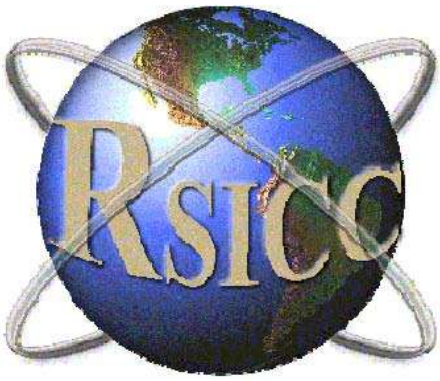
# Radiation Safety Information Computational Center




**Oak Ridge National Laboratory**
**Post Office Box 2008**
**Oak Ridge, Tennessee 37831-6003**
**Managed by**
**UT-Battelle, LLC**
**for the U.S. Department of Energy**
**under contract DE-AC05-00OR22725**

**phone 865-574-6176 fax 865-241-4046**
**email PDC@ORNL.GOV**
**www http://rsicc.ornl.gov/**

**Timothy E. Valentine, Ph.D. - RSICC Director**

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**"The important thing is not being afraid to take a chance. Remember, the greatest failure is to not try. Once you find something you love to do, be the best at doing it." – *Debbi Fields***

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# CHANGES TO THE RSICC CODE AND DATA COLLECTION

There was one update to the RSICC catalog for those individuals that may be interested.

## PSR-614/COBRA-SFS, Cycle 4

Pacific Northwest Laboratory, Richland, Washington has contributed COBRA-SFS (Spent Fuel Storage), a code for thermal-hydraulic analysis of multi-assembly spent fuel storage and transportation systems. COBRA-SFS is a computer program that performs thermal-hydraulic analyses of multi-assembly spent-fuel storage and transportation systems. It uses a lumped-parameter, finite-difference approach to predict flow and temperature distributions in spent fuel storage systems and fuel assemblies, under forced and natural convection heat transfer conditions, in both steady-state and transients. Derived from the COBRA family of codes, which have been extensively evaluated against in-pile and out-of-pile data, COBRA-SFS retains all the important features of the COBRA codes for single-phase analysis and extends the range of application to problems with two-dimensional radiative and three-dimensional conductive heat transfer. With these added capabilities, COBRA-SFS has been used to analyze various single- and multi-assembly spent fuel storage systems containing unconsolidated and consolidated fuel, with a variety of fill media.

The package is transmitted as a tar file a on a single CD. The distribution files contain source files, information file, test case input and output. Reference: PNNL-24841 (October 2015). Fortran; Linux, MacOS and Windows (P00614MNYCP00).

# 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 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

## PHYSOR 2016

The next Reactor Physics Division biannual topical on the Physics of Reactors, PHYSOR 2016, will be held in Sun Valley, Idaho, **May 1-5, 2016**. Based on more than 460 summaries submitted, this is likely to be a well-attended meeting and an opportunity to engage in an international review of current reactor physics research, developments, and applications. More information on the meeting may be found at www.physor2016.org.

# TRAINING COURSES

## Radioactive Material Package Shielding Evaluation and Nuclear Criticality Safety Evaluation Training

The U.S. Department of Energy (DOE) Packaging Certification Program (PCP), Office of Packaging and Transportation, is offering Safety Analysis Report for Packaging (SARP) shielding and nuclear criticality safety (NCS) courses for SARP generalists and analysts.

The SARP Generalist Course is designed for project managers, supervisors, NCS/shielding subject matter experts (SME), or SMEs in non-NCS/shielding technical areas (e.g., structural, thermal, package design, etc.) who need to better understand how the NCS/shielding analyses fit in the broader SARP documentation. Specifically, the Generalist Course provides an overview of the regulations and guidelines for the criticality and shielding analysis for a SARP, and the course shows how the NCS/shielding chapters integrate with the other parts of the SARP. Students in the Generalist Course will review an actual SARP document after the course material is presented to emphasize the key elements of the shielding and criticality analyses.

The Analysts Course will provide detailed training on the radioactive material package shielding analyses and NCS evaluation fundamentals needed by analysts/practitioners (i.e., safety analysts and/or technical reviewers) to prepare and/or review technical analyses for the SARP documentation. The Analyst Course also provides an overview of regulations and guidelines in addition to detailed in-class exercises associated with the package shielding and NCS analyses. With regard to the in-class exercises, analysis teams will be faced with "staged" SARP examples in which a number of important decision processes in the generation of a SARP will be demonstrated and discussed.

Both the SARP Generalist and SARP Analyst Courses will be offered in Fiscal Year 2016.

The SARP Generalist Course will be held at Oak Ridge National Laboratory in Oak Ridge, Tennessee. The SARP Generalist Course is tentatively scheduled for the second or third quarter in FY16, and the training dates will be announced once the course logistics are finalized.

The SARP Analyst Course will be scheduled in FY16 after the SARP Generalist Course. The training location and dates for the SARP Analyst Course will be announced once the course logistics are finalized.

Further information will be posted as soon as it is available. Contact Douglas G. Bowen at bowendg@ornl.gov or (865) 576-0315.

# LANL MCNP6 Class Schedule

Website: https://laws.lanl.gov/vhosts/mcnp.lanl.gov/classes/classinformation.shtml

| Date | Course Name and Description | Cost |
|---|---|---|
| Dec 7-11, 2015<br>Los Alamos, NM | Introduction to MCNP6<br>Non-US citizens must register by 2015-10-02 \|<br>Mon 10:30 - Fri 12:00 | $1800 or<br>$1500* |

*** 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 and Visual Editor Training

Website: http://www.mcnpvised.com/index.html

| MCNP6 Intermediate Workshops 2016 | | |
|---|---|---|
| January 11-15, 2016 | MCNP6 Intermediate Workshop | Las Vega, NV |

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.

| Visual Editor Classes 2015 & 2016 | | |
|---|---|---|
| January 25-29, 2016 | Advanced Visual MCNP6 with Applications in Mesh Tallies and Variance Reduction. | Richland, WA |
| February 15-19, 2016 | Beginning Visual MCNP6 | Paris, France |
| February 29-March 4, 2016 | Advanced Visual MCNP6 with Applications in Mesh Tallies and Variance Reduction. | Barcelona, Spain |
| March 21-25, 2016 | Intermediate Visual MCNP6 for Shielding Calculations | Richland, WA |
| March 28-April 1, 2016 | Intermediate Visual MCNP6 for Criticality Calculations | Richland, WA |
| April 4-8, 2016 | Intermediate Visual MCNP6 for Medical Physics Calculations | Richland, WA |
| April 11-15, 2016 | Beginning Visual MCNP6 | Las Vegas, NV |

| | | |
|---|---|---|
| May 16-20, 2016 | Advanced Visual MCNP6 with Applications in Mesh Tallies and Variance Reduction. | Las Vegas, NV |
| May 23-27, 2016 | Intermediate Visual MCNP6 for Shielding Calculations | Barcelona, Spain |
| May 30-June 3, 2016 | Intermediate Visual MCNP6 for Criticality Calculations | Barcelona, Spain |
| June 27-July 1, 2016 | Beginning Visual MCNP6 | Prague, Czech Republic |
| July 11-15, 2016 | Advanced Visual MCNP6 with Applications in Mesh Tallies and Variance Reduction. | Prague, Czech Republic |
| October 10-14, 2016 | Beginning Visual MCNP6 | Paris, France |

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.

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.

## NEA Nuclear Energy Agency

These workshops combine teaching by the authors on program physics, along with instructions on how to use the software. The courses include a large number of practical exercises.

Should you be interested in attending, information is available at:

http://www.oecd-nea.org/dbprog/trainingcourses.htm or contact: programs@oecd-nea.org.

The NEA Headquarter is moving to Boulogne-Billancourt.

Please note that our services will be unavailable from 9 to 11 December 2015 inclusive.

The courses scheduled for 2016 will take place at the new address (provided in registration forms). Please note that all attendees must be registered users.

| Date | Class | Course Content | Price | Location |
|---|---|---|---|---|
| 29 February-4 March 2016 | SCALE Lattice Physics and Depletion | Course description To register, click here | 2000 Euros | Paris, France |
| 7-11 March 2016 | SCALE/ORIGEN Standalone Fuel Depletion, Activation, and Source Term Analysis | Course description To register, click here | 2000 Euros | Paris, France |
| 18-22 April 2016 | Beginning Visual MCNP6 | Course description To register, click here | 2200 Euros | Paris, France |
| 25-29 April 2016 | MCNP6 Intermediate | Course description To register, click here | 2200 Euros | Paris, France |
| 23-27 May 2016 | PHITS Monte-Carlo Particle and Heavy Ion Transport Code System | Course description | 500 Euros | Paris, France |

* The fee includes the training course, luncheons and coffee breaks.

Contact: programs@oecd-nea.org


# SCALE ORNL and NEADB Training Courses – Winter 2016

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 6.2 users. SCALE 6.2 will be available soon 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 |
|---|---|---|---|
| February 15-19, 2016 | **SCALE Lattice Physics and Depletion Course** 2D lattice physics calculations using TRITON and the new Polaris code to generate few group constants for nodal core simulators; 1D, 2D, and 3D depletion calculations, including the new 3D continuous-energy (CE) Monte Carlo depletion capabilities; resonance self-shielding techniques including Monte Carlo Dancoff factors for non-uniform lattices; generation of ORIGEN reactor libraries for spent fuel characterization | ORNL Oak Ridge, TN USA | $2000* |
| February 22-26, 2016 | **SCALE/ORIGEN Standalone Fuel Depletion, Activation, and Source Term Analysis Course** Isotopic depletion, activation analysis, and source term characterization using ORIGEN/OrigenArp and the new ORIGAMI tool for convenient characterization of used nuclear fuel with radially and axially varying burnup. | ORNL Oak Ridge, TN USA | $2000* |
| February29-March 4, 2016 | **SCALE Criticality Safety and Radiation Shielding Course** Basic criticality calculations with KENO-VI; shielding analysis with automated variance reduction using MAVRIC; and criticality accident alarm system analysis. Calculations will be performed using multigroup and CE cross sections, including resonance self-shielding of multigroup data, optimized CE capabilities in KENO, and new coupled CE neutron and photon transport in Monaco | ORNL Oak Ridge, TN USA | $2000* |
| March 7-11, 2016 | **SCALE Sensitivity/Uncertainty Analysis and Uncertainty Quantification Calculations Course** In this updated class, participants will learn to apply the sensitivity/uncertainty analysis (SA) and uncertainty quantification (UQ) capabilities in SCALE, focusing on two approaches: 1) perturbation theory-based TSUNAMI | ORNL Oak Ridge, TN USA | $2000* |

| | | | |
|---|---|---|---|
| | sequences to perform nuclear data SA and UQ for eigenvalue and reaction rates using 1D, 2D and 3D tools, including multigroup and new CE Monte Carlo capabilities; and 2) stochastic sampling-based UQ analysis using the new Sampler super-sequence to perform UQ for any computed parameter with respect to uncertainties in many input quantities including nuclear data, dimensions, densities, temperatures, etc. Training will include workshop problems analyzing a variety of different systems including LWR (both UO2 and MOX fuel), HTGR, and fast systems. | | |
| February 29-March 4, 2016 | **SCALE Lattice Physics and Depletion Course** 2D lattice physics calculations using TRITON and the new Polaris code to generate few group constants for nodal core simulators; 1D, 2D, and 3D depletion calculations, including the new 3D continuous-energy (CE) Monte Carlo depletion capabilities; resonance self-shielding techniques including Monte Carlo Dancoff factors for non-uniform lattices; generation of ORIGEN reactor libraries for spent fuel characterization | OECD/NEA Data Bank, Paris, France | 2000 Euro |
| March 7-11, 2016 | **SCALE/ORIGEN Standalone Fuel Depletion, Activation, and Source Term Analysis Course** Isotopic depletion, activation analysis, and source term characterization using ORIGEN/OrigenArp and the new ORIGAMI tool for convenient characterization of used nuclear fuel with radially and axially varying burnup. | OECD/NEA Data Bank, Paris, France | 2000 Euro |

***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 these classes, visit their website at http://scale.ornl.gov/training_2016_feb-mar.shtml

# SYMPOSIA

## 2016 CALENDAR

***January***

**Institute of Nuclear Materials Management (INMM) 31st Spent Fuel Management Seminar**, January 11-13, 2016, Washington, D.C. See website for more information http://www.inmm.org/31st_Spent_Fuel_Seminar.htm.

***February***

**Nuclear and Emerging Technologies for Space (NETS) 2016**, February 22-25, 2016, Huntsville, AL. See website for more information http://www.ans.org/meetings/c_3.

***May***

**47th Annual Meeting on Nuclear Technology (AMNT 2016)**, May 10-12, 2016, Hamburg, Germany. See website for more information http://www.nucleartech-meeting.com/welcome.html.

***June***

**2016 Society of Nuclear Medicine and Molecular Imaging (SNMMI) Annual Meeting,** June 11-15, 2016, San Diego, CA. More information to follow.

**2016 American Nuclear Society (ANS) Annual Meeting.** June 12-16, 2016. New Orleans, LA.

***July***

**61st Annual Health Physics Society (HPS) Meeting,** July 17-21, 2016, Spokane, WA. See website for more information http://hps.org/meetings/meeting39.html.

***November***

**2015 American Nuclear Society (ANS) Winter Meeting and Nuclear Technology Expo.** November 6-10, 2016, Las Vegas, NV.

# 2017 CALENDAR

***May***

**2017 International Symposium on Reactor Dosimetry, ISRD-16.** May 7-12, 2017, Santa Fe, New Mexico. See website for more information http://reactordosimetry.org.

***June***

**2017 American Nuclear Society (ANS) Annual Meeting.** June 11-15, 2017, San Francisco, CA.

***July***

**62nd Annual Health Physics Society (HPS) Meeting.** July 9-13, 2017, Raleigh, NC.

***October***

**2017 American Nuclear Society (ANS) Winter Meeting and Nuclear Technology Expo.** October 29-November 2, 2017, Washington, DC.