

RSIC Newsletter



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Live your life each day as you would climb a mountain. An occasional glance toward the summit keeps the goal in mind, but many beautiful scenes are to be observed from each new vantage point. Climb slowly, steadily, enjoying each passing moment; and the view from the summit will serve as a fitting climax for the journey. —
Harold V. Melchert

SANTE FE TOPICAL MEETING PLANS FINALIZED

An American Nuclear Society (ANS) Topical Meeting, **Advances in Nuclear Engineering Computation and Radiation Shielding**, will be held April 9–13, 1989, in Sante Fe, New Mexico, USA. The thirteenth in the series of biennial Mathematics and Computation (M&C) Division Topicals, co-sponsored by the Radiation Protection and Shielding Division and organized by the Trinity Section, will provide an in-depth, concentrated forum for the exchange of technical information on computational methods in nuclear engineering with extra emphasis on radiation shielding methods and applications. Seventy-eight papers from 13 countries representing 42 institutions will be presented during 3½ days of sessions at the Eldorado Hotel in Sante Fe. **Meeting and hotel registration forms are attached to this newsletter for your convenience.**

The technical program topics are provided below.

Deterministic Transport Methods I

Shielding I

Acceleration Techniques for Transport Methods

Cross Sections and Data

Computational Diffusion Theory & System Simulation

Shielding II

Methods and Computer Codes

Charged Particle & Radiation Transport

Fluid Dynamics/Thermal Hydraulics I

Deterministic Transport Methods II

Reactor Design & Operation

Numerical Transport Applications

Fluid Dynamics/Thermal Hydraulics II

Registration and meeting check-in will begin on Sunday, April 9, at 3:00 pm. The reception to be held from 6–9:00 pm Sunday evening and the banquet on Tuesday evening at 6:30 are complimentary to registrants from the meeting's industrial sponsors. There are a number of attractions for the enjoyment of spouses/guests as well as two optional tours to Taos or Los Alamos. Preregistration for spouses/guests is requested.

The Eldorado is a full-service luxury hotel located 1½ blocks from the central Plaza, heart of the Sante Fe Historical District. The hotel is holding a block of rooms until February 23, after which reservations will be accepted on a space-available

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basis. An overflow hotel is located next door to the Eldorado, and other accommodations are available throughout Sante Fe.

The January 1989 *Nuclear News* will also feature a meeting announcement. More detailed information may be obtained from Robert C. Little, Registration Chair, MS B226, Los Alamos National Laboratory, Los Alamos, NM 87545 USA (phone 505-667-6691).

CHANGES TO THE COMPUTER CODES COLLECTION

Five changes were made to the computer code collection during the month. Two new code systems were packaged and added to the collection, an existing code package was replaced with a newly frozen version, a code package was extended with a new hardware version, and the documentation for one code package was updated. Three changes resulted from foreign contributions.

CCC-186/FSCATT

This code package was extended to include a new hardware version for the IBM 3033 contributed by Bell Aerospace Textron, Buffalo, New York. This discrete ordinates gamma-ray transport code calculates the spatial distribution of gamma-ray energy absorbed in a multilayered target for an arbitrary incident x-ray spectrum at an arbitrary angle. In addition, the transmitted spectrum at the rear of the target is calculated as a function of energy and angle. References: DASA 2418 (May 1971), DASA 2618 (November 1970), and Informal Notes (September 1985). FORTRAN IV; UNIVAC (A) and FORTRAN 77; IBM 3033.

CCC-289/SKYSHINE-III

A newly frozen version of this Monte Carlo procedure, contributed by Radiation Research Associates, Fort Worth, Texas, provides a substantial increase in versatility. The program has the ability to address both neutron and gamma-ray point sources. In addition, the emitted radiation may be characterized by an energy emission spectrum defined by the user. The enhanced capabilities of the program are the production of a new SKYSHINE data base developed for each of the source types described above. Most of the computational options present in past versions of the program have been retained. Hence, the new code used in conjunction with the new data base provides a ver-

satile and viable tool for the analysis of the radiation environment in the vicinity of a building containing nuclear radiation sources. Since the code conforms to FORTRAN 77 standards, it should run on most mainframe and desktop PC computers with a numeric co-processor and suitable memory. Due to the size of the data files included, SKYSHINE-III is not available on diskette. References: RRA-T8209A (June 1982, revised September 1988). FORTRAN 77; VAX.

CCC-501/SUSD

The document for this code package for cross-section sensitivity and uncertainty analysis was updated with corrections noted by the developers at the University of Tokyo. The English translation has now been published as ORNL/TR-88/18 and is provided with requests for the code. Reference: ORNL/TR-88/18. FORTRAN; HITACHI-M Series.

CCC-534/COLUMN2

This code system for calculating effects of physiochemical processes on radionuclide migration was contributed by the Riso National Laboratory, Roskilde, Denmark, through the Nuclear Energy Agency Data Bank, Gif-sur-Yvette, France. COLUMN2 solves the solute transport equation, taking into account dispersion, sorption, ion exchange, and first and second order homogeneous chemical reactions. Spatial variations of input pulses and retention factors are possible. The solution is based on a finite difference method followed by the application of the method of characteristics on two separate grid systems. The code was tested at the NEADB and was not retested by RSIC. Reference: RISO-R-514 (October 1985). FORTRAN 77; IBM 3090 and VAX 11/780.

CCC-535/MORSE-CV

This multigroup neutron and gamma-ray Monte Carlo transport code system, contributed by the Tokyo Institute of Technology, Japan, calculates the covariance of the mean spectral values for each

energy group. The geometry is not described by the "combinatorial geometry" package found in most versions of MORSE but by the older "generalized geometry" package which utilizes surfaces instead of volumes. Reference: ISSN 0387-6144 (1988) and *Nucl. Sci. Eng.* **94**, 227-281 (1986). FORTRAN 77; Hitachi M-280H.

Report on São Paulo Radiation Physics Meeting

The following is an edited excerpt of a report submitted by J. H. Hubbell on ISRP-4 recently held in Brazil.

Twenty-five countries were represented by 173 participants who presented 127 papers in the *4th International Symposium on Radiation Physics (ISRP-4)* held at the University of São Paulo, Brazil, October 3-7, 1988. This symposium was sponsored by the International Radiation Physics Society (IRPS), founded at ISRP-3 in 1985, and the University of São Paulo, with a number of South American scientific organizations (SRF, CNPq, FAPESP, FINEP, CAPES, CNEN, and CLAF) providing co-sponsorship.

In addition to the formal papers, a panel discussion, "Radiation Physics and Scientific Development in Developing Countries," was moderated by A. S. Paschoa (Brazil), who suggested that developing country governments could do more to assist their own scientists in realizing both their personal and national professional potentials. Also, scientific secrecy between governments, particularly in nuclear energy programs, in contrast to the desired openness and exchanges between individual scientists, can be a barrier to development, according to Paschoa. J. R. Morales (Chile) used a photo of Santiago smog to dramatize the variety of human problems, some of which may be amenable to applied physics solutions. Morales also emphasized the importance of a research environment for the teaching process, often difficult to provide in small universities.

A. Reggoug (Morocco) mentioned goals of strengthening nuclear physics and developing physics curricula. Reggoug also pointed out the value of hosting IAEA workshops in developing countries, based on his personal experience. T. Vilaithong (Thailand) described a novel and effective scheme in his country, via scholarships and job guarantees for top students, 30 annually, to attract them into physics, chemistry, mathematics, and biology instead of almost exclusively medicine and engineering. However, a remaining problem in Thailand is

government disinterest in basic research, only in tangible inventions which immediately support industry and other economic sectors. R. T. Mainardi (Argentina) mentioned the "brain drain" from Argentina due to economic conditions, and that nuclear research has shifted from atomic energy to the universities. Most Argentine physicists are theorists, not experimentalists, but government policy is trying to reverse this. D. V. Gopinath (India) mentioned the isolation of radiation physicists in developing countries, hence the value of this symposium series and the new International Radiation Physics Society. Finally, M. Eisenbud (USA) commented on the need for science curricula and graduates to be flexible enough to adapt to emerging technologies and human needs, rather than to be bound to past, popular but dying fields, which may include some areas of radiation physics.

Based on the lively technical exchanges, all topical areas and subfields presented at ISRP-4 appeared to be very much alive. An abundance of fresh challenges, such as T. C. Weekes' (USA) hint of some "new physics" perhaps emerging from TeV gamma-ray astronomical observations and analysis, and W. E. Engelhardt's (UK) comments on present quantitative unpredictability of turbulent motion in fusion device plasmas, point us toward an anticipated whiz-bang program at ISRP-5 in Dubrovnik in 1991!

On behalf of the IRPS and the general global radiation physics community, this reporter thanks Prof. Ivan C. Nascimanto and his hard-working Organizing Committee for their heroism, scientific expertise, and warm Brazilian hospitality. Much credit also goes to Prof. Didier B. Isabelle and his Programme Committee for their creativity, imagination, and evolving perception of "radiation physics" as an emerging identity, in their superb selection of invited topics and speakers.

In this reporter's (Hubbell) opinion, the optimum level and discipline for a fulfilling understanding of our

cosmos is physics, standing between mathematics and chemistry (thence molecular biology, etc.) in the scheme of the sciences. Within physics, I think radiation physics occupies a unique niche as the "messenger world" bridging the "material worlds" of the remaining physics subfields. Overlying this technical role is the inevitable hidden agenda of all scientific societies of "peace on earth, good will among men."

The results of the IRPS first general election has been announced. The officers for 1988-1991 will be:

President: **P. K. Iyengar** (India)

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

Treasurer: **D. B. Isabelle** (France)

Also announced at the IRPS General Meeting was the acceptance by the Council of the invitation from A. Ljubicic (Yugoslavia) to organize and hold ISRP-5 in Dubrovnik, Yugoslavia, in early June 1991.

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PERSONAL ITEMS

In serving a specialized area of scientific endeavor, it seems important that we note significant changes in the activities of people concerned with radiation protection, transport, and shielding in the nuclear industry. We, therefore, continue to carry personal items as they are brought to our attention.

Marable, FORSS Developer, Dies

James (Jim) H. Marable, long-time RSIC friend and colleague, died November 28, 1988, in Oak Ridge, Tennessee. Jim's contributions to RSIC in methods development led to the FORSS computer code system for performing sensitivity and uncertainty analyses of reactor systems in the late 1970s. A significant by-product of this work was the development of a vastly improved and enhanced version of the FIDO input system that is incorporated into FORSS.

Following early retirement in 1983, Jim continued to be a consultant on various projects at ORNL. One of particular significance for the RSIC community was the development of a PC version of ORIGEN2.

His leadership as a fine musician, orchestral conductor, and supporter of a variety of musical endeavors in the region is well recognized.

Keran O'Brien has been appointed adjunct professor in the Department of Physics and Astronomy of Northern Arizona University.

A. (Tony) Foderaro has retired from the College of Engineering, Nuclear Engineering Department, Penn State University. Prior to Tony's 28-year career at Penn State, he was a shielding specialist in the naval reactor program at the Bettis Atomic Power Laboratory. Foderaro was responsible for Chapter 9, the shielding equations for various sources and the most used chapter of the Rockwell book, *Reactor Shielding Design Manual*, even today. Tony plans to pursue many interests as well as some consulting and teaching. Did he say he was "retiring"?

CONFERENCES, COURSES, SYMPOSIA

RSIC attempts to keep its users/contributors advised of conferences, courses, and symposia in the field of radiation protection, transport, and shielding through this section of the newsletter. Should you be involved in the planning/organization of such events, feel free to send your announcements and calls for papers to RSIC.

Solid State Dosimetry '89

A call for papers has been announced for the *9th International Conference on Solid State Dosimetry*, to be held November 6-9, 1989, in Vienna. The conference, organized by the Austrian Research Centre Seibersdorf, is expected to provide an excellent overview on the state of the art in fundamental and applied Solid State Dosimetry for ionizing and non-ionizing radiation. Authors

wishing to present a paper must submit an original and two copies of an abstract on the following topics: Basic physical aspects and fundamental principles; Characteristics of materials; Thermoluminescence (TLD), photoluminescence (RPL), lyoluminescence and thermally stimulated exo-electron emission (TSEE) Etched-track-processes; Archaeological dating by solid state techniques; Individual radiation monitoring; Environmental radiation monitoring; Clinical applications of solid state dosimetry; High level radiation dosimetry; and Modern trends and developments in instrumentation and systems. The original and two copies must be received by the Congress Secretariat by **March 31, 1989**. Contact Solid State Dosimetry, Vienna 1989, Austrian Research Centre Seibersdorf, A-2444 Seibersdorf, Austria (Phone 0 22 54/80-2500, Telex: 014-353fzs, Telefax: 022 54-80-2118, Teletex: 61-3222545-FZS) for details and the appropriate forms required for the submission of an abstract.

Calendar

Your attention is directed to the following events of interest.

February 1989

WATTec '89, Feb. 14-17, 1989, Knoxville, Tennessee. Contact: WATTec, P.O. Box 629, Oak Ridge, TN 37831-0629.

Waste Management '89, Feb. 26-Mar. 2, 1989, Tucson, Arizona, sponsored by the University of Arizona, the American Society of Mechanical Engineers, the American Nuclear Society, and the Electric Power Research Institute. Contact: University of Arizona, Waste Management '89, Dept. NEE, College of Engineering & Mines, Tucson, AZ 85721.

April 1989

25th Annual Meeting of the National Council on Radiation Protection and Measurements, Apr. 5-6, 1989, in Washington, D.C. Contact: W. Roger Ney, Executive Director, NCRP, 7910 Woodmont Ave., Suite 800, Bethesda, MD 20814.

Advances in Nuclear Engineering Computation and Radiation Shielding, Apr. 9-13, 1989, Santa Fe, New Mexico, a topical meeting sponsored by the ANS M&C and RP&S Divisions. Contact: E. W. Larsen, Technical Program Chairman, Group X-6, MS B226, Los Alamos National Laboratory, Los Alamos, NM 87545 USA (phone 313-936-0124)

7th International Meeting on Radiation Processing, April 23-28, 1989, Leeuwenhorst Congress Center, Noordwijkerhout, The Netherlands, a biennial conference dedicated to the dissemination and advancement of the technology of industrial radiation processing. Contact: E. Franken, 7th Internatl. Meeting on Radiation Processing, P.O. Box 4240, 6710 EE Ede, The Netherlands (phone AA 31 8380 37476; Telex 37030; FAX AA 31 8380 39643).

Fifty Years With Nuclear Fission, Apr. 26-28, 1989, Gaithersburg, Maryland, sponsored by the U.S.

National Bureau of Standards. Contact: Jan Hauber, Room B109, Bldg. 245, National Bureau of Standards, Gaithersburg, MD 20899.

10th Annual Meeting of the Canadian Radiation Protection Association, Apr. 30-May 3, 1989, in Victoria, British Columbia. Contact: Lutz E. Moritz, TRIUMF, 4004 Wesbrook Mall, Vancouver, B. C., Canada V6T 2A3 (phone 604-222-1047; Telex (0)-4508503; FAX 604-222-1047).

June 1989

Annual Meeting of the American Nuclear Society, June 4-8, 1989, Atlanta, Georgia. Contact: ANS Meetings Dept., 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

4th International Symposium on Radiation Protection—Theory and Practice, June 4-9, 1989, Malvern, England.

Packaging and Transportation of Radioactive Materials: PATRAM '89, June 11-16, 1989, Arlington, Virginia, sponsored by US-DOE. Contact: Larry Blalock, Chairman, US Organizing Comm., US Dept. of Energy, P.O. Box 2001, Oak Ridge, TN 37831-8765 (phone 615-576-0945 or FTS 626-0945).

July 1989

26th IEEE Annual Conference on Nuclear and Space Radiation Effects, July 24-28, 1989, Marco Island, Florida. Contact: Dante M. Tasca, General Electric Co., Room M1211, Bldg. 100, P.O. Box 8555, Philadelphia, PA 19101 (phone 215-354-4132).

September 1989

International Workshop on New Developments in Occupational Dose Control and ALARA Implementation at Nuclear Power Plants and Similar Facilities, Sept. 18-21, 1989, Brookhaven National Laboratory, Upton, New York. Contact: Dr. John W. Baum, BNL ALARA Center, Bldg. 703M, Upton, NY 11973 (phone 516-282-4214).

DECEMBER ACCESSION OF LITERATURE

The following literature cited has been ordered for review, and that selected as suitable will be placed in the RSIC Information Storage and Retrieval Information System (SARIS). This early announcement is made as a service to the shielding community. Copies of the literature are not distributed by RSIC. They may generally be obtained from the author or from a documentation

center such as the National Technical Information Service (NTIS), Department of Commerce, Springfield, Virginia 22161.

RSIC maintains a microfiche file of the literature entered into SARIS, and duplicate copies of out-of-print reports may be available on request. Naturally, we cannot fill requests for literature which is copyright-

ed (such as books or journal articles) or whose distribution is restricted.

This Literature is on order. It is not in our system. Please order from NTIS or other available source as indicated.

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