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FROM THE EDITOR

Dudley Creagh

First - let me congratulate Professor Ladislav Musilek on the success of the ISRP-8 Meeting which was held in Prague in June. The conference was a success in every possible way: good science, beautiful city, gracious hosts, good fellowship…. John Hubbell writes in some detail on the meeting, in this issue.

As you will see, there have been changes in the officeholders of the IRPS. We welcome Malcolm Cooper as the new President, and say vale and "well done" to Bikash Sinha, the retiring President.

I shall gradually cease existence as Editor, and be replaced by Mic Farquharson by the middle of next year. Shirley McKeown, who has been my "right hand man" for many years, will continue on the Editorial Board, and I shall remain in the shadows giving advice. We thank Suprakash Roy for the sterling work he has put into the maintenance of the Membership Records of the IRPS and for his continuing advice to the Editorial Board.

It is essential for the health of our society that as many people as possible occupy positions within its structure. It is just as important to recruit young people to our society and to foster their interests in all aspects of Radiation Physics.

We are trying to reach as many members as possible by electronic means because of the high cost of preparing hard copy versions and posting them. Please send Mic Farquharson your email address if you have not already done so .

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PRESIDENT'S COLUMN

Malcolm Cooper

This is by no means the first article that I have written for the IRPS Bulletin but it is the first time that I have had the honour to write under the above banner. For those of you who have not met me perhaps a few biographical details are in order (more science next time I promise you).

For longer than I dare to remember I have tried to use Compton scattering in order to study the motion of electrons in solids, using the Doppler broadening of the scattered radiation that was first exploited by J W DuMond. In fact his measurement of the momentum density of conduction electrons in beryllium was considered to be the first direct evidence for the then 'new' Fermi-Dirac statistics and possibly the most important paper in my field (Phys Rev 33, 643, 1929). Latterly my more feeble efforts have focussed on the study of spin density in ferromagnetic solids using high energy circularly polarized x-rays for the Compton experiment and conventional energies for x-ray diffraction experiments, which again require the special polarization properties of synchrotron radiation. This work has taken me around the world to synchrotron sites but especially to ESRF, Grenoble, where I have been involved in spending a lot of UK taxpayers' money by building a beamline. Fortunately Warwick University, which has employed me for 30 years, takes an enlightened view of all the travelling as long as I can find enough hours in the week to fit in all the teaching!

I was invited to become involved with IRPS two decades ago by Daphne Jackson, who was the first female professor of Physics in the UK.

I helped to organize our ISRP meetings in Dubrovnik (1991) and Rabat (1994) and the publication of their proceedings, as I shall be doing for Cape Town in 2003 together with Dudley Creagh and Dan Jones.

I delight in the diversity of our radiation physics community, the way it is reflected in our symposia and the lateral thinking that it encourages. On the other hand I am mindful of the need to compete for your attention with the 'professional' societies whose tighter focus perhaps provide more compelling reasons for membership subscription.

As I am sure your are aware, we are not a rich society and we have deliberately chosen to encourage membership from developing countries by keeping those dues to what I trust are acceptably low levels. Nevertheless many of the things that we would wish to do require money. We can add our endorsement to a regional meeting as so many words but we would like to be able to support it with bursaries to young scientists - that would be real sponsorship! Alas that is not possible unless we can attract more subscribing members and keep their renewals. At least we are cutting our costs by offering the Bulletin electronically. Mic Farquharson and Dudley Creagh, who are masterminding this transformation, are pleased to report that most of you who have been contacted have opted to receive the bulletin by email. This will be a tremendous help in reducing paper, printing and postage costs. If you have not already responded to their enquiry please do so as soon as possible, but rest assured that, if you do not have these facilities, you can still continue to receive the hard copy - just as long as your subscriptions are paid up!

Those of you who were in Prague will have received from me an email questionnaire soliciting your views on the symposia in particular and the society in general. If you have not replied yet (most of you have not!) please email me, or write to me with your views and, I promise you, we will consider all your suggestions and ideas for the future of the Society.

MEMBERS' PAPERS

Contribution of Patient Dose from Computed Tomography to Human Background Radiation Levels

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The current trend in the medical use of diagnostic x-rays is towards the increasing use of digital format images. Computed tomography (CT), however, has been with us clinically for almost 30 years and has had a very significant impact on diagnosis. It is less well known, outside of the area of medical physics, that CT is the biggest contributor of radiation dose to the population from diagnostic radiology1, which in itself far outstrips the contribution of other medical uses of radiation (such as radiation therapy) to background dose. Tables 1 and 2 show the magnitude and extent of effective doses in the UK, including CT. It is likely that data that are more current would show even higher doses attributable to CT.

The distribution of CT services is uneven as shown in Table 3 (the author would be grateful for any data from other countries) and suggests that clinical constraint may lead to a population reducing dose in some instances. The dose per CT slice could be shown to vary from machine to machine, however it has not reduced appreciably (if at all) over the last 30 years. The advent of continuous patient scanning (so called helical CT as opposed to discrete slice acquisition) has led to an increase in the number of slices per patient. The even more recent introduction of multi-slice (or volume) CT, delivering reduced patient scan time, has given mixed preliminary indications of patient dose when compared to similar previous machines2.

If one looks at the detector efficiency, one sees that with detector quantum efficiency (DQEs) of >90% that the key to dose reduction is unlikely to lie in new detector efficiency. The high doses seem to be connected to attempts to reduce the image quantum noise levels, by increasing the photon flux at the detector, to allow better visualisation of small contrast structures.

While unnecessary high doses have been controlled in much film-based radiology, by regulatory standards relating to equipment performance and patient dose documentation, it is difficult to presently effect such controls in digitally based imaging equipment. Recent work has suggested that designs utilising feedback from detectors to the x-ray generator (as used in TV based x-ray fluorographic equipment) may have an impact inreducing dose3. However, the continued increase in the use of CT, and increasing newer available digital x-ray equipment in radiology poses a significant problem in terms of increasing population radiation levels. This is clearly highlighted in recent incidents of skin erythema doses from x-ray controlled cardiac catheter procedures4. It remains to be seen what attention is given this problem and how useful standards can be introduced and implemented to reverse the current trend of increasing population dose from medical diagnosis.

References

J.S. Hughes and M.C. O'Riordan, Report No. NRPB-R263, "Radiation Exposure of the UK Population - 1993 Review", 1993.

Table 1 : Typical patient effective dose for diagnostic procedures in UK (1995)[1]

Examination	mSv
Chest PA	0.017
Abdomen AP	0.7
Skull AP	0.03
Ba Enema	7.2
CT Head	3.5*
CT Abdomen	8.8*

* 1993

Table 2 : Contributions to the annual collective dose from medical X-ray examinations in the UK[1]

Examination	% frequency	% collective dose
Computed tomography	2.4	22
Lumbar spine	3.3	15
Barium enema	0.9	14
Barium meal	1.6	12
Intravenous urography	1.3	11
Abdomen	2.9	8
Pelvis	2.9	6
Chest	24.0	2
Limbs and joints	25.0	1.5
Skull	5.6	1.5
Thoracic spine	0.9	1
Dental	25.0	1
Others	4.2	5
Total	100	100
Annual collective dose from all procedures		20,000 man Sv

Table 3 : CT utilisation in the world

Country	scanners per 10^6 people	exams per 10^3 people
Australia	16-19 ('94)*	60 ('94)
Japan	69 ('95)	97 ('89)
USA	18 ('90)	52 ('90)
NZ	7 ('92)	21 ('92)
UK	6 ('93)	22 ('93)
Norway	16 ('93)	-
Italy	13 ('91)	-

* date of publication

REPORTS FROM MEMBERS

ICRU starts new activity - *Ines Krajacar Bronic*

Second International Workshop on EGS - *Suprakash Roy*

XEMID : Electron-Material Interaction Database - *Valentina Lazurik, Tatsuo Tabata and Valentin Lazurik*

Report on ISRP-8 - *John Hubbell*

Report on Triennial General Meeting of IRPS - *John Hubbell*

ICRU starts new activity

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International Commission for Radiation Units and Measurements (ICRU), having headquarters in Bethesda, MD, USA, has recently formed a new Report Committee that should prepare a new ICRU Report on "Elastic Scattering of Electrons and Positrons". As any other report committee, this one "plays a pivotal role in the accomplishment of the Commission's task - the development of reports which constitute a synthesis of the leading scientific thinking on matters of radiation quantities, units and measurements techniques and provide recommendations that represent an international consensus on these matters" [1].

The ICRU sponsors for the new report committee activity are Dr. Mitio Inokuti (Argonne National Laboratory, Argonne, IL, USA and ICRU) and Mr. Steven M. Seltzer (NIST - National Institute of Standards and Technology, Gaithersburg, MD, USA). The sponsors "serve a liaison function between the Commission and the report committee, keeping the Commission informed on report committee activities and making available to the report committee information on the views and actions of the Commission that affect the committee's work" [1]. As the Chairman of the Report Committee on Elastic Scattering of Electrons and Positrons, ICRU appointed Dr. Francesc Salvat (Faculty of Physics, University of Barcelona, Barcelona, Spain). The members of the committee were selected by the ICRU and the invitations to serve on the report committee were issued. Finally, after the proposed members accepted membership, the Report Committee was formed and started its activity. The members of the Report Committee are: Dr. Francesc Salvat (Chairman), Dr. Martin J. Berger (Bethesda, MD, USA), Prof. Dr. Aleksander Jablonski (Institute of Physical Chemistry, Polish Academy of Sciences, Warszawa, Poland), Dr. Ines Krajcar Bronic (Rudjer Boskovic Institute, Zagreb, Croatia), Dr. James Mitroy (Faculty of Science, Northern Territory University, Darwin, Australia), Dr. Cedric J. Powell (NIST, Gaithersburg, MD, USA) and Dr. Leon Sanche (Faculty of Medicine, University of Sherbrooke, Sherbrooke, Canada).

The first constitutional meeting of the Report Committee on Elastic Scattering of Electrons and Positrons was held in ICRU Headquarters in Bethesda, MD, USA, on April 17 and 18, 2000. All the Report Committee members were present, as well as Mr. Seltzer as the ICRU sponsor. During the meeting the proposed outline of the report was modified and the objectives and scopes of the report have been elaborated. Calculated data for atoms will be given for energies above 100 eV, while experimental data for materials of interest (noble gases, Hg, Na, H_2O in gaseous, liquid and condensed phases, H_2, O_2, N_2, CH_4) will be presented in the whole available energy range for both electrons and positrons.

The Report Committee members agreed on the following outline:

1. Introduction (including nomenclature, application of data to be given in the Report, and scope of the report)
2. Experimental measurement methods (for atomic and molecular gases, for liquids and solids, and transport techniques)
3. Theoretical background (fundamentals of scattering theory, quantum theory, approximation methods, elastic scattering by molecules, scattering in the condensed phase, positron scattering, low-energy effects)
4. Calculations for atoms (self-consistent electron densities, numerical calculation methods, properties of the phase shifts, differential cross sections for atoms, high-energy factorization)
5. Experimental data (comparison of theoretical with experimental data, atomic and molecular gases, condensed phases)
6. Multiple-scattering angular deflections, and
7. Data presentation. Tabulated data from elastic cross sections for different materials will be provided on CDROM.

Individual tasks have been taken. The tentative time for the next meeting after accomplishment of the first phase of the work has been set for November 2000.

Reference:

1. ICRU: Guidance on the Preparation of ICRU Reports by Report Committees, ICRU/96/38, 1996.

Second International Workshop on EGS

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The Second Workshop on EGS was held at the Radiation Science Centre, KEK High Energy Accelerator Research Organization at Tsukubu in Japan from August 8 to 12, 2000.

The opening address was presented by W.R. Nelson, and the welcome address by K. Kondo in the inaugural session. The workshop was attended by 113 scientists from eight different countries including Japan. There were 16 oral and 17 poster presentations. Almost 90% of the papers presented were on the applications of EGS (Electron Gamma Shower) code in different areas of radiation physics such as health physics, medical physics, aceelerators, detectors and material analysis.

The future improvement of the EGS code (to be known as EGS5), a re-write of the earlier version of EGS4 code, is under way using modern photon and electron transport algorithms, and deploying them in modern computer language like C++ was emphasised. The use of this code with the object-oriented interface was also discussed in the workshop. The aim of the project is to simplify and integrate the geometry/ scoring aspects of the EGS process using modern object-oriented visual user interface (VUI). The EGS5+VUI package will allow users to solve independent problems by run-time linking of the EGS5 code with VUI-generated libraries that encapsulate the geometry and scoring aspects of each problem. The complete package is expected to be released by the end of 2001. This is a welcome proposal and all user scientists of this code are waiting to receive the new package. An interesting lecture involving science, technology and society issues of EGS code was also delivered in the workshop. The concluding remarks presented by Alex Bielajew were very entertaining.

EMID : Electron-Material Interaction Database

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Tatsuo Tabata

Institute of Data Evaluation and Analysis and Osaka Prefecture University
Sakai, Osaka, Japan

Valentin Lazurik

Kharkov National University
Kharkov, Ukraine

Using empirical formulas and algorithms developed by Tabata et al., this database carries out calculations on the client-side computer, and provides the user with plots and numerical data of quantities related to the passage of fast electrons through thick layers of matter. Plane-parallel electron beams of energies mainly in the region from 0.1 to 20 MeV incident on various materials are considered. The quantities treated are energy deposition, primary-charge deposition, transmission and backscattering coefficients and ranges by different definitions.

EMID also allows the user to compare the curves of the quantities, for example, as a function of absorber depth, between different incident electron energies or different absorber materials. Thus the database would be useful in getting not only an insight into the general trends of the interactions of electrons with matter but also quick evaluation of the effects of electron irradiation in such applications as materials modification, food preservation and sterilization of medical products.

This database has been developed by using the modern Web technology, has friendly interface and is accessible also by users not possessing special knowledge in the areas of computer technologies and the passage of radiation through matter.

The Web database EMID is available at the following URLs:

http://www3.ocn.ne.jp/~ttabata/emid/Welcome.htm

and

http://univer.kharkov.ua/rdg/emid/Welcome.htm

REPORT ON THE 8th INTERNATIONAL SYMPOSIUM ON RADIATION PHYSICS

(ISRP-8)

Prague, Czech Republic, June 5 - 9, 2000

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The Conference **Papers presented** **Poster Competition** **Epilogue and Pictorial Summary**

The 8th International Symposium on Radiation Physics (ISRP-8) was held in the picturesque and historic city of Prague, at the Faculty of Nuclear Sciences and Physical Engineering (FNSPE) of the Czech Technical University (CTU) in Prague. This University is the oldest non-military technical higher education institution in Europe, having been founded by Royal Decree in 1707. An even much longer tradition of academic life in Prague exists, dating back to the founding of Charles University in 1348. For centuries, Prague has been at the crossroads of ideas, culture and art in the heart of Europe, and was a particularly fitting venue for the year-2000 millennium-opening convocation of this triennial series of Symposia which provide a crossroads and cross-fertilization for many otherwise-compartmentalized scientific, medical and engineering disciplines. The conference was held under the patronage of Mr. Milos Zeman, the Prime Minister of the Czech Republic, and is included in the programme of "Prague - European City of Culture 2000."

ISRP-8 drew 160 registered participants from 39 countries representing all parts of the globe. 25 oral plenary invited papers were presented by researchers from 17 different countries, and 149 contributed papers were presented by poster, representing 36 different countries. The presentations as usual offered a broad spectrum of stimulating and mind-stretching topics from the diverse scientific, technological, medical and other fields having in common the interdisciplinary crossroads of radiation physics.

The proceedings (invited papers, plus summaries of the contributed papers) will again be published in the *Elsevier/Pergamon journal Radiation Physics and Chemistry (RPC).* Representing the journal and Elsevier/ Pergamon (Amsterdam) in the ISRP-8 commercial exhibits, and underscoring the editorial and other connections between RPC and the IRPS/ISRPs were *Publishing Editor Laura ter Haar and Marketing Manager Mary McAdam*.

This Symposium, ISRP-8, was a sequel to previous Symposia held in Calcutta (ISRP-1, 1974), Penang (ISRP-2, 1982), Ferrara (ISRP-3, 1985), São Paulo (ISRP-4, 1988), Dubrovnik (ISRP-5, 1991), Rabat (ISRP-6, 1994), and Jaipur (ISRP-7, 1997). Following ISRP-8, the next triennial Symposium (ISRP-9) is planned to be held in Cape Town, South Africa, October 27-31, 2003.

The ISRP-8 Symposium was organized as a cooperative effort between the International Radiation Physics Society (IRPS) and the Faculty of Nuclear Sciences and Physical Engineering of the Czech Technical University in Prague. Special thanks are due to the Czech Energy Company (CEZ) for financial support, and to the management and staff of Faculty of Nuclear Sciences and Physical Engineering for administrative and technical support.

The ISRP-8 Local Organizing Committee consisted of

Ladislav Musílek (Chairman),
Tomás Cechák (Co-Chairman),
L. Vrána (Treasurer),
D.Barbasová, L. Cerná,
A. Daríckova,
D. Drábová,
M. Dufková,
F. Klik,
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J. Losinská,
J. Niederlová,
Z. Prouza,
V. Spevácek,
L. Skoda,
M. Smejkalová,
L. Thinová,
K. Turek.

The ISRP-8 International Programme Committee consisted of

David A. Bradley (U.K., Chairman)
L. Musílek (Czech Republic, Co-Chairman)
M. Chudy (Slovakia)
M. Cooper (U.K.)
D. Creagh (Australia)
L. Gerward (Denmark)
V. Hnatowicz (Czech Republic)
Z. Janout (Czech Republic)
K. Kearfott (USA)
R. Keddy (South Africa)
J. Niederle (Czech Republic)
D. Nikodemová (Slovakia
A. Paschoa (Brazil)
R. Pratt (USA)
J. Sabol (Czech Republic)
Y. Tsipenyuk (Russia)

The above working committees were assisted in a variety of ways, including general promotion of the Symposium, by the ISRP-8 International Advisory Board consisting of :

D. Berenyi (Hungary),
J. Dobes (Czech Republic),
W. Gilboy (U.K.),
D. Jones (South Africa),
L. Makovicka (France),
I. Nascimento (Brazil),
F. Rustichelli (Italy),
M. Berrada (Morocco),
B. Dörschel (Germany),
F. Hezoucky (Czech Republic),
A. Ljubicic (Croatia),
D. Nagel (USA),
F. Pazdera (Czech Republic),
P. Sen (India),
A. Tsybin (Russia).
E. Casnati (Italy),
Y. Feng (People's Republic of China),
J. Hubbell (USA),
R. Mainardi (Argentina),
T. Nakamura (Japan),
J. Rotblat (U.K.),
C. Simáne (Czech Republic),

Following a sumptuous welcoming reception Sunday evening, June 4, generously prepared by *FNSPE staff members*, in the halls and on the rooftop of the Faculty of the Nuclear Sciences and Physical Engineering building, the conference was opened Monday morning June 5 at the historic and spacious Bethlehem Chapel which now serves as the ceremonial hall of the Czech Technical University in Prague. The Chapel was first built in 1391 for use by University-nominated preachers, one of whom was John Huss (about 1374-1415) who caused the Chapel in 1402 to become the center of the first great European reformation movement, predating the work of Martin Luther (1483-1546). The succeeding centuries saw the near-destruction of the Chapel, but in 1949-1954 it was reconstructed by the architect Jaroslav Fragner to correspond to its original appearance.

In this historic setting, accompanied by music from trumpeter *Frantisek Bílek and organist Václav Rabas*, key representatives of the IRPS, ISRP-8, the University and other institutions, marched into the Chapel and took their places in the seating on the platform. The Principal Organizer of the conference, *Ladislav Musílek* introduced the speakers, beginning with the IRPS President (1997-2000) *Bikash Sinha* who gave the main address, discussing radiation physics, the Society and its history and mission, and the goals of the Symposium. Other IRPS representatives sharing the platform were *Malcolm Cooper* who will be the IRPS President 2000-2003 and *David Bradley*, Chairman of the ISRP-8 Programme Committee.

Others on the platform included *Václav Havlícek* Professor and Vice-Rector of the CTU Prague (on behalf of the Rector *Prof. Witzany*) who gave the welcome from the University. *Miloslav Havlícek* (same last name but not related), Professor and Dean of the Faculty of Nuclear Science and Physical Engineering of CTU Prague in which the conference was held, gave the welcome from the Faculty. Further welcoming comments were given by *Marie Dufková*, MSc., as a representative of the Czech Energy Company as the sponsor of the Symposium. The Czech Energy Company operates the Dukovany Nuclear Power Plant (NPP), and is building the Temelin NPP which some of us visited (hard hat tour) as one of our stops on a post-congress 2-day tour of South Bohemia, arranged by the conference.

The Opening Ceremony concluded with Ladislav Musílek announcing the official opening of the Symposium. Later, Tuesday evening, we would return to the Bethlehem Chapel for the Symposium Concert offered by the *Bennewitz Quartet* composed of prize-winning students of the Faculty of Music at the Academy of Arts in Prague: *Jirí Nemecek (first violin), Stepán Jezek (second violin), Jitka Hosprová (viola) and Lukás Polák (violoncello).* The programme consisted of string quartet pieces by Leos Janácek (1854-1928), Ludwig van Beethoven (1770-1827) and Bedrich Smetana (1824-1884), much enjoyed by all.

For the second half of Monday morning, after the ISRP-8 Opening Ceremony, we all made our way on foot through the streets of Prague from the Bethlehem Chapel to the FNSPE of the CTU in Prague for the first of the technical sessions. The oral (invited paper) sessions were each co-chaired by two persons:

(1) M.J. Cooper (U.K.) and B. Sinha (India),
(2) L. Gerward (Denmark) and R.H. Pratt (USA),
(3) D.C. Creagh (Australia) and T. Nakamura (Japan),
(4) J.E. Fernandez (Italy) and J.A. Simmons (U.K.),
(5) F. Rustichelli (Italy) and R. Cherkauoi El Moursli (Morocco),
(6) D.T.L. Jones (South Africa) and A.Paschoa (Brazil),
(7) M.M. Lamoureux (France) and A. Tartari (Italy),
(8) R.J. Keddy (South Africa) and L. Musílek (Czech Republic),

(9) O.D. Gonçalves (Brazil) and M. Pardy (Czech Republic),
(10) Luo Zhengming (People's Republic of China) and A. Ljubicic (Croatia),
(11) T. Cechák (Czech Republic) and J.H. Hubbell (USA).

The ISRP-8 oral (invited) presentations, by session, were as follows:

(1) "Applications of Radiation for a Better Environment" by P.R. Danesi (Austria);
"Research Programme of the Nuclear Microprobe at the National Accelerator" by V.M. Prozesky et al. (South Africa);
"Environmental Monitoring and In Situ Gamma Spectrometry" by J. Kluson (Czech Republic).

(2) "Islands of Stability of Superheavy Elements" by Yu. Oganessian (Russia);
"Measurements of Double Beta Decay - Experiments TGV and NEMO" by I. Stekl (Czech Republic).

(3) "Search for Hadronic Axions" by M. Krcmar et al. (Croatia);
"Measurement of Rayleigh Scattering and Relativistic Calculations of Incoherent Scattering Functions" by S. Kahane (Israel).

(4) "Accelerators for Hadron Therapy" by A.J. Lennox (USA);
"Superheated Liquid and Its Place in Radiation Physics" by S.C. Roy (India);
"Review of Three-Dimensional Position Sensing Semiconductor Spectrometers" by G.F. Knoll et al. (USA).

(5) "Three-Dimensional Polymer Gel Dosimetry" by J. Novotny et al. (Czech Republic);
"Radiation-Based Security" by R.D. Speller (U.K.).

(6) "X-Ray Imaging Using the Radiation Diffracted by Polycrystalline Materials" by T. Wroblewski (Germany);
"Current Status of Parametric X-Ray Radiation Research" by A.V. Shchagin (Ukraine).

(7) "Optically Stimulated Luminescence Techniques in Retrospective Dosimetry" by L. Boetter-Jensen and A.S. Murray (Denmark);
"Radiation Doses at High Altitudes and During Space Flights" by F. Spurny (Czech Republic).

(8) "Large-Scaled Biomonitoring of Trace-Element Air Pollution: Goals and Approaches" by H.Th. Wolterbeek (The Netherlands);
"Radiation in Archeometry: Archeological Dating" by M. Martini (Italy);
"Dating Ancient Monuments by Nuclear Radiation" by C. Goedicke (Germany).

(9) "Chemical Analyses of Martian Soil and Rocks with Alpha Proton X-Ray Spectrometer on the Pathfinder Mission" by T.E. Economou (USA);
"Accelerator Mass Spectrometry: Ultrasensitive Analysis for Global Science" by C. Tuniz (Australia).

(10) "Uses of Neutron and X-Ray Beams to Investigate Magnetism" by S.W. Lovesey (U.K.);
"Residual Stress Evaluation by Neutron and Synchrotron Radiation" by A Lodini (France).

(11) "Advanced Imaging Techniques Based on Coherent Synchrotron Radiation" by A. Snigirev (France);
"The Super-Kamiokande Experiment" by K. Nishijima (Japan).

L. Boetter-Jensen (Denmark) presenting his talk
(Photo : J Hubbell)

The contributed (poster) papers for ISRP-8 focused on a menu of topical areas of radiation physics in the tradition of previous Symposia in this triennial series:

A. Fundamental Processes in Radiation Physics
B. Radiation Sources and Detectors
C. Radiation in Physical and Material Sciences
D. Radiation in Medicine and Biology
E. Radiation in Space, Earth and Environmental Sciences
F. Radiation in Archeometry and the History of Art
G. Radiation in Technologies and Industrial Applications

The following account describes the contributed (poster) papers presented at ISRP-8.

Under Topic A, **Fundamental Processes in Radiation Physics**, the 22 contributed papers covered a wide range of subtopics including: Calculation of proton stopping power for organic materials and water, near-zero minima in elastic photon-atom scattering, resolving discrepancies of atomic form factors and attenuation coefficients in the near-edge soft x-ray regime, new measurementsof the imaginary component of atomic form factors using synchrotron radiation for Si, Cu, Ag and Au, measurements in the x-ray regime verifying the dominance of Rayleigh scattering vs. thermal-diffuse and Bragg-Laue scattering, geometry effects on the fluorescence radiation field, nuclear excitation by positron annihilation with bound electrons in screened atomic potential, the mean-free-path of monochromatic hadronic axions, experimental determination of beta-decay endpoint energies, when radiation is not absorbed: photoionization matrix element zeros, measurements of a non resonant photoactivation cross-section for Cd-111, modeling and study of the Cherenkov effect, empirical evaluation of photoionisation for L3 magnetic sub states, total photon cross sections for low energy photons in light elements, incoherent scattering of 59.54 keV gamma rays in some rare earths at low momentum transfers, mechanism for nuclear excitation during positron annihilation using Coulomb wave functions, quantum field theory of laser acceleration, absolute-scale measurement of bremsstrahlung following photon absorption, measurement of Compton backscattering in Ge at 105.3 keV, ionization by photoabsorption and related radiative processes at high photon energies, M-shell satellite structure of W x-ray emission lines, and double-electron excitation above the Xe K-edge.

Under Topic B, **Radiation Sources and Detectors,** the 42 contributed papers included the subtopics: Thermoluminescence of a Ge-doped optical fibre, slot scintillation detector modelling for digital radiography, effect of encapsulating material on the peak-ratio response of TLD-300 irradiated with varying neutron energies, radiation effect on TL and EPR of pink beryl, HPGe detector photopeak efficiency calculation for cylindrical sources, efficiency calibration of Ge detectors for gamma spectrometry, a high power bremsstrahlung radiator for the production of monochromatic x rays, superheated drops of R114 as a neutron spectrometer, the super-ACO free electron laser source in the UV, improving tomographic images with a filtered projection in the real space, a new procedure for dose measurements in mixed high-energy electron and photon fields, a CdZnTe detector for space research, Monte Carlo calculation of resonance self-shielding factors for epithermal neutron spectra, x-ray Peltier cooled detectors for x-ray fluorescence analysis, ultra-

high precision gamma-ray spectroscopy, monoenergetic neutron sources below 100 MeV, electron-hole density dependence of plasma delay in Si surface barrier detectors, analytical method for bulk shielding calculation in a medium energy accelerator facility, database driven analysis for nuclides quantification by gamma spectra, analysis of rock-forming elements using portable neutron generators, experimental study of gas mixtures in strong non-uniform electric fields, and minimization of channel electron multiplier background counting rate.

Topic B continued with the subtopics: Thick-target bremsstrahlung for an innovative compact x-ray source, influence of synthesis on gamma irradiation dose response of A-type carbonated apatite, humidity effect on electret radon dosimeter accuracy, undulator linear accelerator as a generator of ribbon high power ion beams, radial behavior of non-steady neutron field from a 14-MeV n-generator for PNL standards, suitability of Peltier-cooled Si-PIN detectors in transmission experiments, a self time-of-flight neutron detector and its application to concrete and iron shielding experiments, deep penetration concrete and iron shielding benchmark experiment with an 800 MeV proton accelerator, investigation of some commercial TLD chips/discs as UV dosimeters, low level gamma counting for measuring NORM/TENORM with a radon reducing system, energy deposition in the plasma facing components of Ignitor, threshold temperature for gamma detection in superheated drop detector, neutron radiography system using Cf-252 neutron source, LET spectrometry with track-etched detectors, projectile dependency of radioactivities of spallation products induced in C, Al, Cu, Fe, Cr, Ni, and Pb, differences between signal currents for both polarities of applied voltages on cavity ionization chambers, a new type of multi-moderator neutron spectrometer, low-energy plasma neutron sources using laser-produced dynamic electrodes, activity distribution measurement of wires, and TL and EPR studies on mineral chrysocolla (dioptase).

Under Topic C, **Radiation in Physical and Material Sciences,** the 15 contributed papers included the subtopics: Measurement of amorphous materials porosity by gamma transmission methodology, interaction of photons with some solutions, evolution of induced point defects in Si, TL and ESR studies on natural petalite crystals, spin-dependent electron momentum densities in Co-2FeGa studied by Compton scattering, total attenuation coefficient measurements for four mixtures using 13 to 50 keV x rays, Monte Carlo transport of electrons and positrons through thin foils, effective Z of some polymers and other materials for photo effect at 59. 54 keV, photo induced optical changes in amorphous GaS thin films, TL property of Caspian seashore sand, moisture profile measurements of concrete samples in vertical water flow by gamma transmission method, electron spectra from a 200 keV beam penetrating polyurethane layers: EGS4 calculation and FTIR analysis, neutron diffraction measurements of residual stresses in metal matrix composite samples, calculation of gamma buildup factors for two-layer shields of water, concrete and iron and approximating formula, and the origin of diffraction peaks in x-ray fluorescence.

Under Topic D, **Radiation in Medicine and Biology,** the 13 contributed papers included the subtopics: Minimum detectable limits in bone mineral density measurements using an energy dispersive x-ray diffraction system, principles of applying Poisson units in radiology, interface dosimetry: measurements and Monte Carlo simulations of low energy photon beams, monitoring body iron burden using x-ray fluorescence, an XRF system for measuring trace element concentrations in breast tissue, evaluation of resolution contrast, scatter/primary ratio and grid performance in mammography using breast phantoms and human breast tissue, theoretical and experimental study of spectral distortion at the output of a medical-use accelerator, magnetically scanned proton therapy beams: rationales and techniques, health effects of ionizing radiation, 3-dimensional polymer gel dosimetry, use of Monte Carlo technique to optimize the dose distribution in total skin irradiation, a model for Monte carlo simulation of low angle photon scattering in tissues, and neutron transport in a clinical linac bunker: comparison of materials for reducing the photoneutron dose at the maze entrance.

Under Topic E, **Radiation in Space**, Earth and Environmental Sciences, the 29 contributed papers included the subtopics: Soil erosion survey in a small basin in the Parana State using Cs-137 methodology, Ge detector efficiency calculations for determination of 3-D radioactivity distributions, the NIEL concept for estimating the damage induced by particles and gamma rays in Si and GaAs, investigations and use of LR-115 track detector for radon measurements, radon retention and fission track annealing with temperature in natural apatites, atmospheric Kr-85 concentration growth in Gent between 1979 and 1999, uranium and radium in groundwater and surface water samples in Morocco, radiation exposure of airline crew members to the atmospheric ionizing radiation environment, gas filled prototype of a CdZnTe pixel detector, concentration of Po-210, Ra-226 and Ac-228 in non-siliceous environmental materials, TL probe for measurements of natural radiation in soil, Cs deposition in soil and its effects, natural sources of radioactivity as indicators of rocks' lithological and geochemical evolution and properties, physical and petrophysical laws of radiation fields in nuclear well logging, radon enriched spring waters from south Poland, environmental C-14 and H-3 activities: global trends and local contamination, a new site for Kr-85 measurements on groundwater samples, EDXRF determination of Pb in aerosol samples from Mexico valley, distribution of fallout Cs-137 in soils from Biscay (Spain) and the associated collective dose commitment, impact of surface disposal of Ra-226 contaminated gravel on the local radiation environment as monitored by TLD and charcoal canisters, relationship between short and long term radon measurements, the IMS radionuclide network of the CTBT, radioactivity of powdered milk produced at Londrina, Paraná State, Brazil, determination of hydraulic conductivity of undisturbed soil columns by gamma transmission, Th/U dating of marine

and continental mollusk shell and travertine samples in quaternary deposits in Morocco, studies of air pollution by biological indicators using 14 MeV neutron activation analysis, distribution of radionuclides in forest soils of varying pedochemistry, natural radionuclides in a eucalyptus forest located in the south of Spain, and instrumentation-software system of controllable well logging neutron generator AINK-36-Ts and its application in petroleum geology.

Under Topic F, **Radiation in Archeometry and the History of Art,** the 8 contributed papers included the subtopics: Mollusk shells dating by U-series method on Quaternary Moroccan seas level, analysis of fresco painting by XRF method, radioluminescence (RL) probe dosimetry using Al2O3:C for precise calibration of beta sources applied in luminescence dating, artifact reduction on CT images of fossils to allow 3D visualization, the CTU Prague laboratory of quantitative methods in historic monument research, automation of TL brick dating by ADAM-1, program for the evaluation of TL-brick dating: "ADAM-1-EVA," and ECOSP: an enhanced Compton spectrometer proposal for frescos inspection.

Under the final topic G, **Radiation Technologies and Industrial Applications,** the 20 contributed papers included the subtopics: Nucleargeophysical technologies in studying oil and gas fields, matrix characterization using synchrotron radiation x-ray diffraction, ways of providing hardening in magnetic field semiconductor sensors, evaluation of scatter-to-primary ratio in soil CT imaging, radiographic films as detector system for a CT-scanner, x-ray reflectivity and grazing incidence diffraction studies of the adhesion of protective wax coatings on metal surfaces, sulphur content measurement in coal by XRF method, the use of the characteristics method to solve the transport equation in unstructured geometries, use of thermal neutron tomography for the detection of drugs and explosives, radiolysis of HCN in heterogeneous phase, analysis of benchmark on the reactivity temperature coefficient using new libraries based on ENDF/B-VI (release 5) and JEF2-2 data, analysis of safety limits of the Moroccan TRIGA Mark II research reactor, neutron-based techniques for detection of explosives and drugs, information-measuring system of pulsed neutron log, x-ray tomographic imaging in industrial process control, new proposal for the fast energy amplifier using a spallation neutron source, isodose distributions and dose uniformity in the Portuguese gamma irradiation facility calculated using the MCNP code, measurement of electron/hole mobility in stabilized a-Se thin films as an x-ray imaging photoconductor using a modified time-of-flight apparatus, contribution of the Science and Technology Center in Ukraine (STCU) to nuclear safety and radiation technologies in the Ukraine, and the use of gamma radiation in fluid flow measurements.

An innovation at ISRP-8, organized by Anselmo Paschoa (Brazil),was a poster competition.

The winners were awarded pieces of Czech crystalware, and it is intended that their papers will be published in this Bulletin.

The prize for the best poster went to

A. Mishev (Bulgaria) and his co-authors, E. Duverger, L. Makovicka and J. Stamenov for their poster "Modelling and Study of the Cherenkov Effect."

Second prize was awarded to

F. Vaca, G. Manjón and M. García-León (Spain) for their poster "Natural Radionuclides in a Eucalyptus Forest Located in the South of Spain."

Third prize was awarded to

S. Schlenker, D. Degering, S. Unterricker and G. Raben (Germany) for their poster "Distribution of Radionuclides in Forest Soils of Varying Pedochemistry."

Poster 1st Prize winner
Alexander Mishev
with Bikash Sinha (left)
and
Anselmo Paschoa (centre)
(Photo : J Hubbell)

Poster 2nd Prize winner
Frederico Vaca
with Malcolm Cooper (left)
and
Anselmo Paschoa (right)
(Photo : J Hubbell)

Poster 3rd Prize winner
Sylke Schlenker
with Bikash Sinha (centre)
and
Anselmo Paschoa (right)
(Photo : J Hubbell)

Click here to continue to Epilogue and Pictorial Summary

Members' Reports | To ISRP-8 index | Main | IRPS General Meeting

International Radiation Physics Society

Triennial General Meeting

Prague, Czech Republic, June 5 - 9, 2000

John Hubbell

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The Triennial International Radiation Physics Society General Meeting was held June 9, 2000 at ISRP-8 in Prague, immediately following the final technical oral session. The meeting was chaired by the incoming IRPS President Malcolm Cooper. His closing remarks, in addition to his thanks to all who were involved in ISRP-8 just closed, centered on soliciting views of the attendees on the activities and goals of the Society. He mentioned his intention to send an e-mail questionnaire to all attendees, which has indeed already happened as I write this report. In particular, he floated the idea that the IRPS would try to sponsor "focused" (i.e., specialist) regional meetings at the time of the ISRPs and also in between. President Cooper also highlighted the need to disseminate the IRPS Bulletin by e-mail to all who could receive it by this mode, to avoid the crippling cost of postage which is now the major financial outlay of the Society. The decision of the IRPS Council to raise the 3-year dues for developed-country full members from $40 to $60, and commensurate raises for developing country and student members, was noted, except that dues paid before departing Prague would still be $40.

The results of the election of IRPS Officers and Councillors for the term 2000-2003 were announced :

President: **M.J. Cooper (U.K.)**

Secretary: **R.H. Pratt (USA)**

Treasurer: **A. Ljubicic (Croatia)**

Regional Vice Presidents:

Western Europe: **F. Rustichelli (Italy)**

Eastern Europe: **L. Musílek (Czech Republic)**

F.S.U.: **A.E. Shikanov (Russia)**

North America: **J.H. Hubbell (USA)**

South & Central America: **A. Paschoa (Brazil)**

South East Asia: **S.C. Roy (India)**

North East Asia: **Luo Zhengming (China)**

Africa & Middle East: **D.T.L. Jones (South Africa**)

Australasia: **D.C. Creagh (Australia)**

Councillors Elected: **M.J. Farquharson (U.K.)**

D. McLean (Australia)

L. Gerward (Denmark)

R.T Mainardi (Argentina)

W. Gilboy (U.K.) (for one term of three years to replace D. Creagh who would other-otherwise have had one remaining term as Councillor)

Councillors Continuing: **T. Nakamura (Japan)**

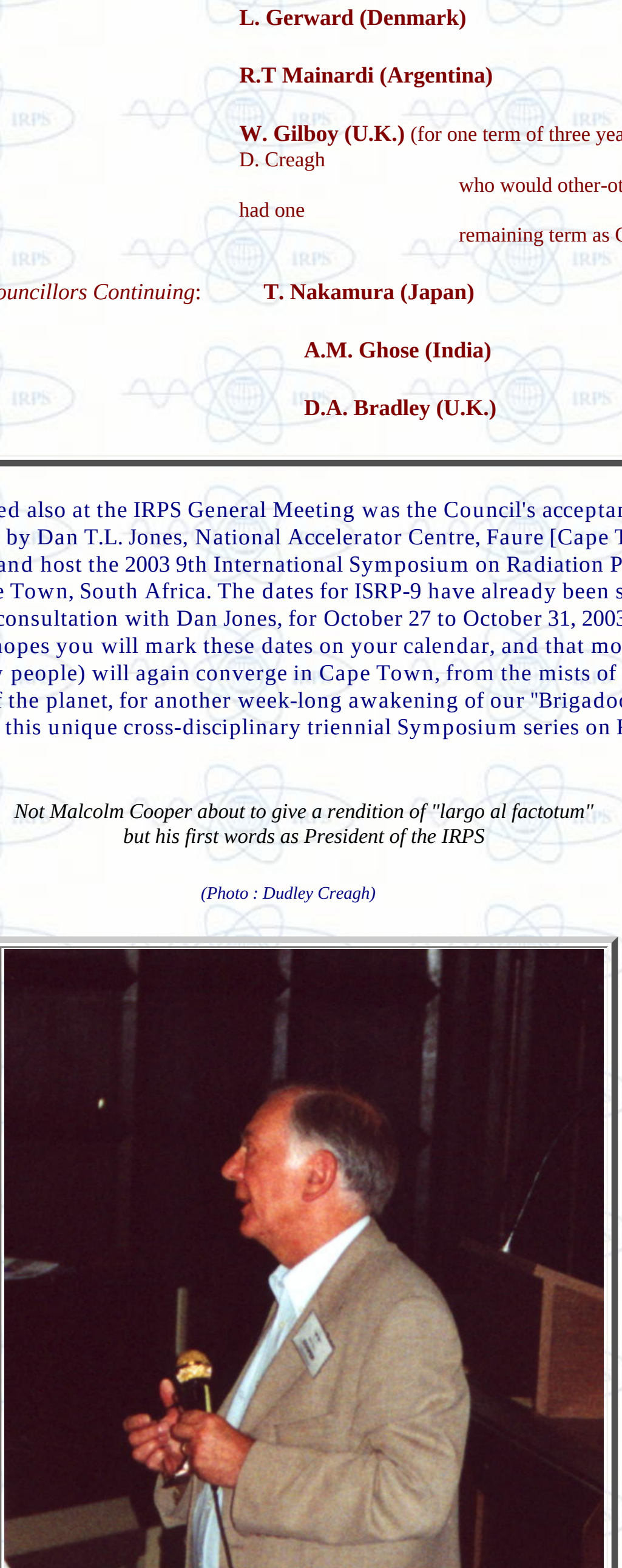
A.M. Ghose (India)

D.A. Bradley (U.K.)

Announced also at the IRPS General Meeting was the Council's acceptance of the invitation by Dan T.L. Jones, National Accelerator Centre, Faure [Cape Town] to organize and host the 2003 9th International Symposium on Radiation Physics (ISRP-9) in Cape Town, South Africa. The dates for ISRP-9 have already been set, by Council action in consultation with Dan Jones, for October 27 to October 31, 2003. This reporter hopes you will mark these dates on your calendar, and that most of you (and some new people) will again converge in Cape Town, from the mists of the far corners of the planet, for another week-long awakening of our "Brigadoon" in October of 2003 in this unique cross-disciplinary triennial Symposium series on Radiation Physics.

Not Malcolm Cooper about to give a rendition of "largo al factotum"
but his first words as President of the IRPS

(Photo : Dudley Creagh)



BOOK REVIEW - ***by Suprakash C Roy,*** Department of Physics,
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Trends in Atomic and Molecular Physics

Edited by Krishan K Sud and Upendra N Upadhyaya

(Kluwer Academic/ Plenum Publishers, 1999, 427pp. ISBN:0-306-46301-6
Price: US$155/ UK Pounds 107/ NLG 360).

This is a collection of 24 articles of current topics of the atomic and molecular physics contributed by distinguished scientists of the field originally presented as invited talks in the XII National Conference on Atomic and Molecular Physics held at Udaipur, India during 29th December 1998 to 2nd January 1999. Interest in the atomic and molecular physics has been revived recently and is again on the center stage of physics research essentially due to the recent advances in experimental sophistication and technology. Although ionization of atoms by electrons, photons and other particles constitutes the major part of this volume, important current research activities e.g. ultra short laser interactions with matter, inner shell ionisation, electron correlation, nano crystals, quantum optical resonance, trapped atoms, rydberg atoms, Bose-Einstein condensates etc. have taken their place in this volume. Although the conference has been called as a national conference, the participation and hence the contributions are international in nature (at least six contributions are from important research centres from abroad).

Due to limitation of space, it is not possible to discuss in details the articles published in the volume, but I am presenting below a glimpse of what the volume is all about (at least, I hope, it will be better than the table of contents of the book).

Under the laser-matter interactions, the paper "Intense, Ultrashort, Laser-Solid Interactions" (*Authors: Sudeep Banerjee, G. Ravindra Kumar and Lokesh Tribedi)* presented a simple and inexpensive method of estimating the absolute yield of x-rays from ultra short pulse excited metal plasma. It has also been emphasized the crucial role the photon statistics play in estimating the absolute yields.

In the paper "Intense-field Many-Body S-matrix Theory of Atomic and Molecular Processes in Femtosecond Laser Pulses" *(Authors: F.H.M. Faisal, A. Becker and J. Muth-Bohm),* IMST has been projected as an alternative tool capable of handling both highly non-perturbative field interactions and the many-body problem, when the present state-of-the-art computational facilities could not go beyond two electron atomic systems.

A method of measuring radiative lifetime and perturbed electronic states of NO_2 by exciting the gas by a tunable dye laser has been presented in the article "Radiative Lifetime Measurements and Study of Perturbed Electronic States of NO_2" *(Authors: K.P. Subramanian, V. Sivakumaran and Vijay Kumar).*

Laser-atom interaction and multiphoton laser ionization spectroscopy utilized to reveal 52 new odd-parity energy levels of the Eu atom (Eu I) in the region of 40575-43410 cm-1 and 80 high lying odd-parity energy levels in the region 43410-45735 cm-1 with unique J value has been presented in the article "Multiphoton and Multistep Laser Ionization Spectroscopy of Atoms" *(Author: S.A. Ahmad and S.G. Nakhate).*

In the paper "Inner Shell Ionization Processes" *(Author: C.T. Whelan),* electron impact ionization for atomic inner shells including some excitements of the field has been presented, while the paper "Electron Impact Ionisation: A Progress Report" *(Author: Hubert Klar)* essentially summarises the use of correlated three-body continuum wave function to (e,2e) events in a simple atom like hydrogen. It also discusses the circular dichroism in (e,2e) reactions from laser-excited targets by spin-polarised electrons.

The paper "Electron Impact Ionisation of Atoms and Molecules" *(Authors: S.P. Khare and Surekha Tomar)* deals with the electron impact inner-shell ionisation of atoms and outer-shell ionisation of molecules in the energy range ionisation threshold to 1 GeV using the methods developed by Khare and collaborators.

Total ionisation cross sections of atoms and molecules have been presented using quantum mechanical and semi-empirical approach for a large number of atoms and compounds in the paper "Total Ionisation Cross Sections for Electron Scattering from Atomic and Molecular Targets Using Quantum Mechanical Semi-empirical Approach from Threshold to 400 eV" *(Author: K.L. Baluja).*

The possibility of accelerating high Z ions to relativistic velocities (close to c) and thereby to strip all or almost all electrons opened up a new kind of investigation of inverse radiative recombination leading to new tests of quantum electrodynamics in strong field as has been presented in the article "Radiative Electron Capture and the Photoionization of Hydrogenlike Ions" *(Author: Jorg Eichler).* Experimental investigations on the energy and angular distributions of electrons emitted in ionization of atomic and molecular hydrogen and helium in collision with fast bare ions and have been compared with available theoretical predictions in the paper "Low Energy Electron Emission in Fast Ion-Atom Collision" *(Author: Lokesh C. Tribedi).*

In the paper "Classical and Quantum Mechanical Investigations on Charge Transfer in Heavy Ion-Atom Interactions" *(Author: C.R. Mandal),* theoretical studies on charge transfer processes in collisions of partially stripped heavy ions with neutral atoms both classically and quantum mechanically, have been presented.

Electron impact excitation of the lowest lying autoionizing states of alkali atoms (Na, K, Rb, Cs) have been calculated using improved distorted wave approximation in the paper "Electron Excitation of Autoionizing States in Alkalis" *(Author: Rajesh Srivastava).*

Method of calculating the total and doubly differential cross sections for proton impact and total ionization cross sections for both proton and antiproton impact on hydrogen atom has been discussed in the paper "Ionization of Atom Under Heavy Particle Impact" *(Author: S.C. Mukherjee).*

Atomic photoionization is known to be an excellent tool to study electron correlations in atoms. Inelastic x-ray scattering spectroscopy has been projected as an effective tool in understanding the electron correlation effect in matter in the paper "Chemical Binding and Electron Correlation Effect Studied by Inelastic X-ray and High Energy Electron Spectroscopy" *(Author: A.N Tripathi),* while reviews on the double photoionization and future issues and directions have been presented in the paper "Correlation and Photoionization: Retrospect and Prospect" *(Author: S.N. Tiwary).*

Jaynes-Cummings model in the Rotating Wave Approximation (RWA) is used extensively in connection with the quantum optical resonance. The importance of non-RWA terms in understanding many physical situations has been demonstrated in the paper "Quantum Optical Resonance" *(Authors: S. Mathur and U.N. Upadhyaya).*

The paper "Low Energy Photoionization in the Ar Isoelectronic Sequence: Complex Effects of Z" *(Authors: H.S. Chakraborty, P.C. Deshmukh and S.T. Manson)* presented a set of new results on photoionization studies in the Ar isoelectronic sequence in conformity of the earlier findings on Ne, while the other paper "Z-Dependence of Photoabsorption Properties in Isoelectronic Sequences" *(Authors: P.C. Deshmukh, H.S Chakraborty, E.W.B. Dias and S.T. Manson)* warns that any kind of interpolation/extrapolation procedure to obtain new information from the existing data of isoelectronic sequence may lead to wrong result for low Z members of isoelectronic sequence. Positronium scattering is an important tool in the field of condensed matter and surface physics.

In the paper "Electron Exchange Model Potential: Application to Positronium Scattering from Atoms and Molecules" *(Author: P.K. Biswas),* coupled-channel calculations using nonlocal model potential for electron exchange in complex systems has been used to calculate elastic and inelastic scattering of positronium from H, He and H_2. The low energy collision between a highly excited atom (Rydberg atom) and a compact perturber can not be visualised by any simple model due to different depopulation cross sections for different perturbers but requires to include complete three-body interactions as has been discussed in the paper "Depopulation of Low-Rydberg Atoms: A Semi-Classical Approach" *(Author: Anil Kumar).*

How the periodic table for atoms in the configuration average Hartree-Fock approximation is modified when the atoms are confined in a cavity has been discussed and application of Dirac-Fock in stead of Hartree-Fock approximation in future has been proposed in the paper "Confined Atoms: A New Path Towards Controlled Orbital Collapse" *(Authors: J.-P Connerade, P. Anantha Lakshmi and V.K. Dolmatov).*

A general review and some selected properties of atomic clusters containing several thousand atoms has been presented in the paper "Structure and Properties of Atomic Clusters" *(Author: Sugata Mukherjee).*

Basic ideas of laser cooling and trapping of atoms leading to a new state of matter - the Bose-Einstein condensate - and its application to explore many new frontiers of exciting research have been presented in the article "Neutral-Atom Traps for Bose-Einstein Condensates" *(AuthorsB.N. Jagatap, A.P. Marathe, K.G. Manohar, R.C. Sethi and S.A. Ahmad).*

Although a little departure from other hard-core physics articles of this volume, a very interesting and useful article to tackle down-to-earth problems like global warming and ozone holes using collision physics has been presented in the paper "Collision Physics as a Tool for Environmental Physics" *(Authors: N.J. Mason, S.K. Pathak, J.M. Gingell and N.C. Jones).*

Truly, this volume provides the recent trends of research in atomic and molecular physics quite in conformity with the title of the book. In my opinion, this book will be found useful to serious and advanced graduate students who are willing to pursue research in atomic and molecular physics as well as to interested scientists. Indian researchers will also find this volume particularly useful because they will get a feeling of the nature of research going on in the areas of atomic and molecular physics at different advanced research centres of India. However, some of the articles appear to be a good review on the topic and tutorial in nature. I recommend that at least one copy of this book be kept in the libraries of all research institutes and universities. Editing, printing and publishing of the book is impressive ignoring a few trivial printing and other mistakes.

Order may be placed at Kluwer Academic Publishers, Order Dept, P.O.Box. 322, 3300 AH Dordrecht, The Netherlands or at Kluwer Academic Publishers, Order Dept, P.O.Box. 358, Accord Station, Hingham, MA 02018-0358, USA.

NEW MEMBERS, ADDRESS CHANGES

Welcome to New Members :

Professor Israel Ayo Babalola, *BOTSWANA*

Dr Nayak N Govinda *INDIA*

Mr P Andrew Karam, *U.S.A.*

Mr H M Mahesh , *INDIA*

Mr Ernesto Mainegra-Hing, *CANADA*

Professor Armando Ponce de Leao Policarpo, *PORTUGAL*

Professor Dragana Popovic, *YUGOSLAVIA*

Mr Bassam Zuhdi Othman Shakhreet, *MALAYSIA*

New Members' addresses are listed in the Contact Members' Details (click on country next to name)

Address changes of Members :

Dr Mahmoud I Abbas, *now* *EGYPT*

Professor P Andreo, *now* *SWEDEN*

Dr Mario Ivo, *HUNGARY*

Dr Imre Kasa, *HUNGARY*

Dr George A Sandison, *now* *U S A*

Dr Yoshitomo Uwamino, *JAPAN*

Members' new addresses are listed in the Contact Members' Details (click on country next to name)

New Members, Address Changes etc.

Epilogue

In the opinion of this reporter, both the invited papers and the contributed papers continued the tradition, set at the previous Symposia in this series, of interest and high density of diverse but related (via Radiation Physics) information. In addition to the technical cross-fertilization exchanges in the oral and poster sessions, the face-to-face personal contacts and conversations, beginning with the Sunday evening reception and continuing through the week in the hallways, at the coffee breaks and at the social events, between participants normally widely separated by both geography and discipline, were perhaps the most valuable products of the Symposium.

Other major social events, beside the Sunday evening reception, and the Tuesday evening concert in the Bethlehem Chapel already mentioned, were the Wednesday afternoon excursion on a side-paddle steamboat down the Vltava River (including a lock transit) to the Troja Chateau where the conference photo was taken, and the Thursday evening Symposium Banquet at the Melník Chateau. In addition to the all-conference social events, ISRP-8 provided arrangements for a full and comprehensive programme of excursions in and around Prague during the conference, much enjoyed and appreciated by the accompanying persons, also pre- and post-congress tours farther afield from Prague, to maximize the benefit to the ISRP-8 participants, of this visit to the Czech Republic.

..and a pictorial summary of the very enjoyable social events of ISRP-8

Tyn Cathedral, Old Town Square, Prague

(L to R) Dorris Gilboy (UK), Kulwant Singh (India) and Glenn and Gladys Knoll (USA)

Joan and President (2000-2003) Malcolm Cooper (UK)

(L to R) Anselmo Paschoa and O Goncalves (Brazil) at Troja Chateau

(L to R) John and Jean Hubbell (USA), Walter Gilboy (UK), Glenn Knoll (USA), Malcolm Cooper (UK)

(L to R) John Hubbell (USA) and R Cesareo (Italy)

(L to R) Ilmary and Rex Keddy (South Africa) and John Hubbell (USA)
meet in Old Town Square

(L to R, standing) Dudley Creagh (Australia) and Ladislav Musilek (Czech Republic)

Malcolm and Joan Cooper (UK) in earnest conversation at the ISRP-

8

- no doubt discussing the virtues of the wine ...! (***see right of picture)***

Photos courtesy of John Hubbell and Dudley Creagh

On behalf of the IRPS and the general radiation physics community,
this reporter thanks

Chairman Ladislav Musílek and Co-Chairman Tomás Cechák
and their hard-working ISRP-8 Local Organizing Committee,
with special thanks to Ms. Jindra Niederlová and her willing helpers
for staging the Symposium and for their warm hospitality including tasty, generous and artistic food preparation for the reception and coffee breaks.

The ISRP-8 Programme Committee under David Bradley and Co-Chairman Ladislav Musílek is to be congratulated on a superb selection of invited speakers to set the focus of ISRP-8 and to provide a stimulating and cutting-edge programme in the interdisciplinary field of radiation physics.

* * * * * *

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Mr D.N. Avadhani	Department of Physics Mangalore Univesity Mangalagangotri Mangalore 574 199 Karnataka INDIA
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