@surrey.ac.uk

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

INTERNATIONAL RADIATION PHYSICS SOCIETY

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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.

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email: farquhm@mcmaster.ca

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(Signature)

(Date)