Radiation Safety Information Computational Center

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"Change is inevitable. Growth is optional."

~John C. Maxwell

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CHANGES TO THE RSICC CODE AND DATA COLLECTION

There were two updates to the RSICC catalog for those individuals that may be interested.

PSR-610/GADRAS-DRF

The Gamma Detector Response and Analysis Software–Detector Response Function (GADRAS-DRF) was contributed by Sandia National Laboratories, Albuquerque, NM and Livermore, California. GADRAS-DRF contains a suite of capabilities related to radiation detection. Its primary function is the simulation of gamma-ray and neutron detector signals to radiation sources. It also contains limited analysis functionality. GADRAS-DRF is the public version of the full version of GADRAS with capabilities such as radiation transport and advanced analyses removed. Features in a gamma-ray detector spectrum; such as photopeaks and the Compton continuum are derived from first-principles calculations based on interaction cross sections. Neutron detector response is computed by interpolating on a pre-computed database of thermal (^{3}He) detector responses. For both gamma-ray and neutron detectors, the response to radiation that scatters into the detector from the surrounding environment is determined by a combination of first-principles calculations and empirical modeling. For new detectors, known detector parameters such as size and resolution are all that is necessary to compute an initial response function. This response function may be refined by measuring calibration sources and fitting the detector's parameters to match the data.

The package contains setup executable, user manual, source, and data files and is transmitted on one CD. FORTRAN, Windows (P00610PCX8600).

PSR-611/ART MOD2

ART MOD2 was contributed by Japan Atomic Energy Research Institute, Severe Accident Research Laboratory, Department of Reactor Safety Research, Tokai-mura, Naka-gun, Ibaraki-ken, Japan through the OECD Nuclear Energy Agency Data Bank, Issy-les-Moulineaux, France.

ART MOD2 aims at a comprehensive analysis for the FP behaviour in primary system and in containment during severe accidents and therefore the code considers the removal of radio-nuclides of up to 60 materials including chemical compounds by natural deposition and by the engineered safety features (ESF) such as spray systems. As for the natural deposition of radio-nuclides, the code can consider the phenomena such as gravitational settling, thermophoresis, diffusiophoresis, Brownian diffusion, diffusion under laminar or turbulent flows, resuspension, condensation, chemisorption and revaporization. The code also models the aerosol growth by agglomeration of aerosols and condensation/ evaporation of volatile material at the aerosol surface. Recently, the models for iodine chemistry in containment sump water was incorporated into ART MOD2

ART MOD2 was modified in January 2015 to correct coding errors and improve the variation of the calculation result of water (H2O) vapor.

This package contains executable for Sun Sparc systems, source, sample input, sample output and reference material transmitted on one CD (P00611PCX8600).

SINGLE-USER LICENSE AGREEMENT
REVISED

The single-user license agreement has been revised to address concerns regarding changes in end-use and employment changes of individuals that have received packages from RSICC. In some instances individuals only obtain approvals from our Federal regulators for use of software packages for very specific purposes or while employed or associated with specific organizations. To address this concern, the single-user license agreement has been modified to indicate that the license is only valid for the end-use as stated in the Licensee's request and only while associated with the organization under which the request is being made. After February 1, 2015, the individual's single-user license would no longer be valid if they change their end-use or are no longer associated with the organization for which they obtained the original license. In these cases, the individual would need to submit a new request to RSICC for the package for the new end-use or the new affiliation.

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 has catapulted their careers in science and technology. You can find it on YouTube at http://ow.ly/2EQLz.

CONFERENCES, TRAINING COURSES,
SYMPOSIA

RSICC attempts to keep its customers 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 walkersy@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. Please provide a website address for the event if one is available.

Every attempt is made to ensure that the links provided in the Conference and Calendar sections of this newsletter are correct; however, if the links become unavailable, please call the point of contact for the event.

CONFERENCES

The 17th International Conference on Emerging Nuclear Energy Systems (ICENES2015)

This conference will consist of an informative and comprehensive scientific program, featuring oral and poster presentations and a commercial exhibition. This will provide a unique opportunity to become familiar with the most recent advancements in innovative nuclear energy systems, as well as looking at "bold" and "unthinkable" ideas on a sound scientific-technical basis. The forum will also be open to intellectual debate leading to practical applications around innovative non-nuclear technologies, such as hydrogen energy, solar energy, deep space exploration and others. This conference will take place **May 10-14, 2015** inclusive, in Antalya, Turkey.

For up-to-date information about this conference, visit their website at http://www.icenes2015.org.

International Workshop on Operational and Regulatory Aspects of Criticality Safety

The OECD Nuclear Energy Agency (NEA) Committee on the Safety of Nuclear Installations (CSNI) Working Group on Fuel Cycle Safety (WGFCS) will hold an international workshop on Operational and Regulatory Aspects of Criticality Safety (ORACS). The workshop will be hosted jointly by the United States Nuclear Regulatory Commission and the United States Department of Energy **May 19-21, 2015** in Albuquerque, New Mexico, United States. The workshop is planned for three days. This announcement includes the information on this event and the call for papers to be submitted for presentation at the workshop.

For up-to-date information about this workshop, visit their website at:

www.oecd-nea.org/nsd/calendar.html.

Society of Nuclear Medicine and Molecular Imaging Annual Meeting

The SNMMI Annual Meeting will be held in Baltimore, Maryland, USA, **June 6-10, 2015**. Please visit their website for more details.
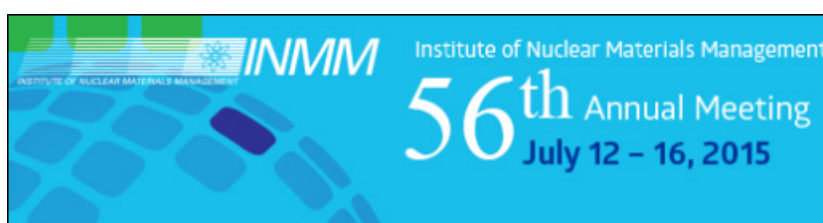
INMM 56th Annual Meeting

The INMM 56th Annual Meeting will be held **July 12-16, 2015** at the Esmeralda Renaissance in Indian Wells, California, USA. Please visit their website for more information: www.inmm.org.

HPS 60th Annual Meeting

60th Annual Meeting of the Health Physics Society will be held **July 12-16, 2015**, in Indianapolis, Indiana. Please visit their official website for more details, http://www.hpschapters.org/2015AM/.

2015 IEEE Nuclear and Space Radiation Effects Conference

The 2015 IEEE Nuclear and Space Radiation Effects Conference will be held **July 13-17, 2015,** at the Marriott Copley Place, Boston, Massachusetts. The conference features a technical program consisting of eight to ten technical sessions of contributed papers describing the latest observations in radiation effects, a Short Course on radiation effects offered on July 13, a Radiation Effects Data Workshop, and an Industrial Exhibit. The technical program includes oral and poster sessions. Please visit their website for more information http://www.nsrec.com/.

ICNC 2015

The Nuclear Criticality Safety Division of the American Nuclear Society (ANS) will host the International Conference on Nuclear Criticality (ICNC): 35 Years of International Cooperation. The international conference is co-sponsored by the NEA and will be held at the Omni Hotel in Charlotte, North Carolina from **September 13-17, 2015**.

For up-to-date information about this conference, visit their website at
http://ncsd.ans.org/site/icnc2015.htm.

2015 ANS Winter Meeting and Nuclear Technology Expo

This meeting will be held **November 8-12, 2015**, in Washington, DC at the Marriott Wardman Park. Please visit the ANS website for more information at www.ans.org.

TRAINING COURSES

LANL MCNP6 Class Schedule

Date	Course Name and Description	Cost
Apr 27 - May 1, 2015 Los Alamos, NM	Introduction to MCNP6 Non-US citizens must register by 2015-02-20 | Mon 10:30 - Fri 12:00	$1800 or $1500*
June 1-5, 2015 Los Alamos, NM	Introduction to MCNP6 Non-US citizens must register by 2015-03-27 | Mon 10:30 - Fri 12:00	$1800 or $1500*
July 27-29, 2015 Los Alamos, NM	Unstructured Mesh with Attila4MC Non-US citizens must register by 2015-05-22 | Mon 12:30 - Wed 4:30	$1000 or $800*
Aug 3-7, 2015 Los Alamos, NM	Introduction to MCNP6 Non-US citizens must register by 2015-05-29 | Mon 10:30 - Fri 12:00	$1800 or $1500*
Aug 10-14, 2015 Los Alamos, NM	Criticality Calculations with MCNP6 Non-US citizens must register by 2015-06-05 | Mon 10:30 - Fri 12:00	$1800 or $1500*
Aug 17-21, 2015 Los Alamos, NM	Variance Reduction with MCNP6 Non-US citizens must register by 2015-06-12 | Mon 10:30 - Fri 12:00	$1800 or $1500*
Oct 19-23, 2015 Los Alamos, NM	Introduction to MCNP6 Non-US citizens must register by 2015-08-14 | Mon 10:30 - Fri 12:00	$1800 or $1500*
Oct 26-28, 2015 Los Alamos, NM	Unstructured Mesh with Attila4MC Non-US citizens must register by 2015-08-21 | Mon 12:30 - Wed 4:30	$1000 or $800*

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

* Classes may be cancelled or postponed if fewer than 8 students register.
* Maximum of 15 students per 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 specification), 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 proceed at a much faster pace and are more in-depth than 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 & 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 usually 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.

MCNP6 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.

Visual Editor Classes 2015		
May 11-15, 2015	Visual MCNP6 for Shielding Calculations (Class size limited to 6)	Barcelona, Spain
May 18-22, 2015	Visual MCNP6 for Criticality Calculations (Class size limited to 6)	Barcelona, Spain
May 25-29, 2015	Visual MCNP6 for Medical Physics (Class size limited to 6)	Barcelona, Spain
June 15-19, 2015	Beginning Visual MCNP6	Prague, Czech Republic
June 29-July 3, 2015	Intermediate Visual MCNP6	Barcelona, Spain
July 13-17, 2015	Beginning Visual MCNP6	Anaheim, CA
July 20-24, 2015	Intermediate Visual MCNP6	Anaheim, CA
August 17-21, 2015	Beginning Visual MCNP6	Orlando, FL
August 24-28, 2015	Intermediate Visual MCNP6	Orlando, FL
September 14-18, 2015	Beginning Visual MCNP6	Las Vegas, NV

September 21-25, 2015	Intermediate Visual MCNP6	Las Vegas, NV
October 5-9, 2015	Beginning Visual MCNP6	Paris, France

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.

MCNP6 Workshops 2015		
April 27-May 1, 2015	MCNP6 Intermediate Workshop	Livermore, CA
June 22-26, 2015	MCNP6 Intermediate Workshop	Prague, Czech Republic
August 31-September 4, 2015	MCNP6 Intermediate Workshop	Orlando, FL
October 12-16, 2015	MCNP6 Intermediate Workshop	Paris, France

Intermediate Workshops cover the entire spectrum of MCNP6 but proceed at a much faster pace and are more in-depth than Introductory Classes. These workshops are open to new users; the first day 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.

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://www.mcnpvised.com/train.html.

To register send an email to Randy Schwarz at randyschwarz@mcnpvised.com, indicating the workshop of interest to you.

Sixth MCNPX-PoliMi Training Workshop

The Sixth MCNPX-PoliMi Training Workshop will be held **June 24-26, 2015**, at the University of Michigan, in Ann Arbor, Michigan.

The MCNPX-PoliMi code is a modified version of MCNPX v. 2.7.0 that provides unique capabilities for simulating correlated-particle measurements and detector response. This workshop will introduce new users to the capabilities of the MCNPX-PoliMi code and acquaint experienced users with new features.

For up-to-date information and registration, please visit their website at http://goo.gl/forms/jQW7Y58kAp. If you have any questions, please email clarkesd@umich.edu.

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

The next "Practical MCNP for the Health Physicist, Medical Physicist, and Radiological Engineer" class presented by the Radiation Measurements Group at Los Alamos National Laboratory has been scheduled for **August 24-28, 2015**. The course, to be held in Los Alamos, has recently been updated to reflect the release of MCNP6. Further details can be found on RSICC's homepage under the "Workshops MCNP-Health Physicist" link (http://www.lanl.gov/orgs/rp/mcnp.shtml).
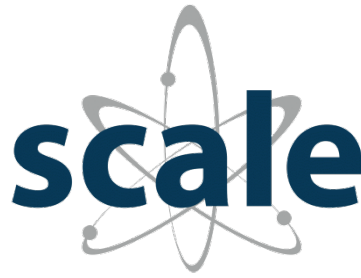
SCALE Training Courses

Training is provided by developers and expert users from the SCALE team. Courses provide a review of theory, description of capabilities and limitations of the software, and hands-on experience running problems of varying levels of complexity.

All attendees MUST be licensed SCALE 6.1 users. SCALE 6.1 is available from ORNL/RSICC in the USA, the OECD/NEA Data Bank in France, and the RIST/NUCIS in Japan. All currently scheduled SCALE Courses are described below.

Date	Course Name and Description	Location	Cost
June 29-July 3, 2015	**SCALE Lattice Physics and Depletion Course** 2D lattice physics calculations; 1D, 2D, and 3D depletion calculations; resonance self-shielding techniques including Monte Carlo Dancoff factors for non-uniform lattices; generation of libraries for ORIGEN-ARP	OECD/NEA Data Bank, Paris, France	2000 Euro
August 10-14, 2015	**SCALE Criticality Safety Calculations Course** Introductory through advanced criticality calculations using KENO V.a and KENO-VI; resonance self-shielding techniques	ORNL Oak Ridge, TN USA	$2000*
August 17-21, 2015	**SCALE Sensitivity and Uncertainty Calculations Course** TSUNAMI: 1D, 2D, and 3D k_{eff} sensitivity/uncertainty analysis; 2D generalized sensitivity analysis for lattice physics; reactivity sensitivity analysis; advanced S/U methods for code and data validation using trending analysis and data assimilation (data adjustment) techniques; k_{eff} burnup credit validation	ORNL Oak Ridge, TN USA	$2000*
August 24-28, 2015	**SCALE Lattice Physics and Depletion Course** 2D lattice physics calculations; 1D, 2D, and 3D depletion calculations; resonance self-shielding techniques including Monte Carlo Dancoff factors for non-uniform lattices; generation of libraries for ORIGEN-ARP	ORNL Oak Ridge, TN USA	$2000*
August 31 - September 4, 2015	**SCALE/ORIGEN Standalone Fuel Depletion, Activation, and Source Term Analysis Course** Isotopic depletion, activation analysis, and source term characterization using ORIGEN/OrigenArp	ORNL Oak Ridge, TN USA	$2000*

Full-time university students can register at a reduced rate. Both professional and student registration fees are discounted $200 for each course over one.

FOREIGN NATIONAL VISITORS TO ORNL - *Payment MUST be received at least one week prior to attending the training course. All foreign national visitors must register 40 days before the start date of the training course they plan to attend.*

For more information regarding this class, visit their website at
http://scale.ornl.gov/training_2015.shtml

<u>SYMPOSIA</u>

2015 CALENDAR

<u>April</u>

ANS Mathematics & Computation (M&C) 2015 & Supercomputing in Nuclear Applications (SNA) and Monte Carlo (MC), April 19-23, 2015, Nashville, TN. For up-to-date information about this conference, visit their website at http://mc2015.org/.

World Nuclear Fuel Cycle, April 21-23, 2015, Prague, Czech Republic. Visit the website.

<u>May</u>

2015 International Congress on Advances in Nuclear Power Plants (ICAPP '15), May 3-6, 2015, Nice, France. For up-to-date information about this conference, visit their website at https://www.sfen.fr/ICAPP.

Used Fuel Management Conference, May 5-7, 2015, Orlando Florida. Visit the website: http://www.nei.org/Conferences/Used-Fuel-Management-Conference.

International Symposium on Isotope Hydrology: Revisiting Foundations and Exploring Frontiers, May 11-15, 2015, Vienna, Austria. For up-to-date information, visit the website.

62nd Annual Industry Conference and Supplier Expo, May 12-14, 2015, Washington, DC. For more information, see their website.

North American Young Generation in Nuclear, May 12-14, 2015, Washington, DC. For up-to-date information, visit the website.

Emergency Preparedness Training Course, May 31-June 2, 2015, Denver, Colorado. For up-to-date information, visit the website.

<u>June</u>

International Conference on Computer Security in a Nuclear World: Expert Discussion and Exchange, June 1-5, 2015, Vienna, Austria. For up-to-date information, visit the website.

Emergency Preparedness Forum, June 3-4, 2015, Denver, Colorado. For up-to-date information about this conference, visit their **website**.

ANS Annual Meeting: Nuclear Technology: An Essential Part of the Solution, June 7-11, 2015, San Antonio, TX. For up-to-date information about this conference, visit their website at: http://www.ans.org/meetings/m_144.

International Conference on Management of Spent Fuel from Nuclear Power Reactors – An Integrated Approach to the Back-End of the Fuel Cycle, June 15-19, 2015, Vienna, Austria. For up-to-date information, visit the website.

International Conference on Operational Safety, June 23-26, 2015, Vienna, Austria. For more information, visit the website.

July

U.S. Women in Nuclear Conference, July 12-15, 2015, Austin, TX. Website not yet available.

September

Global 2015 International Nuclear Fuel Cycle Conference, September 20-24, 2015, Paris, France. For up-to-date information about this conference, visit their website at. https://www.sfen.fr/GLOBAL.

November

International Conference on Research Reactors: Safe Management and Effective Utilization, November 16-20, 2015, Vienna, Austria. For up-to-date information, visit their website.