RSIC Newsletter

Oak Ridge National Laboratory
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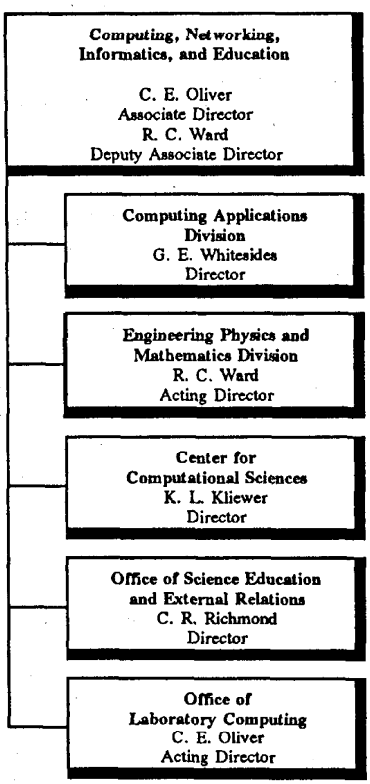
No. 352 *March 1994*

We must constantly build dikes of courage to hold back the flood of fear.—Martin Luther King, Jr.

ORNL Reorganization Impacts RSIC Parent Organizational Structure

Effective February 1, 1994, Oak Ridge National Laboratory Director, Alvin Trivelpiece announced the formation of a new ORNL Directorate for Computing, Networking, Informatics, and Education (CNIE). The directorate includes the following organizations: Engineering Physics and Mathematics Division (EPMD, RSIC's parent division), Computing Applications Division, the Center for Computational Sciences, the Office of Laboratory Computing, and the Office of Science Education Programs and External Relations. **Dr. Carl Edward Oliver** is the Associate Director of CNIE and **Dr. Robert C. Ward** is the Deputy Associate Director. Bob Ward is currently Director of the Engineering Physics and Mathematics Division and will act as EPMD Director pending the announcement of his successor.

Computational science adds a new dimension to the more traditional experimental and theoretical approaches to scientific research. The use of computational tools has become vital to most fields of science and engineering and to many parts of the educational enterprise. The creation of this Directorate will improve the Laboratory's ability to advance in this area which is critical to the Laboratory's future.



IF YOU CHANGE YOUR ADDRESS, please notify us (including Building and Room No. where needed). *Third Class Mail* is returned to us at our expense if the addressee has moved. If your mail is returned, your name will be deleted from our distributions until we hear from you.

Everitt P. Blizard Scholarship

The Executive Committee of the Radiation Protection and Shielding Division has voted to establish a scholarship fund in honor of Everitt P. Blizard. The scholarship is a deserving recognition for "the father of reactor shielding," who by his technical insight, creative visions, and personable manner, brought the discipline of reactor shielding from an empirical art to a respected physical science. The Everitt P. Blizard Scholarship will be administered by the American Nuclear Society and will be awarded annually to a graduate-level student who is pursuing studies in the field of radiation protection and shielding.

WE NEED YOUR HELP. It is hoped that the endowed scholarship can be initiated at a level of $1000, which will require that approximately $20,000 be collected. With nearly 2000 members in RP&S alone, a trivial contribution of only $10 each would allow us to reach our goal. Realistically, larger individual contributions will be needed to compensate for those who are not able to contribute. Many employers will provide matching funds for activities of this type, so please explore this potential for doubling your impact. Your one-time contribution to this cause will continue to live through the direct financial assistance to promising young researchers and through the indirect encouragement of new talent into our field.

Please give this opportunity careful consideration. You may use the enclosed form to submit your contribution. Thank you for your generosity and your participation in this significant activity of our division.

Dan Ingersoll

RSIC Technical Resources Enhance User Interaction

RSIC Equipment Upgrades

To better serve the radiation transport and shielding community, RSIC continues to acquire computer equipment and technology. Besides having access to mainframes and supercomputers at different sites, RSIC has acquired an IBM RISC 6000, Model 550 running AIX 3.2.5; a Sun Sparcstation 2 running Solaris 2.3; a Sun Sparcstation 1 running SunOS 4.1.2; and an EISA-based PC-486 which is running Banyan VINES for networking. Each staff member is equipped with a PC-486/50 and is connected to the VINES network. All staff members have access to the Internet.

ORNL GOPHER Service

Abstracts of RSIC computer codes (CCCs and PSRs) and data libraries (DLCs) are now available through the ORNL gopher server. The server Internet hostname is *gopher.ornl.gov*. The ORNL gopher internet address is *128.219.129.51*.If you have a gopher client on your computer, you can access RSIC abstracts. From the main menu, choose 'Technical Resources'. If you have a PC with Internet connectivity, you can obtain the Windows 3.1 gopher client software via anonymous ftp from *lister.cc.ic.ac.uk*. Go to the directory pub/wingopher. This Windows-based gopher software works very well in accessing the ORNL gopher. Gopher client software for most systems is available via anonymous ftp from *boombox.micro.umn.edu*.

Request for PC Codes on Cartridge Tapes

RSIC recently purchased a 250 Mb capacity tape drive for a PC 486. This means we will be able to address requests for PC codes to be written on tapes. The following tapes are compatible:
Formatted QIC-40 or Thetamat
Formatted QIC-80 or Ximat
Formatted DT-120 or DT-250 from Colorado Systems
Formatted DC-2000, DC-2060, DC-2080, DC-2120 from 3M
Formatted DC-2000, DC-2000XL, DC-2080, DC-2120 from Verbatim
Formatted QD-2060, QD-2120 from Sony

NOTE: ONLY FORMATTED TAPES WILL BE ACCEPTED.
NOTE: The end user tape drive must be capable of reading 250 Mb tapes.

Request for Codes Through FTP
RSIC is moving away from distributing computer codes on 9-track (1/2 inch) round tapes. We have occasionally responded to requests for codes through FTP. In order to take advantage of this service, you need to provide Dan Garner (615-574-6176,e-mail: dlg@ornl.gov) access to your computer after the necessary RSIC paperwork (registration, payment where applicable, etc.) has been completed.

Media
For UNIX-based systems, we can copy computer codes on
4 millimeter tapes (8 gigabyte capacity compressed; 4 uncompressed)
8 millimeter tapes (2.3 gigabyte capacity compressed; 1.2 uncompressed)
quarter-inch data cartridge (150 megabyte capacity)
1.44 megabyte diskettes (FOR CODES THAT WILL FIT ON ONE)
2.0 megabyte diskettes (FOR CODES THAT WILL FIT ON ONE)

For PC-based codes, we copy on
5.25-inch diskettes (1.2 megabytes)
3.5-inch diskettes (1.44 megabytes)
Bernoulli disks (90 megabytes, 150 megabytes)
data cartridge (250 megabytes - see above)

RSIC supplies the 3.5- or 5.25-in. diskettes. For large requests we have requested that customers send us new diskettes. The general policy for all other tapes, cartridges, and Bernoulli disks is for the end user to supply them.

Bernadette L. Kirk

CHANGES TO THE COMPUTER CODE COLLECTION

Six changes were made to the computer code collection. Three new code systems were packaged and added to the collection, two existing code packages were updated to enhance operation of the codes, and an existing code package was replaced with a newly frozen version. Three changes resulted from foreign contributions.

CCC-200/MCNP4A

OP SYS: UNIX, DOS, VMS

Language: Fortran 77

Computers: All

Format: tar, DOS

Los Alamos National Laboratory, Los Alamos, New Mexico, has updated this package with the addition of an install package, which automates MCNP4A installation on nine currently supported systems (Sun SunOS, Sun Solaris, Vax VMS, PC DOS, IBM RS/6000, HP HPUX, DEC Ultrix, SGI IRIX, Cray UNICOS). Users who have installed the previous release of MCNP4A do not need to request the package but may request the first diskette on which all new files are written. MCNP4A is a general purpose Monte Carlo code system for calculating the time-dependent continuous-energy transport of neutrons, photons, and/or electrons in three-dimensional geometries.

MCNP4A is available in UNIX tar format on cartridge tape or on 29, 3.5-in. DS/HD (1.44 MB) diskettes in self-extracting compressed DOS files. In addition to the source files, MCNP4A executables are included for personal computer users. These were created on a PC/486 under DOS 6.0 using the Lahey Fortran F77L3-EM/32 Version 5.10 compiler. Reference: LA-12625 (1993). Fortran 77 and C; UNIX workstations, PC 386, Cray, Vax, IBM (C00200/ALLCP/02).

CCC-467/ITS 3.0

OP SYS: UNIX, MVS, VMS, DOS

Language: Fortran 77

Computers: Many

Format: tar, DOS

The documentation for the ITS 3.0 code system has been updated with the addition of a short primer written by Titan Corporation, Albuquerque, New Mexico, to help beginning PC users get started. Interested users who have already received the package, may request that the primer be mailed to them. Sandia National Laboratories, Albuquerque, New Mexico, and the National Institute of Standards and Technology, Gaithersburg, Maryland, developed the integrated TIGER code system, which permits a state-of-the-art Monte Carlo solution of linear time-integrated coupled electron/photon radiation transport problems with or without the presence of macroscopic electric and magnetic fields of arbitrary spatial dependence. References: SAND91-1634 (March 1992) and informal notes. Fortran 77; Cray, IBM, Vax (C00467/MFMWS/00) or IBM PC (C00467/PC486/01).

CCC-622/EXPRESS

OP SYS: UNIX, MVS-XA, VMS

Language: Fortran 77

Computers: FACOM, IBM 3040, Vax

Format: DOS

Atomic Energy Research Institute, Ibaraki-ken, Japan, through the NEA Data Bank, Issy-les-Moulineaux, France, contributed the emergency response supporting system EXPRESS (EXact PREparedness Supporting System), which was developed to calculate real-time predictions of affected areas due to radioactivities discharged into the atmosphere from nuclear facilities.

The computational models in EXPRESS are the mass-consistent wind field model (EXPRESS-I) and the particle dispersion model (EXPRESS-II) for atmospheric dispersions. The real-time ability of the code is obtained using a high-speed iteration method, MILUCR (Modified Incomplete Linear Unitary Conjugate Residual), in EXPRESS-I and a kernel density method in EXPRESS-II, which employs a random walk model based on gradient-transfer theory. The code was developed to run on UNIX workstations and has also run on FACOM, IBM 3090, and Vax systems. The code package, including sample input and output and the source files, is transmitted on one DS/HD 5.25-in. (1.2 MB) diskette in self-extracting compressed DOS files. Reference: JAERI-M 92-082 (June 1992). Fortran 77; FACOM, IBM 3090, Vax (C00622/MNYCP/00).

CCC-626/RIVER-RAD

OP SYS: DOS

Language: Fortran 77

Computers: PC

Format: DOS

Oak Ridge National Laboratory contributed the RIVER-RAD code system for simulating the transport of radionuclides released to rivers. The model is simplified in nature and is intended to provide guidance in determining the potential importance of the surface water pathway, relevant transport mechanisms, and key radionuclides in estimating radiological dose to man. A compartmental linear transfer model is used in RIVER-RAD. The code system runs on IBM PC and compatible computers and has also been tested on IBM RISC 6000 running AIX and on Vax running VMS. The code package contains sample input and output, a PC executable, and the RIVER-RAD source file and is transferred on one DS/HD 3.5-in. (1.44 MB) diskette in self-extracting compressed DOS files. Reference: ORNL/TM-12169 (November 1992.) Fortran 77; IBM PC (C00626/MNYCP/00).

PSR-294/SCAT-2

OP SYS: DOS, VMS, MVS

The Centre d'Estudes de Bruyeres-le-Chatel through the NEA Data Bank, Issy-les-Moulineaux, France, contributed a newly frozen version of SCAT-2, which is designed as a fast, easy-to-use code system to calculate total cross sections, elastic scattering cross sections and their angular distributions, and transmission coefficients from the optical

Language: Fortran 77

Computers: Many

Format: DOS

model of a spherical nucleus. The calculation is performed at a specified set of energies for one of the following incident particles: neutron, proton, deuteron, triton, helium-3 or alpha. SCAT-2 runs on an IBM PC/AT with a math coprocessor using Microsoft Fortran V5.0 compiler under the MS-DOS 3.20 operating system. It has also been tested on Vax VMS and IBM MVS systems. One DS/HD (1.2 MB) 5.25-inch diskette written in DOS format is used to transmit the Fortran source, PC executable, and sample case input and output. References: CEA-N-2227 (Oct. 1981) and NEANDC-152"A", INDC(NEA)4 (Oct. 1983). Fortran 77; IBM PC, Vax, IBM (P00294/MNYCP/01).

PSR-340/LPTAU

OP SYS: DOS, VMS

Language: Fortran 77

Computers: Many

Format: DOS

Keldysh Institute of Applied Mathematics, Russian Academy of Sciences, Moscow, through the NEA Data Bank, Issy-les-Moulineaux, France, contributed the LPTAU, quasi-random LP_τ-sequence generator. The sequences, uniformly distributed sets of $L=M^N$ points in the N-dimensional unit cube: $I^N=[0,1]$, can be used as nodes for multidimensional integration, as searching points in global optimization, as trial points in multicriteria decision making, or as quasi-random points for quasi Monte Carlo algorithms. The number of points that can be generated is less than 2^{30}. The dimension of the space cannot exceed 51. The C and Fortran 77 versions should run on any platform with only minor modifications where program input/output are concerned. The package is transmitted on one DS/HD 5.25-in. (1.2 MB) diskette in DOS format. References: Informal documentation (1993 and 1992, *SIAM J. Numer. Anal.* Vol.16, No. 5 (October 1979). Fortran 77 and C; IBM PC compatibles and Vax (P00340/MNYCP/00).

CHANGES TO THE DATA LIBRARY COLLECTION

Two new data libraries were packaged and added to the collection.

DLC-176/MATXS10

OP SYS: Any

Language: Fortran 77

Computers: All

Format: DOS

Los Alamos National Laboratory contributed the MATXS10 library, with 30 neutron groups and 12 photon groups and includes 121 materials from ENDF/B-VI (including changes through Release 2). The materials are given at 300 K without self shielding. The weight function has a fusion + fission + 1/E + thermal Maxwellian shape. The Legendre order for the scattering matrices is P4. Photon production, photon interaction, KERMA, damage, and all ENDF partial cross sections are included. Thermal upscatter is not included.

MATXS10 is useful for many high-energy calculations, including coupled neutron-photon-heating calculations in fusion systems, the analysis of fast critical assemblies like GODIVA, and some shielding calculations for which resonance self-shielding effects are not too important. It has the advantage of being compact, and TRANSX2 and particle transport calculations run very fast with this library. The current files supersede the original version of MATXS10 included in the initial TRANSX2 release.

BBC is included in this package to convert the library to binary format for subsequent processing with the PSR-317/TRANSX2 code system to interface the MATXS cross-section libraries with nuclear transport codes for radiation transport calculations. The package is

available on either 3 DS/HD 5.25-in. (1.2 MB) diskettes in self-extracting compressed DOS files or as a compressed tar file on cartridge tape. Reference: Informal notes (Feb. 1994). Fortran 77; all computers (D00176/ALLCP/00).

DLC-177/MATXS11

OP SYS: Any

Language: Fortran 77

Computers: All

Format: tar

Los Alamos National Laboratory contributed the MATXS11 library, with 80 neutron groups and 24 photon groups and includes 105 materials from ENDF/B-VI (including changes through Release 2). The materials are given at up to 9 temperatures ranging from 300 to 4000 K with typically 5 to 8 background cross sections for each temperature. The weight function has a fast reactor or fusion blanket shape with a fusion peak at high energies and a 1/E + thermal Maxwellian extension at low energies. The Legendre order for the scattering matrices is P5. Photon production, photon interaction, KERMA, damage, and all ENDF partial cross sections are included. Thermal upscatter is not included. MATXS11 is useful for most high-energy calculations, including coupled neutron-photon-heating calculations in fusion blanket systems and the analysis of fast reactor cores.

BBC is included in this package to convert the library to binary format for subsequent processing with the PSR-317/TRANSX2 code system to interface the MATXS cross-section libraries with nuclear transport codes for radiation transport calculations. The package is distributed in a compressed tar file on cartridge tape. Reference: Informal notes (Feb. 1994). Fortran 77; all computers (D00177/ALLCP/00).

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.

Gary Lee Bennett has been elected Fellow of the American Physical Society "for his successful management of the safety and nuclear operations program for the radioisotope thermoelectric generators which are now successfully operating on the Galileo and Ulysses spacecraft."

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.

Introduction to MCNP

The Radiation Transport Group of the Los Alamos National Laboratory is offering an introductory class on the MCNP Monte Carlo computer code for people who have never used MCNP or have very limited experience. Hands-on computer sessions emphasizing active learning will be featured. A preliminary list of session topics follows.

Session 1: Introduction, General Principles and Input Files
Session 2: Basic Geometry
Session 3: Advanced Geometry
Session 4: Sources
Session 5: Tallies and Statistical Analysis
Session 6: Variance Reduction
Session 7: Criticality Problems
Session 8: Physics Issues, Wrapup

The class will be held April 5-8, 1994, at Los Alamos, New Mexico, USA, for a cost of $1400 (U.S.). The deadline to register is Friday, **March 18, 1994**. The class may be cancelled if minimum registration is not met. For further information send e-mail to Judi Briesmeister at jfb@lanl.gov, telephone 505-667-7277, or fax

Reactor Analysis and Radiation Transport Short Courses

The Department of Nuclear Engineering at the University of Tennessee-Knoxville is offering two five-day short courses of interest to radiation transport specialists during Tennessee Industries Week (TIW-29), August 15–19, 1994.

Computational Methods in Reactor Analysis will familiarize the course participant with computational methods and computer codes currently used to describe the neutronic behavior of nuclear fission reactors. Emphasis will be placed on "understanding" the neutronic models and associated numerical methods currently employed in codes. A good understanding of the models and methods is essential for the successful use of the codes in designing new reactors or improving the performance and safety of existing reactors. Areas to be covered include multi-dimensional diffusion theory methods and perturbation theory methods for applications in reactor statics, space-dependent kinetics, and fuel depletion; transport theory methods including the discrete ordinates method, integral transport theory, and the Monte Carlo method; and cross section generation and processing utilizing the AMPX and SCALE systems developed at ORNL. The first day of the course will cover the fundamentals of reactor physics beginning with the fission process and proceeding through development of the Boltzmann transport equation and the diffusion approximation of the transport equation. This material will provide a good foundation for the non-nuclear engineer for study of the more advanced material to be presented Tuesday through Friday. For the participant with some nuclear background, the first day would be a review of basic nuclear engineering.

Monte Carlo Analysis is designed specifically for the practicing engineer engaged in shield design and does not presume any prior knowledge of Monte Carlo methods. However, some understanding of radiation transport physics is desirable. A wide range of topics will be presented that will lead to a good understanding of the basics of Monte Carlo analysis and the specialized applications of Monte Carlo methods to practical shielding problems. Many advanced topics will be included that will promote the best use of existing computer code systems. Special attention will be paid to the understanding and Monte Carlo implementation of the adjoint analysis. Advantages and disadvantages of the adjoint mode versus the forward mode of analysis will be described including several practical applications of the adjoint mode of Monte Carlo analysis. Variance reduction techniques will be developed in a comprehensive fashion for both forward and adjoint calculations. The versatile computer code system, MORSE, will be described to illustrate the general features of Monte Carlo computer programs. The relationships of the Monte Carlo methods to other methods of solving radiation transport problems, such as discrete ordinates, will be described, as well as computational advantages and disadvantages of Monte Carlo versus the other methods. This course will cover, in depth, the theory and mathematics a user must have in order to understand and use the Monte Carlo method effectively to solve difficult problems in radiation transport.

The registration fee is $995 per person for each course. The deadline for registration in these two courses is July 31, 1994. For additional information contact T. W. Kerlin, Head of the Dept. of Nuclear Engineering, University of Tennessee, Knoxville, TN 37996 (phone 615-974-2525).

Calendar

Your attention is directed to the following events of interest.

April 1994

30th Annual Meeting of the National Council on Radiation Protection and Measurements, Apr. 6–7, 1994, Arlington, Virginia. Contact: National Council on Radiation Protection and Measurements, 7910 Woodmont Ave., Suite 800, Bethesda, MD 30814-3095 (phone 301-657-2652).

Methods and Applications of Radioanalytical Chemistry (MARC III), Apr. 10–16, 1994, Kona, Hawaii, an International Topical Conference of the American Nuclear Society. Contact Prof. Roy H. Filby, Technical Program Chairman, Department of Chemistry, Washington State University, Pullman, WA 99164-4630 (phone 509-335-3331, fax 509-335-8867).

Topical Meeting on Advances in Reactor Physics, Apr. 11–15, 1994, Knoxville, Tennessee, sponsored by the American Nuclear Society. Contact: B. A. Worley, Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831-6363 USA (phone 615-574-6106).

High Performance Computing '94: Grand Challenges in Computer Simulation, Apr. 11–15, 1994, La Jolla, California, sponsored by the Society for Computer Simulation. Contact: Dr. Adrian Tetner, Argonne National Laboratory, 9700 S. Cass Ave., Argonne, IL 60439 (phone 708-252-8454).

ARS '94, International Meeting on Advanced Reactor Safety, Apr. 17–21, 1994, Pittsburgh, Pennsylvania. Contact: D. Squarer, Westinghouse Electric Corp., Science and Technology Center, 1310 Beulah Road, Pittsburgh, PA 15235-5098 USA (phone 412-256-2063; fax 412-256-1348).

8th International Conference on Radiation Shielding, Apr. 24–28, 1994, Arlington, Texas, sponsored by the American Nuclear Society with cooperation from several international and professional societies. Contact: Dr. R. M. Rubin, TU Electric, 400 N. Olive St., LB81 24 SLIC, Dallas, TX 75201, or Nolan Hertel, Georgia Tech, Atlanta, Georgia 30332-0405 USA. R. W. Roussin is the International Liaison.

RECOD '94, 4th International Conference on Nuclear Fuel Reprocessing and Waste Management, Apr. 24–28, 1994, London. Contact: W. L. Wilkinson, RECOD '94 Steering Committee, British Nuclear Forum, 22 Buckingham Gate, London SW1E 6LB, United Kingdom. (phone 071-828-0116; fax 071-828-0110).

42nd Annual Meeting of the Radiation Research Society, Apr. 25–29, 1994, Nashville, Tennessee. Contact: Radiation Research Society, 1891 Preston White Drive, Reston, VA 22091.

Occupational Internal Dosimetry, Apr. 25–29, 1994, a course offered by REAC/TS in Oak Ridge, Tennessee. Contact: Registrar, REAC/TS, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831-0117 (phone 615-576-3131).

Specialist's Meeting on Shielding Aspects of Accelerators, Targets, and Irradiation Facilities, Apr. 28–29, 1994, Arlington, Texas. Contact: R. W. Roussin, RSIC, ORNL, P.O. Box 2008, Oak Ridge, TN 37831-6362 USA (phone 615-574-6176; fax 615-574-6182).

May 1994

9th Pacific Basin Nuclear Conference, May 1–6, 1994, Sydney, Australia. Contact: Australian Nuclear Association, P.O. Box 445, Sutherland, NSW 2232, Australia.

Advanced Health Physics (C.H.P. Part 2 Exam Study), May 1–6, 1994. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

International Workshop on Implementation of ALARA at Nuclear Power Plants, May 8–11, 1994, Long Island, New York. Contact: Dr. John W. Baum or Dr. T. A. Khan, Brookhaven National Laboratory, ALARA Center, Upton, Long Island, NY 11973 USA (phone 516-282-3228, Fax 516-282-5810).

International Conference on Nuclear Data for Science and Technology, May 9–13, 1994, Gatlinburg, Tennessee, USA. Contact: J. K. Dickens, Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831-6356 USA (phone 615-574-6115).

Principles of Liquid Scintillation Counting, May 11–12, 1994, a continuing education course presented by North Carolina State University. Contact: Joni M. Tanner, Office of Continuing Education and Professional Development, Box 7401, Raleigh, NC 27695-7401 (phone 919-515-2261, Fax 919-515-7614).

1994 Symposium on Radiation Measurements and Applications, May 16–19, 1994, Ann Arbor, Michigan, the 8th in a series sponsored by the U.S. Department of Energy. Contact: Helen Lum, Symposium Secretary, 3034 Phoenix Memorial Laboratory, The University of Michigan, Ann Arbor, MI 48109-2100.

Radiation Safety Principles and Procedures, May 16–20, 1994, a continuing education course presented by North Carolina State University. Contact: Joni M. Tanner, Office of Continuing Education and Professional Development, Box 7401, Raleigh, NC 27695-7401 (phone 919-515-2261, Fax 919-515-7614).

Radioactive Materials Transport and Radwaste Disposal, May 16–20, 1994. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

Radiopharmaceutical Internal Dosimetry, May 16–20, 1994, a course offered by REAC/TS in Oak Ridge, Tennessee. Contact: Registrar, REAC/TS, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831-0117 (phone 615-576-3131).

1994 International High Level Radioactive Waste Management Conference, May 22–26, 1994, Las Vegas, Nevada, sponsored by the American Nuclear Society and the American Society of Civil Engineers. Contact: William R. Wells, University of Nevada-Las Vegas, 4505 S. Maryland Pkwy., Las Vegas, NV 89154-4005 (phone 702-739-3699).

June 1994

Radiation Safety Officer Training, June 13–17, 1994. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

An Introduction to the MCBEND Monte Carlo Radiation Transport Package, June 14–17, 1994, a workshop presented by AEA Technology at Winfrith, U.K. Contact: Mrs. J. Wilkinson-James, AEA Technology, Winfrith, Dorchester, Dorset DT2 8DH, UK (phone 0305-202352; fax 0305-202746).

11th Topical Meeting on the Technology of Fusion Energy, June 19–24, 1994, New Orleans, sponsored by American Nuclear Society Fusion Energy Division. Contact: Donald J. Dudziak, Dept. of Nuclear Engineering, 110B Burlington Engg. Labs., North Carolina State University, Raleigh, NC 27695-7909 (phone 919-515-2301; fax 919-515-5115, email dudziak@ncsu.edu).

Third International Symposium on Fusion Nuclear Technology, June 27–July 1, 1994, University of California, Los Angeles. Contact: Dr. Mark Tillack, 44-139 Engineering-IV, Univ. of California, Los Angeles, CA 90024-1597 (phone 310-206-1230; Fax 310-825-2599, Internet, MST@fusion.ucla.edu).

July 1994

First International Congress of Environmental Geotechnics: Geotechnical and Related Aspects of Waste Management Associated with Municipal, Mine, Industrial and Nuclear Wastes, July 10–15, 1994, Edmonton, Canada. Contact: D. C. Sego, University of Alberta, Dept. of Civil Engineering, Sego, Edmonton, TG6 2G7, Canada.

Environmental Health Physics, July 11–15, 1994. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

Planning for Radiation Emergencies, July 11–15, 1994, Guildford, Surrey, England. Contact: Prof. J.R.A. Lakey, c/o MOS Ltd, 17 Wrotham Road, Gravesend, Kent DA11 OPA, UK (phone 44-0-474-350580, Fax 44-0-474-320042).

18th International Radiation Physics Society, July 18–22, 1994, Rabat, Morocco. Contact: Pr. M. Berrada, Lab. de Physique Nucléaire, Faculté des Sciences, B. P. 1014 Rabat, Morocco (Fax 212-7-77-99-78).

27th International Conference on High Energy Physics, July 21–27, 1994, Glasgow, United Kingdom. Contact: Institute of Physics, 47 Belgrave Square, London SW1X 8OX, UK.

October 1994

European Nuclear Conference and Exhibition, Oct. 2–6, 1994, Lyon, France. Contact: P. Fuez, European Nuclear Society, P.O. Box 5032, CH-3001 Berne, Switzerland (phone 41-31-21-61-11; fax 41-31-22-92-03).

Meeting of the American Society for Therapeutic Radiology and Oncology, Oct. 3–7, 1994, Philadelphia, Pennsylvania. Contact: ASTRO, 1101 Market St., 14th Floor, Philadelphia, PA 19107-2990 (phone 215-574-3180).

ANSWERS Shielding & Criticality Seminar, Oct. 11–14, 1994, a workshop presented by AEA Technology at Winfrith, U.K. Contact: Mrs. J. Wilkinson-James, AEA Technology, Winfrith, Dorchester, Dorset DT2 8DH, UK (phone 0305-202352; fax 0305-202746).

Fourth Conference on Radiation Protection and Dosimetry, Oct. 24–26, 1994, Orlando, Florida, sponsored by the Oak Ridge National Laboratory. Contact: J. S. Bogard, ORNL, P.O. Box 2008, Oak Ridge, TN 37831-6379 (phone 625-574-5851, fax 615-574-9174).

November 1994

2nd Radiation Physics Conference, Nov. 20–24, 1994, Sadaat City, Egypt, sponsored by the

Atomic Energy Authority, Menoufia University. Contact: Prof. M. A. Gomaa, Atomic Energy Authority, 101. Kasr El-Aini Street, Cairo, Egypt (phone 02-355-8269/8264, fax 02-354-0982).

March 1995

5th Topical Meeting on Tritium Technology in Fission, Fusion, and Isotopic Applications, Mar. 26-31, 1995, Augusta, Georgia, sponsored by the ANS. Contact: C. E. Murphy, Westinghouse SRC, Savannah River Lab., Aiken, SC 29808.

May 1995

Particle Accelerator Conference, May 1-5, 1995, Dallas, Texas. Contact: Richard Briggs, SSC Laboratory, 2550 Beckleymeade Avenue, Dallas, TX 75237.

FEBRUARY ACCESSION OF LITERATURE

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RADIATION SHIELDING LITERATURE

Health Phys. 66(2), 155-158. . *Application of the Moyer Method to Transverse Shielding of a Linear Bremsstrahlung Source* . . Swanson, W.P. . February 1994

FEI-2104. . *Application of the Method of Partial Factorization in the Three-Dimensional Problem of the WWER Type Reactor Neutron-Physical Calculation* . . Ginkin, V.P.; Troyanova, N.M. . 10/90. . In Russian

FEI-2324. . *The Method of Conjugate Gradients in Combination with Incomplete Factorization and Compensation Addings in an Iterable Equation Operator* . . Ginkin, V.P.; Troyanova, N.M. . 10/93. . In Russian

UCRL-JC-114680-VGS. . *Estimated Inventory of Radionuclides in Former Soviet Union Naval Reactors Dumped in the Kara Sea* . . Mount, M.E.; Sheaffer, M.K.; Abbott, D.T. . July 1993. . OSTI; NTIS; INIS; GPO. . Lawrence Livermore National Laboratory, Livermore, CA.

EVERITT PINNELL BLIZARD (1916-1966)[1]

The manner in which a particular corner of science develops is often deeply influenced by the right man appearing at the right moment in its history. For reactor radiation shielding, that man was Everitt Pinnell Blizard.

Everitt Blizard was born September 30, 1916, in Ottawa, Canada. He received a bachelor's degree in chemistry from Wesleyan University and a master's degree in physics from Columbia University. Before completing his doctorate work, he was employed by the Navy in 1941. As a result of his contributions in such programs as the "CROSSROADS" atom bomb tests at Bikini, he was selected by Captain Hyman Rickover to participate in the nuclear submarine program and was sent to Oak Ridge, Tennessee, to attend the charter session of a nuclear training school. Although intended to be temporary, his stay in Oak Ridge continued until his death from leukemia in 1966.

"Bliz," as he was better known, began with a small group of pioneers at Oak Ridge National Laboratory and developed a significant division of researchers addressing all aspects of radiation shielding, including experiments, analytical models, and nuclear data. Four major test facilities were constructed under his leadership, beginning with the "Core Hole" facility -- a 2-ft-square hole in the shield of the original X-10 Graphite Reactor. Although immediately successful, the facility had significant limitations, and the group went on to develop more powerful and more flexible test facilities, including the Lid Tank Shielding Facility, the Bulk Shielding Facility, and the Tower Shielding Facility. This latter facility provided the international shielding community with abundant benchmark data over a span of nearly four decades. Blizard also recognized the importance of analytic methods and was instrumental in bringing theoretical physicists together to develop and apply new methods. His exploitation of the concept of a neutron removal cross section had, perhaps, the widest impact on early methods development.

Beyond Bliz's technical leadership, his humanistic interest and sensitivity toward others often led him into a role as international ambassador for reactor shielding. He was one of the scientific members of the U.S. Atoms for Peace Mission to the Far East in 1957 and participated in numerous other outreach missions. He also contributed substantially to many handbooks and encyclopedias, including the shielding portion of the *Reactor Handbook* and the *Engineering Compendium on Radiation Shielding*.

Because of his vision, his technical alertness, and his warm and inspiring personality, Blizard is rightly recognized as the "father of reactor shielding" and is attributed with bringing the field of reactor radiation shielding from an empirical rule-of-thumb craft to a distinct discipline in nuclear science and technology.

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[1]Extracted from eulogy written by Herbert Goldstein, *Nuclear Science and Engineering*, **Vol 27**, No. 2 (February 1967).

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