ARCHIVE EDITION OF

IRPS BULLETIN

Volume 17 No 3 March, 2004

Office Bearers : 2003 - 2006

Return to Archive Home Page

OFFICE BEARERS : 2003 - 2006

Home Page

EDITORIAL *Paul Bergstrom*

Dear Members,

I apologize for the delay in putting out the remaining issues of volume 17 in a timely fashion. A lack of contributions has, coupled with inertia on my part, led to this unfortunate situation.

This issue, volume 17 number 3, will be followed shortly by the concluding issue of volume 17. That issue will deal mostly with news from our recent meeting.

In April, we will resume a regular publication schedule. I urge the membership to contribute articles or ideas for articles to me in order that we can revitalize this enterprise.

Home Page | Next

OBITUARIES

David Keith Trubey

(1928 - 2003)

Adapted by Suprakash Roy and John Hubbell from information received from son, Richard Trubey

* * * * * * * * * *

Dave K. Trubey was born in Coldwater, Michigan, on April 23, 1928. He grew up on the family farm outside Colon, Michigan, and was one of three sons (William, Gaylord). During Dave's teenage years the three boys gained major responsibilities for running the farm. Dave still somehow found time to be on the Colon High School basketball team.

After graduating from Colon High School, Dave studied engineering at Lawrence Institute of Technology in Detroit (1946-1948). In July of 1948, Dave entered Flight-Training School in the U.S. Navy, where he achieved the rank of Midshipman. On October 7, 1950, Dave married Jean Marie Mains, falling for her lovely voice and good looks. In 1951, Dave went into the Reserves and resumed his university education (in physics) at Michigan State College (now Michigan State University) in East Lansing.

Dave began a highly successful career in nuclear physics in 1953, at the Oak Ridge National Laboratory in Tennessee. While there he had a chance to work with some of the leading scientists of the day. In 1962, Dave co-founded the Radiation Shielding Information Center (RSIC), which quickly became the premier world facility for maintaining radiation shielding data and making this information available to researchers in the nuclear power industry, defense, and medicine. In 1966 he became the director of RSIC.

During the next 25 years, Dave developed contacts with scientists all over the world (Japan, India, Germany, Italy) and regularly travelled to consult and give presentations. His leadership in the American Nuclear Society (ANS) earned him the designation of "Fellow". In 1992, Dave won the prestigious "Rockwell Award" from the ANS, for a lifetime of significant accomplishments in the field of radiation protection.

Dave was associated with the IRPS, if not directly, from the time of its conception during the time when he attended the 1st International Symposium on Radiation Physics (ISRP-1) held in Calcutta in 1974, from where it all began - the present series of the ISRP. Many of the present IRPS members found a new friend in them and fondly remember him as "Mr. Nice Guy Personified". It was Dave who requested Suprakash Roy (one of the current Vice-Presidents of the IRPS) to arrange to donate his remuneration of examining the Ph.D. thesis of one of his students to Mother Teresa's organisation in Calcutta - "Missionaries of Charity". "This simply reflects his humane nature and his concern about the poor. In spite of my best efforts to persuade university authorities, I regret that I could not succeed to fulfill Dave's dream" said Suprakash.

After Dave's retirement in 1991, he and Jean moved to Citrus Springs, Florida, and they lived there until 1998. Then they moved to Greensboro, North Carolina, to be closer to their children. In 2001, Dave and Jean returned to Florida, to live in Dunnellon (just south of Ocala).

David was a loyal husband, father, and provider. Dave and Jean were married for almost 53 years and had two sons, Robert and Richard. Dave was known as a very kind and tolerant person, no matter the person's ethnicity or background. David and Jean were always very generous with their financial resources. The Salvation Army and the Heifer Project were among their favorite charitable organizations. David returned home to the Lord on July 11, 2003, after fighting cancer. He will be dearly missed and will be fondly remembered by those who knew him.

We are comforted, knowing that Dave is fully at peace now.

* * * * * *

Professor Dr Sakae Shimizu

(July 18, 1915 to December 13, 2003)

(Adapted by John Hubbell from obituary provided by Prof. Yasuhito Isozumi, Kyoto University,
also from a biosketch by Prof. Megumi Tashiro at the time of Prof. Shimizu's retirement to emeritus status in 1979.)

Prof. Em. Dr. Sakae Shimizu, 1915-2003 (1979)

Many of you will remember Prof. Sakae Shimizu's keen interest in the International Radiation Physics Society and his major participation and contributions to several of our International Symposia on Radiation Physics, beginning with ISRP-2 (1982) in Penang, Malaysia, at which he was a panelist in a round table on the environmental impact of nuclear facilities chaired by Joseph Rotblat (U.K., 1995 Peace Prize Nobel laureate for his Pugwash organizing). In Prof. Shimizu's round table presentation, he provided statistics on both infant and adult cancer mortality rates in high- and low-dose natural radiation areas in Japan which suggested a negative correlation, if any, between cancer rates and these relatively low-level ambient dose fields. Similarly, no statistically significant difference in cancer rates could be detected between populations near and far from Japanese nuclear power plants. Nevertheless, according to Prof. Shimizu, "the Japanese are understandably 'very nervous' about nuclear hazards, and patronize coin-slot devices which read out body and environmental activity."

Prof. Shimizu was also an active participant in the founding meeting of the IRPS at ISRP-3 (1985) in Ferrara, Italy, where he presented a detailed analysis of the nature and effects of the radioactive dust fallout from the Bikini atoll hydrogen bomb test "Bravo" on the 23 fishermen on the fishing boat Fukuryu Maru (Lucky Dragon No. 5) which unfortunately happened to be in the area. We were benefitted also by Prof. Shimizu's participation in ISRP-4 (1988 in São Paulo, see snapshot photo) and at ISRP-5 (1991 in Dubrovnik).

My own first encounter with Prof. Shimizu was by correspondence concerning his landmark work with Yasuyuki Nakayama and Takeshi Mukoyama "Incoherent scattering of gamma rays by K-shell electrons," Phys. Rev. 140, A806-A815 (1965), a topic in which I had a special interest. Later, it was my privilege to meet Prof. Shimizu in person at the International Conference on Inner Shell Ionization Phenomena on the Production and Decay of Atomic Inner Shell Vacancies, in Atlanta, Georgia, in April 1972. Later in that same year (September 1972), I could meet Prof. Shimizu on his home turf while I was in Kyoto for a Crystallography Congress, at which time his research interests were focused on looking for changes in the decay constants of some radioactive nuclides by external effects - chemical bonding, ultra-high hydrostatic and mechanical pressures, intense internal electric field in ferroelectric substances, extreme low temperatures, and in ultra-high-rpm centrifuges.

Prof. Sakae Shimizu, son of Eijiro and Naka (Sakurai), was born July 18, 1915 in Tokyo. Entering the Kyoto Imperial University in 1935, he received a B.Sc. in Physics in 1940 and became a graduate student in experimental nuclear physics under the supervision of Prof. Bunsaku Arakatsu. He became a lecturer in 1943 and an Associate Professor in 1946. After receiving his Ph.D. from the Kyoto Imperial University in 1950 he was promoted to Full Professor in the Institute of Chemical Research, Kyoto University, and in 1952 he was appointed Director of the Laboratory of Nuclear Radiation (now, the Laboratory of Atomic and Nuclear Physics, Division of States and Structures). At the same time, beginning in 1953, he served as a Lecturer in Physics at the Konan University in Kobe, Japan.

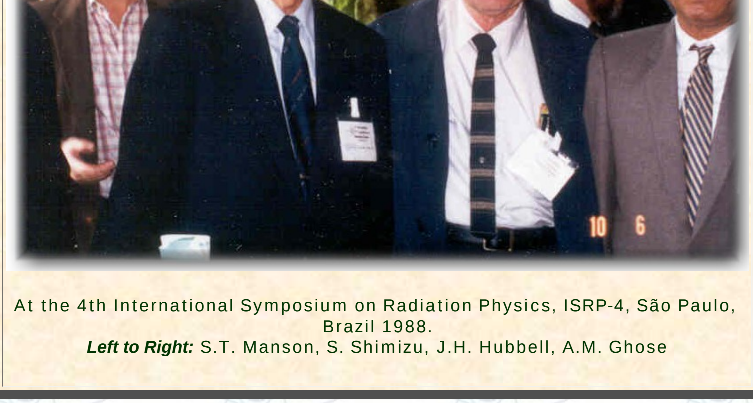
During World War II Prof. Shimizu worked in the field of experimental nuclear physics, including photonuclear reactions, construction of a 105 cm cyclotron (for 15 MeV deuterons), and separation of 235U by the ultra-high centrifugal method. A major and defining episode in his career was his participation in a special survey party, headed by Prof. Arakatsu, formed immediately after the atomic bomb was dropped on Hiroshima August 6, 1945, to enter the affected area and collect and analyze the first scientific evidence of the nature of the cataclysmic nuclear explosion. A vivid and detailed first-hand account of the experiences, data obtained, and impressions of the first and subsequent survey parties is given by Prof. Shimizu in his gripping and sobering paper "Historical Sketch of the Scientific Field Survey in Hiroshima Several Days after the Atomic Bombing," Bulletin of the Institute for Chemical Research, Kyoto University 60(2), 39-54 (1982). For several years thereafter, his main research concern was on photonuclear reactions and on development of various types of nuclear radiation detection devices.

From 1961 to his retirement to Emeritus Professor in 1979, Prof. Shimizu's research interests straddled the boundary between nuclear and atomic physics. His main topics were 1) External effects on radioactive decay constants, 2) positron annihilation with K-shell electrons, including radiationless and single-photon annihilation and 3) K-shell internal ionization accompanying nuclear decay. He is credited, with T. Mukoyama and Y. Nakayama, with the first experimental evidence of radiationless positron annihilation, in a Pb foil, as described in Phys. Lett. 17, 295 (1965) and in Phys. Rev. 171, 405 (1968).

In addition to Prof. Shimizu's past membership in the IRPS commencing in 1985 as a Founding Member, he held memberships in the Physical Society of Japan, the Atomic Energy Society of Japan, the Japan Radiation Research Society, the Japan Radioisotope Association (Board of Directors 1962-2000, Association Vice President 1990-2000), the American Physical Society, the American Nuclear Society, the Health Physics Society, and Sigma Xi. In 1995 he was made an Honorary Member of the Hungarian Academy of Science in recognition of his continuous efforts to develop science interchanges between Japan and Hungary.

Prof. Shimizu's broader civic-minded interests and contributions to the promotion of science education for the younger generation in Kyoto included his service as the Director of the Kyoto Municipal Science Center for Youth from 1970 to 1979, and as a Member of the Kyoto City Board of Education from 1979 to 1994. These significant academic and educational contributions were recognized by Prof. Shimizu's award in 1988 of the Order of the Rising Sun (3rd Class).

Prof. Em. Sakae Shimizu passed away December 13, 2003 in Osaka, Japan, survived by his widow Momoe (nee Iwamura, married 1947) and sons Toru and Masaru. The "global radiation physics family" mourns the loss of this major contributor to our scientific knowledge, particularly in nuclear, atomic and radiation physics, and to other aspects of the human condition and life on this small planet.



At the 4th International Symposium on Radiation Physics, ISRP-4, São Paulo, Brazil 1988.
Left to Right: S.T. Manson, S. Shimizu, J.H. Hubbell, A.M. Ghose

REPORT FROM MEMBER

Bright Future with Synchrotron Light at HASYLAB/ DESY

Leif Gerward

Department of Physics,
Technical University of Denmark
DK-2800 Kongens Lyngby/Denmark
Email : gerward@fysik.dtu.dk

Source: HASYLAB Annual Report 2003
Websites: http://www-hasylab.desy.de ***and*** http://xfel.desy.de

Great plans for exciting science in the coming decade using high-energy photons have recently been presented at HASYLAB/DESY in Hamburg, Germany. Research with photons at DESY will in the future be based on four pillars:

1. The present DORIS III storage ring for experiments needing a high photon flux;
2. The PETRA III storage ring, upgraded and optimized for high brilliance;
3. The VUV-FEL user facility providing coherent laser radiation of extreme intensity in 100 fsec pulses with 6 to 100 nm wavelength;
4. The European XFEL facility providing laser radiation in the X-ray regime down to 0.1 nm wavelength.

Thus, DESY will provide a number of outstanding facilities for research with photons. DESY will maintain its expertise in high-energy and accelerator physics, but the accelerator department will focus more and more on the development, construction and operation of accelerator based synchrotron radiation sources.

DESY will continue to operate its workhorse for synchrotron radiation, the 4.5 GeV storage ring DORIS III. Attempts will be made to improve the beam stability and to increase the brilliance of the source by replacing older accelerator components. As an example of new developments one may mention the high-energy wiggler beamline, HARWI-II, for materials science, including a multianvil press for high pressure/high temperature X-ray diffraction up to 25 GPa (250 kbar) and 2000 ºC, simultaneously.

According to a Technical Design Report just released, the 12 GeV storage ring PETRA II, at present part of the injector system for the HERA ring, will in the near future be reconstructed and upgraded into PETRA III, a world class dedicated 3rd generation synchrotron radiation source of hard X-rays. Funding of 120 M€ will be provided by the German Research Ministry. DESY intends to build and operate seven undulator beamlines out of 13 possible ones. The remaining six beamlines are expected to be developed by external institutions. As a result of a recent workshop, 18 possible experimental stations were proposed. The ones actually to be realized will be chosen by an external advisory board.

The reconstruction of the PETRA storage ring will presumably start in 2007, when the ongoing high-energy physics program of HERA is completed. Commissioning of the new dedicated synchrotron radiation source will take place in late 2008, with first user operations foreseen for spring 2009.

The first phase of the VUV Free-Electron Laser (FEL) at the TESLA Test Facility has already been completed. It has been convincingly demonstrated that the principle of Self Amplification by Stimulated Emission, in short SASE, works perfectly also in the VUV spectral regime. The recent successful experimental study of Coulomb explosion of Xe clusters has been a breakthrough for research using the VUV Free-Electron Laser and the SASE principle.

Work is now in progress to construct the first VUV-FEL user facility for radiation with wavelengths from 6 to 100 nm. The installations will be completed in the summer 2004 and commissioning of the accelerator and the FEL is planned for the second half of 2004.The first user experiments are expected in spring 2005. Another two experimental stations will be ready for the users by the end of 2005.

In 2003 the German federal minister of education and research decided to support a number of large-scale facilities for basic scientific research. These included the X-ray free-electron laser (XFEL) for wavelengths down to 0.1 nm (1 Å), originally conceived as an integral part of the international TESLA collaboration. The latter was based on a 33 km long electron-positron linear collider to be built near DESY.The German government, however, decided not to proceed nationally with the linear collider, and not to propose a German site for such a facility. Consequently, the XFEL will now be realized as a separate project in its own right.

The German government is suggesting Hamburg as the site for a European XFEL facility and is prepared to contribute half of the estimated investment of 684 M€. Parallel to the political process of forming a collaboration of European partners, a local organization structure has been set up for the next two years to prepare the project at DESY, so that a decision to start the construction of the facility can be made in the near future. The German Ministry of Education and Science and the DESY XFEL Coordination Board are now looking for potential international partners. Various countries have started to organize meetings for prospective users of a European XFEL facility.

A decision on the realization of the proposed European XFEL facility should be possible within two years, followed by a construction period of six years. Thus, the X-ray free-electron laser facility hopefully should open its doors for the users around 2010.

A stepwise approach towards the realization of the European XFEL facility is pursued by DESY in close collaboration with the Stanford Linear Accelerator Center (SLAC), where a similar facility with a wavelength of 0.15 nm (1.5 Å) is under construction. It is called the Linac Coherent Light Source (LCLS) and is expected to be completed by October 2008.

Detailed plans for the European XFEL facility were presented to the public in October 2003. Starting from the electron injector at the DESY campus in the city of Hamburg, the particles will be accelerated in an underground tunnel, running in north-west direction. The 3.3 km long beamline will end near the town of Schenefeld in the region of Schleswig-Holstein, where an experimental hall will be erected ***(Fig. 1)***. The site is large enough to accommodate another experimental hall at a later stage.

The realization of a European XFEL facility will no doubt open up new and exciting studies of matter using a radiation source of unprecedented brilliance, coherence and sub-picosecond resolution.

The future for research based on synchrotron radiation at HASYLAB/DESY is indeed bright with new challenges and discoveries waiting just around the corner.

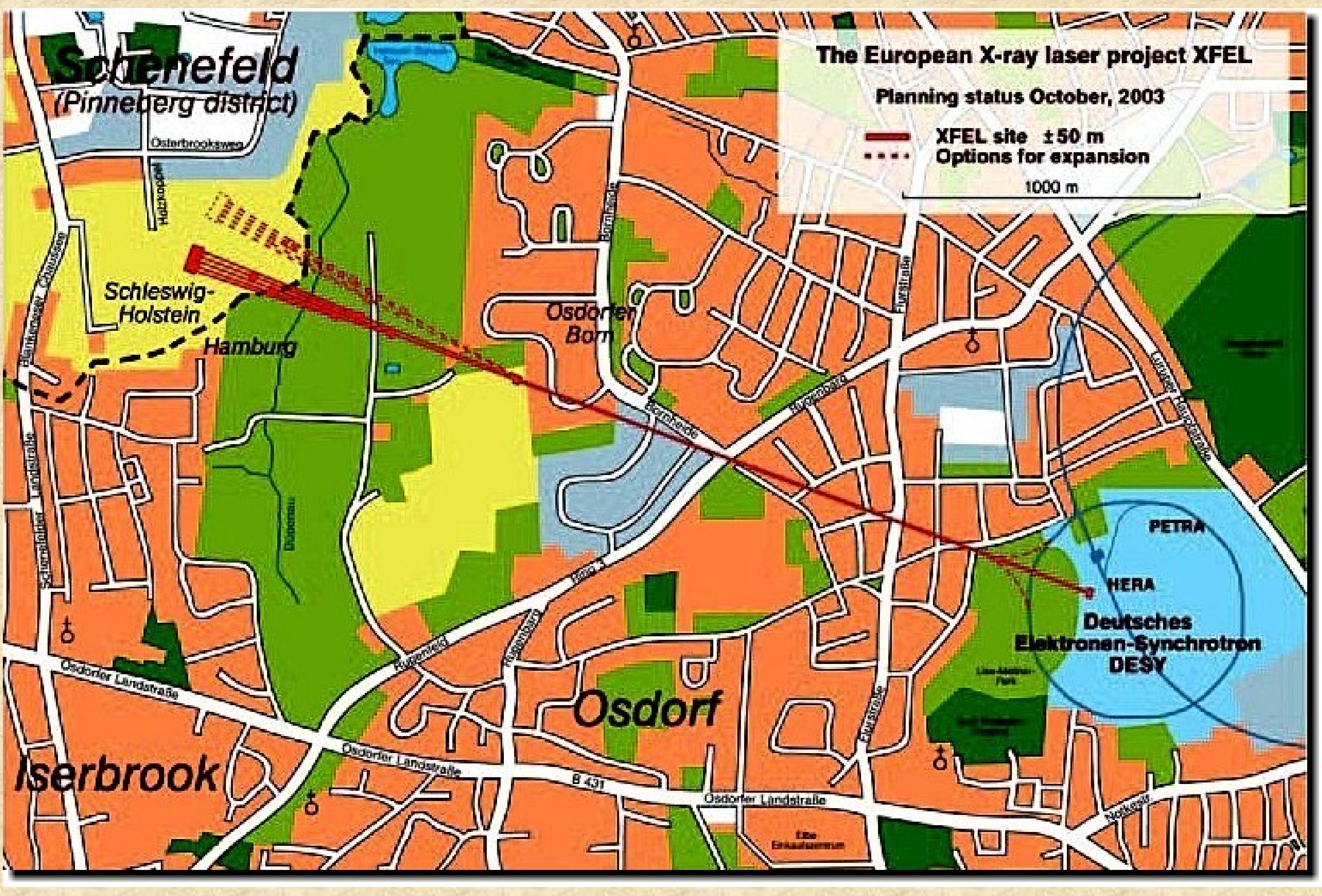


Fig. 1 Location of the X-Ray Free-Electron Laser (XFEL) at DESY

BOOK REVIEW

John H. Hubbell

National Institute of Standards and Technology
Gaithersburg, Maryland, USA

Handbook on Radiation Probing, Gauging, Imaging and Analysis

Volume I: Basics and Techniques
Volume II: Applications and Design

Esam M.A. Hussein

Dept. of Mechanical Engineering, University of New Brunswick, Fredericton, Canada

Kluwer Academic Publishers, Dordrecht, 2003
Hardbound :
Set (Vol. I & II) 990 pp.: ISBN 1 4020 1296 9 US$354.00, EUR300.00, GBP 215.00.
Vol. I : 464 pp.: ISBN 1 4020 1294 2 US$177.00, EUR190.00, GBP129.00.
Vol. II : 526 pp.: ISBN 1 4020 1295 0 US$177.00, EUR190.00, GBP 129.00.

In browsing through this two-volume "how-to" desk reference on virtually all aspects of the use of photon and corpuscular radiations in the interrogation of materials and structures, I found the presentation format to be unique and useful. Although the variety and comprehensiveness is akin to a topical encyclopedia, the presentation reminded me of a thesaurus, in which the subtopics are not sequenced alphabetically, but, similar to a thesaurus, are sequenced in a logical progression. Then, going "Roget" one better, at the end of the book are found not one, but two alphabetized indexes, first an "application index" and finally a conventional index alphabetically listing key words and their page numbers from throughout the text.

In Volume One (Basics and Techniques), following a brief Chapter 1 (Introduction) surveying the unique features of radiation interrogation, often the only available tool for some NDE (nondestructive evaluation) challenges, Part I (Basics) begins this logical progression, in Chapter 2 (Radiation Types and Sources), with the definitions and nature of the various available radiations and how they can be obtained, then progressing in Chapter 3 (Modifying Physics) to the basic underlying physical processes by which these different radiations interact with atoms and with bulk materials. Part I concludes with a virtual Baedeker to the many types of radiation detectors and their underlying principles in Chapter 4 (Detection Methods) and a briefer Chapter 5 (Radiation Safety) addressing both common-sense and mandatory regulatory concerns.

In Part II (Techniques) the logical topical progression continues in Chapter 6 (Transmission Methods) with a comprehensive array of topics ranging from time-honored film radiography to the mathematical intricacies of tomography to the esoteric application of Mössbauer spectrometry. Chapters 7 (Scattering Methods), 8 (Emission Methods) and 9 (Absorption Methods) similarly provide encyclopedic coverage of the available methods and techniques in each of these categories. Volume One closes with several appendices (repeated in Volume Two) providing valuable information including (A) Basic Units and Constants, (B) List (alphabetically) of Elements and Natural Isotopes, (C) Relativistic Mechanics, (D) Quantum Mechanics, including the Schrödinger equation and the concept of cross-section, (E) Nuclear/Atomic Parameters for Compounds and Mixtures, (F) Effective Energy, and finally (G) Radiation Counting Statistics, including Poisson statistics, mean and variance. Following the appendices (in both Volumes) is the listing of the 1373 references including full titles and inclusive page numbers, followed in turn by the two indexes mentioned, an Application Index and a conventional Index concluding this monumental and uniquely useful "encyclopedic/thesauric" guide and companion through the thickets of radiation nondestructive probing, gauging, imaging and analysis.

Volume Two (Applications and Design) brings the above wealth of "why?" and "how-to" information "into the real world" beginning in Part III (Applications) with an introductory Chapter 10 (Probing, Inspection and Monitoring) with topics ranging from the function of the alpha-particle sources in most smoke detectors (such as the ones in my home) to monitoring package-filling in opaque containers. This is followed by Chapter 11 (Gauging) listing and exhaustively discussing the otherwise-difficult-or-impossible interrogations of bulk density, thickness, porosity and voidage, moisture content, fluid flow and finally dating including with carbon-14 (geological time scales), tritium (short term, such as for ground waters) and the use of thermoluminescence for TL dating (archeological time scales). Chapter 12 (Elemental and Content Analysis) continues the logical progression of subtopics including nucleus-based analysis (e.g., activation analysis), atom-based analysis (e.g., x-ray fluorescence spectroscopy, XRFS), hydrogen measurement (mostly by neutrons), and material content analysis (e.g., applications of the above-mentioned Mössbauer spectroscopy). Concluding Part III, Chapter 13 (Imaging) catalogs and provides detailed information on the many different kinds of photon radiography, on neutron and charged-particle radiography, on tomography and on imaging for material content such as in dual-energy imaging.

Finally, in Part IV (Design) the author shares the experiences and knowledge accumulated in his long and distinguished teaching and research career, much of it involved in synthesizing the above material into the invention, production and putting into practice a significant fraction of the above principles and devices for carrying out NDE tasks. Thus, Chapter 14 (Performance Parameters and Design Aspects) opens Part IV with material on performance parameters, statistical optimization, design objectives, and source, technique, and detection system selections, followed by Chapter 15 (Source Modulation), with collimation considerations, filtration, and for neutrons, both moderation and multiplication.

The book's logical topical progression continues in Chapter 16 (Design Calculations) with subtopics on Monte Carlo simulations, and shielding requirements in the differing cases of x-ray machines, isotopic gamma sources, and for neutron sources. Finally, Chapter 17 (Experiments) treats the important considerations of licensing, background reduction and dynamic analysis to verify that the device will indeed perform its intended function, and the brief Chapter 18 (Finalization) discusses prototyping and intellectual property protection (trade secrets, copyright, trademarks and patents).

Although this Handbook is intended for purchase as an integral two-volume set, it is anticipated that Volume I: Basics and Techniques will be purchased separately by some students for use as a textbook. On the other hand it is anticipated that some experienced practitioners will find Volume II: Applications and Design attractive for separate purchase, hence the three different purchase options as offered above, and the inclusion of the extensive and useful appendices in both volumes.

Previous | Home Page | Next

NEW MEMBERS and ADDRESS CHANGES

Welcome to New Members :

Dr. Nagappa M. Badiger, India

Mr Harvinder Singh Klare, India

Dr Ajay Kumar, India

Mr Rohit Mehra, India

Miss Gurpreet Kaur Sandhu, India

Mrs Gopi Sharma, India

Dr. Gurmel Singh, India

Dr. Parjit Shamsher Singh, India

Dr Srikanta S Sinha, India

Mr. Gou Chengjun, P.R. China

Mr. Wu Zhangwan, P.R. China

Dr. Peter K.N. Yu, Hong Kong

Dr. Emmanuel H. Agba, Nigeria

Dr Dobroslana, South Africa

Dr Mohamed E. Eisa, South Africa

Mr Johan A Mars, South Africa

Dr Jolanta M Mesjasz-Przybylowicz, South Africa

Mr Mandlenkosi Msimange, South Africa

Dr Carlos A Pineda-Vargas, South Africa

Dr Gabriel G Pitsoane, South Africa

Dr Wojciech J Przybylowicz, South Africa

Dr Thulaganyo P Sechogela, South Africa

Ms Patience P Segonyane, South Africa

Dr Grzegorz J Tylko, South Africa

Dr. Richard Hugtenburg, U.K.

Dr Alexander Rakov, Uzbekistan

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

Changes to Members' Addresses and Contact Information

Address change :

Dr D McLean, Australia

Dr D N Avadhani, India

Email address changes :

Dr Servo Kasi, Finland

Prof. Mohammed Ahmed Gomaa, Egypt

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

India

Mr. D.N. Avadhani	Department of Physics R.V. College of Engineering R.V. Vidyaniketan Post Mysore Road Bangalore 560 059 Karnataka INDIA *email:* d_avadhani@yahoo.com
Dr Nagappa M. Badiger	Reader, Department of Physics Karnataka University Dharwad 58003 INDIA *email:* nagappa123@yahoo.com
Dr. Rao Mallikarjuna Bendapudi	Department of Nuclear Physics Andhra University Visakhapatanam 530 003 INDIA
Dr. Reddy Seetharami Byreddy	Department of Nuclear Physics Andhra University Visakhapatanam 530 003 INDIA
Dr. K. Prem Chand	Department of Nuclear Physics Andhra University Visakhapatanam 530 003 INDIA
Dr. Barun Kumar Chatterjee	Reader, Department of Physics Bose Institute 93/1 Acharya Prafulla Chandra Road Calcutta 700 009 INDIA
Dr. Ramesh Desai	B/6 Deval Apartment (near Anjali Cinema) Chhaganlal Jadhav Marg Bhattha, Paldi Ahmedabad 380007 INDIA *email:* desairamesh99@yahoo.com
Professor A. M. Ghose	23/8 Gariahat Road Calcutta 700 029 INDIA
Dr. S.K. Ghosh	Saha Institute of Nuclear Physics Calcutta 700 064 INDIA
Prof. P.P. Kane	Dept. of Physics Indian Inst. of Techonology Powaii Bombay 400 076 INDIA *email:* ppkane@vsnl.com
Dr. B. R. Kerur	Department of Physics Gulbarga University Gulbarga 585 106 INDIA *email:* kerurbrk@hotmail.com
Dr. Dorlando T. Khathing	Regional Sophisticated Instrumentation Centre North Eastern Hill University Bijni Complex, Laitumkhrah Shillong 793 003 INDIA
Mr Harvinder Singh Klare	Sr. Research Fellow Physics Department Guru Nanak Dev University Amritsar 143005 INDIA *email:* klarehs@yahoo.co.in
Dr. Ajay Kumar	X-ray Fluorescence Laboratory Department of Physics Panjab University Chandigarh 160014 INDIA
Mr. Rohit Mehra	Lecturer in Physics M.I.M.I.T. Malout dist. Muktsar Punjab 152 107 INDIA *email :* rohit_mimit@rediffmail.com
Dr. Govind N. Nayak	Department of Physics Mangalore University Mangalagangotri 574 199 INDIA *email :* nerolunayak@yahoo.com
Dr. Biva Roy	Department of Physics Bose Institute Calcutta 700 009 INDIA *email:* biva@bosemain.boseinst.ac.in biva @indiatimes.com
Prof. Suprakash C. Roy	Dept. of Physics Bose Institute Calcutta 700 009 INDIA *email:* sup_roy@yahoo.com
Miss Gurpreet Kaur Sandhu	Sr. Resarch Fellow Physics Department Guru Nanak Dev University Amritsar 143005 INDIA *email:* sandhu_75@yahoo.com
Dr. Ramkumar Saptharishi	2126 6th Cross 15th Main HAL III Stage Bangalore 560 008 INDIA *email :* mp96sr@yahoo.com Ramkumr.Saptharishi@geind.ge.com
Mrs Gopi Sharma	Research Fellow Physics Department Guru Nanak Dev University Amritsar 143005 INDIA *email :* sharmagopi28@yahoo.com
Dr. Prasanta Sen	Saha Institute of Nuclear Physics Block AF, Sector I, Salt Lake Calcutta 700 064 INDIA *email:* psen@hp1.saha.ernet.in
Dr. Bhajan Singh	Department of Physics Punjabi University Patiala 147 002 INDIA
Dr Gurmel Singh	Department of Physics Punjabi University Patiala 147002 INDIA
Dr Parjit Shamsher Singh	Department of Physics Punjabi University Patiala 147002 INDIA
Dr Raj Mittal Singla	Department of Physics Punjabi University Patiala 147002 INDIA *email:* rmsingla@yahoo.com
Dr. Bikash Sinha	Director Variable Energy Cyclotron Centre Bidhan Nagar Calcutta 700 064 INDIA *email:* bikash@tnp.saha.ernet.in
Dr Srikanta S. Sinha	Space Astronomy and Instrumentation Division ISRO Satellite Center Airport Road Bangalore 560017 INDIA *email:* sinha@isac.ernet.in
Dr. Tripurari P. Sinha	Department of Physics Bose Institute Calcutta 700 009 INDIA
Dr. Kulwant Singh Thind	Department of Physics Guru Nanak Dev University Amritsar 143 005 INDIA *email:* kulwantsthind@yahoo.com
Dr. T.K. Umesh	Department of Studies in Physics University of Mysore Manasagangotri Mysore 570 006 INDIA *email:* tku@vsnl.net tku@uomphysics.net
Dr. Thomas Varghese	Department of Physics Nirmala College Muvattupuzha Keral 686 661 INDIA *email:* surajthomas@sancharnet.in

Pakistan

Dr. Rizwan Hussain	23A Street 3, Valley Road Westriddge 1 Rawalpindi PAKISTAN

Australia

Dr. Christopher T. Chantler	School of Physics University of Melbourne Parkville Victoria 3010 AUSTRALIA *email:* chantler@ph.unimelb.edu.au
Prof. D.C. Creagh	Division of Health Design and Science Room 3C40 University of Canberra Canberra ACT 2601 AUSTRALIA *email :* dudleyc@ise.canberra.edu.au
Dr. Ross L. Dawe	Maritime Operations Division Defence Science and Technology Organisation P.O. Box 1500 Salisbury S.A. 5108 AUSTRALIA *email :* ross.dawe@dsto.defence.gov.au
Ms. Shirley McKeown	Division of Health Design and Science Room 3C40 University of Canberra Canberra ACT 2601 AUSTRALIA *email:* shirleym@ise.canberra.edu.au
Dr. D. McLean	Medical Physics Department Westmead Hospital P.O. Box 533 Wentworthville NSW 2145 AUSTRALIA *email:* rdmc@imag.wsahs.new.gov.au

Japan

Dr. Mala Das	Department of Quantum Energy Engineering Graduate School of Engineering Hokkaido University Kita-Ku, Kita-13, Nishi -8 Sapporo Hokkaido - 060 8626 JAPAN *email :* mala_das@yahoo.com
Dr. Yoshiaki Ito	Institute for Chemical Research Kyoto University Uji, Kyoto 611 JAPAN
Prof. Akira Iwasaki	School of Health Sciences Hirosaki University 66-1 Hon-cho Hirosaki Aomori 036-8564 JAPAN *email:* akira@cc.hirosaki-u.ac
Dr. Ikuo Kanno	Department. of Nuclear Engineering Kyoto University Sakyo-ku Kyoto 606-01 JAPAN *email:* kanno@qsec.kyoto-u.ac.jp
Dr. Takashi Nakamura	Cyclotron and Radioisotope Center Tohoku Univeresity Aoba, Aramak Sendai JAPAN *email:* nakamura@cyric.tohoku.ac.jp
Dr. Yoshitomo Uwamino	Safety Center/RIKEN 12-1 Hirosawa Wako Saitama 351-0198 JAPAN *email:* uwamino@postman.riken.go.jp
Dr. Mihai A. Vlaicu	Osaka Electgro-Communication University 18-8 Hatsu-Cho Neyagawa Osaka 572-8530 JAPAN *email:* avlaicu@isc.osakac.ac.jp

Korea

Dr. Jae-Shik Jun	G&G Radcon Co., Ltd 301 Jangyoungsil-gwan, Venture Town Shinil-dong, Daeduk-gu Daejon 306-230 KOREA (South) *email:* junjss@hanmail.net
Dr. J. K. Kim	Department of Nuclear Engineering Hanyang University 17 Haengdang Sungdong Seoul 133-791 KOREA *email:* jkkim@nural.hanyang.ac.kr
Mr. Jong-Song Moon	Department of Physics Donga University 840 Hadon, 2-dong, Saha-gu Pusan 604-714 SOUTH KOREA

New Zealand

Dr. C. M. Bartle	National Isotope Centre Institute of Geological and Nuclear Sciences P.O. Box 31312 Lower Hutt NEW ZEALAND *email:* m.bartle@gns.cri.nz

People's Republic of China

Dr. Guo Chengjun	
Dr. Tao Jin	Department of Radiation Physics Xinjiang Institute of Physics Chinese Academy of Science P.O.Box. 139, Urumqi Xingiang 830011 P.R. CHINA
Dr. Zheng-ming Luo	Centre for Radiation Physics Institute of Nuclear Science and Technology Sichuan University Chengdu 610 064 P.R. CHINA
Prof. Jun Quan Xu	Sanghai Institute of Nuclear Research Academia Sinica, P.O. Box. 800-204 Shanghai 201800 P.R. CHINA
Dr. Mian Xu	National Institute of Metrology No. 18 Bei San Huan Dong Lu Beijing 100 013 P. R. CHINA
Dr. Peter K.N. Yu	Department of Physics and Material Science City University of Hong Kong 83 Tat Chee Avenue Kowloon Tong HONG KONG *email:* peter.yu@cityu.edu.hk
Dr. Wu Zhangwen	
Dr. Zheng Zheng	Department of Environmental Science and Engineering Nanjing University Nanjing Jiangsu 210014 P.R. CHINA *email :* zzheng@nju.edu.cn

Thailand

Dr. Thiraphat Vilaithong	Director Fast Neutron Research Facility Department of Physics Faculty of Science Chiang Mai University Chiang Mai 50002 THAILAND

Botswana

Professor Israel Ayo Babalola	Department of Physics University of Botswana Post Bag 0022 Gaborone BOTSWANA
Dr. V.R.K. Murty	Department of Physics University of Botswana Post Bag 0022 Gaborone BOTSWANA *e-mail :* murtyvrk@mopipi.ub.b

Egypt

Dr. Mohamed I. Abbas	Physics Department Faculty of Science Alexandria University Alexandria EGYPT *email:* mabbas@physicist.net
Prof. Ahmed Abu El-Ela Ahmed	Physics Department Mansousa University Mansousa EGYPT
Professor Nassef Comsan	Nuclear Research Centre Atomic Energy Authority Cairo EGYPT *email:* rucycle@rusys.eg.net
Prof. Abdul-Hamid Hussein El-Kateb	Faculty of Science Helwan University Post Nr. 11795 Helwan Cairo EGYPT *email:* ahelkateb@frcu.eun.eg
Dr. Wael Mohyeldin Elshemey	Biophysics Department Faculty of Science Cairo University Giza EGYPT *email:* mellshimy@internetegypt.com
Prof. Mohamed Ahmed Gomaa	17 Mohamed Mahmoud Qasem St. Heliopolis, Cairo EGYPT *email:* mohgomaa2000@yahoo.com
Dr. Abdel Megid Mamoon	C/- Egyptian Atomic Energy Authority Ahmed al Zmer St Nasr City Cairo EGYPT

Ghana

Dr. John Justice Fletcher	AE-10 Atomic Kwabenya-Accra GHANA

Iran

Dr. Saeed Mohammadi	Physics Department Payam-Nour University Fariman 93914-33 IRAN *email:* smohammadi1958@yahoo.co.uk
Prof. Ali Pazirandeh	Physics Department University of Tehran PO Box 1943 Tehran IRAN *email:* Paziran@chamran.ut.ac.ir
Dr. Mehdi Sohrabi	Radiation Protection Department Atomic Energy Organisation P.O. Box 14155-4494 Tehran IRAN

Jordan

Mr. B. Z. O. Shakhreet	P.O. Box 11386 Amman 11123 JORDAN *email:* bshakhreet@hotmail.co

Kenya

Dr. Nadir O. Hashim	Department of Physics Kenyatta University PO Box 43844 Nairobi KENYA *email:* hashim_nadir@avu.org
Dr. Amidu Mustapha	Department of Physics University of Nairobi PO Box 30197 Nairobi KENYA *e-mail :* amustapha@uonbi.ac.ke

Libya

Dr. Amina Shakir Mahmood	Physics Department Faculty of Arts and Science Mergib University Khoms PO Box 40117 LIBYA *Email :* aminamahmood2002@yahoo.com
Dr. Ayad Miftah Shahout	AL-KHOMS P.O. Box 40099 LIBYA *Email :* shahout@hotmail.com

Morocco

Dr. R.M. Cherkaoui	University Mohammed V Faculte des Sciences, Rabat Department of Physics Av Ibnnattota B.P. 1014 Rabat MOROCCO *email:* rcherkao@fsr.ac.ma
Dr. Jillali Ghassoun	University of Cadi Ayyad Faculty of Science Semlalia Department of Physics BP 2390 Marrakech 40000 MOROCCO
Prof. Fouad Lahlou	Faculte des Sciences Dhar Mehraz BP 1796 (Atlas) Fes MOROCCO *email:* flahlou@yahoo.com

Namibia

Professor J. A. Oyedele	Department of Physics University of Namibia Private Bag 13301 Windhoek NAMIBIA *email:* oyedelej@unam.na

Nigeria

Dr. Emmanuel H. Agba	Department of Physics Faculty of Science Benue State University PMB 102 119 Makurdi NIGERIA *email :* hemenagba@yahoo.com
Dr. Ayodeji O. Awodugba	Department of Pure and Applied Physics Ladoke Akintola University of Technology P.M. B400 Ogbomoso NIGERIA *email :* fasal@skannet.com
Dr. Taofeeq Ige	National Hospital (Medical Physics) PMB 425 Garki Ablja NIGERIA *email:* taofeeqige@yahoo.com
Dr. Sunday A. Jonah	Centre for Energy Research and Training Ahmadu Bello Univesity PMB 1014 Zaria NIGERIA *email:* jonahsa2001@yahoo.com

Saudi Arabia

Dr. Osama Fageeha	Environmental Protection Department Aramaco PO Box 12526 31311 SAUDI ARABIA

South Africa

Mr. Samuel S. S. Bakhane	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA
Dr Dobroslana Budka	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA *email:* dobrusiabudka@tlabs.ac.za
Dr Mohamed E. Eisa	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA *email:* eisa@tlabs.ac.za
Dr. Egbert E. R. Hering	Department of Medical Physics Groote Schuur Hospital Observatory 7925 SOUTH AFRICA
Dr. Dan T. Jones	iThemba LABS (Laboratory for Accelerator Based Sciences) P O Box 722 Somerset West 7129 SOUTH AFRICA *email:* jones@tlabs.ac.za
Prof. Rex J. Keddy	Dept. of Medical Physics University of the Witwatersrand Private Bag 3 Powits Johannesburg 2050 SOUTH AFRICA *email:* mwrexilm@mweb.co.za keddy@sic.wits.ac.za
Dr. Steven S. Maage	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA *email:* maagest@nac.ac.za
Mr Johan A. Mars	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA
Mr Mandlenkosi Msimange	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA *email:* m_msimanga@hotmail.com
Prof. Ivo. Petr	National Nuclear Regulator (NNR) PO Box 7106 Centurion Hennopsmeer 0046 SOUTH AFRICA *email:* ipetr@nnr.co.za
Dr Carlos A. Pineda-Vargas	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA
Dr Gabriel G. Pitsoane	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA
Dr Wojciech J. Przybylowicz	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA
Dr Jolanta M. Mesjasz-Przybylowicz	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA
Mr. Johann van Rooyen	iThemba LABS (Laboratory for Accelerator Based Sciences) P O Box 722 Somerset West 7129 SOUTH AFRICA *email:* johanvr@nac.ac.za
Dr Thulaganyo P. Sechogela	iThemba LABS (Laboratory for Accelerator Based Sciences) P O Box 722 Somerset West 7129 SOUTH AFRICA
Ms Patience P. Segonyane	iThemba LABS (Laboratory for Accelerator Based Sciences) P O Box 722 Somerset West 7129 SOUTH AFRICA *email:* patience@tlabs.ac.za
Professor John F. Sharpey-Schafer	iThemba LABS (Laboratory for Accelerator Based Sciences) P O Box 722 Somerset West 7129 SOUTH AFRICA
Dr. Julyan J.E. Symons	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA *email:* symons@tlabs.ac.za
Dr. Chris Theron	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA *email:* ctheron@tlabs.ac.za
Dr. Grzegorz J. Tylko	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA

Syria

Dr. Ibrahim Othman	Atomic Energy Commission P.O. Box 6091 Damascus SYRIA *email:* aecs@mail.sy

Tanzania

D.r W. E. Muhogora	National Radiation Commission PO Box 743 Arusha TANZANIA *email :* nrctz@habari.co.tz

Togo

Prof. E.B.A.K. Edee	Department of Physics and Biophysics University of Lome PO Box 1515 or 2036 Lome TOGO *email:* eedee@ub.tg

Turkey

Dr. Ahmet Cengiz	Uludag University Faculty of Science and Literature Department of Physics Gorukle Bursa 16059 TURKEY
Dr. Arzu Kurtoglu	Istanbul Technical University Institute for Nuclear Energy Ayazaga Campus 80626 Maslak Istanbul TURKEY

Austria

Dr. Mohammed Berrada	Senior Training Officer Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO) International Monitoring System Division (IMS) Vienna International Centre (VIC) PO Box 1200 A 1400 Vienna AUSTRIA
Dr. Andrezj A Markowicz	IAEA Laboratories 2444 Seibersdorf AUSTRIA *email:* A.Markowicz@iaea.org

Belgium

Mr. Bert B. Masschaeele	Proeftuinstr 86 9000 Gent BELGIUM *email:* bert.masshaele@rug.ac.be
Mr. Peter P. C. Cauwels	Proeftuinstr 86 9000 Gent BELGIUM *email:* peter.cauwels@rug.ac.be
Prof. Franxois V. Tondeur	ISIB Rue Royale 150 Brussels B1000 BELGIUM *email:* tondeur@isib.be

Croatia

Dr. Ines Krajcar Bronic	Radiocarbon and Tritium Laboratory Department of Physics Rudjer Boskovic Institute P.O. Box 1016, Bijenicka 54 10001 Zagreb CROATIA *email:* krajcar@rudjer.irb.hr
Dr. Ivana Jelovica	Faculty of Philosophy Omladinska 14 51000 Rijeka CROATIA
Dr. Zoran Kaliman	Faculty of Philosophy Omladinska 14 51000 Rijeka CROATIA *email:* kaliman@mapef.pefri.hr
Dr. Milica Krcmar	Rudjer Boskovic Institute Bijenicka 54 Zagreb 41001 CROATIA *email :* mkrcmar@rudjer.irb.hr
Mr. Zvonko Krecak	Rudjer Boskovic Institute P.O. Box 1016 Zagreb 41001 CROATIA *email :* krecak@rudjer.irb.hr
Dr. Ante Ljubicic	Rudjer Boskovic Institute Bijenicka 54 Zagreb 41000 CROATIA
Dr. Vladimir Lokner	Hazardous Waste Management Agency 10000 Zagreb Savska 41 IV CROATIA *email:* vladimir.lokner@apo.tel.hr
Dr. (Mrs) Saveta Miljanic	Rudjer Boskovic Institute Bijenicka c. 54 10000 Zagreb CROATIA *email:* saveta@rudjer.irb.hr
Dr. Bogomil Obelic	Rudjer Boskovic Institute P.O. Box 1016 Zagreb 41001 CROATIA *email :* obelic@rudjer.irb.hr
Dr. Nada Orlic	Faculty of Philosophy University of Rijeka Omladinska 14 Rijeka 51000 CROATIA
Dr. Dubravko Rendic	Rudjer Boskovic Institute P.O. Box 1016 Bijenicka 54 Zagreb 41001 CROATIA *email :* rendic@rudjer.irb.hr

Czech Republic

Dr. Tomas Cechak	Czech Technical University in Prague Faculty of Nuclear Sciences and Physical Engineering Brehova 7 Prague 1 11519 CZECH REPUBLIC *email* cechak@br.fjfi.cvut.cz
Prof. Jaroslar Kluson	Czech Technical University in Prague Faculty of Nuclear Sciences and Physical Engineering Brehova 7 Prague 1 11519 CZECH REPUBLIC *email* kluson@br.fjfi.cvut.cz
Dr. Martin Kubelik	Fakulta Architektury Cvutv Praze Thakuroua 7 CZ 16000 Praha 6 CZECH REPUBLIC *email :* kubelik@br.fjfi.cvut.cz
Dr. Ladislav Musilek	Czech Technical University in Prague Faculty of Nuclear Sciences and Physical Engineering Brehova 7, Praha 1 115 19 CZECHOSLOVAKIA *email:* musilek@br.fjfi.cvut.cz
Dr. Miroslav Pardy	Department of Theoretical Physics and Astrophysics Masaryk University Kotlarska 2 BRNO 61137 CZECH REPUBLIC *email:* pamir@physics.muni.cz

Denmark

Prof. Leif I. Gerward	Physics Department Bldg. 307, Technical University of Denmark Kgs. Lyngby DK- 2800 DENMARK *email:* gerward@fysik.dtu.dk
Dr. Per Hedemann Jensen	Riso National Laboratory Roskilde DK- 4000 DENMARK *email:* p.hedemann@risoe.dk
Dr. Bente Lauridsen	Riso National Laboratory Roskilde DK- 4000 DENMARK *email:* bente.lauridsen@risoe.dk

Finland

Dr. Servo Kasi	Kajavankatu 6 B 45 FIN-04230 Kerava FINLAND *email:* servokasi@hotmail.com

France

Dr. Monique Jung	Laboratoire PHASE 23, rue du Loess B.P. 20 67037 Strasbourg-Cedex 2 FRANCE *email:* Monique.jung@phase.c-strasbourg.fr
Prof. L. Makovicka	CREST Universite de Franche-Comte (UFC) 4, Place L. Tharradibn, BP 71427 25211 Montbelliard FRANCE *email:* Libor.Makovicka@pu-pm.univ-fcomte.fr
Dr. Cecile Malgrange	Lab de Mineralogie-Cristallographie Universite Paris 6 4 place Jussieu F-75252 Paris Cedex 5 FRANCE *email :* cecile.malgrange@lmcp.jussieu.fr
Dr. Jean Paul Patau	LP2R2, Faculte de Pharmacie Universite Paul Sabatier 35 chemin des Maraichers 31062 Toulouse Cedex 4 FRANCE *email :* patau@cict.fr

Germany

Dr. (Mrs) Elisabetta Gargioni	Section 624 Physikalische - Technische Bundesanstalt Bundesallee 100 - Braunschweig GERMANY *email:* elisabetta.gargioni@ptb.de
Dr. Maria S.A. Zankl	GSF-Forschugszentrum fur Umwelt und Gesundhelt Institut fur Strahlenschutz Ingolstadter Landstr 1 85764 Neuherberg GERMANY *email:* zankl@gsf.de

Gibraltar

Dr. John Pardo	32 Ross House Red Sands Road GIBRALTAR *email :* tribunal@gibnet.gi

Greece

Dr. Dimitris Emfietzoglou	Department of Medical Physics University of Ioannina Medical School Ioannina 451 10 GREECE *email :* demfietz@cc.uoi.gr
Prof. Ioannis Kandarakis	Technological Educational Institute Department of Medical Instruments Technology Ionising Radiation Laboratory Agiou Spyridonos 12210-Aigaleo Athens GREECE *email:* kandarakis@teiath.gr

Hungary

Dr. Denes Berenyi	Institute of Nuclear Research Hungarian Academy of Science Bem ter 18/C Debrecan Pf 51 H-4001 HUNGARY *email :* berenyi@moon.atomki.hu
Prof. Guyla J. Csikai	4010 Debrecen-10 Pf. 105 HUNGARY *email :* csikai@delfin.klte.hu
Dr. Maria Ivo	H6500 Baja Kodaly u, 6 HUNGARY *email :* adukvfrad@ktm.x400gw.itb.hu
Dr. Imre Kasa	H-1024 Budapest Kaplar u. 10/a HUNGARY

Italy

Dr. Giovammi De Angelis	Lab. Epidemiology and Biostatistics Instituto Superiore Di Samita Via le Regima Elema 299 Rome 00161 ITALY *email :* Giammi.deangelis@iol.it
Dr. Alfredo A. Castellano	Dipartimento Di Scienaz Dei Materiali Universita Di Lecce Leece 7310 ITALY *email:* alfredo.castellano@uuik.it
Prof. Roberto Cesareo	Instituto di Matematica and Fisica Universita Di Sassari Sassari 07100 ITALY *email:* cesareo@ssmain.uniss.it
Dr. Jorge E. Fernandez	Laboratorio di Ingegneria Nucleare di Montecuccolino Universita di Bologna via dei Colli 16 I-40136 ITALY *email :* jorge.fernandez@mail.ing.unibo.it
Dr. Claudio Manfredotti	Istituto di Fisica Superiore Decl' Universita di Torino Corso M. D'Azeglio N.46 Torino 10100 ITALY *email:* manfredotti@to.infn.it
Ms. Sofia Rollet	Cre-enea Via E Fermi 27 Frascati Rome 1-100044 ITALY *email:* rollet@frascati.enea.it
Dr.F. Rustichelli	Istituto di Scienze Fischie Facolta di Medicina e Chirugia Universita Degli Studi di Ancona via Ranieri 65 Ancona 60131 ITALY *email:* isf@alisf1.unian.it

Latvia

Mr. Ainars Bajinskis	Department of Radiotherapy and Nuclear Medicine P. Stradins Clinical University Hospital 13 Pilsonu str Riga LV-1002 LATVIA *email :* ainars4@hotmail.com

Portugal

Professor Margarida Costa	Departmento de Fisica Universidade de Coimbra Coimbra 3004-156 PORTUGAL *email:* guida@pollux.fis.uc.pt
Professor Isabel Lopes	Departmento de Fisica Universidade de Coimbra Coimbra 3004-156 PORTUGAL *email:* isabel@lipc.fis.uc.pt
Professor A. P. de Leao Policarpo	Departmento de Fisica Universidade de Coimbra 3004-156 Coimbra PORTUGAL *email:* policarpo@lipc.fis.uc.pt
Dr. L. M. Tavora	Departmento de Fisica Universidade de Coimbra 3004-156 Coimbra PORTUGAL *email:* lmtavora@saturno.fis.uc.pt

Romania

Dr. Tatiana A. Angelescu	Physics Faculty University of Bucharest PO Box MG11 R 76900 Bucharest ROMANIA *email:* angt@scut.fizica.unibuc.ro
Dr. Dan M. Timus	National Institute for Laser, Plasma and Radiation Physics Electron Accelerators Department PO Box MG-36 Bucharest R-76900 ROMANIA *email :* dante@alpha2.infim.ro timusmdan@yahoo.co.uk timusdan@netscape.net

Russia

Dr. Andrei V Korol	Department of Physics St Petersburg State Maritime Technical University 101 Leninski Prospect 198262 St Petersburg RUSSIA
Dr. Konstantin Kozlovskii	Moscow State Engineering Physics Institute 31 Kashimskoe Sh. Moscow 115409 RUSSIA
Dr. Vladimir A. Maisheev	Institute for High Energy Physics Protvino Moscow Region 142284 RUSSIA *email:* maisheev@mx.ihep.su
Dr. Boris Yu. Melchuk	VNII Geosystem State Scientific Center of Russian Federation Warshavskoe Shosse 8 Moscow 113105 RUSSIA *email:* geosystem@public.mtu.ru
Dr. Alexander Shikanov	Federal Nuclear Geophysics and Geochemist Center (FNGGC) 140 100 Ramenskoe Neftegazosjimka RUSSIA
Prof. Victor L. Sukhorukov	Rostov State University of Transport Communication N. Opolcheniya Square 2 Rostov-na-Donu 344038 RUSSIA *email:* vls@AAAnet.ru
Dr. Alexander S. Tsybin	Department of Solid State Physics Moscow Engineering Physics Institute (State University) Kashirskoe Shosse 31 Moscow 115405 RUSSIA *email:* iheas@tpark.ru

Slovenia

Dr. Matjaz Korun	Jozef Stefan Institute Jamova 39 Ljubljana 1000 SLOVENIA *email:* matjaz.korun@ijs.si

Spain

Mr. Juan Pedro Bolivar	Dep. Fisica Aplicada Huelva University Palos-Huelva 21819 SPAIN *email:* bolivar@uhu.es
Prof. Pedro Coll Buti	Universidao Politecnica de Catalunya Department de Fisica i Enginyeria Nuclear C/Avenida Diagonal 647 Barcelona 08028 SPAIN
Dr. Fernando Legarda	Universidad del Pais Vasco Departamento de Ingenieria Nuclear Mecanica de Fluidos E.T.S. Ingenieros Industriales Alameda de Urquijo s/n 48013 Bilbao SPAIN *email:* inpleibf@bi.ehu.es

Sweden

Professor P. Andreo	Department of Medical Radiation Physics University of Stockholm-Karolinsk Inst Karolinska Hospital Hus P9-02 PO Box 260 S-171 76 Stockholm SWEDEN *email:* p.andreo@ks.se

Switzerland

Professor Georges Charpak	Emerging Energy Technology Group CERN Ch 1211 Geneva 23 SWITZERLAND *email:* anne.dirat@eet.cern.ch
Professor Carlo Rubbia	Emerging Energy Technology Group CERN Ch 1211 Geneva 23 SWITZERLAND *email:* Carlo.rubbia@eet.cern.ch

The Netherlands

Dr. Gerrit J. Kemerink	Department of Radiology University Maastricht P.O. Box 5800 6202 A2 Maastricht THE NETHERLANDS *email :* gkk@rdia.azm.nl

Ukraine

Dr. Inessa A. Boshakova	Lviv State Polytechnical University Kotliarevsky St 1 Lviv 79013 UKRAINE *email:* inessa@mail.lviv.ua
Mr. I. R. Entinzon	International Solomon University ul. Sholudenko, 1-B Kiev 01135 UKRAINE
Dr. Alexander V. Shchagin	Kharkov Institute of Physics and Technology 1 Akademicheskaya Kharkov 310108 UKRAINE *email:* shchagin@kipt.kharkov.ua

U.K.

Dr. Shetha Selman Al-Dargazelli	Surface Science Group Electronic Engineering Computer Group Aston University Birmingham B4 7ET U.K. *email:* s.aldargazelli@aston.ac.uk
Mr. A. W. Allday	Department of Radiography City University Rutland Place, Charterhouse Square London EL 1M 6PA U.K. *email:* a.w.allday@city.ac.u
Dr. A. P. Bagshaw	Department of Clinical Neurophysiology 3rd Floor, Outpatients' Building Middlesex Hospital Mortimer Street London W1N 8AA U.K. *email:* Andrew@madeira.physiol.ucl.ac.uk
Dr. Colin R. Baker	Radiotherapy Division Department of Allied Health Professions University of Liverpool Liverpool U.K. *email :* colin.baker@liverpool.ac.uk colin.baker@physics.org
Dr. David A. Bradley	School of Physics University of Exeter Stocker Road Exeter EX4 4QL U.K. *email:* d.a.bradley@exeter.ac.uk
Professor Malcolm J. Cooper	Department of Physics University of Warwick Coventry CV4 7AL U.K. *email:* m.j.cooper@warwick.ac.uk
Dr. M. J. Farquharson	Department of Radiography City University Rutland Place Charterhouse Square London EC1 M6PA U.K. *email:* M.J.Farquharson@city.ac.uk
Ms. Kalotina Geraki	Department of Radiography City University Rutland Place Charterhouse Square London EC1M 6PA U.K. *email:* k.geraki@city.ac.uk
Dr. Walter B. Gilboy	Physics Department University of Surrey Guildford Surrey GU2 5XH U.K. *email:* w.gilboy@surrey.ac.uk
Dr. Christopher C. Goddard	BNFL Environmental Services Berkeley Centre Berkeley Gloucestershire GL13 9PB U.K. *email:* goddard@myrealbox.com
Dr. Stuart Green	Department of Medical Physics and Bioengineering Queen Elizabeth Medical Centre Birmingham B15 2TH U.K. *email:* Stuart.Green@uhb.nhs.uk
Dr. Richard Hugtenburg	School of Physics and Astronomy University of Birmingham Birmingham B15 2TT U.K. *email:* r.p.hugtenburg@bham.ac.uk
Dr. Russell D. Luggar	Department of Physics University of Surrey Guildford Surrey GU2 5XH U.K. *email:* r.luggar@surrey.ac.uk
Dr. H. M. Mahesh	ETL, EERC, School of Civil Engineering David Keir Building, Stranmillis Road Queen's University of Belfast Belfast - BT9 5AG Northern Ireland U.K. *email* : m.matt@qub.ac.uk hm.mahesh@rediffmail.com
Dr. Pirunthavany Muthuvelu	Biomedical Physics Group School of Physics University of Exeter Exeter Surrey EX4 4QL U.K. *email:* P.Muthuvelu@exeter.ac.uk
Dr. Hooshang Nikjoo	MRC Radiology Unit Chilton, Didcot Oxon OX11 0RD U.K. *email:* H.Nikjoo@har.mrc
Ms. Elaine Ryan	Radiation Laboratory City University Northampton Square London EC1V OHB U.K. *email:* e.ryan@city.ac.uk
Professor J. A. Simmons	74 Whitehall Park London N19 3TN U.K.
Profesor Robert Speller	Department of Medical Physics and Bioengineering 11-20 Capper Street London WC1E 6JA U.K. *email:* rspeller@medphys.ucl.ac.uk
Dr. D. N. Timms	School of Environmental and Earth Sciences Burnaby Building Portsmouth University Portsmouth PO1 3QL U.K. *email:* david.timms@port.ac.uk

Uzbekistan

Dr. Alexander Rakov	

Yugoslavia

Profesor Dragana Popovici	Department of Physics and Biophysics Faculty of Veterinary Medicine University of Belgrade, Bul. JA 18 Belgrade 11000 YUGOSLAVIA *email:* stankopo@eunet.yu