# Radiation Safety Information Computational Center


Oak Ridge National Laboratory
POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831-6171

Managed by
UT-Battelle, LLC
for the U.S. Department of Energy
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Phone No. 865-574-6176
FAX 865-241-4046 Internet **PDC@ORNL.GOV**
**http://www-rsicc.ornl.gov/rsicc.html**

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"One cool judgment is worth a thousand hasty councils. The thing to do is to supply light and not heat."
-- Woodrow Wilson

## Bob Santoro Will Be Greatly Missed

*(by Dan Ingersoll)*

**Robert T. Santoro**, a senior researcher at Oak Ridge National Laboratory, died March 8, 2004. During his nearly 47 years in the field of theoretical, analytic and experimental nuclear physics and engineering, Bob became widely recognized in the international shielding community for his work in space, fusion, and defense radiation environments. He authored or co-authored more than 390 technical reports and journal articles and frequently participated in international working groups.

Among his many accomplishments, in 1972 he co-authored a cornerstone handbook for spacecraft designers that estimated effects of space radiation on astronauts. During 1993-98, Bob served as a senior member of the International Thermonuclear Experimental Reactor (ITER) Joint Central Team at the Max Planck Institute for Plasma Physics in Garching, Germany, and was appointed to lead the ITER Nuclear Analysis Group. Most recently, he played a key role in an international effort that resulted in the resolution of the 50-year-old discrepancy in the reconstruction of doses at Hiroshima and Nagasaki.

Often referred to locally as "the Colonel," Bob was a highly decorated Army officer. He received a BS degree in physics from Virginia Polytechnic Institute in 1957 and an MS degree in physics from the University of Tennessee in 1967. He was also a 1963 graduate of the Oak Ridge School of Reactor Technology and a Fellow of the American Nuclear Society.

Despite his very distinguished and prolific career, Bob will be remembered most by those who knew him for his warm, outward nature. His passion for his work was surpassed only by his love of people. He always had time to ask about the kids, or to "chew the fat" on last weekend's fishing experience. He will be greatly missed in the hallways of ORNL, and in the "virtual hallways" of the international shielding community.

# MCNP5 Notice

April is the final month that the user fee for the MCNP5 package will be waived for requesters who received a prior version of MCNP from RSICC. Complete a request form and select the MCNP5 (C00710MNYCP01) package. In the comments field, please state your name and the installation at which you received the earlier version for verification.

# Workshop* on the DOORS Particle Transport Code Package

A five-day, hands-on workshop on the Discrete Ordinates of Oak Ridge System (DOORS**) particle transport code package is offered **June 7-11, 2004**, on the Pennsylvania State University, University Park campus, at State College, Pennsylvania.

The workshop will cover:

- Theoretical foundations of transport theory
- The two- and three-dimensional transport codes DORT and TORT, respectively
- Several of the peripheral codes in DOORS
- The mesh generation and visualization code package BOT3P* (produced by ENEA FIS-NUC, Bologna, Italy)

Instruction will take place in a computer laboratory where participants will be able to immediately and extensively apply the material presented. Attendees will benefit by learning:

- How to solve neutral particle transport problems, with examples from the reactor physics and shielding areas, using DORT, TORT, and DOORS auxiliary codes.
- How to set up input files.
- How to interpret code output and visualize the solution.
- The many powerful options and computational tools in the DOORS package.

Attendees should have elementary theoretical background in transport theory and must be able to function in a Linux environment, including file editing and transferring across computers.

All instruction will be provided by:

- Dr. Yousry Y. Azmy, Professor of Nuclear Engineering, Penn State University: Dr. Azmy led the TORT development effort at Oak Ridge National Laboratory since 1995; he has extensive experience in the development and use of the codes comprising the DOORS package, and is well versed in the use of the BOT3P package.
- Dr. Allen Barnett, Radion Technologies: Dr. Barnett has 16 years of experience with the use and development of neutral particle transport methods and codes, including the DOORS package.

To ensure effective instruction, enrollment is limited to the first 20 paid registrations. The workshop registration fee is $1,600. All registrations must be received by May 21, 2004.

For more information on the workshop, travel to State College, accommodations, and for a registration form, please visit the DOORS Workshop web site at: **http://www.engr.psu.edu/cde/doorsworkshop** or contact Yousry Y. Azmy at (814) 865-0039, or e-mail **yya3@psu.edu**.

Since the workshop is scheduled the week prior to the ANS Summer Meeting in Pittsburgh and since Pittsburgh is a relatively easy three-hour drive from State College, participants may be able to combine travel plans to the two events.

*Cosponsored by Pennsylvania State University, the Radiation Safety Information Computational Center, and the Nuclear Energy Agency Data Bank.

** Availability of the DOORS and BOT3P packages is through the Radiation Safety Information Computational Center (RSICC), 865-574-6176, **pdc@ornl.gov**, **http://www-rsicc.ornl.gov/rsicc.html**.

# Changes to the Computer Code and Data Collection

One new package and one new software version were added to the computer code and data collection.

**CCC-658/VIM 4.0**

**OP SYS:** Linux, Unix
**Language:** Fortran 77 & C
**Computers:** PC, Sun, IBMRS/6000
**Format:** tar

Argonne National Laboratory, Argonne, Illinois, contributed a version of this continuous energy neutron and gamma-ray transport code system that runs under Linux on personal computers. This release also includes additional libraries from JENDL 3.2 and a code that plots a 2D slice from VIM input files. VIM solves the steady-state neutron or photon transport problem in any detailed three-dimensional geometry using either continuous energy-dependent ENDF nuclear data or multigroup cross sections. Neutron transport is carried out in a criticality mode, or in a fixed source mode (optionally incorporating subcritical multiplication). Photon transport is simulated in the fixed source mode. The geometry options are infinite medium, combinatorial geometry, and hexagonal or rectangular lattices of combinatorial geometry unit cells, and rectangular lattices of cells of assembled plates. Boundary conditions include vacuum, specular and white reflection, and periodic boundaries for reactor cell calculations. The VIM 4.0 distribution includes data from ENDF/B-IV, ENDF/B-V, ENDF/B-VI and JEF2.2.

VIM uses standard Monte Carlo methods for particle tracking with several optional variance-reduction techniques. These include splitting/Russian roulette, non-terminating absorption with nonanalog weight cutoff energy. The k-eff is determined by the optimum linear combinations of two of the three eigenvalue estimates -- analog, collision, and track length. Resonance and smooth cross sections are specified pointwise with linear-linear interpolation, frequently with many thousands of energy points. Unresolved resonances are described by the probability table method, which allows the statistical nature of the evaluated resonance cross sections to be incorporated naturally into self-shielding. Neutron interactions are elastic, inelastic and thermal scattering, (n,2n), fission, and capture, which includes (n,gamma), (n,p), (n,alpha), etc. Photon interaction data for pair production, coherent and incoherent scattering, and photoelectric events are taken from MCPLIB. Trajectories and scattering are continuous in direction, and anisotropic elastic and discrete level inelastic neutron scattering are described with probability tables derived from ENDF/B data.

The new Linux version was developed with the Portland Group Fortran and Gnu C and C++ compilers. The Gnu Fortran compiler can also be used. DISSPLA coding has been removed in this release. The author's executables are included in the package. RSICC tested this release on Red Hat 7.3 with Portland Group Fortran 4.0-2 and Gnu gcc 2.96. The Unix version is unchanged from the previous release.

Included are the referenced document and one CD-rom with compressed Unix tar files which contain installation instructions, the User's Guide, Fortran source, test cases and Linux executables. Reference: "VIM User's Guide Version 4.0" (December 27, 2000). Fortran 77 and C; Sun, IBM RS/6000, Linux PC (C00658MYWS03).

**DLC-220/HILO2K**

**OP SYS:** Unix, Linux
**Language:** Fortran 77
**Computers:** IBM RS/6000, PC
**Format:** tar

Oak Ridge National Laboratory, Oak Ridge, Tennessee, contributed these coupled 83-neutron, 22-photon group cross sections for neutron energies up to 2 GeV. HILO2k is a new high-energy neutron and photon transport cross-section library containing neutron cross sections to 2 GeV and photon cross sections to 20 MeV and is intended for use in multidimensional deterministic transport codes. It represents the culmination of work directed at updating and extending the DLC-119/HILO86 transport cross-section library developed at Oak Ridge National Laboratory (ORNL) in the mid 1980's.

HILO2k was developed as part of the neutronics R&D effort associated with the design of the Spallation Neutron Source (SNS) currently under construction at ORNL and can be used for other accelerator driven applications. The new library contains transport cross sections for 32 nuclides commonly found in target, reflector, and shielding materials used at spallation neutron source facilities. The high-energy portion (E>20 MeV) of HILO2k is based on neutron elastic and nonelastic interaction and production data generated using the stochastic nuclear collision models in MCNPX Version 2.1.5 (RSICC package C00705MNYCP01). The low-energy portion was derived from ENDF or LENDL data for all nuclides except Hg. The high-energy neutron interaction and production cross sections were also normalized to the nonelastic cross sections for those nuclides treated in the recently evaluated Los Alamos National Laboratory (LANL) 150-MeV library. Dose equivalent obtained from discrete ordinates transport calculations employing HILO2k agreed within approximately a factor of two with that obtained using MCNPX after transport through more than 4000 g/cm2 of typical high-energy shielding materials. Data are provided for: H-1, H-2, He, Be, B-10, B-11, C, N, O, Na, Mg, Al, Si, S, K, Ca, Cr, Mn, Fe, Ni, Cu, Zr, Nb, Cd, Ba, Gd, Ta, W, Hg, Pb, U-235, U-238.

The package is distributed on CD in a Gnu compressed Unix tar file which includes documentation, Fortran programs, and ASCII cross sections. Reference: Informal paper (September 2003). ASCII card images; Many computers (D00220MNYCP00).

# 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**. April's code focus is **Experimental Detector Analysis and Spectral Analysis**.

**ACTIV-PC**
**BON**
**CALOR95**
DIFBAS

**FERD-PC**
FLYSPEC-SHORTS
**GRPANL**
**MCNP-DSP**
**MCNP-POLIMI**
**SAND-II-SNL**
**SCINFUL**

# 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 listed chronologically. More details (if available) are listed alphabetically following the table.

## Condensed Table of Conferences

| Name of Conference | Date and Location | Web Site | Abstract/Paper Due Date |
|---|---|---|---|
| Current Topics in Monte Carlo Treatment Planning | May 3-5, 2004 Montreal, Canada | **http://mctp.medphys.mcgill.ca** | passed |
| 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/** | |
| 5th International Conference on Nuclear Option in Countries with Small and Medium Electricity Grids | May 16-20, 2004 Dubrovnik, Croatia | **http://hnd.zvne.fer.hr/Dubrovnik2004** | |
| ANS Annual Summer Meeting | June 13-17, 2004 Pittsburgh, Pennsylvania | **http://www.ans.org/meetings/students call for papers** | passed |
| 1st International Symposium on Radionuclide Therapy and Radiopharmaceutical Dosimetry | Sept. 4-8, 2004 Helsinki, Finland | **http://www.eanm.org/eanm.php?kopf=head/hd_calendar.html&worte=calendar/calendar.php** | future |

| Name of Conference | Date and Location | Web Site | Abstract/Paper Due Date |
|---|---|---|---|
| 12th International Conference on the Physics of Highly Charged Ions | Sept. 6-10, 2004 Vilnius, Lithuania | **http://www.itpa.lt/hci2004/** | Apr. 15, 2004 |
| 16th American Nuclear Society Topical Meeting on the Technology of Fusion Energy | Sept. 14-16, 2004 Madison, Wisconsin | **http://fti.neep.wisc.edu/tofe** | May 1, 2004 |
| International Conference on Nuclear Data for Science and Technology "ND2004" | Sept. 26-Oct. 1, 2004 Santa Fe, New Mexico | **http://t16web.lanl.gov/nd2004/** | passed |
| 5th International Conference of Yugoslav Nuclear Society (YUNS) | Sept. 27-30, 2004 Belgrade, Serbia & Montenegro | **http://www.vin.bg.ac.yu/YUNS/Yunsc2004.html** | June 1, 2004 |
| Americas Nuclear Energy Symposium 2004 | Oct. 3-6, 2004 Miami Beach, FL | **http://anes.fiu.edu/2004/** | NA |
| 11th International Congress on Neutron Capture Therapy (ISNCT-11) | Oct. 11-15, 2004 Boston, Massachusetts | future site | |
| ANS Annual Winter Meeting and Nuclear Technology Expo | Nov. 14-18, 2004 Washington, D.C. | **http://www.ans.org/meetings/** | |
| Monte Carlo 2005 Topical Meeting | Apr. 17-21, 2005 Chattanooga, Tennessee | **http://meetingsandconferences.com/MonteCarlo2005** | **call for papers** |
| Twelfth International Symposium on Reactor Dosimetry | May 8-13, 2005 Gatlinburg, Tennessee | **announcement / call for papers in pdf** | |
| ANS Annual Summer Meeting | June 5-9, 2005 San Diego, California | **http://www.ans.org/meetings/** | |

# 2004 Conferences

## Americas Nuclear Energy Symposium 2004

The United States Department of Energy and the American Nuclear Society are pleased to announce the next Americas Nuclear Energy Symposium (ANES 2004), which will take place Sunday through Wednesday, **October 3-6, 2004,** at the Deauville Beach Resort in Miami Beach, Florida.

ANES 2004 will feature the theme "Building Bridges to Greater Cooperation." The symposium will provide you with the latest information about the use and development of nuclear energy technology throughout the Americas. The format will include open panel discussions, case studies, technical breakout sessions, and an exhibit of international organizations, not to mention great opportunities to network.

ANES 2004 will include sessions on nuclear reactors; technology development and deployment; production, disposal and usage of isotopes; fuel cycle and waste management; new applications; finance; and environmental, infrastructure and communications issues.

Another successful event is anticipated with the largest number of participants yet attending from across Canada, the Caribbean, Latin America and the United States. Please visit the website at **http://anes.fiu.edu** for frequent updates.

## Current Topics in Monte Carlo Treatment Planning

This workshop will be held at McGill University, Montreal, Canada, from **May 3-5, 2004**, and aims to bring together medical physicists and researchers to discuss development, clinical implementation and clinical evaluation of Monte Carlo treatment planning techniques in radiotherapy. The meeting will have both invited speakers and proffered contributions and is designed to have plenty of opportunity for informal and in-depth discussions.

For details regarding registration, program, invited speakers, abstract submission, etc, please consult the workshop website: **http://mctp.medphys.mcgill.ca**. Early registration is encouraged as the number of participants will be limited to around 100.

## 1st International Symposium on Radionuclide Therapy and Radiopharmaceutical Dosimetry

The 1st International Symposium on Radionuclide Therapy and Radiopharmaceutical Dosimetry will take place in conjunction with the annual European Association of Nuclear Medicine (EANM) Congress in Helsinki, Finland, **September 4-8, 2004.**

The format of the meeting has evolved from a series of seven interesting and important radiopharmaceutical and dosimetry symposia held approximately every 5 years since 1970, with distribution of published proceedings. The last meeting (7th International Radiopharmaceutical Dosimetry Symposium) was held in Nashville, Tennessee in 2002.

The decisions of the scientific committee and the set-up of the program for Helsinki will be coordinated by the EANM Task Group on Dosimetry and EANM Therapy Committee. All organisational matters will be handled by the EANM.

A call for abstracts (also electronic) will go out in a few months, with authors notified of outcome in approximately May 2004. Contributors will be asked either to bring an electronic version of their manuscript to the meeting in September 2004 or to submit it within two months after the meeting; early plans are to have extended peer-reviewed abstracts published as a supplement to a journal.

Contacts for more information:

Michael Lassmann, Chair T/G Dosimetry EANM, **Lassmann@nuklearmedizin.uni-wuerzburg.de**

Val Lewington, Chair Therapy Committee EANM, **vjlewington@hotmail.com**

**http://www.eanm.org/eanm.php?kopf=head/hd_calendar.html&worte=calendar/calendar.php**

## 5th International Conference on Nuclear Option in Countries with Small and Medium Electricity Grids

The 5th International Conference on Nuclear Option in Countries with Small and Medium Electricity Grids will be held in Dubrovnik, Croatia, **May 16-20, 2004.**

In view of the good response and success of the previous Dubrovnik conferences devoted to the needs and interests of countries with small or medium nuclear systems and electricity grids, the Dubrovnik 2004 conference will serve the same general purpose, with concentration on the topics which invited most interest in the previous conference. The Conference will consider the nuclear option from the point of view of resources, costs, technological, organizational and educational requirements, and environmental advantages. It will also focus on matters related to operational safety, fuel cycle, waste management and decommissioning.

The important goal of the Dubrovnik 2004 conference is to serve as a forum to promote regional co-operation and exchange of experience in the use of nuclear power and fuel cycle facilities among the small or medium European countries interested in the nuclear option.

For updated information please visit the Conference website **http://hnd.zvne.fer.hr/ Dubrovnik2004**, or contact the Conference secretariat at **hnd2004@fer.hr**.

## 5th International Conference of Yugoslav Nuclear Society (YUNS) - 2004

The Conference will be held **September 27-30, 2004**, at the Chamber of Commerce of the Republic of Serbia, Belgrade, Serbia & Montenegro. For more information visit **http://www.vin.bg.ac.yu/YUNS/Yunsc2004.html**.

## 12th International Conference on the Physics of Highly Charged Ions

HCI-2004 will be the 12th conference in an international series taking place every two years around the world. This year's conference will be in Vilnius, Lithuania, **September 6-10, 2004.** Born in Stockholm in 1982, HCI became a major forum for the presentation and discussion of important new research results in the physics of highly charged ions. The conference will continue to emphasize basic, fundamental science at the atomic and molecular level, and its application to important technology challenges. Opportunity will be given to provide insights in other disciplines where HCI physics have a strong impact like nuclear physics, material science, radiation chemistry, radiobiology, etc.

Some important dates are: deadline for abstracts April 15, 2004; deadline for grant applications April 15, 2004; student housing reservation May 15, 2004; early registration deadline May 15, 2004. For more information, please email **hci2004@itpa.lt** or see the website: **http://www.itpa.lt/hci2004/**.

## 16th American Nuclear Society Topical Meeting on the Technology of Fusion Energy

The ANS Topical Meeting on the Technology of Fusion Energy will be held **September 14-16, 2004**, in Madison, Wisconsin. You are cordially invited to submit one-page abstract(s) describing work that is new, significant, and relevant to both magnetic and inertial fusion technologies. A Microsoft Word template that can be used to create the abstract is available on the TOFE website: **http://fti.neep.wisc.edu/tofe**.

The 16th Topical Meeting on the Technology of Fusion Energy (TOFE) will continue the tradition of stand-alone topical meetings originated in the early 1970's, continued through the 80's, and re-established in the year 2000 in Park City, Utah. The scope of the TOFE meeting is to provide a forum

for sharing exciting new progress that has been made in fusion research as well as presenting the future of the national and worldwide fusion program.

The 2½ day program of the 16th TOFE meeting will have plenary, oral, and poster sessions, including a mix of invited oral papers and a significant number of contributed oral and poster papers. Key deadlines follow: one-page abstracts (May 1, 2004); nominations for ANS-FED awards (May 31, 2004); notification to authors (June 1, 2004); early registration deadline (August 10, 2004); hotel reservation cutoff date (August 10, 2004); full papers due at the meeting (September 14, 2004).

## International Conference on Nuclear Data for Science and Technology "ND2004"

The International Conference on Nuclear Data for Science and Technology will be held **September 26-October 1, 2004,** in Santa Fe, New Mexico. This is an OECD-Nuclear Energy Agency Conference, which is held approximately every 3 years. Recent conferences in this series were held in Antwerp (1982), Santa Fe (1985), Mito (1988), Jüelich (1991), Gatlinburg (1994), Trieste (1997) and Tsukuba (2001). This International Conference focuses on nuclear data, their production, dissemination, testing and application. The data are produced through both experimental and theoretical models; they are compiled and evaluated to form data libraries for use in applications; and they are tested through benchmark experiments and a very wide range of applications. This Conference includes all of these activities with the goal of improving nuclear data for applications including fission and fusion energy, accelerator driven systems, accelerator technology, spallation neutron sources, nuclear medicine, environment, space, non-proliferation, nuclear safety, astrophysics and cosmology, and basic research. Please see the web site for more information: **http://t16web.lanl.gov/nd2004/**.

## 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,** in Funchal, Madeira Island (Portugal).

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 Conference website 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**.

## ICCR 2004

The ICCR 2004 meeting will be held **May 10-13, 2004**, in Seoul, Korea. Your active participation and contribution will make this conference successful. Additional information is available from the ICCR 2004 conference secretariat at Hanjin Travel Service Co., Ltd. (tel +82-2-726-5554, fax +82-2-778-2514, email **jssong@hanjinpco.com**, url **http://www.iccr.info**).

## MCNP Courses

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**

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|---|---|---|
| June 1-4 | Introductory | Los Alamos, NM |

Introductory classes are for people who have little or no experience with MCNP. This class surveys the features of MCNP so the beginning user will be introduced to the capabilities of the program, and will have hands-on experience at running the code to solve simple problems. Course topics include Basic Geometry, Source Definitions, Output (Tallies) Specification and Interpretation, Advanced Geometry (repeated structures specification), Variance Reduction Techniques, Statistical Analysis, Criticality, Plotting of Geometry, Tallies, and Particle Tracks, and Neutron/Photon/Electron Physics.

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 class will be based on MCNP5 and will cover the new capabilities of version 5. Attendees may elect to receive the new package. If you have previously received an older registered version of MCNP from RSICC, you may request that the MCNP5 package be sent to you at no charge through the end of April. If you have not received an older version of MCNP from RSICC, you will be charged the applicable user fee.

The other capabilities of 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.

## MCNPX Workshops

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**

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|---|---|---|
| May 3-7 | Intermediate | Lisbon, Portugal |
| June 7-11 | Introductory | Santa Fe, NM |
| July (TBA) | Intermediate | Houston, TX |

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**.

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

DATES: **June 7-11, 2004**
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 health physicist, 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 an overview of the MCNP code and the Monte Carlo method, 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.

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**.

Please note that this course is separate from and independent of the courses being offered by the MCNP and MCNPX Teams at LANL.

## SCALE TRAINING COURSES

The SCALE staff at Oak Ridge National Laboratory (ORNL) will be offering two training courses this spring, **May 3-4 and May 5-7, 2004.** The courses will emphasize hands-on experience solving practical problems on PCs. There will be workgroups of two persons. Courses are open to both

new and experienced SCALE users. The registration deadline has passed. A surcharge of $300 will be added to the fee.

Classes are cosponsored by RSICC which offers a discounted price of $200 (single user license) to all attendees for the SCALE software and manual on CD.

**Registration forms should be submitted from the Web**. Registration via fax is also acceptable. The registration fee may be paid by check, bank transfer, or credit card (VISA or MasterCard only). Course agendas and description information are found at **http://www.ornl.gov/sci/scale/trcourse.html**. Class size is limited and courses are subject to cancellation if minimum enrollment is not obtained one month prior to the course. Course fees are refundable up to one month before each class.

For further information, contact Kay Lichtenwalter, **scalecoding@ornl.gov** , 865-574-9213.

### Short Courses on Monte Carlo Analysis and Nuclear Criticality Safety

The Department of Nuclear Engineering at the University of Tennessee-Knoxville is offering two short courses for radiation transport and criticality safety specialists during Tennessee Industries Week (TIW-39), **August 9-13, 2004.**

Engineers, scientists, and technical managers who wish to increase their knowledge and understanding of nuclear criticality safety will be interested in the criticality safety course, which also runs for five days. The topics covered in the course are based primarily on the experience of the five instructors which totals over 120 years of nuclear criticality safety related experience. Such a wealth of experience needs to be shared with the criticality safety community including both new professionals in the field as well as experienced professionals.

Monte Carlo is often the method of choice to solve complex problems in nuclear criticality safety and radiation shielding. To use Monte Carlo effectively, the analyst must understand the theoretical and computational fundamentals of the method, as well as the computational options available in particular computer tools. Also, it is sometimes advantageous to create new special-purpose Monte Carlo programs to solve particular problems rather than use an existing program. The Monte Carlo course runs for 5 days.

The deadline for registration is July 23, 2004. Classes are limited in size and will be filled on a first-come first-serve basis. For additional information on these and other courses offered during TIW-39, contact Kristin England at the University of Tennessee, phone (865) 974-5048, email **kengland@utk.edu**, url **http://www.engr.utk.edu/nuclear/TIW.html**.

## 2005 Conferences

### Monte Carlo 2005 Topical Meeting

Monte Carlo 2005 will be held **April 17-21, 2005,** (Sunday-Thursday). The theme of the conference will be "The Monte Carlo Method: Versatility Unbounded in A Dynamic Computing World".


The conference site is the Chattanooga Marriott and Convention Center in Chattanooga, Tennessee. The conference will be hosted by the American Nuclear Society (ANS) Oak Ridge/Knoxville Section, with ANS Radiation Protection and Shielding Division (RPSD) as the sponsoring division and Mathematics and Computations Division (MCD) as a co-sponsor. Co-sponsors will also include Oak Ridge National Laboratory (ORNL), Radiation Safety Information Computational Center (RSICC) and the Organization for Economic Cooperation and Development (OECD) Nuclear Energy Agency Data Bank (NEADB).

The Monte Carlo method and its applications have been frequently addressed at several major conferences and workshops organized in recent years in the area of nuclear applications. Monte Carlo topics have included radiation shielding, radiation physics, medical physics, and high energy physics. Significant developments have taken place in computational and data issues, resulting in state-of-the-art computer codes and tools. Monte Carlo 2005 is the next in a series devoted to the topic, following Monte Carlo 2000 which was held in Lisbon, Portugal, in October 2000.

Conference topics will include: Methods Advancements (Physics) (proton transport, neutron transport, gamma transport, electron transport, heavy ion transport); Nuclear Data Advancements (proton transport, neutron transport, gamma transport, electron transport, heavy ion transport); Mathematical and Computational Advances (experiments & benchmarks, mathematical advances, computational advances, visualization); Applications (reactor, medical, accelerator, neutron science, dosimetry, shielding, fuel cycle, waste management, space & aviation, fusion, criticality safety, non-nuclear applications).

The website is **http://MonteCarlo2005.org**. Full papers are due September 10, 2004. For information contact Bernadette Kirk (**kirkbl@ornl.gov**, 865-574-6176), General Chair, or Jeff Johnson (**johnsonjo@ornl.gov**, 865-574-5262), Technical Chair.

### Twelfth International Symposium on Reactor Dosimetry

The Twelfth International Symposium on Reactor Dosimetry will be held **May 8-13, 2005,** in Gatlinburg, Tennessee.

This Symposium is held approximately every three years to provide a forum for the interchange of state-of-the-art techniques, data bases and standardization of radiation metrology. The Symposium will be of value to those involved in reactor dosimetry, including researchers, manufacturers and representatives from industry, utilities and regulatory agencies.

This Symposium is jointly sponsored by ASTM International, the European Working Group on Reactor Dosimetry (EWGRD), and the Atomic Energy Society of Japan (AESJ). It is organized by ASTM Committee E10 on Nuclear Technology and Applications and EWGRD.

The Symposium will be organized into oral and poster presentations, informal round-table workshops and tutorials. The meeting language will be English. No translations will be provided.

All papers presented at the Symposium will be subject to peer-review before acceptance for publication in the on-line Journal of ASTM International. Registrants will receive a complimentary CD of the papers presented at the Symposium. For more information visit the website at: **http://reactordosimetry.com/**.

## CALENDAR

**May 2004**

*Current Topics in Monte Carlo Treatment Planning*, May 3-5, 2004, McGill University, Montreal, Canada. Contacts: Jan Seutjens and Frank Verhaegen (tel 514-934-8052, url **http://mctp.medphys.mcgill.ca**).

*MCNPX Intermediate Workshop*, May 3-7, 2004, Lisbon, Portugal Contact: Bill Hamilton (tel 505-455-0312, email **registrar@mcnpxworkshops.com**, url **http://mcnpxworkshops.com** for details).

*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**).

*5th Intl. Conference on Nuclear Option in Countries with Small and Medium Electricity Grids*, May 16-20, 2004., Dubrovnik, Croatia, Contact Prof. Nenad Debrecin (tel +385-1-6312-399, email **hnd2004@fer.hr**, url

**http://hnd.zvne.fer.hr/Dubrovnik2004**).

*Seminar on Uncertainty and 3D Coupled Calculations (3D SUNCOP 2004)*, **May 24-27, 2004**, University of Pennsylvania, University Park, PA. (**pdf brochure**) Contact: Alessandro, Petruzzi (tel 814-863-3926, fax 814-865-8499, email **axp46@psu.edu**).

**June 2004**

*Practical MCNP for the HP, Medical Physicist, and Rad Engineer*, June 7-11, 2004, Univ. of New Mexico, Los Alamos Campus. Contact: David Seagraves, (tel 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**, url **http://drambuie.lanl.gov/~esh4/mcnp.htm**).

*MCNPX Introductory Workshop*, June 7-11, 2004, Santa Fe, NM. Contact: Bill Hamilton (tel 505-455-0312, email **registrar@mcnpxworkshops.com**, url **http://mcnpxworkshops.com** for details).

*DOORS Particle Transport Coder Package Workshop*, June 7-11, 2004, State College, PA. Contact: Yousry Azmy (tel 814-865-0039, email **yya3@psu.edu**, url **http://www.engr.psu.edu/cde/doorsworkshop**).

**July 2004**

*MCNPX Intermediate Workshop*, July (TBA), 2004, Houston, TX. Contact: Bill Hamilton (tel 505-455-0312, email

**registrar@mcnpxworkshops.com**, url **http://mcnpxworkshops.com** for details).

**September 2004**

*1st International Symposium on Radionuclide Therapy and Radiopharmaceutical Dosimetry*, Sept. 4-8, 2004, Helsinki, Finland. Contact: Michael Lassmann or Val Lewington, (emails **lassmann@nuklearmedizin.uni-wuerzburg.de**; **vjlewington@ hotmail.com**).

*16th American Nuclear Society Topical Meeting on the Technology of Fusion Energy*, Sept. 14-16, 2004, Madison, WI. (url **http://fti.neep.wisc.edu/tofe**).

*International Conference on Nuclear Data for Science and Technology "ND2004"*, Sept. 26-Oct. 1, 2004, Santa Fe, NM. (Contact: **http://t16web.lanl.gov/nd2004/**).

*5th International Conference of Yugoslav Nuclear Society (YUNS) - 2004*, Sept. 27-30, 2004, Belgrade, Serbia & Montenegro. Contact: Dr. Milan Pesic, (tel 381-11-245-82-22/ext. 681, email **mpesic@vin.bg.ac.yu**, url **http://www.vin.bg.ac.yu/YUNS/index.htm**).

**October 2004**

*11th World Congress on Neutron Capture Therapy (ISNCT-11)*, Oct. 11-15, 2004, Boston, MA. Contact: Robert G. Zamenhof (tel 617-636-1681, fax 617-636-5867, email **rzamenhof@tufts-nemc.org**, url **http://meetingsandconferences.com/ISNCT-11/**).

**April 2005**

*Monte Carlo 2005 Topical Meeting*, Apr. 17-21, 2005, Chattanooga, TN. Contact: Bernadette Kirk (tel 865-574-6176, fax 865-241-4046, email **kirkbl@ornl.gov**, url **http://meetingsandconference.com /MonteCarlo2005**).

# 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.

**Ann. of Nucl. Energy, 31, 961-974**. . . *RELAP5/MOD3.2 Investigation of Primary-To-Secondary Reactor Coolant Leakage in VVER440*.. . .Groudev, P.P. et al.. . . June 2004. . . Bulgarian Academy of Sciences, Sofia, Bulgaria.

**Ann. of Nucl. Energy, 31, 975-990**. . . *Measurements of Activation Cross Sections of (n,p) and (n,a) Reactions with d-D Neutrons in the Energy Range of 2.1-3.1 MeV*.. . .Shimizu, T. et al.. . . June 2004. . . Nagoya University, Japan; JAERI, Ibaraki-ken, Japan.

**Ann. of Nucl. Energy, 31, 991-1003**. . . *Criticality of Reflected Spheres by PN*.. . .Sahni, D.C. et al.. . . June 2004. . . VES Inst. of Technology, Mumbai, India; Chalmers University of Technology, Sweden.

**Ann. of Nucl. Energy, 31, 1005-1025**. . . *Monte Carlo Importance Sampling Optimization for System Reliability Applications*.. . .Campioni, L. et al. . . . June 2004. . . Universita di Bologna, Italy.

**Ann. of Nucl. Energy, 31, 1027-1037**. . . *Computational Efficiencies of Approximated Exponential Functions for Transport Calculations of the Characteristics Method*.. . .Yamamoto, A. et al. . . . June 2004. . . Nagoya University, Nagoya, Japan.

**Ann. of Nucl. Energy, 31, 1039-1051**. . . *Efficient Numerical Solution of the Point Kinetics Equations in Nuclear Reactor Dynamics*.. . .Kinard, M. et al.. . . June 2004. . . Texas Tech University, Lubbock, TX.

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**J. Nucl. Mater., 326, 75-79**. . . *Theoretical Study on the Alloying Behavior of y-Uranium Metal: y-Uranium Alloy with 3D Transition Metals*.. . .Kurihara, M. et al. . . . March 2004. . . Nikkaykyo, Co., Ibaraki, Japan; JAERI, Ibaraki, Japan; Shizuoka University, Japan; Tokyo Inst. of Technology, Japan; Kyoto University, Japan.

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