Radiation Safety Information Computational Center

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Toleration . . is the greatest gift of the mind; it requires that same effort of the brain that it takes to balance oneself on a bicycle.—Helen Keller

CHANGES TO THE RSICC CODE AND DATA COLLECTION

CCC-767/SWORD 4.0
U.S. Naval Research Laboratory, Washington, DC, through the Department of Homeland Security, Washington, DC, has released an update to SWORD 4.0. SoftWare for Optimization of Radiation Detectors (SWORD) is a framework to allow easy simulation and evaluation of radiation detection systems. It is targeted at system designers, who want to evaluate and optimize system parameters without actually building hardware first, at sponsors who need to evaluate proposed or actual system designs independent of the supplier, without having access to actual hardware, and at operators who want to use simulation to evaluate observed phenomena.

SWORD is vertically integrated and modular. It allows users to define their own radiation detection

instruments by building them from basic geometric "objects" and assigning those objects materials, detection, and/or radioactive emission properties. This process is accomplished by a CAD-like graphical user interface, in which objects may be defined, translated, rotated, grouped, arrayed, and/or nested to produce compound objects. In addition to providing the ability to build a detection system model from scratch, SWORD provides a library of "standard" detector design objects that can be used "as is" or modified by the user.

Changes in this SWORD 4.0 update include:

- Disk partition on virtual disk is now 60 GB (occupies entire disk); user has a little more than 40 GB available space (before MCNPX install)
- Bugs fixed in this version:
  1. copying a scaleable norm source was not copying over the multiplicative weight from the area correctly; and
  2. copying a beam source was not copying over the face from which to shoot properly in some circumstances (i.e., if you selected the copy in the source panel, the face was resetting)

SWORD gives the user the option of running a simulation using one of two well-known simulation engines: GEANT 4 from CERN and MCNPX from Los Alamos National Laboratory. Installation instructions are included in the documentation. Note: GEANT4 V8.1 is included with this distribution. MCNPX is distributed in the B004MNYCP02 package available from RISCC. Users should be aware that current versions of the MCNPX precompiled executables will not work with this version of SWORD.

SWORD 4.0 runs on any Intel-based Windows, Linux or Mac OSX platform with at least 3 GB of RAM and 30 GB of free disk space. Current distribution is available as a VMware virtual appliance only at http://www.vmware.com/. It can run under a free VMware server or player (player recommended) on a Windows or Linux host or under VMware Fusion (purchase only) on an Intel-based Mac OSX host. SWORD 4.0 was tested at RSICC using Windows and Linux platforms. The package is distributed as a zip file (created with WinZip 11 on Windows XP) which contains the virtual appliance and installation and tutorial guides. C++, Java, Python; Linux (C00767MNYCP04).

DLC-253/ CRYO-S(A,B)-ACE1

Universitaet Stuttgart, Institut fuer Kernenergetik und Energiesysteme, Stuttgart, Germany, contributed this new library through the NEADB Data Bank. The datasets are provided in the standard ENDF-6 format and in the ACE format and used for continuous energy Monte Carlo applications. Cross section libraries can also be produced for deterministic approaches through the use of the NJOY computer code. Processing of the S(alpha,beta) data to energy dependent differential and integral cross sections as well as data sets for neutron transport calculations has been carried out e.g. MCNPX. This was done with the following sequence of modules from NJOY-99.161: RECONR - BROADR - THERMR - ACER. ACE format files were generated for use with the Monte Carlo codes MCNP-4, MCNP-5 and MCNPX-2.6. These processed data were used for validation of calculated neutron cross sections with experimental data.

Data libraries in ENDF and ACE format, XDIR files and the referenced documents are transmitted on DVD. Uncompressed files are about 340 MB. Unix workstation, PC, Mac (D00253MNYCP00).

DLC-252/ TENDL-2011-ACE

NRG - Nuclear Research and Consultancy Group, Petten, The Netherlands, contributed this new library for use with MCNPX. The TENDL-2010 library (TALYS-based Evaluated Nuclear Data Library), developed at NRG, was processed to the ACE format for use with Monte Carlo codes. It consists of a set of 348 neutron data files for isotopes from F-19 to Po-209, stable and long-lived nuclides, completely and

consistently evaluated using the TALYS-1.2 nuclear reaction code package (distributed by RSICC as TALYS 1.2/PSR-548). For all isotopes and incident particles, the same methodology is applied to obtain cross sections, angular distributions, double differential data, gamma production data, isomeric production cross sections covariance information. The result is a nuclear data library with mutually consistent reaction and covariance information for all isotopes. ACE files are provided for neutrons, protons, deuterons, tritons, helions and alpha particles. The data libraries and documentation are transmitted on DVDs in WinZIP files which includes data libraries and xsdir files. ASCII card images; Unix workstation, PC, or Mac (D00252MNYCP00).

PSR-532/CEM03.03

Los Alamos National Laboratory, Los Alamos, New Mexico, contributed this new version of the Monte-Carlo code system to calculate nuclear reactions in the framework of the improved cascade-exciton model. The Fortran 77 code CEM03.03 is an extended and improved version of the earlier codes CEM03.01 and CEM2k+GEM2. CEM03.03 calculates total reaction and fission cross-sections, nuclear fissilities, excitation functions, nuclide distributions (yields) of all produced isotopes separately as well as their A- and Z-distributions, energy and angular spectra, double-differential cross-sections, mean multiplicities, i.e. the number of ejectiles per inelastic interaction of the projectile with the target, ejectile yields and their mean energies for n, p, d, t, ^{3}He, ^{4}He, π^{+}, π^{-}, and π^{0}. In addition, CEM03.03 provides in its output separately the yields of Forward (F) and Backward (B) produced isotopes, their mean kinetic energies, A and Z-distributions of the mean emission angle, their parallel velocities, and the F/B ratio of all products in the laboratory system, distributions of the mean angle between two fission fragments, of neutron multiplicity, of the excitation energy, of momentum and angular momentum, and of mass and charge numbers of residual nuclei after the INC and preequilibrium stages of reactions, as well as for fissioning nuclei before and after fission. CEM03.03 calculates reactions induced by nucleons, pions, bremsstrahlung and monochromatic photons on not too light targets at incident energies from ~10 MeV (~30 MeV, in the case of γ +A) up to several GeV. The User's Manual describes the basic assumptions of the improved CEM as realized in the code CEM03.03, essential technical details of the code such as the description of the input and output files, and provides the user with necessary information for practical use of and for possible modification of the CEM03.03 output, if required.

A Fortran 77 compatible compiler is required. The package is transmitted on a DVD which includes a user's manual and a GNU compressed tar file which contains the CEM03.03 Fortran source files, data files, and test case input and output. Reference: LA-UR-12-01364 (2012). Fortran 77; Sun and PC (P00532MNYCP01).

AMERICAN NUCLEAR SOCIETY NEWS

Nuclear Technology Journal Foreword by Daniel T. Ingersoll

Former ORNL staff member, Daniel T. Ingersoll, who is currently the Director of Research at NuScale Power, is the guest editor of this month's ANS *Nuclear Technology Journal's* special issue on small modular reactors. In the Foreword, Dan provides the reader his expert perspective on the evolution of small modular reactors and the factors attributing to the downsize.

The Foreword also gives a brief overview of the eight technical papers on small modular reactors that follow:

- Pioneering Role of IRIS in the Resurgence of Small Modular Reactors
  Bojan Petrovic, Marco Ricotti, Stefano Monti, Nikola Cavlina, Hisashi Ninokata

- NuScale Plant Safety in Response to Extreme Events
  José N. Reyes, Jr.
- The B&W mPower™ Scalable, Practical Nuclear Reactor Design
  Jeff A. Halfinger, Michael D. Haggerty
- Steam Cycle Modular Helium Reactor
  Arkal Shenoy, John Saurwein, Malcolm Labar, Hankwon Choi, John Cosmopoulos
- PRISM: A Competitive Small Modular Sodium-Cooled Reactor
  Brian S. Triplett, Eric P. Loewen, Brett J. Dooies
- Design of the 4S Reactor
  Yasushi Tsuboi, Kazuo Arie, Nobuyuki Ueda, Tony Grenci, A. M. Yacout
- Financial Case Studies on Small- and Medium-Size Modular Reactors
  Sara Boarin, Giogio Locatelli, Mauo Mancini, Marco E. Ricotti
- A Perspective on Small Reactor Licensing and Implementation
  Nicholas G. Trikouros

The entire Foreword and abstracts of the technical papers are available on the ANS website at http://www.new.ans.org/pubs/journals/nt/v_178:2.

ORNL's Mark Williams Elected to ANS Fellow

The ANS Board of Directors has elected Mark Williams to an ANS Fellow for "his extensive work in sensitivity/uncertainty methods, development of 'contributon' transport theory, development of new techniques for lattice physics and resonance self-shielding computations, and contributions to reactor pressure vessel fluence analysis."

Dr. Williams is a Distinguished R&D Staff Member in the Reactors Physics Group of the Reactor and Nuclear Systems Division at ORNL.

Mark will be presented with the ANS Fellow distinction at the 2012 ANS Annual Meeting on June 24-28, 2012, in Chicago.

OBITUARY

Ann B. Gustin of Oak Ridge, Tennessee passed away on April 8, 2012, at the age of 88. Ann retired from Oak Ridge National Laboratory on July 31, 1989, after a 25 year career. While at ORNL, Ms. Gustin held various positions and her most recent as a Sr. Information Assistant in the Radiation Safety Information Computational Center.

SCIENCE EDUCATION PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

Looking for an internship or post graduate opportunity at Oak Ridge National Laboratory? The Science Education Programs at Oak Ridge National Laboratory provide paid opportunities for undergraduates, grad students, recent graduates, and faculty to participate in high-quality research alongside world-class scientists to solve real-world problems. Opportunities are available for internships and co-ops, research appointments, and sabbaticals.

You can access all available opportunities through the website at http://www.orau.org/ornl. The Talent and Opportunity System allows you to create a profile, and then answer only 5 or 6 questions for each program or job posting for which you apply.

All levels of participants from undergraduates to faculty are encouraged to publish research papers with their mentors. Please browse through the Research Profiles on the different participants and their research experiences at the right hand side of the bottom of the web site listed above. Also, there is a video of research participants at ORNL sharing their thoughts on how access to world-class research facilities and staff have catapulted their careers in science and technology. You can find it on YouTube at http://ow.ly/2EQLz.

CONFERENCES, COURSES, SYMPOSIA

RSICC attempts to keep its users and 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 bennas@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.

TRAINING

MCNPX and Visual Editor Training

Classes are taught using the most recent (beta) version of the Visual Editor Code. All class attendees must have a valid MCNP/MCNPX RSICC license. Bring proof of receipt (letter or email) to the class.

2012 Classes for Visual Editor		
June 18-22	Intermediate MCNPX Visual Editor with a special emphasis on tallies and variance reduction	Newcastle, UK
July 16-20	Introduction to MCNP/MCNPX using the MCNPX Visual Editor	Livermore, CA
July 23-27	Introduction to MCNP/MCNPX using the MCNPX Visual Editor	Anaheim, CA
July 30-August 3	Intermediate MCNPX Visual Editor with a special emphasis on tallies and variance reduction	Anaheim, CA
August 6-10	Intermediate MCNPX Visual Editor with a special emphasis on tallies and variance reduction	Livermore, CA

2012 Classes for Visual Editor		
September 10-14	Introduction to MCNP/MCNPX using the MCNPX Visual Editor	Myrtle Beach, SC
September 17-21	Intermediate MCNPX Visual Editor with a special emphasis on tallies and variance reduction	Myrtle Beach, SC
October 15-19	Introduction to MCNP/MCNPX using the MCNPX Visual Editor	Paris, France
November 5-9	Introduction to MCNP/MCNPX using the MCNPX Visual Editor	Las Vegas, NV
November 12-16	Intermediate MCNPX Visual Editor with a special emphasis on tallies and variance reduction	Las Vegas, NV

The introductory workshops combine teaching on MCNP basics and how to create MCNP input files using the Visual Editor. The intermediate Visual Editor workshops focus on more advanced topics such as tallies and variance reduction using the Visual Editor.

Exercises will focus on creating input files and visualizing output data with the Visual Editor. Attendees are encouraged to bring their own input files for viewing and modifying in the Visual Editor; this is particularly important for the intermediate workshop.

The course description and registration information can be found at http://www.mcnpvised.com/index.html.

MCNPX Classes 2012		
July 2-6	MCNP/MCNPX Intermediate Workshop	Barcelona, Spain
September 24-28	MCNP/MCNPX Intermediate Workshop	Washington, DC
October 22-26	MCNP/MCNPX Intermediate Workshop	Paris, France

The MCNPX team at Los Alamos National Laboratory offers interactive workshops for training users in the capabilities of MCNPX at the intermediate level.

The list of workshops is tentative, as workshops may be added, removed, or modified throughout the year, depending on user interests. Workshops with fewer than 12 registrants on the early registration date are subject to cancellation or rescheduling.

In order to process non-U.S. citizens by the class date, non-U.S. citizens must register at least 6 weeks prior to the start of the training class. All non-U.S. citizens who reside in countries listed in the U.S. Code of Federal Regulations, Title 10, Part 810.8, are required to register at least 8 weeks prior to the start of the training class. These participants must be processed by the DOE and should not make travel arrangements until approval from DOE has been obtained.

Additional information about the courses can be found at the website, http://mcnpx.lanl.gov/. To register send an email to Randy Schwarz at randyschwarz@mcnpvised.com, indicating the workshop of interest to you.

General Course on Monte Carlo N-Particle (MCNP) Transport Code
2012 – MCNP Class Schedule

Date	Course name and description	Location	Cost
June 4-8	**Introduction to MCNP6** Registration is open to all. Non-U.S. citizens must have been registered for this course by 3/3/12. Minimum of 8 students-Maximum of 15, Monday 12:30 p.m. - Friday 12:00 p.m.	Los Alamos, NM	$1,900 or $1,600*
October 29-November 2	**Introduction to MCNP6** Registration is open to all. Non-U.S. citizens must register by 8/31/12. Minimum of 8 students-Maximum of 15, Monday 12:30 p.m. - Friday 12:00 p.m.	Los Alamos, NM	$1,900 or $1,600*
December 3-7	**Variance Reduction with MCNP6** Registration is open to all. Non-U.S. citizens must register by 10/08/12. Minimum of 8 students-Maximum of 15, Monday 12:30 p.m. - Friday 12:00 p.m.	Los Alamos, NM	$1,900 or $1,600*
December 10-14	**Criticality Calculations with MCNP6** Registration is open to all. Non-U.S. citizens must register by 10/15/12. Minimum of 8 students-Maximum of 15, Monday 12:30 p.m. - Friday 12:00 p.m.	Los Alamos, NM	$1,900 or $1,600*
January 28-February 1, 2013	**Introduction to MCNP6** Registration is open to all. Non-U.S. citizens must register by 11/26/12. Minimum of 8 students-Maximum of 15, Monday 12:30 p.m. - Friday 12:00 p.m.	Los Alamos, NM	$1,900 or $1,600*

*Early payment discount: A discount of $300 per student is given when the registration payment is received in full at least 4 weeks prior to the start of class.

Introductory classes are for those 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), Advanced Geometry (repeated structures specifications), Variance Reduction Techniques, Statistical Analysis, Criticality, Plotting of Geometry and Tallies, and Neutron / Photon / Electron Physics.

Intermediate workshops cover the entire spectrum of MCNP/MCNPX, but proceeds at a much faster pace and is more in-depth than the introductory classes. These workshops are open to new users; the first

day of class is a review of basics. However, the intermediate workshops are targeted toward more experienced users and are more problem solving than lecture classes. Intermediate workshops feature flexible course content, skip topics of least interest to the participants, and provide significantly more depth than introductory classes.

Advanced classes- Variance Reduction and Criticality are for people with MCNP experience who want to extend their knowledge and gain depth of understanding. Most areas of MCNP operation will be discussed in detail, with emphasis on Advanced Geometry, Advanced Variance Reduction Techniques, and other advanced features of the program. Time will be available to discuss approaches to specific problems of interest to participants. Classes on specific topics are offered when there is sufficient interest.

Note: While MCNP supports a number of platforms, LANL class computers are Windows based.

More information about the MCNP courses at LANL is available on their website at https://laws.lanl.gov/vhosts/mcnp.lanl.gov/classes/classinformation.shtml.

Nuclear Reactor Simulation Hands-On Training

The Nuclear Research Group of San Piero a Grado of the University of Pisa, the Atomic Energy Research Institute, and the Innovative Systems Software are jointly organizing Nuclear Reactor Simulation Hands-On Training (NRSHOT) courses in Budapest, Hungary on June 25-29, 2012, at the Atomic Energy Research Institute.

The NRSHOT is directed toward beginner and intermediate users of System Thermal-Hydraulic Codes and 3D Neutron Kinetic Coupling.

Further details are available at: http://www.grnspg.ing.unipi.it/nrshot/.

Further information may be requested from Alessandro Petruzzi at the following email address: a.petruzzi@ing.unipi.it or may be obtained from the seminar's homepage at http://www.grnspg.ing.unipi.it/nrshot/.

Information on accommodations and travel to the meeting venue will be provided at a later date.

Course on Practical MCNP for the Health Physicist, Medical Physicist, and Radiological Engineer

Los Alamos National Laboratory will present a course on "Practical MCNP for the Health Physicist, Medical Physicist, and Radiological Engineer" on July 9-13, 2012, at the University of New Mexico, Los Alamos, NM, MESA Complex, Room 130. This 4.5 day course introduces the basic concepts of Monte Carlo, demonstrates how to put together a MCNP input file, and illustrates some health and medical

physics applications of the code. No prior knowledge of Monte Carlo is assumed. This course is ideally suited for professionals interested in performing radiation shielding and skyshine calculations, detector simulation studies, or dosimetry. For more information about this course, visit the website at http://www.lanl.gov/orgs/rp/mcnp.shtml.

MCNPX-PoliMi Training Workshop

The Detection for Nuclear Nonproliferation Group at the University of Michigan will present the MCNPX-PoliMi Training Workshop at the University's North Campus on July 25-26, 2012. The MCNPX-PoliMi code is an enhanced version of MCNPX v. 2.6.0 that provides unique capabilities for simulating correlated-particle measurements and detector response. This two-day workshop will introduce new users to the capabilities of the MCNP-PoliMi code and acquaint experienced users with new features.

- MCNPX-PoliMi source capabilities
- Detector-response calculations
- Simulations of time-of-flight and cross-correlations distributions
- Simulations of multiplicity distributions

Workshop attendees should have software licenses for both MCNPX and MCNP-PoliMi. There are two separate licenses that are available by registration and request at the Radiation Safety Information Computational Center (RSICC) at Oak Ridge National Laboratory. Requests for the required software licenses may be made at the RSICC website at www-rsicc.ornl.gov. It is recommended that requests for the software licenses be submitted as soon as possible as the licensing procedure can take upwards of several weeks to complete.

Registration available online at http://www-ners.engin.umich.edu/labs/dnng/polimi_workshop.html. Seating is limited; therefore, the registrations will be accepted on a first-come-first-serve-basis.

Professional Development Short Courses on Radiological Assessment, Nuclear Criticality Safety, and Monte Carlo Analysis

The Department of Nuclear Engineering at the University of Tennessee-Knoxville is offering short courses for radiation transport and criticality safety specialists during Tennessee Industries Week (TIW-47), August 13-17, 2012.

Radiological Assessment—This three-day course is based on selected topics from the University of Tennessee courses on Radiological Assessment, Internal Dosimetry, and Uncertainty Analysis, and is intended for personnel working in areas associated with radiological assessment or internal dosimetry. Individuals professionally established in a particular area would benefit from exposure to a number of important topics, and those who are new to this area of science would benefit from the integration of a variety of important and relevant topics.

Fundamentals of nuclear physics, health physics, and internal dosimetry will be presented for review and to establish a common framework for subsequent presentations. Information presented on radionuclide transport and pathways analysis will include basic theory and solutions to several tutorial examples. Descriptions of several computer programs used for internal dosimetry and for radiological assessment will be presented, and details from several studies will be used as examples.

Information on external dosimetry generally follows material in the cited text. Material presented on internal dosimetry will go beyond the reference text and will involve computational methods as well as practical examples. Methods for analyzing bioassay program data will be carefully reviewed and case studies will be discussed.

Nuclear Criticality Safety—Engineers, scientists, and technical managers who wish to increase their knowledge and understanding of nuclear criticality safety will be interested in this intensive one-week short course. 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.

The course topics include illustrative applications using the SCALE system developed at Oak Ridge National Laboratory with emphasis on the Monte Carlo code KENO, standards, regulations, review of accidents, hand calculation methods, subcritical limits, code validation techniques, accident response planning and management, and transient excursion modeling.

Monte Carlo Analysis—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 five days and has the following objectives:

1. To familiarize the student with the basic concepts of the Monte Carlo method in a general (non-transport) context to add to the ability of the student to apply the Monte Carlo method to a variety of problems in mathematics, physics, and engineering.
2. To familiarize the student with the particular mathematical techniques and probability distributions that are used in analog Monte Carlo solutions of neutral-particle radiation transport problems. This is reinforced through an in-class exercise that develops an analog Monte Carlo code solution to a simple slab transport problem.
3. To familiarize the student with the mathematical basis for variance reduction techniques: non-analog mathematical methods that increase the efficiency of the calculation without biasing the solution. This is reinforced with a continuation of the in-class exercise to incorporate variance reduction techniques.
4. To apply the lessons learned to the most commonly used Monte Carlo code, MCNP. In a series of hands-on exercises with the PC version of MCNP, the novice user will learn to set up simple problems, and all levels of users will gain experience in using the variance reduction techniques offered by the MCNP code.

Special attention will be given to the understanding of the use of adjoint calculations in transport analyses, both as an alternate means of obtaining system responses and as importance functions for accelerating Monte Carlo forward solutions. Advantages and disadvantages of the adjoint mode versus the forward mode of analysis will be described. In addition, the relationship of Monte Carlo methods to deterministic methods will be described, including strategies involving the hybrid use of both methods to more efficiently solve certain transport problems.

Case Studies in Neutron Transport Theory—The study of the neutron transport equation is a delicate blend of theoretical mathematics, numerical methods and computational strategies describing the interaction of neutrons and nuclei. Not only do we gain physical insight from the solution to the transport equation, but we also create new mathematics and numerical methods for the solution of equations. This

short course is offered to those individuals who want to experience the elegance of analytical transport theory and how this theory can impact the development of transport methods for application.

This course will concentrate on transforming theoretical solution representations of the neutron transport equation into numerically useable forms. The course will study reactor physics from neutron slowing down to multidimensional multigroup theory and criticality. Though the backdrop is reactor physics, our emphasis will be on analytical manipulations of the transport equation and the numerical realization of its solutions.

The deadline for registration is **July 23, 2012**. 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-47, 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.

CONFERENCES

2012 Consortium for Advanced Simulation of Light Water Reactors (CASL) Round Table Meeting

The 2012 CASL Round Table meeting will be held on June 12-14, 2012, in Ann Arbor, Michigan on the campus of the University of Michigan. The theme of this year's meeting is Multiphysics and Multiscale Modeling. This meeting will bring together CASL, university, industry, and national laboratory partners on a continuing debate on how best to solve ongoing nuclear industry problems, using state-of-the-art techniques in modeling and simulation.

For more information about this meeting, go to their website at http://www.casl.gov/round_table/index.shtml.

The Energy and Materials Research Conference - EMR2012

The EMR2012 conference will be held at the Torremolinos Congress Center in Torremolinos (Malaga), Spain, on June 20-22, 2012. The EMR2012 will bring together researchers and professionals from a broad set of science and engineering disciplines with the aim of sharing the latest developments and advances in materials, processes and systems involved in energy generation, transmission-distribution, and storage. More information about this conference is available at http://www.formatex.org/emr2012/index.html.

The International Youth Nuclear Congress 2012

The International Youth Nuclear Congress (IYNC) and the North American Young Generation in Nuclear (NA-YGN) invite you to attend the 7th IYNC in Charlotte, NC, August 5-11, 2012. The primary purpose of the Congress is to transfer knowledge from the current generation of leading scientists and engineers to the next generation. Scientific, political, public and corporate views regarding the development of different nuclear issues will be presented to provide comprehensive discussions on all sides of the subject. More information about this conference is available at http://www.iync.org/.

ICRS-12 and RPSD-2012

The 12th International Conference on Radiation Shielding (ICRS-12) and the 17th Topical Meeting of the Radiation Protection and Shielding Division of the American Nuclear Society (RPSD-2012) will be held in Nara, Japan, September 2-7, 2012. The first ICRS conference was held in 1958 at Cambridge, United Kingdom. Since then, ICRS has been held in Europe, Japan, and the United States. The ICRS series occurs every four or five years.

This conference, organized by the Atomic Energy Society of Japan, will explore the scientific, technological and engineering issues associated with particle and ionizing radiation shielding in its broadest context, including nuclear energy systems, accelerator facilities, space and other radiation environments. It is one of the premier international radiation shielding events, regularly drawing hundreds of the world's top scientists and engineers.

The conference will open with a special session summarizing the facts and circumstances surrounding the Fukushima accident and consequent environmental assessment and recovery. The special session will complement the conference topics.

Check the website http://www.icrs12.org or contact ICRS-12 & RPSD-2012 Local Organizing Committee secretariat (office@icrs12.org) for further information.

ICFO-SI9

The 9th International Conference on Facility Operations- Safeguards Interface (ICFO-SI9) will be held on September 23-28, 2012, in Savannah, Georgia. The topical conference program committee invites individuals with professional interest in safeguards technology and nuclear material facility operations to participate. The Conference is sponsored by the American Nuclear Society Isotopes and Radiation Division, Oak Ridge/Knoxville Local Section and is cosponsored by the Institute of Nuclear Materials Management, Central Region Chapter, Southeast Chapter.

The purpose of the conference is to foster a better understanding of the relationships of operations in nuclear facilities and the application of safeguards under national and international regimes. This ninth conference in the series will provide an international forum for exchanging ideas and experiences, as well as describing progress in the areas of safeguards implementation. The conference will be timely considering the current activities to strengthen the international safeguards regime. The four and a half

day conference will be held in nine half-day sessions at which policy, technical, and scientific aspects of safeguards implementation will be discussed.

Papers are encouraged in the following areas:

- Integrated design of facility safeguards systems,
- Nuclear material accountancy,
- Materials control and accountability activities,
- Measurement and instrument techniques,
- Transparency and confidence-building measures,
- Research and development in general safeguards technology,
- Extension of safeguards in light of the threat of radiological dispersal devices,
- Preparation for and implementation of the IAEA Additional Protocol,
- Safeguards by design,
- The impact of "fully information driven safeguards" on traditional safeguards,
- Advances in process monitoring, unattended measurements/monitoring, remote measurements/monitoring, and
- Application of safeguards earlier in the front end of the fuel cycle, mining and conversion.

Conference information is posted at the website at http://ICFO-9.org.

2012 CALENDAR

June

EMR2012, June 20-22, 2012, Torremolinos (Malaga), Spain. Follow the website for up-to-date information at http://www.formatex.org/emr2012/index.html

2012 ANS Annual Meeting, June 24-28, 2012, Chicago, IL, USA. Follow the website for up-to-date information, http://www.new.ans.org/meetings/c_1

- ICAPP '12, June 24-28, 2012, Chicago, IL. Contact: Lynne Schreiber, Administrator (email icapp@ans.org) url http://www.icapp.ans.org/icapp12/
- NFSM 2012 "Nuclear Fuels and Structural Materials for the Next Generation Nuclear Reactors," June 24-28, 2012, Chicago, IL. Follow the website for up-to-date information, http://www.new.ans.org/meetings/c_1
- Decommissioning, Decontamination and Reutilization and Technology Expo, June 24-28, 2012, Chicago, IL. Contact: Sue Aggarwal, Technical Program Chair (phone 303-984-5788, email saggarwal@nmnuclear.com) url http://ddrd.ans.org

July

Practical MCNP for the Health Physicist, Medical Physicist, and Radiological Engineer, July 9-13, 2012, University of New Mexico, Los Alamos, NM. For up-to-date information, visit their website at http://www.lanl.gov/orgs/rp/mcnp.shtml

MCNPX-PoliMi Training Workshop, July 25-26, 2012, Ann Arbor, MI, USA. Follow the website for up-to-date information, http://www-ners.engin.umich.edu/labs/dnng/polimi_workshop.html

August

IYNC2012, August 5-11, 2012, Charlotte, NC, USA. For up-to-date information, visit their website at http://www.iync.org/

September

Workshop on Computational Medical Physics, September 2, 2012, Nara Prefectural New Public Hall, Nara, Japan. The meeting agenda is available at http://www.icrs12.org/img/Workshop-CMP-announcement.pdf

ICRS-12 (12th International Conference on Radiation Shielding) and RPSD-2012 (17th Topical Meeting of the Radiation Protection and Shielding Division of the American Nuclear Society), Sept. 2-7, 2012, Nara, Japan. Contact: ICRS-12 & RPSD-2012 Local Organizing Committee secretariat (office@icrs12.org) url http://www.icrs12.org/

November

2012 ANS Winter Meeting and Nuclear Technology Expo, Nov. 11-15, 2012, San Diego, CA, USA

Embedded Topical Meetings:

- Advances in Thermal Hydraulics (ATH'12)
- International Meeting on Severe Accident Assessment and Management: Lessons Learned from Fukushima Dai-ichi

For up-to-date information, visit their website at http://www.new.ans.org/meetings/c_1.