Radiation Safety Information Computational Center

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"Procrastination is the thief of time." -- Edward Young

Printable PDF file of this newsletter available at: **http://www-rsicc.ornl.gov/NEWSLETTER.html**.

RSICC CELEBRATES 40!

Oak Ridge National Laboratory is proud to host the Radiation Safety Information Computational Center. For 40 years, this information center has delivered excellent service to a worldwide user community. It has collected, analyzed, and disseminated the best possible resources on radiation shielding and protection, supporting advances in energy research, space exploration, national security, and human health. Congratulations on reaching this significant milestone!

William J. Madia
Director, Oak Ridge National Laboratory

RSICC- A legend of professional excellence and success

Shafiqul Bhuiyan

It was in early 1980, I came to know that I was fortunate to get an offer to work at RSIC, under the administrative cover of Engineering Physics Division, as a research scholar through the courtesy of the U.S. National Academy of Sciences and International Atomic Energy Agency. I quickly grabbed the offer. Since then RSIC has been shaping my career in my graduate studies, in my profession, and in building up a center for reactor physics and radiation shielding studies at a remote corner in Bangladesh. In my home institute I had no chance to work with a computer code. RSIC provided me not only plentiful computer codes and supporting data libraries, but I was exposed to the scientists working behind those. I started to interact with many of the peers in the field, some of the names I came across in my textbooks, an exciting experience! I was fortunate to get the dynamic supervision of Bob (Dr. R. W. Roussin) and Dave (Dr. D. E. Bartine), great minds to work with. The academics and professional skill & competence available in RSIC elevated my work to the level that it not only earned me a Ph. D. degree but also was recognized in the national level in the 1982 ANS Los Angeles meeting. The experience of working with dozens of computer codes and data libraries helped me in establishing a center for Reactor Physics, Radiation protection and Shielding studies. Currently the center's capability includes basic ENDF data processing and customization, neutronics, thermal hydraulics, safety parameters, and shielding calculations and analysis. This stands as an

outstanding example of RSIC cooperation. I served as the National Counterpart and Chief Investigator of a number of TC (Technical Cooperation) and CRP (Coordinated Research Project) Projects sponsored by IAEA. In accomplishing all these projects the cooperation and technical support of RSICC played a pivotal role. Some of the RSICC staff members provided expert services. In some cases, such as, in the CRP 'WIMSD Library Update Project' the participation of RSICC staff members was crucial for its successful accomplishment. In 1991 I worked for some time under the supervision of Dr. D. W Muir in the IAEA Nuclear Data section on FENDL related work. There also I noted the constant support of RSICC. I collaborated with a good number of sister laboratories (such as, JAERI, Japan), the RSICC packages provided with the common platform and interests for interactions. I have been serving as a faculty member in the King Abdulaziz University, KSA, since Nov. 2000. One of the RSICC packages is being taught in 'Radiation Protection Engineering' in the undergraduate level in the Department of Nuclear Engineering. Thus RSICC shaped my student life, then my career as a nuclear scientist, and now in teaching Nuclear Engineering. The great leadership of Betty Maskewitz, scholarship of Dave Trubey, academic and professional excellence of Bob Roussin mingled with 'those magnificent working staff members' brought RSICC into being. In the advent of this auspicious occasion I wish that RSICC will continue to sail across the globe fostering scientific research, technical support and information exchange to promote the peaceful uses of the atom to improve the quality of life of mankind in the challenging years ahead.

"Recollection of RSICC and its interaction with the shielding community"

by Herbert Rief

The Forty years of RSICC is also an occasion to commemorate ESIS, the European Shielding Information Centre, founded by Dr. Rudolf Nicks in 1972. It was located at the Joint Research Centre in Ispra (Italy) operated by the Commission of the European Community (Brussels). ESIS was embedded in a section dealing with radiation shielding activities and its link to the world was a quarterly Newsletter. It therefore can be considered a sister organization of RSIC tailored to the European scene. Over the years there had been a continuous collaboration between these two institutions to the benefit of shielders around the world. In particular one should mention the open-minded attitude of Betty Maskewitz and Bob Roussin, who were both in favour of a free flow of information. The service provided by RSIC was instrumental to the development of shielding methods and tools in Europe and to establishing confidence in the predictive power of the methods.

In Europe ESIS was the driving force in organizing training courses on Radiation Shielding Methods and "blind test" exercises on shield designs. RSIC together with ESIS had a catalytic function in stimulating the cooperation of shielders.

Apart from collecting and disseminating information on radiation shielding ESIS maintained its own research activities. In the early days, when computers where slow and had a very limited memory, shielding problems were computed with the 'removal-diffusion' methods. Carlo Ponti and his collaborators had developed such a code (SABINE) but this method was replaced later by MC and deterministic transport codes that provided much higher accuracy. The visit to RSIC and ORNL by Carlo Ponti, who brought a first version of the MORSE Monte Carlo Code written by E.A. Straker, P.N. Stevens, D.C. Irving, V.R. Cain to Ispra, established a long and strong cooperation. (This code replaced the famous O5R code by D.C. Irving and R.M. Freestone, Jr.)

Empirical methods and formulae were used then extensively and were found useful to estimate orders of magnitude in shielding attenuation. Articles on "shielding calculations on the back of an envelope" were then written by Hans Penkuhn. His speciality was also the point kernel method and the determination of build-up factors in heterogeneous shields.

Herbert Rief developed within those activities the time-dependent Monte Carlo Code TIMOC72 that was widely used and later extended the MC code KENO to include gradient estimates and perturbation algorithms.

The EURACOS facility constructed and operated by Giuseppe Perlini and his group allowed for ambitious deep penetration neutron shielding experiments, such as:

- monoenergetic "removal diffusion" factors in Fe, C, Al, Pb, D2O, Diphenyl OM2 and a comparison with the codes SABINE e CINNA.
- fast neutron propagation in iron up to 1.5 m and sodium up to 3.6 m (G. Perlini, reti. 1993). The measurements carried out in simple geometrical structures served mainly as benchmarks in data-adjustment studies. A description of the detailed measurements was later integrated into the SINBAD shielding database, a joint RSICC-OECD/NEA project.

With the early retirement of H. Braun (1985, passed away in 2001) the series of 51 ESIS News-letters came to an end and only a few years later, in Ispra, all the R&D in shielding was sacrificed in favour of new (non-nuclear) activities.

Note from Paul Webb

Lawrence Livermore National Lab

You are aware of my appreciation for the service provided by RSICC, and I would like to restate that appreciation at this time. RSICC has been a very valuable service to me, to the persons with whom I work, and to persons who are affected by our use of the RSICC services.

I first learned of RSICC's repository of codes and data libraries in the area of radiation shielding, transport and protection back in the 1970's (when RSICC had a different name). I was working for the General Electric Company at that time.

Occasionally, I have provided RSICC information that should be useful to the developer/contributor, and, sometimes, I have provided information directly to the developer or contributor. I have made use of the notices from RSICC about newer versions of some codes that either provide more information for user convenience or that correct coding errors that either could have, or have caused inaccurate results.

A number of projects on which I have worked have received the benefits of the resources available through RSICC. For example, I used MCNP for criticality work associated with the Oak Ridge Y-12 Plant, for plutonium handling operations at the Hanford site, for design efforts associated with the stabilized plutonium storage facility to be built at the Savannah River site, for criticality analyses associated with the design of the Device Assembly Facility (DAF) at the Nevada Test Site (NTS), for criticality and radiation shielding work associated with LLNL, etc. I have received and used a broad range of computational resources from RSICC's collection--tools such as MCNP, KENO, SCALE, RESRAD, RISKIND, GENII, QAD-CGGP, SKYSHINE, VARSKIN are listed as a few examples.

I have also found RSICC's sponsorship and support of seminars and workshops useful for staying aware of professional meetings and their meeting times and locations. The services provided by RSICC have been very valuable to me during my career in the nuclear business whether I performed that work as an employee or as a consultant.

Longstanding International Co-operation of RSICC as seen from the OECD/NEA

by Enrico Sartori, OECD/NEA Data Bank

At the beginning

International cooperation in the field of civil application of nuclear energy started as a result of US President Eisenhower's “Atoms for Peace” program. The key event was the first International Conference on Peaceful Uses of Atomic Energy in Geneva, Switzerland, in August 1955, organised in the frame of the United Nations. Countries from the ‘Western World’ led by the US, and the Soviet Union shared scientific information to help harness nuclear power for the purpose of increasing prosperity of humans.

An infrastructure was set up in the ensuing period to help this process. Technical information centres were established to collect, preserve and disseminate scientific-technical information and basic data, and to share the capacity of the few computers then existing to run the available computer codes for studying, designing and modelling future nuclear energy systems.

In particular two centres were established in the early sixties in the USA in connection with computer codes - the Argonne Code Center (ACC) at the Argonne National Laboratory (ANL), focussing on reactor system codes and mathematical subroutines, and the Radiation Shielding Information Center (RSIC) at the Oak Ridge National Laboratory (ORNL), specialising in providing in-depth coverage of the radiation transport field. RSIC was established in 1962.

On the European scene, the Marshall Plan, after accomplishing its primary objectives, gave birth to the European Organisation for Economic Cooperation in 1955 that later became the OECD (Organisation for Econonomic Cooperation and Development) when the USA became a member. The treaty establishing Euratom (European Atomic Energy Community) became effective in 1958.

Nuclear energy received much attention in those times, as it had been identified as a formidable resource for coming generations. In the USA the Atomic Energy Commission (AEC) had already been established for more than a decade when international organisations such as the IAEA and the European Nuclear Energy Agency were set up. The latter was a specialised Agency of the OECD, but grouping only European countries at the beginning. (Later, the USA, Japan and other countries joined and it was renamed the NEA). Close contacts were established with the AEC, and information centres with similar functions to those established in the USA were set up in Europe. One of them was the Computer Program Library (CPL) established by OECD NEA and hosted by the Euratom Joint Research Centre in Ispra, Italy. At this early stage, the information flow was almost one way: from the USA to the other countries. Standards established in the USA in this field were adopted, both for techniques and the organisation of the infrastructure.

The rôle of RSIC

It is modelling nuclear phenomena that in the early days drove the development of computers, programming languages and algorithms. The knowledge acquired was synthesised in a ready-to-use form: the computer code and basic nuclear data libraries. There were few computers available, and those available were, by today's standards, incredibly slow, with hardly any memory and relatively primitive peripherals and they were difficult to program. However, recognising their importance, the effort to develop the codes started to be shared internationally, with RSIC playing an eminent and outstanding rôle as well as others such as the ACC. But RSIC is the one that attained 40 years of operation and we shall concentrate on that.

It was Betty F. Maskewitz, the director of RSIC in those early times, that invested a tremendous effort in serving a large community of scientists and engineers working in the area of radiation protection and shielding. Her information centre had the mission of sharing knowledge within this community and, through it, to amplify the benefit provided to the human community. The expertise and information provided through RSIC has marked a generation of scientists and engineers in the USA. Betty quickly recognised the importance of sharing such information with the scientific-technical community worldwide- and through a generous move and personal investment she took initiatives to make this happen. First with the countries that were allies of the United States, e.g. the scientific laboratories and research centres in Western Europe. This effort was then extended to Japan. The next step concerned the countries behind what was then called the “Iron Curtain.” She felt a need to melt the ice of that ‘cold war’ that prevented people with similar ambitions living under different political regimes to share their competent knowledge and views having an important potential of enriching the scientific community. During her first visits there, she was received with open arms. These people had so much to tell her about their interesting work and achievements and were proud that, through her, it would be known beyond the confines of their borders. We know now that her visits had a tremendous impact in opening up a rather closed world, proven by the

fact that many people still ask after her even though she retired a number of years ago. In many instances she was for them the first contact with America.

Betty established an RSIC atmosphere. Her method was based on building trust, and generosity. In those early days through her bridges were built between people working in nuclear energy and technology. How many of her friends from overseas were invited to her house at “Shalom Vista”?

She realised all this with the help of the outstanding staff she personally selected to assist her. Among these, her successor as director of RSIC: Bob Roussin, whose effort in developing data libraries for a comprehensive field of applications has had an incredible impact on improving the predictive capacity of the codes. Instead of agreements within orders of magnitude, agreements with experiments within percents were achieved. The famous DLC libraries were used worldwide. This was one of the most valued products made available by RSIC. Bob has always approached problems with a smile and kindness, but also with strong determination during his directorship.

The successor of Bob Roussin, Bernadette Kirk, brought to RSIC a large expertise in computing. This was the other important aspect of the activities. Through her competence and insight, the information system was redesigned, modernised and brought in line with modern information technology. Also the “business” of information centres had changed. Nuclear Energy had matured, and governments became less generous in funding the dissemination of information and computational tools. But RSIC under her guidance has overcome these difficulties with new vigour, knowing that to maintain a high safety standard and to keep nuclear energy competitive, the best information must be available to the user community.

Hamilton Hunter, the present director of RSICC, continues along the path set by his predecessors and is assuring that RSICC will continue its competent services for the future.

The OECD/NEA Data Bank has been a partner of RSICC over almost the full 40 years of its existence. This was formalised through international cooperative agreements between the US Department of Energy and NEA. RSICC's generous release and follow-up dissemination of codes and data for nuclear applications within the other OECD countries has had an invaluable effect on improving the quality of modelling and design. Most of these other countries have now developed a sound nuclear power industry and infrastructure and have developed systems (e.g. PWR and BWRs with MOX fuel) that were not introduced in the USA. We are now able to pay back increasingly more through the knowledge acquired through these new systems the generous releases made by the USA.

This cooperation has led to strong ties and friendship between the scientists and engineers around the world. With NEA located in Europe, we could observe more closely the particular strong ties of friendship that were established and continue between the European and American experts.

On its 40th birthday, the staff of the NEA Data Bank, and I am sure all our users around the world, join with us, in wishing many happy returns to RSICC.

SARIS: In the Beginning

by D. K. Trubey

In 1962, when it was proposed that information centers be established at the Oak Ridge National Laboratory (ORNL), the initial staff of several made a trip to Columbus, Ohio. The new centers specialized in the fields of accelerators, atomic-collision cross sections, charged particles, engineering, isotopes, nuclear safety; materials research, shielding, toxicology, and environmental and life sciences. Francois Kertesz organized the trip to Battelle Memorial Institute to learn how the technical information centers there were operated, so that we might benefit from their experience. Keith Penny and I represented the proposed shielding information center. We were particularly interested in the Radiation Effects Information Center because of our similar interests. Keith and I were used to using the Oak Ridge computers for shielding calculations, and we had in mind that we could use a computer for information storage and retrieval. They were not using computers for this purpose at Battelle, and we asked about this. The reply was that they would use computers if they could think of a way that the computers would be useful.

We were not discouraged. Upon our return to Oak Ridge, we recruited Margaret (Peggy) Emmett, and the three of us began to design and program in Fortran II a bibliographic information system for the IBM 7090. I believe it was the first such system at Oak Ridge. We were the only center, of about a dozen, which made that decision. There were critics who said that it was too expensive to use a computer for such an activity. Kertesz, now the coordinator and spokesman for the newly established centers, defended us, saying that Penny and I were used to using a computer for our daily work, so it was natural for us to take this approach.

We had no experience or training in information retrieval, but we forged ahead. We created a set of shielding subject categories and assigned an alphanumeric 6-character code for each. We used 6 characters because that corresponded to the addressable word length of the IBM 7090. In general, a subject category corresponded to an intersection of key words. Although we did not know it at the time, this is known in information retrieval as pre-coordinated indexing. As we were about to enter our first document into the system, we discovered that there was no appropriate category for it! This was our first lesson that the subject category list had to be revised from time to time.

The IBM 7090 pre-dated direct access disks, but it did have 10 magnetic tape drives. We put the main bibliographic data on one tape, authors in alphabetical order on a second tape, and the subject categories assigned to each document on a third tape. Printing out a bibliography required a lot of tape spinning, but we published several bibliographies, ordered by subject category, in the RSIC report series. We also mailed selective dissemination of information (SDI) to researchers according to their interests represented by subject categories when the tapes were updated. Jane Gurney and Ann Gustin prepared the data for updates. At some point, the RSIC information system was named SARIS, Storage and Retrieval Information System.

The system was reprogrammed in COBOL for the IBM System 360 in the late 1960s by Jack Jones and Leon Yount. Great efficiencies were gained by using direct access disks. The data were converted to a standard ORNL format in the 1970s, which allowed interactive searches using the program called ORLOOK. In the 1980s, the data were ported to the RSIC Data General minicomputer, and in the 1990s were again reformatted to allow the system to be used on personal computers.

Words from Alan Avery

Congratulations to RSICC on its 40th anniversary. I remember the beginning with Keith Penney and then the indominitable Betty and Dave Trubey. The concept of providing a centre for collecting and distributing reports and codes of interest to shielders was very forward looking. I recall those early catalogues of reports and codes which grew regularly as items were added. The centre became an international focal point for shielders and in its way it was equivalent to a server providing a network for them. It was always a prominent participant at the International Shielding Conferences and I especially remember the one that was held at Oak Ridge in the sixties. In those early days I think that ANISN must have been the most popular of the codes requested and there was always much discussion on which were the most appropriate sets of cross-sections to be used in a particular application. Most of the latter were restricted in their description of the energy dependence with data being given in schemes having only about 22 energy groups. However one must remember that calculations were then carried out on a site's main frame computer and one was competing for machine time with core physicists and all of the other users.

In the UK we were unable to contribute codes to the collection because the UKAEA was already moving towards its commercialisation and they were considered to be marketable property which was in contrast to the more open US policy. We were however able to co-operate in the development of the basic nuclear data files.

I have been retired for more than 5 years but I still meet up monthly with some of the ex-shielders from the UKAEA. These are John Butler, Atholl McCracken, David Bendall, and Peter Miller. We send best wishes for the celebration of your anniversary and trust that RSICC will continue to be a centre for the shielding community in the future.

Reflections from Charlie Eisenhauer

I think I worked with RSICC and with Betty Maskewitz since its inception. I have fond memories of Betty and of her zeal for disseminating information. I contributed one code, "DETAN," and learned a lot, just getting it into proper shape for distribution. RSICC was invaluable to me during my career by providing codes such as ANISN and MCNP that were ready to use when I received them. Even though I'm retired, I'm still using these two codes in occasional consulting jobs.

We thank all for their comments about RSICC and look forward to another 40 years!

Fulbright Scholar Spends Practical Training with RSICC

Dickerson Moreno, who will receive his doctorate in Nuclear Engineering from the University of Missouri (Columbia) in spring 2003, is spending a few months at Oak Ridge National Laboratory's RSICC. Dickerson is on a practical training assignment at RSICC getting familiar with well-known computer codes. His present research at RSICC is a preliminary study (using MCNPX) of neutron flux and photoneutron dose in a patient body during a multileaf collimator (MLC)-based intensity modulated radiation therapy (IMRT) procedure. He is working with Bernadette Kirk, Jeff Johnson, Dick Lillie, and Douglas Peplow of the Nuclear Science and Technology Division.

BES's Iran Thomas, Former ORNL Chemist, Dies

Dr. Iran L. Thomas, deputy director of Basic Energy Sciences for the Department of Energy, died unexpectedly after a short illness on February 28, 2003, at his Gaithersburg, Maryland, home. He was 64. In his DOE role, Dr. Thomas was instrumental in the development of many of the nation's leading scientific user facilities, including DOE's synchrotron light sources, the Spallation Neutron Source, and the new Nanoscale Science Research Centers including Oak Ridge National Laboratory's recently funded Center for Nanophase Materials Sciences. Dr. Thomas was also responsible for DOE's $400 million per year portfolio in materials sciences. His rich legacy of leadership, vision, and love of science had an enormous impact nationally and at ORNL. Dr. Thomas was a strong supporter of RSICC for many years. Before joining DOE, Dr. Thomas was a research chemist at ORNL from 1967 to 1981. He is survived by his wife, Barbara, two children, and three grandchildren.

New Electronic Notebook Available

RSICC's latest electronic notebook called "The Medical Applications Issues, Bugs, Wish Lists for Users of RSICC Modeling Software and Data" is now available at **http://www-rsicc.ornl.gov/nucmedicine.html.** Check out the other electronic notebooks also available: ANISN, DOORS, ORIGEN-ARP, SCALE and KENO3D just to name a few at: **http://www-rsicc.ornl.gov/ENOTE.html**.

CCC-601/GENII 1.485

OP SYS: DOS/Windows
Language: Fortran 77 & QuickBasic
Computers: PC
Format: compressed DOS

Change to the Computer Code and Data Collection

Two newly frozen packages and one notice were added to the computer code collection this month.

The potential for obtaining erroneous results while using the GENII 1.485 code has been brought to our attention by the developer at

Pacific Northwest Laboratory, Richland, Washington. The potential exists for a limited combination of options: specifically, only for cases of acute, atmospheric release when the "food production grid" input option is used, if "food export" is chosen, and one of the input radionuclides is tritium or carbon-14. See the **notice** appended to the RSICC abstract on this website for details. The RSICC package is not being updated because a new version is undergoing review and is expected to be released soon.

GENII is a coupled system of seven programs and the associated data libraries that comprise the Hanford Dosimetry System (Generation II) to estimate potential radiation doses to individuals or populations from both routine and accidental releases of radionuclides to air or water and residual contamination from spills or decontamination operations. GENII was developed to incorporate the internal dosimetry models recommended by the International Commission on Radiological Protection (ICRP) into the environmental pathway analysis models used at Hanford.

Lahey F77L (92%) and Microsoft QuickBASIC 3.0 (8%) were used to create the executable, which runs under DOS 3.1 or later. These executables were created in the early 1990s and will not run on Windows XP. The package is transmitted on 4 DS/HD 3.5-in. (1.44 MB) diskettes in self-extracting compressed DOS files. References: PNL-6584 Vol. 1 (December 1988) and Vol. 2 (November 1988). IBM PC; Fortran 77 and Quick Basic (C00601/IBMPC/02).

CCC-641/NESTLE 5.2.0

OP SYS: Unix & Windows
Language: Fortran 77
Computers: Workstation & PC
Format: Unix, tar & Windows

Electric Power Research Center at North Carolina State University, Raleigh, North Carolina, contributed a newly frozen version of this code system for solving the few-group neutron diffusion equation utilizing the Nodal Expansion Method (NEM). The NESTLE code can solve the eigenvalue (criticality), eigenvalue adjoint, external fixed-source steady-state, and external fixed-source or eigenvalue initiated transient problems. The eigenvalue problem allows criticality searches to be completed, and the external fixed-source steady-state problem can search to achieve a specified power level. Transient problems model delayed neutrons via precursor groups. Several core properties can be input as time dependent. Two- or four-energy groups can be utilized, with all energy groups being thermal groups (i.e., upscatter exits) if desired. Core geometries modeled include Cartesian and hexagonal. Three-, two-, and one-dimensional models can be utilized with various symmetries. The thermal conditions predicted by the thermal-hydraulic model of the core are used to correct cross sections for temperature and density effects. Cross sections are parameterized by color, control rod state (i.e., in or out), and burnup, allowing fuel depletion to be modeled. Either a macroscopic or microscopic model may be employed. The March 2003 RSICC update to NESTLE Version 5.2.0 is a modification of version 5.0.2 and includes the following enhancements:

Hexagonal geometry:
+ hexagonal semi-analytic nodal method based on the conformal mapping
+ capability to read initial node-wise and surface exposures
+ intra-nodal cross-section treatment to capture burnup gradient
+ pin-wise power reconstruction
+ correction of error in hexagonal reflective boundary condition treatment

Rectangular geometry:
+ capability to read initial node-wise exposure and isotopic number densities
+ cross section type dependent reference soluble poison concentration (REFB)
+ Am-241 isotope treatment
+ isotope dependent delayed neutron precursor group's decay constants

The few-group neutron diffusion equation is spatially discretized utilizing the Nodal Expansion Method (NEM). For Cartesian geometry, quartic polynomial expansion for the transverse integrated fluxes are employed. Transverse leakage terms are represented by a quadratic polynomial. For hexagonal geometry, a conformal mapping based hexagonal nodal method is employed. The transverse integrated flux expansion consists of trigonometric, hyperbolic trigonometric, and polynomial functions. The transverse leakage term in the axial direction is presented by a quadratic polynomial for both Cartesian and hexagonal

geometries. The quadratic polynomial is also utilized for radial directed leakage in Cartesian geometry, but is expressed in terms of the mapping scale function and the physical currents for hexagonal geometry. Discontinuity Factors (DFs) are utilized to correct for homogenization errors.

A Fortran 77 compiler is required on Unix workstations. The code has not been tested on Linux. A CVF compiled executable is included for Windows users. The authors run NESTLE on:

Windows PC with Compaq Visual Fortran V6.6.A Fortran compiler
440MHz Sun Ultra10 under Solaris with SUN's Fortran compiler.

The package is transmitted on one CD written in Windows self-extracting and GNU compressed tar formats. The disk contains documentation, source code, Windows executable, makefiles, and test problem input/output. Reference: NCSU report (December 2001). Unix Workstations and Windows Personal Computers; Fortran 77 (C00641/MNYCP/03).

PSR-137/ MARLOWE (Version 15b)

OP SYS: Unix, Linux, Windows, Mac OSX
Language: Fortran 90 & C
Computers: Workstation, PC, & Mac
Format: Unix tar & Windows

Oak Ridge National Laboratory, Oak Ridge, Tennessee, contributed a newly frozen version of the MARLOWE program for simulating atomic collisions in crystalline targets using the binary collision approximation. It follows out the consequences of launching an energetic atomic projectile, from either an external beam or an interior site, into a target. The targets may have many material regions, each with its own arbitrary (triclinic) crystal structure and with many kinds of atoms. The program follows the slowing-down of the primary particle and, if desired, that of all target particles which are displaced from their lattice sites, until they either leave the target or fall below a selected low kinetic energy. All cascades may be initiated in undamaged material or damage may be accumulated from one cascade to another; cascades may be run in groups of a selected size. The User's Guide contains a detailed listing of changes in Version 15 and a summary of changes in earlier versions.

Version 15b of MARLOWE, dated 5 December 2002, includes some error corrections for the previous release. The new package includes Version 3 of TABULA, a program which uses MARLOWE interatomic potential energy functions to tabulate the classical elastic scattering integrals and related data. News about MARLOWE will be posted on the developer's website from time-to-time **http://www.ssd.ornl.gov/Programs/Marlowe/Marlowe.htm**.

MARLOWE and TABULA are designed to be highly portable. The programs are written in Fortran 77, fully compatible with the Fortran 90 standard, and have been used for many years on many different computers. The codes run on IBM RS/6000 AIX, DEC Alpha Digital Unix, Sun SunOS5, Mac OS X (Darwin) and Pentiums under UNIX , Linux, Windows 95/98/ME/NT/2000/XP, and Mac OS X 10.2 (Darwin 6.0). Some procedures written in C are included in the Unix version. Compilers are required on all computers. No executables are included. The GNU f77 compiler can be used on most systems. The MARLOWE distribution is available on CD containing the source, scripts, test problems, and documentation files in two formats: a GNU compressed tar file intended for UNIX environments and a self-extracting Windows file. Reference: User's Guide (December 5, 2002). Fortran 90 and C; UNIX, Linux, Windows 95/98/ME/NT/2000/XP, Mac OS X (Darwin) (P00137/MNYCP/08).

Monthly Code Focus

As years have gone by many different codes and applications have been sent to RSICC for stewardship. We currently have over 1700 analytical code and data packages and distribute as many each year to 73 countries in the world. To help 'categorize' each package, we have developed a database of 'Subject Categories' to attach applications to the packages at RSICC. Doing so requires investigation into each code package, user feedback from end use statements, and extensive RSICC staff experience and analysis so that we can deliver useful information each month on the 30 different categories we have identified thus far. Links to the package abstracts are embedded into the WWW version of the RSICC

Newsletter. Feedback from our Newsletter community is very valuable so please direct your comments and/or suggestions to **PDC@ORNL.GOV**. Many packages in the RSICC code collection are in this subject category. A few are highlighted here for your review.

Auxiliary Mathematical Methods and Uncertainty Analysis

ALICE91	**LHS**	**STAR CODES**
ALPHAM	**LPTAU**	**SUGGEL**
CEM95	**MESYST**	**SUSD3D**
DANCOFF-MC	**POLYRES**	**TNG1**
LAPUR5	**SCAT2B**	**ZOTT99**

CONFERENCES, COURSES, SYMPOSIA

RSICC 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 via email to **FINCHSY@ornl.gov** with "conferences" in the subject line by the **20th of each month**. Please include the announcement in its native format as an attachment to the message. If the meeting is on a website, please include the url.

Every attempt is made to ensure that the links provided in the Conference and Calendar sections of this newsletter are correct and live. However, the very nature of the web creates the possibility that the links may become unavailable. In that case, please call or mail the contact provided. Below is a condensed list of the **conferences** only. More details are listed following the table.

Condensed Table of Conferences

Name of Conference	Date and Location	Web Site	Abstract/Paper Submission Date
M&C 2003	Apr. 6-10, 2003 Gatlinburg, Tennessee	**meetingsandconferences.com/MC2003**	passed
39th Annual National Council on Radiation Protection (NCRP)	Apr. 9-10, 2003 Arlington, Virginia	**http://www.ncrp.com**	
International Congress on Advanced Nuclear Power Plants (ICAPP '03)	May 4-7, 2003 Cordoba, Spain	**www.ans.org/goto/icapp03**	passed
2003 IEEE Nuclear and Space Radiation Effects Conference (NSREC)	July 21-23, 2003 Monterey, California	**http://www.nsrec.com/**	passed
21st International System Safety Conference	Aug. 4-8, 2003 Ottawa, Canada	**http://www.system-safety.org/**	passed
9th International Conf. on Environmental Remediation and Radioactive Waste Mgmt.	Sept. 21-25, 2003 Oxford, England	**http://www.icemconf.com**	passed

Name of Conference	Date and Location	Web Site	Abstract/Paper Submission Date
Supercomputing in Nuclear Applications (SNA-2003)	Sept. 22-24, 2003 Paris, France	**http://sna-2003.cea.fr/**	passed
Advances in Nuclear Fuel Management III	Oct. 5-8, 2003 Hilton Head Island, South Carolina	**http://rpd.ans.org/nfm.htm**	Mar. 15, 2003
6th International Symposium on ESR Dosimetry and Applications	Oct. 12-16, 2003 Campos do Jordão, Brazil	**http://www.if.usp.br/VI_ESR_2003/**	June 30, 2003
7th International Conference on Nuclear Criticality Safety (ICNC2003)	Oct. 20-24, 2003 Tokai-mura, Japan	**http://www.icnc.jp/**	passed
9th International Symposium on Radiation Physics (ISRP-9)	Oct. 27-31, 2003 Cape Town, South Africa	**www.medrad.tlabs.ac.za/isrp9.htm**	
11th International Conference on Fusion Reactor Materials (ICFRM-11)	Dec. 7-12, 2003 Kyoto, Japan	**icfrm.iae.kyoto-u.ac.jp**	Apr. 30, 2003
PHYSOR 2004	Apr. 25-29, 2004 Chicago, Illinois	**www.td.anl.gov/PHYSOR2004**	Sept. 5, 2003
International Conference on Radiation Shielding (ICRS-10) and Topical Mtg. on Radiation Protection & Shielding (RPS 2004)	May 9-14, 2004 Funchal, Madeira Island (Portugal)	**http://www.itn.mces.pt/ICRS-RPS/**	

Advances in Nuclear Fuel Management III - Call For Papers

Preparations for the American Nuclear Society's Advances in Nuclear Fuel Management III Topical Meeting to be held in Hilton Head Island, South Carolina, during the period of **October 5-8, 2003**, have now begun in earnest. You are invited to serve on the Meeting's Technical Program Committee (TPC). In this capacity your commitment will include:

1. Electronically submit one or more papers, and encourage colleagues to do the same,
2. Help identify and organize special session(s) on timely topics you are interested in, and solicit participation, and
3. Electronically review papers assigned to you in a timely and professional manner

Please return the following information (name, affiliation, phone, alternative email if preferable, topics of interest) to Youssef A. Shatilla at **shatilya@westinghouse.com**.

The success of this meeting depends on your active support and involvement. Finally, please bookmark the conference web site: **http://rpd.ans.org/nfm.htm** and visit it occasionally for news and updates. Comments and suggestions are most welcome.

2003 IEEE Nuclear and Space Radiation Effects Conference (NSREC)

The 2003 IEEE Nuclear and Space Radiation Effects Conference (NSREC) will be held in Monterey, California, **July 21-25, 2003**. This annual meeting of engineers and scientists presents the latest techniques for enhancing the performance of microelectronic devices and circuits that are used in radiation environments. The final call for papers for the 2003 IEEE Nuclear and Space Radiation Effects Conference (NSREC) is available on the web site at **www.nsrec.com**. Deadline for submission is February 7, 2003.

Make plans for the 2003 short course in Monterey. Joe Benedetto and his team of professors have put together an interesting program about radiation effects on device scaling. The syllabus is at **www.nsrec.com/short.htm**.

Forms to nominate an outstanding colleague for the 2003 Radiation Effects Award are at **www.nsrec.com/nominate.htm**. This award comes with a handsome IEEE plaque and $2000 check.

University professors - Forms are available on the NSREC web site to nominate an outstanding student for the 2003 IEEE NPSS Phelps Continuing Education Grant. The cash award ($500 - $1000) comes with an IEEE certificate and complimentary short course registration. NSREC plans to award two grants this year. See **www.nsrec.com/steering.htm**.

Keep checking the web site at **www.nsrec.com** for the latest NSREC information. Contact Paul Dodd, Sandia National Laboratories, 505-844-1447 if you have questions.

International Conference on Radiation Shielding (ICRS-10) and Topical Meeting on Radiation Protection & Shielding (RPS 2004)

The Tenth International Conference on Radiation Shielding (ICRS-10) and the Thirteenth Topical Meeting of the Radiation Protection and Shielding Division of the American Nuclear Society (RPS 2004) will be held **May 9-14, 2004**.

The Local Organization has been assigned to ITN (the Nuclear and Technological Institute, in Lisbon), a laboratory of the Portuguese Ministry of Science and Higher Education. At the international level, the joint organization is co-sponsored by the Nuclear Energy Agency (NEA) of the Organization for Economic Co-operation and Development (OECD), the Radiation Protection and Shielding Division (RPSD) of the American Nuclear Society (ANS), and the Radiation Safety Information Computational Center (RSICC, Oak Ridge National Laboratory).

It is anticipated that this will be the most important event in the areas of Radiation Shielding and Radiation Protection during 2004. For further information please refer to the Conferences Web pages at the following URL **http://www.itn.mces.pt/ICRS-RPS**. Please don´t hesitate to contact the Conference Secretariat at **icrs-rps@itn.mces.pt**.

In addition, if you would be interested in serving on the Scientific Program Committee, and contribute to the success of the meeting by either submitting or encouraging colleagues to submit papers, and participating in the technical review process, please contact the Conference Secratariat at the above email and provide your name, organization, email and topics of interest or expertise.

The Organizing Committee welcomes your comments and suggestions to make your meeting a success.

2003 International Congress on Advanced Nuclear Power Plants (ICAPP '03)

We are pleased to announce the call for papers for the “2003 International Congress on Advanced Nuclear Power Plants” (ICAPP '03) which will be held in Cordoba, Spain, **May 4-7, 2003,** at the Congress Palais. Please make note of the October 15, 2002 deadline for abstracts.

Following the highly successful ICAPP ’02 meeting held in Hollywood, Florida, this international congress will bring together international experts of the nuclear industry involved in the operation,

development, building, regulation, and research related to nuclear power plants. The conference is sponsored by the leading nuclear societies of Europe, Asia, and the USA.

The program will cover the full spectrum of nuclear power plant issues from design, deployment and construction of plants to research and development of future designs and advanced systems. The program is expected to cover lessons learned from power, research and demonstration reactors from over 50 years of experience with operation and maintenance, structures, materials, technical specifications, human factors, system design, and reliability. You may visit the ICAPP '03 website at **www.ans.org/goto/icapp03** for updated information on the congress and to download a copy of the Call For Papers.

6th International Symposium on ESR Dosimetry and Applications

The 6th International Symposium on ESR Dosimetry and Applications will be held **October 12-16, 2003**, in Campos do Jordão, Brazil. For complete information, please see **http://www.if.usp.br/VI_ESR_2003/** and click on "second announcement (PDF version)" on the left side of the screen.

7th International Conference on Nuclear Criticality Safety (ICNC2003)

The 7th International Conference on Nuclear Criticality Safety (ICNC2003) will be held **October 20-24, 2003,** in Tokai-mura, Japan. This conference has been held approximately every 4 years under the support of OECD/Nuclear Energy Agency/Nuclear Science Committee. The last conference, hosted by Japan, was the 3rd conference held in Tokyo in 1987. In the Versailles conference held in 1999, over 300 people from 25 countries participated, and more than 200 presentations were given on the recent activities in research work, industrial applications, regulatory studies, and other topics related to criticality safety. ICNC2003 will provide a good opportunity for communication among researchers, engineers, plant operators, and regulators. The Conference will consist of invited talks, contributed talks, and poster sessions. On the final day of the conference, technical tours to nuclear facilities are scheduled, and social programs are planned during conference. Please see the website for more information: **http://www.icnc.jp/**.

9th International Conference on Environmental Remediation and Radioactive Waste Management

The conference will be held in Oxford, England, **September 21-25, 2003**. Session M-6 - Applying Strategic Planning, Decision-making, and Risk Reduction Methodologies in EM, includes the following:

-- Applications of strategic planning, decision-making, and/or risk reduction methodologies and tools (e.g., roadmapping) to resolve environmental management issues
-- Innovative approaches to decision-making to resolve problems/issues related to environmental management
-- Innovative approaches to assessing risk and cost-effective reduction of risk for issues related to environmental management
-- Innovative approaches to strategically plan for and implement science and technology (S&T) to resolve environmental barriers to project completion
-- Ways to effectively integrate strategic planning, decision-making, and risk reduction techniques and tools to resolve environmental management issues
-- Methodologies used in developing the sites' plans to meet DOE EM's goals of site closures, cost savings, schedule acceleration, and risk reduction

Additional details on the ICEM conference are on the website at **http://www.icemconf.com**.

21st International System Safety Conference

The System Safety Society is pleased to announce the 21st International System Safety Conference, **August 4-8, 2003**, in Ottawa, Ontario, Canada. The conference is an international forum for the technical presentation and discussion of all aspects and issues regarding system safety engineering and management. The conference theme is "Broader Perspectives, Focused Solutions." The emphasis is on the

knowledge and skills necessary to create system safety solutions for increasingly complex technologies and missions. The range of topics will cover both the art and science of system safety and the organizational issues influencing the effective management of system safety in the product life cycle. This is the major conference for system safety and related professions, with a week of technical sessions, tutorials, workshops, special events, social affairs, luncheons, and the society's awards banquet. The conference proceedings are the premier collection of work in the system safety field. For more information, please visit: **http://www.russona.com/issc21/**.

9th International Symposium in Radiation Physics (ISRP-9)

The 9th International Symposium on Radiation Physics (ISRP-9) will be held in Cape Town, South Africa, **October 27-31, 2003**. This triennial event will be organized jointly by the International Radiation Physics Society (IRPS) and iThemba Laboratory for Accelerator Based Sciences (iThemba LABS) [formerly the National Accelerator Centre]. The Symposium is the latest in a series which began in Calcutta in 1974 and thereafter continued in Penang (1982), Ferrara (1985), São Paulo (1988), Dubrovnik (1991), Rabat (1994), Jaipur (1997) and Prague (2000). A 2½ day "Workshop on Radiation-Based Analytical Techniques" (WoRBAT) will be held prior to ISRP-9 (October 24-26, 2003) with emphasis on x-ray fluorescence and diffraction (XRF, XRD) and particle-induced x-ray emission (PIXE). For more information, please visit **www.medrad.tlabs.ac.za/isrp9.htm**.

MCNP Courses for 2003

Registration: **http://www-xdiv.lanl.gov/x5/MCNP/registration.html**
MCNP home page: http://www-xdiv.lanl.gov/x5/MCNP/index.html
LANL contact: **selcow@lanl.gov**
European contact: **sartori@nea.fr**
Japanese contact: **tadakazu@hero.tokai.jaeri.go.jp**

2003

April 11	MCNP5 Parallel Processing Workshop	Gatlinburg, Tennessee
May 12-16	Introductory class	Japan
June 10-13	Introductory class	Los Alamos National Laboratory
August date TBA	Advanced MCNP Topics	Los Alamos National Laboratory

The introductory class is for people who have little or no experience with MCNP. The intermediate to advanced class will be held for people who have used MCNP and want to extend their knowledge and understanding of the code system.

The classes will be based on MCNP5. The code and data package will be available through RSICC at a reduced rate to class participants. The new capabilities of version 5 will be covered.

The other capabilities on MCNP will also be covered, including: basic and advanced geometry, source definitions, tallies, data, variance reduction, statistical analysis, criticality, plotting of geometry, and particle tracks, neutron/photon/electron physics.

All classes provide interactive computer instruction. Time will be available to discuss individual questions and problems with MCNP experts or to pursue in more detail topics mentioned in the talks. Please note that other classes are offered based on MCNP. The classes mentioned here are the only ones that are taught by the people who develop and write MCNP.

MCNP Visual Editor Classes

The Visual Editor is a powerful visualization tool that can be used to rapidly create complex Monte Carlo N Particle (MCNP 4C2) geometry models, including lattices, universes, fills, and other geometrical transformations. The Visual Editor can:

Display MCNP 4C2 geometries in multiple plot windows,
Create surfaces and cells to build a geometry,
Create materials using the local xsdir file,
Store commonly used materials in a material library,
Sub-divide large cells into smaller cells,
Create cells containing universes and lattices,
Interactively set cell importances from the plot window, and
Display source points and collision points in the plot window.

Two classes are scheduled **June 2-6, 2003**, and **September 8-12, 2003,** both in Richland, Washington. The class will focus on the use of the visual editor, with an overview of MCNP. The fifth day is optional and will focus on using the Visual Editor and MCNP to do some example problems.

Class will include computer demonstrations and exercises that will focus on creating and interrogating input files with the Visual Editor. Advanced visualization work using MCNP will also be demonstrated. The class will be taught on Pentium computers running the Linux operating system and Windows NT. Class attendees can use either the Linux or Windows version of the visual editor. Attendees are encouraged to bring their own input files for viewing and modifying in the visual editor. Further information on this class can be located at: **http://www.mcnpvised.com/train.html**, or by contacting Randy Schwarz (email **randyschwarz@mcnpvised.com**).

MCNPX Workshops for 2003

Lead Teachers: Drs. John Hendricks, Gregg McKinney, Laurie Waters
Organizer: HQC Professional Services Contact: **bill@solutionsbyhqc.com**
More Information: **http://mcnpxworkshops.com** MCNPX homepage: **http://mcnpx.lanl.gov**

2003

April 14-18	Advanced	Knoxville, Tennessee
May 19-23	Introductory	Los Alamos/Santa Fe
June/July	Advanced	Europe
August 25-29	Advanced	Los Alamos/Santa Fe
September/October	Introductory	Europe
November	Advanced	Japan

MCNPX is the LANL all-particle, all-energy (eV-TeV) Monte Carlo transport code based on MCNP4C, LAHET, CEM, etc. MCNPX has been in active development since 1995, sponsored by the particle accelerator community. It has now become an accepted tool for a broad range of applications by nuclear engineers, physicists, and scientists. The MCNPX development effort has expanded the use of the Los Alamos tools to applications such as APT, waste transmutation, accelerator shielding and health physics, particle beam cancer therapy, space shielding and cosmic ray analysis, single event effects in semiconductors, radiography, and more detailed analysis of the effects of light and heavy ions in matter. In addition, the entire functionality of MCNP4C is retained. New variance reduction and data analysis techniques, many adapted from high energy accelerator methodologies, have also been added, such as the extensive 'mesh tally' capability which allows up to 3-d plotting of particle tracks, fluence and

fluence-derived quantities, energy deposition, next event estimator generation contributions and particle sources.

The workshops include hands-on instruction, generally on PC Windows machines. Subject to participant export approval for the MCNPX beta test team, participants will be able to access the Fortran-90 version of MCNPX 2.4, the LA150 (150 MeV) cross-section data for over 40 isotopes for incident neutrons and protons, and 12 for photonuclear interactions, and a notebook of viewgraphs.
Follow-up consultation for class participants will be provided.

Classes are taught by experienced MCNPX code developers and instructors. More information on code versions and capabilities is available at MCNPX Workshops web site **http://mcnpxworkshops .com**.

Workshop on Nuclear Data for the Transmutation of Nuclear Waste

The "Workshop on Nuclear Data for the Transmutation of Nuclear Waste" will be held **September 1-5, 2003,** at GSI-Darmstadt, Germany. The workshop is organized on the occasion of the end of the HINDAS research program, a collaboration of several European Institutes working on the subject of "High and Intermediate Nuclear Data for Accelerator Driven Systems." Please note that the topics included in the workshop are not restricted to the HINDAS research program. All contributions to the subject of the workshop are more than welcome.

The workshop time-schedule will be organized in the following way: Monday will be dedicated to a closed HINDAS meeting. On Tuesday, the open sessions will start and last till the end of the workshop on Friday.

Those who are interested in participating in the workshop are invited to register (no fee) before August 1, 2003, using the workshop website **http://www-wnt.gsi.de/tramu.** There is also information on workshop topics, accommodations, transportation, and key dates. Please contact Aleksandra Kelic, **A.Kelic@gsi.de** if you have questions.

PHYSOR 2004

The Chicago Section of the American Nuclear Society is pleased to announce that it will host the PHYSOR-2004 Topical Meeting, **April 25-29, 2004,** in Chicago, IL. The meeting is co-sponsored by the Reactor Physics Division of the ANS and the OECD Nuclear Energy Agency. The conference will be held at the Hyatt Regency in downtown Chicago.

The title for the meeting is "The Physics of Fuel Cycles and Advanced Nuclear Systems: Global Developments." The technical program will cover more than 15 topical focus areas; the deadline for submission of 1000-word summaries is September 5, 2003. You are invited to visit the meeting website at **www.td.anl.gov/PHYSOR2004** to obtain updated information and to download a copy of the meeting announcement. Questions may be directed to Ray Klann, the Technical Program Co-Chair, at 630-252-4305 or **klann@anl.gov**.

Practical MCNP for the HP, Medical Physicist, and Rad Engineer

DATE: **June 16-20, 2003** (4.5 days)
FEE: $1,450 per person
PLACE: The MESA Complex, Room 130, University of New Mexico-Los Alamos Campus

Monte Carlo type calculations are ideally suited to solving a variety of problems in radiation protection and dosimetry. This course is aimed at the HP, medical physicist, and rad engineer with no prior experience with Monte Carlo techniques. The focus is almost entirely on the application of MCNP™ to solve a variety of practical problems in radiation shielding and dosimetry. The intent is to "jump start" the student toward using MCNP™ productively. Extensive interactive practice sessions are conducted on a personal computer. Topics will include overview of the MCNP™ code and the Monte Carlo method, basic concepts, input file preparation, geometry, source definition, standard MCNP tallies, interpretation of the output file, exposure and dose rate calculations, radiation shielding, photon skyshine, detector simulation and

dosimetry. Students will be provided with a comprehensive class manual and a diskette containing all of the practice problems. This course has been granted 32 Continuing Education Credits by the AAHP, and 4.5 CM points by the American Board of Industrial Hygiene.

The course is offered by the Health Physics Measurements Group at the Los Alamos National Laboratory and is co-sponsored by RSICC. Registration is available online at **http://drambuie.lanl.gov/ ~esh4 mcnp.htm**. Make checks payable to the University of California (checks must be in U.S. dollars on a U.S. bank) and mail together with name, address, and phone number to: Los Alamos National Laboratory, Group HSR-4, MCNP Class/David Seagraves, Mail Stop J573, Los Alamos, NM 87545.

This course is offered by the Health Physics Measurements Group at LANL and is a completely separate offering from the other courses offered by other groups at Los Alamos.

Inquiries regarding registration and class space availability should be made to David Seagraves, 505-667-4959, fax: 505-665-7686, e-mail: **dseagraves@lanl.gov**. Technical questions may also be directed to Dick Olsher, 505-667-3364, e-mail: **dick@lanl.gov**.

Supercomputing in Nuclear Applications

The conference on "Supercomputing in Nuclear Applications" SNA-2003, will be held in Paris, **September 22-24, 2003**.

The web pages (**http://sna-2003.cea.fr/**) were expanded to include information on tours, sightseeing and events scheduled at the time of the conference.

One of the events at SNA-2003 is linked to the museum of "arts et metier", literally of arts & crafts; art is here used in its primary meaning: skills acquired through studies and by practice, technical knowledge. In this museum are displayed among many other items the "supercomputer" of 1642: arithmetical machine by Blaise Pascal, the original pendulum of Foucault (1851) or the instrument he developed to measure the speed of light (1852), or a decimal clock with a day of 10 hours each of 100 minutes and a minute of 100 seconds etc.

CALENDAR

April 2003

ANS Topical Meeting, Nuclear Mathematical and Computational Sciences: A Century in Review, A Century Anew, Apr. 6-10, 2003, Gatlinburg, TN. Co-sponsored by the American Nuclear Society's Reactor Physics, and Radiation Protection and Shielding Divisions, as well as the ANS Oak Ridge/Knoxville Local Section, Oak Ridge National Laboratory's Radiation Safety Information Computational Center, the Nuclear Energy Agency of the OECD, the Korean Nuclear Society, and the Canadian Nuclear Society. Contacts: Yousry Azmy (tel 814-865-0039, email **yya3@psu.edu** or Bernadette Kirk (tel 865-74-6176, email **kirkbl@ornl.gov**, url **http://meetingsandconferences.com /MC2003/index.html**).

39th NCRP Meeting, Apr. 9-10, 2003, Arlington, VA. Contact: William Beckner (tel 301-657-2652, fax 301-907-8768, url **http://www.ncrp.com**).

MCNP Course, Apr. 11, 2003, Gatlinburg, Tennessee. Contact: Elizabeth Selcow (email **selcow@lanl.gov**, url **http://www-xdiv.lanl.gov/x5/ MCNP/index.html**).

MCNPX Advanced Workshop, April 14-18, 2003, Knoxville, TN. Contact: Bill Hamilton (tel 505-455-0312, email **registrar@mcnpxworkshops.com**, url **http://mcnpxworkshops.com** for details).

Radiation Process Simulation and Modeling User Group, Apr. 22-23, 2003, Gaithersburg, MD. Contact: Mark Smith (tel 704-587-8914, email **msmith@iba-group.com**).

SCALE5 Workshop, Apr. 28-May 2, 2003, Oak Ridge, TN. Contact: Kay Lichtenwalter (email **x4s@ornl.gov**, **scalehelp@ornl.gov**, url **http://www.ornl.gov/scale/ workshop_mc2003.html**).

May 2003

Radiation Transport Calculations using the EGS Monte Carlo System, May 5-8, 2003, Ottawa, Canada. Contact: Blake Walters, Ionizing Radiation Standards, National Research Council of Canada, Ottawa, Canada, K1A 0R6. (tel 613-993-2715, fax 613-952-9865, email **bwalters@irs.phy.nrc.ca**, url **http://www.irs.inms.nrc.ca/inms/irs/papers/egsnrc/brochure.html**).

MCNP Course, May 12-16, 2003, Japan. Contact: Elizabeth Selcow (email **selcow@lanl.gov**, url **http://www-xdiv.lanl.gov/x5/MCNP/index.html**).

MCNPX Introductory Workshop, May 19-23, 2003, Los Alamos/Santa Fe, NM. Contact: Bill Hamilton (tel 505-445-0312, email **registrar@mcnpxworkshops.com,** url **http://mcnpxworkshops.com** for details).

June 2003

Visual Editor for MCNP, June 2-6, 2003, Richland, Washington. Contact: Randy Schwarz (email **randyschwarz@mcnpvised.com**, url **http://www.mcnpvised.com/train.html**).

Practical MCNP For The HP, Medical Physicist, And Rad Engineer, June 16-20, 2003, Los Alamos, NM. Contact: David Seagraves (tel 505-667-4959, fax 505-665-7686, email **dseagraves@lanl.gov**, url **drambuie.lanl.gov/~esh4/mcnp.htm**).

MCNP Course, June 10-13,2003, Los Alamos National Laboratory, Los Alamos, NM. Contact: Elizabeth Selcow (email **selcow@lanl.gov**, url **http://www-xdiv.lanl.gov/x5/MCNP/index.html**).

MCNPX Advanced Workshop, June/July (tbd), 2003, Europe. Contact: Bill Hamilton (tel 505-455-0312, email **registrar@mcnpxworkshops.com**, url **http://mcnpxworkshops.com** for details).

July 2003

PENELOPE Training Course, July 7-10, 2003, OECD/NEA Headquarters, France. Please see **http://www.nea.fr/lists/penelope.html** for official announcement.

Intercomparison on the Usage of Computational Codes in Radiation Dosimetry, July 14-16, 2003, Bologna, Italy. Contact: Gianfranco Gualdrini (tel 39-051-6098350, fax 39-051-6098003, email **guald@bologna.enea.it**, url **http://www.nea.fr/download/quados/quados.html**).

2003 IEEE Nuclear and Space Radiation Effects Conference (NSREC), July 21-25, 2003, Monterey, CA. Contact: Paul Dodd (tel 505-844-1447, url **http://www.nsrec.com**).

MCNPX Advanced Workshop, June/July (tbd), 2003, Europe. Contact: Bill Hamilton (tel 505-455-0312, email **registrar@mcnpxworkshops.com**, url **http://mcnpxworkshops.com** for details).

August 2003

21st International System Safety Conference, Aug. 4-8, 2003, Ottawa, Canada. Contact: Gerry Einarsson, Chair, (tel 613-824-2468, email **einargk@rogers.com**, url **http://www.russona.com/issc21/**).

MCNPX Advanced Workshop, Aug. 25-29, 2003, Los Alamos / Sante Fe. Contact: Bill Hamilton (tel 505-455-0312, email **registrar@mcnpxworkshops.com,** url **http://mcnpxworkshops.com** for details).

MCNP Course, Aug. 2003, (TBA), Los Alamos National Laboratory, Los Alamos, NM. Contact: Elizabeth Selcow (email **selcow@lanl.gov**, url **http://www-xdiv.lanl.gov/x5/MCNP/ index.html**).

September 2003

Workshop on Nuclear Data for the Transmutation of Nuclear Waste, Sept. 1-5, 2003, GSI-Darmstadt, Germany, Contact: Aleksandra Kelic (tel 49-0-6159-71-2727, fax 49-0-6159-71-2785, email **A.Kelic@gsi.de**, url **http://www-wnt.gsi.de/tramu**).

Nuclear Energy for New Europe 2003, Sept. 8-11, 2003, Portorož, Slovenia, Contact: Tomaz Zagar (phone +386-1-588-5450, fax +386-1-561-2335, email **PORT2003@ijs.si,** url **http://www.drustvo -js.si/port2003/**).

Visual Editor for MCNP, Sept. 8-12, 2003, Richland, Washington. Contact: Randy Schwarz (email **randyschwarz@mcnpvised.com**, url **http://www.mcnpvised.com/train.html**)

9th International Conference on Environmental Remediation and Radioactive Waste Management, Sept. 21-25, 2003, Oxford, England. Contact: (url **www.icemconf.com**).

International Conference on Supercomputing in Nuclear Applications, *SNA 2003*, Sept. 22-24, 2003, Paris, France. Organizers: CEA, SFANS, co-organizer: OECD/NEA. (email **SNA-2003@ cea.fr**, url **http://SNA-2003.cea.fr**).

MCNPX Introductory Workshop, Sept/Oct (tbd), 2003, Europe. Contact: Bill Hamilton (tel 505-455-0312, Email **registrar@mcnpxworkshops.com**, url **http://mcnpxworkshops.com** for details).

October 2003

American Nuclear Society's Advances in Nuclear Fuel Management III Topical Meeting, Oct. 5-8, 2003, Hilton Head Island, SC. Contact: Youssef A. Shatilla (email **shatilya@westinghouse.com**, url **http://rpd.ans.org/nfm.htm**).

7th International Conference on Nuclear Criticality Safety (ICNC2003), Oct. 20-24, 2003, Contact: Dr. Yoshinori Miyoshi (tel +81-29-282-6671; fax +81-29-282-6798, email **icnc03miyoshi@nucef.tokai.jaeri.go.jp**, url **http://www.icnc.jp/**).

9th Triennial International Symposium in Radiation Physics, Oct. 27-31, 2003, Cape Town, South Africa. Contact: Dr. D. T. L. Jones (tel +27-21-843-1336, fax +27-21-843-3382, email **Jones@tlabs.ac.za** url **www.medrad.tlabs.ac.za/isrp9.htm**).

MCNPX Introductory Workshop, Sept/Oct (tbd), 2003, Europe. Contact: Bill Hamilton (tel 505-455-0312, Email **registrar@mcnpxworkshops.com**, url **http://mcnpxworkshops.com** for details).

November 2003

MCNPX Advanced Workshop, November, 2003, Japan. Contact: Bill Hamilton (tel 505-455-0312, email **registrar@mcnpxworkshops.com,** url **http://mcnpxworkshops.com** for details).

December 2003

The 11th International Conference on Fusion Reactor Materials (ICFRM-11), Dec. 7-12, 2003, Kyoto, Japan. Contact ICFRM-11 secretariat (tel +81-774-38-3597, fax +81-774-38-3467, email **icfrm@iae.kyoto-u.ac.jp**, url **http://icfrm.iae.kyoto-u.ac.jp).**

April 2004

PHYSOR 2004 Reactor Physics Topical Meeting, Apr. 25-29, 2004, Chicago, IL. Jointly sponsored by the Reactor Physics Division of the ANS and the Nuclear Energy Agency of the OECD. **Contact:** Ray Klann (tel 630-252-4305, email **klann@anl.gov,** url **www.td.anl.gov/PHYSOR2004**).

May 2004

International Conference on Radiation Shielding (ICRS-10) and Topical Mtg. on Radiation Protection & Shielding (RPS 2004), May 9-14, 2004, Funchal, Madeira Island (Portugal). Contact: Conference Secretariat (email **icrs-rps@itn.mces.pt,** url **http://www.itn.mces.pt/ICRS-RPS**).

ACCESSION OF NUCLEAR SYSTEMS LITERATURE

The nuclear systems literature (shielding, safety, materials) cited below has been reviewed and placed in the RSICC Information Storage and Retrieval Information System (SARIS), now searchable on the RSICC web server (**http://www-rsicc.ornl.gov/SARIS.html**). We now include medical physics in addition to material science, radiation dosimetry, radiation safety, reactor dynamics, reactor safeguards, risk assessment, waste management, fuel cycle, fusion and plasmas, high energy particle transport, and shielding.

This early announcement is made as a service to the nuclear sciences community. Copies of the literature are not distributed by RSICC. 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. For literature listed as available from INIS contact INIS Clearinghouse, International Atomic Energy Agency, P.O. Box 100, A-1400 Vienna.

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