

ARCHIVE EDITION OF IRPS BULLETIN

Volume 16 No 4 December, 2002

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M.J. Cooper
**Department of Physics
 University of Warwick
 Coventry CV4 7AL U.K.**

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R.H. Pratt
**Dept. of Physics
 Univ Pittsburgh, PA
 15260 USA**

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A. Ljubicic
**Rudjer Boskovic Institute
 Bijenicka 54
 Zagreb 41000 Croatia**

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FROM THE
EDITOR
**Paul
Bergstrom**

If this issue of the IRPS Bulletin seems a little thin, the reason is that few articles have been submitted. So, I once again urge the membership to consider ways to increase both the size and quality of the Bulletin.

I have several ideas of my own and wish to bring them to your attention. I believe that articles on the day-to-day “practice” of radiation physics in one locale would be of interest to others. Reviews of books, recent articles and conferences in Radiation Physics would also be appreciated. I think that another area of interest would be analyses of classic papers in Radiation Physics. Of course, original research papers are still welcome.

Concentrating on what we have in this issue, Shirley McKeown has given us an overview of her recent eclipse viewing expedition, I provided brief descriptions of three conferences which took place in the US within the last two months, and Lief Gerward has written a report on a DESY press release concerning an X-ray Laser Co-operation agreement.

Other items of note are that Vice President Dan Jones was selected as a new member of the International Commission on Radiation Units and Measurements (ICRU). Leaving the ICRU is Dr. Randall Caswell (who sits down the hall from me at NIST).

Another Vice President, John Hubbell, was elected a fellow of the American Physical Society in, appropriately enough, the Forum on International Physics. His citation is “for constructive syntheses of data on photon interactions in compilations used around the world in a wide range of disciplines, and for his effective promotion of radiation physics in developed and developing countries.”

Congratulations Dan and John!

Best wishes to all in the New Year

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PRESIDENT'S
COLUMN
Malcolm Cooper

First let me wish everyone a happy 2003. It is a big year for IRPS with our triennial conference in Cape Town at the end of October. At the last count over 20 of the speakers we invited (that is almost all) have agreed to lecture. I think that we are set for an excellent symposium. Don't forget that the preceding workshop provides a perfect justification to bring along a student for a double dose of radiation physics.

Those of us nearer the end rather than the beginning of our professional careers are prone to look at the past through rose-tinted spectacles, but it does seem in the UK at least that competition for funding for "blue skies" research is getting harder and harder. Relevance must be claimed at the outset, whereas we all know that many of the scientific advances that have changed society have come about through seemingly "useless" rather than "useful" research.

It is also a couple of generations since the "gifted amateur" has been able to make an impact in physics or specifically radiation physics. I was reminded of this when reading an obituary in the Times of London for Sir Michael Clapham who died on 11th November 2002. He read classics in the 1930's at Cambridge, England and upon graduation became an apprentice printer at Cambridge University Press (what humility: most graduates today expect to become instant management consultants). By the end of the decade Clapham was running a publishing house. During the second world war he worked on improving the metal photo-engraving screens used to print newspapers. Finer, closer spaced holes were needed in order to improve the print resolution. He solved that problem together with a colleague and found that he had actually invented the ideal diffusion barrier for separating uranium isotopes by gaseous diffusion.

The classicist turned printer was now a physicist and was rapidly seconded to the "Tube Alloy Project" a code name for the UK bomb project in the 1950's.

I wonder whether he was the last of a breed? If so it is a pity. I would be pleased to learn of some more contemporary examples, and thinking about it, the quality of our scientific journal articles would be greatly enhanced by having classicist co-authors.

Happy New Year!

Malcolm Cooper

[Three Conferences in Radiation Physics in the United States](#) **by Paul Bergstrom**

[X-ray Laser Co-operation](#) **by Lief Gerward**

[An Amateur Eclipse-Watcher watches an Eclipse](#) **by Shirley McKeown**

Three Conferences in Radiation Physics in the United States

Paul Bergstrom

U.S. Department of Commerce
NIST 100 Bureau Dr., Stop 8460
Gaithersburg MD 20899-8460 U.S.A.

email : palko@nist.gov

The last few months of 2002 have been particularly eventful ones for providing opportunities for radiation physicists to exchange ideas at a number of conferences in the United States. The editor personally attended three of these meetings. These were the annual meeting of the Council of Ionizing Radiation Measurements and Standards (CIRMS), a symposium of the National Council of Radiation Protection (NCRP) entitled "Computed Tomography: Patient Dose" and the 17th Conference on the Application of Accelerators in Research and Industry (CAARI). A brief overview of these meetings is presented.

Within the US, CIRMS is a forum that provides "national leadership, focus, action, and information dissemination across radiation protection disciplines on a wide range of ionizing radiation measurements and standards topics (IRMST)." CIRMS is also the U.S. council that speaks for IRMST and helps to bring the national and international standards groups to consensus and consistency. Furthermore, it works on applications common to industry, academia, the medical community, and government needs. Each year, in October, CIRMS meets at the National Institute of Standards and Technology (NIST) in Gaithersburg. This year the meeting took place from October 21 through October 23.

Dr. Karen Brown, Deputy Director of NIST, opened the meeting by describing the role that CIRMS plays in identifying priorities at NIST and its history as an open forum and driver for new directions in related research and development. She praised the process used by CIRMS in authoring the National Needs Report and the valuable role it has played in the past and will play in the future of radiation research. Richard Kayser, Director of Technology Services at NIST started a series of plenary talks on the subject of traceability with a discussion of the benefits to the radiation measurements community, and the role played by NIST in supporting traceability to the national standards. He described in general terms measurement assurance programs and the role of laboratory accreditation. He also described the international importance of traceability with descriptions of the role played by the International Committee of Weights and Measures (CIPM) and the importance of mutual recognition of measurement certificates among participating countries/agencies. Robert Watters of NIST then followed up with a discussion of the Bureau International des Poids et Mesures (BIPM) Key Comparison Database. This database is broad in scope, containing comparisons in Radiation Physics and beyond. Watters described some of the search tools and gave examples of information which can easily be extracted.

Specializing to ionizing radiation, Ken Shortt of the International Atomic Energy Agency (IAEA) gave a presentation on the IAEA programs for metrology, intercomparisons, and support of traceability. Current comparison programs include Co-60, x-rays for medical applications, and mammography. IAEA is a recognized secondary standards laboratory under the BIPM primary lab. Similar plenary presentations on traceability in various nations were given by Bert Coursey of NIST in the USA, Jürgen Böhm of Physikalisches-Technische Bundesanstalt (PTB) in Germany and Martyn Sené of the National Physical Laboratory (NPL) in the UK. Within the USA, various communities have strong interests in traceability of ionizing radiation measurements. Plenary talks by Geoffrey Ibbott of the American Association of Physicists in Medicine (AAPM), Robert Loesch of the Department of Energy (DOE), Harry Farrar of ASTM Committee E10, and Thomas Tenforde of the NCRP described the needs in the medical, other governmental and industrial communities.

CIRMS meetings are characterized by breakout sessions organized by the various subcommittees of CIRMS. The focus of these breakout sessions differed substantially from the plenary lectures. The Occupational Radiation Protection and Public and Environmental Radiation Protection subcommittees combined efforts to address Homeland Security within the United States. Representatives of government and industry discussed readiness for radiological threats and roadmaps for future progress. The Medical Subcommittee had a full agenda, continuing with discussion of traceability, then discussing upcoming changes in external beam standards, brachytherapy standards and new developments in nuclear medicine. The Industrial and Materials Effects Subcommittee devoted its sessions to understanding standards in high-dose applications, radiation effects on materials and some work in countering terrorism with an emphasis on recent efforts within the US to inactivate anthrax in the US Mail. The conferees did gather en masse a few more times to view posters, to attend the banquet (a barbeque at Smoky Glen Farm) and to recognize awardees for the student poster travel grants and for the Randall Caswell Award.

The Symposium on Computed Tomography: Patient Dose, sponsored by the NCRP (<http://www.ncrp.com>), took place on November 6 and 7 in Arlington, Virginia. The first day was dedicated to invited talks (no parallel sessions). The second, which this reporter was unable to attend, was given to working sessions. This symposium was organized to address the fact that, within the United States, patient dose in diagnostic procedures has been increasing in recent years. The reasons are an increase in the number of procedures and increased dose for new imaging modalities. Within a linear no-threshold projection of risk versus dose, this means that there will be an increase in the number of cancers. This assumption is, of course, considered debatable. Particular emphasis seems to be placed on reducing dose to infants and children as they have many years to manifest any ill effects of the dose needed to form an image.

The first session was dedicated to Radiation Phenomena. Physicists and medical doctors from the US Government, hospitals and universities provided background information. Radiation Phenomena is apparently a term with broad purview as data were presented on a wide range of issues. Some of these were physical or biological: definitions, identification of mechanisms, etc. Others were statistical, epidemiological and economic. A further morning session concentrated on specifics of CT. For example, there are a variety of knobs which can be independently set and which, by themselves, give a partial description of the dose absorbed by the patient. These settings are such things as kVp (the potential of the x-ray tube), mAs (milliamperere seconds) and pitch. There are a number of studies and recommendations which incorrectly utilize one or another of these settings to parameterize the dose during imaging. Other studies indicate that the situation is even worse, finding that many radiologists concentrate on one of these settings without knowledge of or concern for the others. Some of the talks indicated that the issue might not be so much one of reducing dose in individual scans. Rather, limiting scans to essential situations and distinct regions of the body would also help to reduce dose to the population in general. In fact, scans which are made without real clinical indications have very high costs per life saved. Of the 60 million CT scans in the United States (60% of the world total), 11% are performed on children and 17% of those are on those between birth and the age of 5. Many of these scans to these potentially sensitive populations have very little payoff potential. The afternoon sessions started with a wish-list for manufacturers to help simplify things in the clinic and, failing to get action on that, a procedure employed at the Mayo Clinic to regularize scans across a variety of machines. Talks were then given by industry representatives in a manufacturers' panel. Representatives from General Electric, Siemens, Philips and Toshiba discussed their recent efforts to manage CTDI (computed tomography dose index). A point of interest was discussion of the necessary level of image quality versus the level demanded by physicians. The next afternoon session was primarily aimed at education of the various user groups of CT scanners. These groups are radiologists, technicians and physicists. A final afternoon session concentrated on state and federal regulation and on public outreach.

CAARI, the 17th conference in this series, took place from November 13 to November 16 in Denton, Texas. This conference is characterized by having a single plenary session, a large number of parallel sessions and a poster session. Another characteristic of this conference is that nearly every evening the organizers have a social event that brings together the conferees for some Texas hospitality. Additionally, an industrial exhibit runs through the first couple of days of the conference enabling conferees to lay hands upon the latest accelerator-related products. The plenary session consisted of four talks that were on such diverse topics as the Munich Tandem Accelerator, the use of Rutherford backscattering in investigating global warming, the discovery of superheavy elements and the binary theory of electronic stopping. After this session, the parallel nature of the meeting began in earnest. (I say in earnest as, curiously enough, a session on the use of accelerators in medicine was held in parallel with the plenary session.) Longtime attendees are used to shuttling back and forth between various floors of the University Union with an occasional detour to another building (such as Physics) on campus. Talks are twenty five minutes long. In some rooms the doors are inconveniently located so it is necessary to bowl over the speaker as one rushes to catch a talk in another session. The variety of topics reflects the diversity of the participants who come from academia, industry, hospitals and government. There were twenty-two sessions on accelerators, ten on atomic physics, nine on materials analysis and explosives detection, seven on medical physics, five on nuclear physics, two on teaching and a number on other topics including several titled "Selected Topics".

Just as in the case of the CIRMS meeting, Homeland Security (US) sessions were very prominent and well attended. Many of the talks from the meeting will be represented by papers in the proceedings (which will be published by the American Institute of Physics).

For more information please see those proceedings or go to the conference website:

<http://orgs.unt.edu/CAARI>

X-Ray Laser Co-operation

DESY and SLAC sign agreement in Washington

DESY Press Release

Item provided by
Lief Gerward
Department of Physics, Technical University of Denmark
Fysikvej Building 307
DK-2800 Kongens Lyngby, Denmark

email : gerward@fysik.dtu.dk

With the signature of a Memorandum of Understanding, DESY (Deutsches Elektronen-Synchrotron, Hamburg, Germany) and the accelerator center SLAC (Stanford Linear Accelerator Center in California, USA) have set the seal on their intention to start a close collaboration in X-ray laser research and to make joint efforts to promote this trendsetting field of research.

The Memorandum of Understanding will establish a "Collaborative Research Effort to Enable the Exploitation of the Scientific Capabilities of the Linac Coherent Light Source (SLAC project LCLS) and the TESLA (DESY project TeV Energy Superconducting Linear Accelerator) X-Ray Free-Electron Laser".

The Memorandum was signed on Friday, November 1, 2002 in the Department of Energy (DOE) in Washington by Professor Jonathan Dorfan, Director of SLAC, and the DESY Directors Professor Albrecht Wagner and Professor Jochen R. Schneider.

Among others, the Memorandum describes the exchange of personnel, equipment, research results and data, as well as know-how. This will accelerate and contribute to the scientific programs of both facilities, which complement one another in their qualities and, according to current planning, will start operation in 2008 and 2011, respectively.

The first step will be the joint benefit from the research results from each of the small pilot facilities which are already under construction in Stanford and Hamburg.

An Amateur Eclipse-watcher Watches an Eclipse

Shirley McKeown

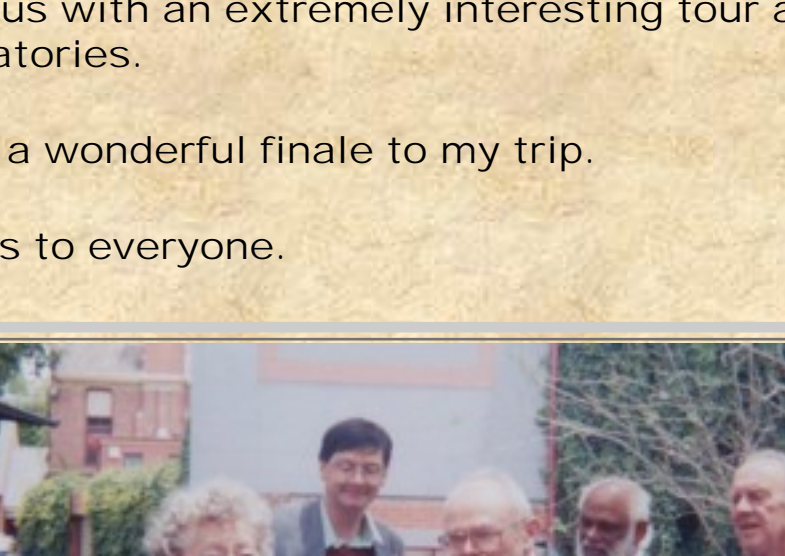
University of Canberra
Canberra A.C.T. 2601 Australia

email : wombats1@tpg.com.au

On 4 December, 2002, at Ceduna, South Australia, I witnessed my first Total Eclipse of the Sun, and now understand why people become Eclipse Chasers!

To watch our greatest source of radiation "overcome" by a tiny, inactive moon was awe-inspiring, to say the least. And to see daylight begin to fade during daylight hours, to feel the sudden cold, to listen to the absolute quietness of the normally vocal birdlife no wonder our ancient ancestors feared these events!

Cloud cover was very heavy at Ceduna, and, like the many thousands of people in the area, I donned my eclipse-viewing glasses, waited, hoped ... but really didn't expect it to clear ... and then, like a curtain being lifted, the cloud parted and we were staring at a tiny black mark touching the rim of the sun ... watching it grow into a full circle of darkness as it moved in front of our giant "radiator" to produce the beautiful effects of 'beads', 'diamond rings', auras ... jubilant that we were seeing such a wonderful example of the beauty and power of our natural world.



This is my one-and-only photograph of the eclipse - the moon "touching" the sun's rim. I made a total mess of the rest ... holding the camera on top of your head so that you can continue to stare at the eclipse while clicking, is not exactly the best way to take photos!!

En route back to Canberra I had the pleasure of meeting up with three IRPS members - Chris Chantler, John Hubbell and Bill Mathew. John and his wife Jean had also witnessed the eclipse (with far better results than mine!) and John gave a presentation on eclipses at the University of Melbourne, hosted by Chris. Chris also provided us with an extremely interesting tour around his laboratories.

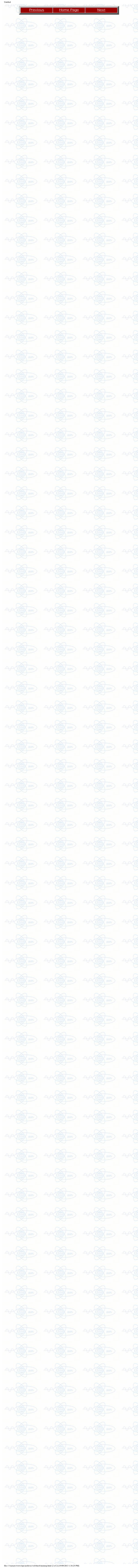
This was a wonderful finale to my trip.

My thanks to everyone.



Left to Right : Jean Hubbell, Chris Chantler, John Hubbell, Bill Mathew, Rod Webster
at University of Melbourne, Australia

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**NEW
MEMBERS,
ADDRESS
CHANGES**

Welcome to New Members :

Dr Thomas Varghese, [India](#)

Dr C M Bartle, [New Zealand](#)

Dr Taofeeq Ige, [Nigeria](#)

Dr Andrei V Korol, [Russia](#)

Mr Samuel S S Barkhane, [South Africa](#)

Dr Steven S Maage, [South Africa](#)

Dr Julyan J E Symons, [South Africa](#)

Dr Chris Theron, [South Africa](#)

Dr Arzu Kurtoglu, [Turkey](#)

Dr David N Timms, [U.K.](#)

Dr Adel M Baryoun, [U.S.A.](#)

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(click on country next to name)

***Changes to Members' Addresses and Contact
Information***

Address change :

Dr Aniruddha Deb, [U.S.A.](#) (from
[Japan](#))

Dr Nadir Omar Hashim, [Kenya](#)

Dr Sameen Ahmed Khan, [U.S.A.](#)
(from [Italy](#))

Dr Nobuhisa Takata [Japan](#)

* Dr Amina Shakir Mahmood, [Libya](#)

* Ms Betty A Torres [U.S.A.](#)

Email updates :

Prof P Andreo, [Sweden](#)

Dr James Turner, [U.S.A.](#)

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Members' Details

(click on country next to name)

* ***indicates the information was gained after this issue was sent to members;
it will be included in the next issue of the Bulletin***

  India  	
Mr D.N. Avadhani	Department of Physics Mangalore Univesity Mangalagangothri Mangalore 574 199 Karnataka INDIA <i>email:</i> d_avadhani@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	Department of Physics Bose Institute Calcutta 700 009 INDIA
Dr Ramesh Desai	B/6 Deval Apartment near Anjali Cinema Chhaganlal Jadhav Marg Bhaltha, Paldi Ahmedabad 380007 INDIA <i>email:</i> desairamesh99@yahoo.com
Dr Srinivasan Ganesan	Theoretical Physics Division 5th Floor, Central Complex Bhabha Atomic Research Centre Trombay Mumbai 400 085 INDIA <i>email:</i> ganesan@magnum.barc.ernet.in
Dr. B.N. Ghosh	Variable Energy Cyclotron Centre Bidhan Nagar Calcutta 700 064 INDIA
Prof. P.P. Kane	Dept. of Physics Indian Inst. of Technolgy Powaii Bombay 400 076 INDIA <i>email:</i> ppkane@vsnl.com
Dr. B. R. Kerur	Department of Physics Gulbarga University Gulbarga 585 106 INDIA <i>email:</i> kerurbrk@hotmail.com
Dr Dorlando T Khathing	Regional Sophisticated Instrumentation Centre North Eastern Hill University Bijnai Complex, Laitumkhrach Shillong 793 003 INDIA
Dr Govind N Nayak	Department of Physics Mangalore University Mangalagangothri 574 199 INDIA <i>email :</i> nerolunayak@yahoo.comn
Dr Biva Roy	Department of Physics Bose Institute Calcutta 700 009 INDIA <i>email:</i> biva@bosemain.boseinst.ac.in
Prof. Suprakash C. Roy	Dept. of Physics Bose Institute Calcutta 700 009 INDIA <i>email:</i> sup_roy@yahoo.com
Dr Ramkumar Saphtharishi	2126 6th Cross 15th Main HAL III Stage Bangalore 560 008 INDIA <i>email :</i> mp96sr@yahoo.com Ramkumr.Saphtharishi@geind.ge.com
Dr Prasanta Sen	Saha Institute of Nuclear Physics Block AF, Sector I, Salt Lake Calcutta 700 064 INDIA <i>email:</i> psen@hp1.saha.ernet.in
Dr Bhajan Singh	Department of Physics Punjabi University Patiala 147 002 INDIA
Dr. Bikash Sinha	Director Variable Energy Cyclotron Centre Bidhan Nagar Calcutta 700 064 INDIA <i>email:</i> bikash@tnp.saha.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 <i>email:</i> kulwantsthind@yahoo.com
Dr. T.K. Umesh	Department of Studies in Physics University of Mysore Manasagangothri Mysore 570 006 INDIA <i>email:</i> tku@vsnl.net tku@uomphysics.net
Dr Thomas Varghese	Department of Physics Nirmala College Muvattupuzha Kerala 686 661 INDIA <i>email:</i> surajthomas@ulns.net
Mr Premanand Yadav	C/- Dr P N Singh New F/18, Hyderabad Colony Banaras Hindu University Varanasi 221 005 INDIA

Australia

Dr Christopher T. Chantler	School of Physics University of Melbourne Parkville Victoria 3010 AUSTRALIA <i>e-mail:</i> chantler@ph.unimelb.edu.au
Prof. D.C. Creagh	School of Applied Sciences University of Canberra Canberra ACT 2601 AUSTRALIA <i>e-mail:</i> 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 <i>e-mail:</i> ross.dawe@dsto.defence.gov.au
Ms Shirley McKeown	PO Box 1330 Queanbeyan NSW 2620 AUSTRALIA <i>email:</i> wombats1@tpg.com.au
Dr D McLean	School of Medical Radiation Sciences Faculty of Health Sciences University of Sydney Cumberland College Campus Lidcombe NSW 2141 AUSTRALIA <i>email:</i> d.mclean@cchs.usyd.edu.au

New Zealand

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

Malaysia

Mr M A Malek	School of Physics Universiti Sains Malaysia 11800 USM Penang MALAYSIA
--------------	---

Mr B Z O Shakhreet	Desa Aman K18, 106B UPPU, JHEP Universiti Sains Malaysia Pulau Pinang USM 11800 MALAYSIA <i>email:</i> bshakhreet@hotmail.com
--------------------	--

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 <i>email:</i> mala_das@yahoo.com
--------------	---

Dr Yoshiaki Ito	Institute for Chemical Research Kyoto University Uji, Kyoto 611 JAPAN
-----------------	---

Prof. Akira Iwasaki	School of Health Sciences Hiroasaki University 66-1 Hon-cho Hiroasaki Amori 036-8564 JAPAN <i>email:</i> akira@cc.hirosaki-u.ac
---------------------	---

Dr. Ikuo Kanno	Dept. of Nuclear Engineering Kyoto University Sakyo-ku Kyoto 606-01 JAPAN <i>email:</i> kanno@qsec.kyoto-u.ac.jp
----------------	---

Dr Takashi Nakamura	Cyclotron and Radioisotope Center Tohoku University Aoba, Aramaki Sendai JAPAN <i>email:</i> nakamura@cycic.tohoku.ac.jp
---------------------	---

Dr. Nobuhisa Takata	Ionizing Radiation Section NMIJ/AIST (National Metrology Institute of Japan/National Institute of Advanced Industrial Science and Technology) C2-3, 1-1-1 Umezono, Tsukuba, Ibaraki, 305-8568 JAPAN <i>email:</i> ntakata@aist.go.jp
---------------------	--

Dr. Yoshitomo Uwamino	Safety Center/RIKEN 12-1 Hirose Wako Saitama 351-0198 JAPAN <i>email:</i> uwamino@postman.riken.go.jp
-----------------------	---

Dr Mihai A Vlaicu	Osaka Electro-Communication University 18-8 Hatsu-cho Neyagawa Osaka 572-8530 JAPAN <i>email:</i> avlaicu@isc.osakac.ac.jp
-------------------	--

Korea

Dr Jae-Shik Jun	G&G Radcon Co., Ltd 301 Jangyoungsil-gwan, Venture Town Shini-dong, Daeduk-gu Daejeon 306-230 KOREA (South) <i>email:</i> junjss@hanmail.net
-----------------	---

Dr J K Kim	Department of Nuclear Engineering Hanyang University 17 Haengdang Sungdong Seoul 133-791 KOREA <i>email:</i> 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
-------------------	---

Pakistan

Dr Rizwan Hussain	23A Street 3, Valley Road Westridge 1 Rawalpindi PAKISTAN
-------------------	--

People's Republic of China

Prof. Peizhu Ding	Institute of Atomic and Molecular Physics Jilin University Changchun 130023 P.R. CHINA
-------------------	--

Prof. Beilai Hu	Department of Physics Nankai University Tianjin 300071 P.R. CHINA
-----------------	--

Dr Tao Jin	Department of Radiation Physics Xinjiang Institute of Physics Chinese Academy of Science P.O.Box. 139, Urumqi Xinjiang 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	Shanghai 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. Zheng Zheng	Department of Environmental Science and Engineering Nanjing University Nanjing Jiangsu 210014 P.R. CHINA <i>email:</i> zzheng@nju.edu.cn
-----------------	---

Italy

Dr Giovammi De Angelis	Lab. Epidemiology and Biostatistics Istituto Superiore Di Sanita Via le Regime Elema 299 Rome 00161 ITALY <i>email:</i> Giammi.deangelis@iol.it
------------------------	--

Dr Alfredo A Castellano	Dipartimento Di Scienza Dei Materiali Universita Di Lecce Lecce 7310 ITALY <i>email:</i> alfredo.castellano@uilk.it
-------------------------	---

Prof Roberto Cesaro	Istituto di Matematica and Fisica Universita Di Sassari Sassari 07100 ITALY <i>email:</i> cesaro@ssmain.uniss.it
---------------------	--

Dr. Jorge E Fernandez	Laboratorio di Ingegneria Nucleare di Montecuccolino Universita di Bologna via dei Colli 16 I-40136 ITALY <i>e-mail:</i> jorge.fernandez@mail.ing.unibo.it
-----------------------	--

Dr. Claudio Manfredotti	Istituto di Fisica Superiore Dept' Universita di Torino Corso M. D'Azeglio N 46 Torino 10100 ITALY <i>email:</i> manfredotti@to.infn.it
-------------------------	--

Ms Sofia Rollet	Cre-enea Via E. Fermi 27 Frascati Rome 1-100044 ITALY <i>email:</i> rollet@frascati.enea.it
-----------------	--

Dr.F. Rustichelli	Istituto di Scienze Fisiche Facolta di Medicina e Chirurgia Universita Degli Studi di Ancona via Ranieri 65 Ancona 60131 ITALY <i>email:</i> isf@alist1.unian.it
-------------------	--

The Netherlands

Dr. Gerrit J Kemmerink	Department of Radiology University Maastricht P.O. Box 5800 6202 A2 Maastricht THE NETHERLANDS <i>e-mail:</i> gkk@rdia.azm.nl
------------------------	--

Poland

Dr.E Zukowski	Institute of Experimental Physics University of Bialystok ul. Lipowa 41 15-424 Bialystok POLAND <i>email:</i> ezukow@alpha.uwb.edu.pl
---------------	---

Portugal

Professor Margarida Costa	Departamento de Fisica Universidade de Coimbra Coimbra 3004-156 PORTUGAL <i>email:</i> guida@pollux.fis.uc.pt
---------------------------	---

Professor Isabel Lopes	Departamento de Fisica Universidade de Coimbra Coimbra 3004-156 PORTUGAL <i>email:</i> isabel@lpc.fis.uc.pt
------------------------	---

Professor A P de Leao Policarpo	Departamento de Fisica Universidade de Coimbra 3004-156 Coimbra PORTUGAL <i>email:</i> policarpo@lpc.fis.uc.pt
---------------------------------	--

Dr. L M Tavora	Departamento de Fisica Universidade de Coimbra 3004-156 Coimbra PORTUGAL <i>email:</i> lmtavora@saturno.fis.uc.pt
----------------	---

Romania

Dr Tatiana A. Angelescu	Physics Faculty University of Bucharest PO Box MG11 R 76900 Bucharest ROMANIA <i>email:</i> angl@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 <i>email:</i> dante@alpha2.infm.ro timusmdan@yahoo.co.uk timusdan@netscape.net
-----------------	---

Saudi Arabia

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

Slovenia

Dr Matjaz Korun	Jozef Stefan Institute Jamova 39 Ljubljana 1000 SLOVENIA <i>email:</i> matjaz.korun@ijs.si
-----------------	--

Thailand

Dr. Thiraphat Vilaithong	Director Fast Neutron Research Facility Department of Physics Faculty of Science Chiang Mai 5002 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 <i>e-mail</i> : murtyrk@mopiol.ub.bw

Canada

Mr. John W. Barnard	Box 1215 Lac du Bonnet Manitoba MB R0E 1A0 CANADA <i>email</i> : jwb@acsion.com
Prof. Paul C. Johns	Department of Physics Carleton University 314 Herzberg Building 1125 Colonel By Drive Ottawa ON K1S 5B6 CANADA <i>email</i> : johns@physics.carleton.ca
Dr John R Johnson	Safety Group Stores (Safety Annex) TRIUMF 4004 Wesbrook Mall Vancouver B.C. CANADA <i>email</i> : johnsrj@triumf.ca
Mr Ernesto Mainegra-Hing	211 7th Street New Westminster Vancouver BC V3M 3K2 CANADA <i>email</i> : mainegra@irs.phy.nrc.ca
Dr Joanne M O'Meara	Medical Physics, GS 105/B McMaster University 1280 Main St W Hamilton ON L8S 4K1 CANADA <i>email</i> : omearam@mcmaster.ca
Prof. William V. Prestwich	Nuclear Research Building McMaster University 1280 Main Street W. Hamilton ON L8S 4K1 CANADA <i>e-mail</i> : prestwic@mcmaster.ca

Iran

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

Ghana

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

Morocco

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

Nigeria

Dr Ayodeji O Awodugba	Department of Pure and Applied Physics Ladoke Akintola University of Technology P.M. B400 Ogbonoso NIGERIA <i>email</i> : fasal@skannel.com
Dr Taofeeq Ige	National Hospital (Medical Physics) PMB 425 Garki Abija NIGERIA <i>email</i> : taofeeqige@yahoo.com

Tanzania

Dr W E Muhogora	National Radiation Commission PO Box 743 Arusha TANZANIA <i>email</i> : nrc.tz@habari.co.tz
-----------------	---

South Africa

Mr Samuel S S Bakhane	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA
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 <i>email</i> : jones@tlabs.ac.za
Prof. Rex J. Keddy	Dept. of Medical Physics University of the Witwatersrand Private Bag 3 Johannesburg 2050 SOUTH AFRICA <i>email</i> : mwrexlim@mweb.co.za keddy@sic.wits.ac.za
Dr Steven S Maage	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA <i>email</i> : maage@nac.ac.za
Prof. Ivo. Petr	National Nuclear Regulator (NNR) PO Box 7106 Centurion Hennopsmeer 0046 SOUTH AFRICA <i>email</i> : ipetr@nnr.co.za
Professor John F Sharpey-Schafer	iThemba LABS (Laboratory for Accelerator Based Sciences) 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 <i>email</i> : johanvr@nac.ac.za
Dr Julian J.E. Symons	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA <i>email</i> : symons@tlabs.ac.za
Dr Chris Theron	iThemba Labs P.O. Box 722 Somerset West 7129 SOUTH AFRICA <i>email</i> : ctheron@tlabs.ac.za

Togo

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

Libya

Dr Amina Shakir Mahmood	Physics Department Faculty of Arts and Science Mergib University Khoms PO Box 40117 LIBYA
-------------------------	---

Namibia

Professor J A Oyedele	Department of Physics University of Namibia Private Bag 13301 Windhoek NAMIBIA <i>email</i> : oyedelej@unam.na
-----------------------	---

Kenya

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

Syria

Dr. Ibrahim Othman	Atomic Energy Commission P.O. Box 6091 Damascus SYRIA <i>email</i> : aecs@mail.sy
--------------------	---

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

Ecuador

Mr Vasquez Pazmino Nicolas	Escuela Politecnica Nacional A.C. 17-17-28 Quito ECUADOR <i>email</i> : egocelua@yahoo.com
----------------------------	--

Finland

Dr Servo Kasi	Kajavankatu 6 B 45 FIN-04230 Kerava FINLAND <i>email</i> : skasi@mappi.helsinki.fi
---------------	---

Russia

Dr. Andrei V Korol	Department of Physics St Petersburg State Maritime Technical University 101 Leninskiy Prospekt 198262 St Petersburg RUSSIA
Dr. Konstantin Kozlovskii	Moscow State Engineering Physics Institute 31 Kashimskoe Sh. Moscow 115409 RUSSIA
Dr. Vladimir A Maishev	Institute for High Energy Physics Protvino Moscow Region 142284 RUSSIA email: maishev@mx.ihep.su
Dr Boris Yu. Melchuk	VNI Geosystem State Scientific Center of Russian Federation Vorshavskoe Shosse 8 Moscow 113105 RUSSIA email: geosystem@public.mtu.ru
Dr. Alexander Shikanov	Federal Nuclear Geophysics and Geochemical Center (FNGGC) 140 100 Ramenskoye Neftegazosiminka RUSSIA
Prof. Victor L. Sukhorukov	Rostov State University of Transport and 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: lhasas@tpark.ru

Spain

Mr. Juan Pedro Bolivar	Dep. Fisica Aplicada Huelva University Palos-Huelva 21819 SPAIN email: bolivar@uhu.es
Prof. Pedro Coll Buli	Universidao Politecnica de Catalunya Departament 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-Karolinska Inst Karolinska Hospital Hus P9-02 PO Box 260 S-171 76 Stockholm SWEDEEN e-mail: p.andreo@ks.se
--------------------	--

Dr Roumiana Peikova Chakarova	Department of Reactor Physics Chalmers University of Technology Göteborg S 41296 SWEDEEN e-mail: rum@nephy.chalmers.se
-------------------------------	---

Switzerland

Professor Georges Charpak	Emerging Energy Technology Group CERN Ch 1211 Geneva 23 SWITZERLAND email: anne.dirat@cet.cern.ch
---------------------------	--

Professor Carlo Rubbia	Emerging Energy Technology Group CERN Ch 1211 Geneva 23 SWITZERLAND email: Carlo.rubbia@cet.cern.ch
------------------------	--

Ukraine

Dr Inessa A Boshakova	Lviv State Polytechnical University Kotliarskyi 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
-------------------------	--

Dr Peter A. Verkhovodov	Box 51/3 Kiev 252142 UKRAINE
-------------------------	------------------------------------

U.K.

Dr Sheha 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 EC1M 6PA U.K. email: a.w.allday@city.ac.uk
---------------	--

Dr A P Bagshaw	Department of Clinical Neurophysiology 3rd Floor, Outpatients' Building Middlesex Hospital Northmead 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. e-mail: 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
--------------------	---

Dr. 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 EC1M 6PA U.K. e-mail: M.J.Farquharson@city.ac.uk
--------------------	--

Ms Katolina Geraki	Department of Radiography City University Rutland Place Charterhouse Square London EC1M 6PA U.K. e-mail: k.geraki@city.ac.uk
--------------------	---

Dr Walter B. Gilboy	Physics Department University of Surrey Guildford Surrey GU2 5XH U.K. e-mail: w.gilboy@surrey.ac.uk
---------------------	---

Dr Christopher C Goddard	BNFL Environmental Services Berkeley Centre Berkeley Gloucestershire GL13 9PB U.K. e-mail: goddard@myrealbox.com
--------------------------	--

Dr Stuart Green	Department of Medical Physics and Biengineering Queen Elizabeth Medical Centre Birmingham B15 2TH U.K. email: Stuart.Green@university-b.wmids. nhs.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.mahesh@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
--------------------	--

Prof J A Simmons	74 Whitehall Park London N19 3TN U.K.
------------------	---

Prof Robert Speller	Department of Medical Physics and Biengineering 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
--------------	--

Yugoslavia

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

Argentina

Dr. Raul T. Mainardi	Faculty of Physics-FaMAF University of Cordoba Ciudad Universitaria 51010 Cordoba ARGENTINA
----------------------	---

Dr. Jorge Esteban Miraglia	Instituto de Astronomia Y Fisica del Espacio (IAFE) C.C. 67, Suc. 28 Buenos Aires 1428 ARGENTINA
----------------------------	--

Dr. Ricardo Romero	IFIMAT-Facultad de Ciencias Exactas UNCPBA, Pinto Tandil 399 7000 ARGENTINA
--------------------	---

Mr. Walter A. Salgueiro	IFIMAT-Facultad de Ciencias Exactas UNCPBA, Pinto 399-7000 Tandil ARGENTINA email: wsalgue@exa.unicon.edu.ar
-------------------------	--

Dr. Alberto H. Somoza	IFIMAT-UNCentro Pinto Tandil 399 - 7000 ARGENTINA e-mail: asomoza@exa.unicon.edu. ar
-----------------------	--

Brazil

Prof. Carlos R Appoloni	Head Applied Nuclear Physics Laboratory Department of Physics - CCE State University of Londrina PO Box 6001 86051-900 Londrina PR BRAZIL email: appoloni@uel.br
-------------------------	--

Mrs Regina Cely Barroso	UERJ - Physics Institute Rua Sao Francisco Xavier 524 Sala 3001A - Maracanã, Instituto De Fisica 20550-900 Rio de Janeiro RJ BRAZIL email: cely@uerj.br
-------------------------	--

Prof. Antonio Jose Pio Ghilardi	Centro de Instrumentacao Dosimetria e Radioprotecao Departamento de Fisica University of Sao Paulo Av. dos Bandeirantes, 3900 14040-901 Ribeirao Preto Sao Paulo BRAZIL
---------------------------------	--

Prof. O dair Dias Gonçalves	Inst. Fisica - U.F.R.J. C.P. 68528 Ilha do Fundao Rio de Janeiro CEP 21541 Rio de Janeiro BRAZIL
-----------------------------	---

Prof Ricardo Tadeu Lopes	Federal University of Rio de Janeiro PO Box 68.509 219945.970 Rio de Janeiro BRAZIL email: ricardo@smblin.ufjf.br
--------------------------	--

Prof. Anselmo S. Paschoa	Pontificia Universidade Catolica do Rio de Janeiro Deplo. de Fisica C.P. 38071 Rio de Janeiro RJ 22453-900 BRAZIL email: aspasa@vdg.fis.puc-rio.br
--------------------------	---

Dr Paulo R Pascholati	Instituto de Fisica Universidade de Sao Paulo Caixa Postal 66318 05315-970 Sao Paulo BRAZIL email: pascholati@if.usp.br
-----------------------	---

Mr Sergio A. Pereira	Rua Almirante de Inhauma, 590 City Lapa cep: 05084-030 Sao Paulo / SP BRAZIL
----------------------	---

Ms Maria Esmeralda R Poli	Rua Almirante de Inhauma, 590 cep:05084-030 City Lapa Sao Paulo BRAZIL email: esmeraldapoli@hotmail.com
---------------------------	---

Egypt

Dr. Mohamed I Abbas	Physics Department Faculty of Science Alexandria University Alexandria EGYPT email: mabbas@physicist.net
---------------------	--

Professor Ahmed Abu El-Ela Ahmed	Physics Department Mansousa University Mansousa EGYPT
----------------------------------	--

Professor Nassef Comsan	Nuclear Research Centre Atomic Energy Authority Cairo EGYPT email: nucycle@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 com: melshimiy@intermetegypt. com
-----------------------------	---

Prof. Mohamed Ahmed Goma	17 Mohamed Mahmoud Casem St. Heliopolis, Cairo EGYPT email: mangomaa@netscape.net
--------------------------	--

Dr Abdel Megid Mamoun	C/ Egyptian Atomic Energy Authority Ahmed al Zmer St Nasr City Cairo EGYPT
-----------------------	---

U.S.A.

Dr. Samuel T. Baker	ESH-201 Argonne National Laboratory 970-0 S Cass Avenue Argonne IL 60439 U.S.A. email: sambaker@anl.gov
D Adel M Baryoun	21 Wilson Drive MSC 6780 Bethesda Maryland 20855 U.S.A. email: abaryoun@nih.gov
Mr Roland R. Benke	Center for Nuclear Waste Regulatory Analysis South West Research Institute 6220 Culebra Road San Antonio TX 78238-5166 U.S.A. email: rbenke@swri.edu
Dr Paul M Bergstrom	US Department of Commerce NIST 100 Bureau Drive Stop 8460 Gaithersburg MD 20899-8460 U.S.A. email: pelko@nist.gov
Dr Alex F Bielajew	Nuclear Engineering and Radiological Sciences College of Engineering Cooley Building 2355 Bonisteel Road Ann Arbor MI 48109-2104 U.S.A. email: bielajew@engin.umich.edu
Dr Richard L Blake	RDS, 7 Azul Drive PO Box 6880 Sante Fe NM 87502-6880 U.S.A.
Mr Steve Boddeker	Shockwave Wireless Inc 9215 Orco Parkway Suite F Riverside CA 92509 U.S.A. email: steve@shockwavewireless.com
Dr Patrick J Byrne	1830 Centurion Parkway Indianapolis IN 46260 U.S.A. email: pbyrne@medphyscon.com
Dr Neal Carron	Mission Research Corporation PO Drawer 719 Santa Barbara CA 93102-0719 U.S.A. email: ncarron@alum.mit.edu
Asst. Prof. Chan-Hyeong Kim	Department of Aerospace, Mechanical and Nuclear Engineering NES Bldg, 1-19 Tibbit Ave Rensselaer Polytechnic Institute Troy NY 12180-3590 U.S.A. e-mail : kimc@rpi.edu
Prof. Sam J. Cipolla	Physics Department Creighton University Omaha NE 68178 U.S.A.
Prof. Bernd Crasemann	Physics Department University of Oregon Eugene OR 97403-1274 U.S.A e-mail: berndc@oregon.uoregon.edu
Dr Paul L Csonka	Institute of Theoretical Physics and Department of Physics 450 Willamette Hall University of Oregon Eugene OR 97403-5203 U.S.A. e-mail: psonka@oregon.uoregon.edu
Professor Indra J Das	Department of Radiation Oncology University of Pennsylvania 3400 Spruce Street 2 Donner Building Philadelphia PA 19104 U.S.A e-mail: das@xrt.upenn.edu
Dr. Aniruddha Deb	Lawrence Berkeley National Laboratory 1 Cyclotron Road, 70-108B Berkeley CA 94720 U.S.A e-mail: E-mail: ADeb@lbl.gov
Mr Leonard A Dietz	135 Glen Eddy Drive Niskayuna NY 12309 U.S.A. email: ldietz1124@aol.com
Dr William L Dunn	Mechanical and Nuclear Engineering Department Kansas State University 346 Rathbone Hall Manhattan, KS 66506-5205 U.S.A. email: dunn@mne.ksu.edu
Dr. Scott M. Epstein	c/o. SME Design 178 Boden Lane Natick MA 01760 U.S.A.
Ms Jessica A Gaskin	University of Alabama Department of Physics Huntsville AL 35899 U.S.A. email: gaskin@email.uah.edu
Dr. Henry M. Gerstenberg	Department of Radiation Biophysics Biophysics Division Armed Forces Radiobiology Research Inst. 8901 Wisconsin Avenue Bethesda MD 20889-5603 U.S.A. email: gerstenberg@mx.afri.usuhs.mil
Dr. Albert L. Hanson	Dept. of Nuclear Energy, Bldg. 130 Brookhaven National Laboratory Upton NY 11973 U.S.A. email: alh@bnl.gov
Mr Allen J Hebert	511 Goss Street Ithaca NY 14850 U.S.A. email: ajh7@cornell.edu
Dr. John H. Hubbell	National Institute for Standards and Technology C-314 Radiation Physics Building 100 Bureau Drive, Stop 8463 Gaithersburg MD 20899-8463 U.S.A. email: john.hubbell@nist.gov
Dr. Mitio Inokuti	Biological, Environment and Medical Research Argonne National Laboratory 9700 S. Cass Avenue Argonne IL 60439 U.S.A. email: inokuti@anl.gov
Mr. John P. Jacobus	National Institute of Health Radiation Safety Branch, Building 21 21 Wilson Drive, MSC 6780 Bethesda MD 20892-6780 U.S.A. email: jjacobus@mail.nih.gov jenday1@email.msn.com
Dr. David Jette	The Lanzl Institute P.O. Box 30760 Seattle WA 98103-0760 U.S.A. email : dave@lanzl.com
Dr Steve B Jiang	Assistant Professor of Radiation Oncology Department of Radiation Oncology Massachusetts General Hospital and Harvard Medical School Founders House Rm 531 100 Blossom Street Boston MA 02114 U.S.A. e-mail : jiang.steve@mgh.harvard.edu
Mr P Andrew Karam	601 Elmwood Avenue Box HP14 Rochester, NY 14642 U.S.A. e-mail : andres_karam@urmc.rochester.edu
Prof. K.J. Kearfott	Dept. of Nucl. Engineering University of Michigan Ann Arbor MI 48109-2104 U.S.A. e-mail : kearfott@umich.edu
Dr Sameen Ahmed Khan	C/ Bushra Khan Apartment 12 1-G 7900 Cambridge Houston Texas 77054 U.S.A. email : rohelaikhan@yahoo.com
Ms Gladys A. Klemic	Environmental Measurement Laboratory U.S. Department of Energy C/ Chicago OPS Office 9800 S. Cass Ave Argonne Ill 60439-4899 U.S.A.
Dr. Glenn F. Knoll	119 Cooley Lab. University of Michigan Ann Arbor MI 48109 U.S.A. email: gknoll@umich.edu
Dr Edwin M Leidholdt, Jr	National Health Physics Program US Department of Veteran Affairs VH A 201 Walnut Avenue More Island CA 94592 U.S.A. email: edwin.leidholdt@med.va.gov
Dr Joseph C McDonald	K3-53, Pacific Northwest National Laboratory PO Box 999 Richland Washington 99352 U.S.A. email: joe.mcdonald@pnl.gov
Dr. Steven T. Manson	Dept. of Physics and Astronomy Georgia State University Atlanta GA 30303 U.S.A. email: smanson@gsu.edu
Mr. Veerendra K. Mathur	Naval Surface Warfare Center 9500 McArthur Blvd Bethesda MD 20817 U.S.A. email: mathurvk@nswccd.navy.mil
Mr. Robert Mayer, Jr	P.O. Box 916 Addison Texas 75001 U.S.A. email: rmayer@aip.org
Mr. Kevin M. Miller	Environmental Studies Division US Dept. of Energy Environmental Measurements Lab 201 Varick Street, 5 th Floor New York NY 10014-44811 U.S.A. email: kevin.miller@eml.doe.gov
Prof. Fearghus O'Foghluhdha	1513 Pinecrest Road Durham NC 27705-5816 U.S.A.
Dr. R.T. Perry	Contact details unavailable
Dr. Richard H. Pratt	Dept. of Physics and Astronomy University of Pittsburgh Pittsburgh PA 15260 U.S.A. email: rpratt@pltt.edu
Professor James E Rodgers	Radiation Medicine Department Georgetown University Hospital 3800 Reservoir Road, NW Washington D.C. 20007 U.S.A. email: rogersj@gunet.georgetown.edu
Prof George A Sandison	School of Health Sciences Room 1263 1338 Civil Engineering Building Purdue University West Lafayette Indiana 47907 - 1338 U.S.A. email: sandison@purdue.edu
Mr A Nick Schreuder	Indiana University Cyclotron Facility 2401 Milo B Sampson Lane Bloomington IN 47408 U.S.A. email: schreuder@ucf.indiana.edu
Prof. Stephen M. Shafroth	304 Glenwood Drive Chapel Hill NC 27514 U.S.A.
Dr Polad M Shikhaliev	Radiological Science Department X-Ray Imaging Physics Laboratory University of California - Irvine Medical Science I B-140 Irvine CA 92697 U.S.A. email: pshikhal@saturn.radscl.ucl.edu pms@peterlink.ru
Ms. Betty A. Torres	Program Manager National Voluntary Laboratory Accreditation Program Acoustics, Construction, Ionizing Radiation Dosimetry National Institute of Standards and Technology 100 Bureau Drive, Mail Stop 2140 Gaithersburg, MD 20889-2140 U.S.A. email: betty.torres@nist.gov
Dr James E. Turner	Health and Safety Research Division Oak Ridge National Laboratory Oak Ridge TN 37831 U.S.A. email: jamesturner17@comcast.net
Professor Roberto M. Uribe	Program on Electron Beam Technology Kent State University 117 Van Deusen Hall Kent OH 44242 - 001 KSU U.S.A e-mail: ruribe@kent.edu
Dr. W. K. Warburton	X-Ray Instrumentation Assoc. 8450 Central Avenue Newark CA 94560-3430 U.S.A. email: bill@xia.com
Dr Kenneth J Weeks	Chief of Physics Department of Radiation Oncology 4420 Lake Boone Trail Raleigh U.S.A. email: ken.weeks@rexhealth.com