Radiation Safety Information Computational Center

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

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"You can't have a million-dollar dream on a minimum wage work ethic."

--Unknown

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CHANGES TO THE RSICC CODE AND DATA COLLECTION

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

CCC-850/MCNP6.2

Los Alamos National Laboratory, Los Alamos, New Mexico, USA, has contributed a new production version of MCNP6.2. Monte Carlo N-Particle® or MCNP® is a general-purpose Monte Carlo radiation-transport code designed to track many particle types over broad ranges of energies. This MCNP® version 6.2 follows the MCNP6.1.1 beta version and has been released to provide the radiation transport community with the latest feature developments and bug fixes for MCNP®. Since the last release of MCNP® major work has been conducted to improve the code base, add features, and provide tools to facilitate ease of use of MCNP® version 6.2 as well as the analysis of results. These release notes serve as a general guide for the new/improved physics, source, data, tallies, unstructured mesh, code enhancements and tools. For more detailed information on each of the topics, please refer to the appropriate references or the user manual which can be found at http://mcnp.lanl.gov. This release of MCNP® version 6.2 contains 39 new features in addition to 172 bug fixes and code enhancements.

Physics:
- Improved correlated prompt secondary particle production (CGM)
- Exact line emission treatment for delayed gamma production
- Decay emission treatment
- Charged particle delta-ray production

Source:
- Addition of spontaneous positrons decay sources
- All-Particle Decay Option
- Spontaneous decay and activation improvements
- Improved cosmic-ray source:
  - o Inclusion of heavy ions
  - o Updated solar modulation data
- Improved background source:
  - o Updated cosmic and terrestrial background data file
  - o Automatic elevation and data scaling

Data:
• Revised nuclear data for hydrogen
• SiO2 S(α ,β) thermal scattering data updated
• Zr-Hydride S(α ,β) thermal scattering data updated at 1200K
• New listing of available ACE data
• New default XSDIR file for MCNP® version 6.2
• New electron-photon relaxation library (EPRDATA14)
• Large-angle and total electron elastic cross section data
• Improved decay library data file, increasing radionuclides from 979 to 3475

Tallies:
• Built-in physics-based neutron and photon response functions
• Improved first-fission special tally option
• New collision-based cell-flag tally option
• Surface flux tally improvements

Unstructured Mesh:
• Improved tracking of charged particles on unstructured mesh
• Creation of new UM input file type (MCNPUM)
• Selection of overlap model by part
• Ability to specify flux multipliers on the UM edits
• Ability to read and handle multiple UM's in separate mesh universes

Code Enhancements:
• Filenames used by MCNP® may now be up to 256 characters in length
• Permit line lengths up to 128 characters in MCNP® input files and xsdir files
• Extend command line length to permit up to 4096 characters
• Remove limit on boundary-list entries for cell descriptions
• The number of point detectors allowed increased from 100 to 1000

Tools:
• Whisper – software for sensitivity-uncertainty-based nuclear criticality safety validation
• The MCNPTools package
• Intrinsic Source Constructor (ISC)
• The UM_CONVERT utility program
• Improved UM_POST_OP functionality

The MCNP6.2 package is distributed on 4 DVDs that can be read on Windows, Linux or MacOS systems.
• Disc 1 of C00850MNYCP00 contains MCNP6.2 source code, pre-compiled executables and reference documents.
• Disc 1 of C00850MNYCP01 contains MCNP6.2 pre-compiled executables and reference documents.
• Discs 2 and 3 of both packages contain the same ENDF/B-VII.1 data.

Export control regulations restrict the distribution of source code. If restrictions apply, RSICC will send the executable-only version. Please order the package you prefer, and your preference will be honored if possible. FORTRAN 90 and C; Windows PCs, Linux PC, MacOS [Package ID: C00850MNYCP00 (full source distribution) and C00850MNYCP01 (executable-only distribution)].

END USE STATEMENT

Customers are strongly encouraged to provide full and complete information regarding the intended end use of the software being requested. End use statements that specify that the code is for research, training or educational activities are not sufficient. RSICC's regulators need to know explicitly for what purpose you intend to use the codes and detail needs to be provided. Requests that lack sufficient detail will be rejected.

REGISTRATION REQUIREMENTS

RSICC does not permit individuals to "pre-register" or "pre-order" software for use at a temporary or alternate location. The single user license and export control agreements are specific to the individual's end use and the location at which the software will be used. During the registration process, individuals are required to provide the name of the institution at which they will use the software, an institutional mailing address and an institutional e-mail address. As an example, students that work at a location other than their university are required to update their registration with RSICC and submit a new request for any software that they intend to use after they have begun work at the new location.

SINGLE-USER LICENSE AGREEMENT REVISED

The single-user license agreement has been revised to address concerns regarding changes in end-use and/or employment 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.

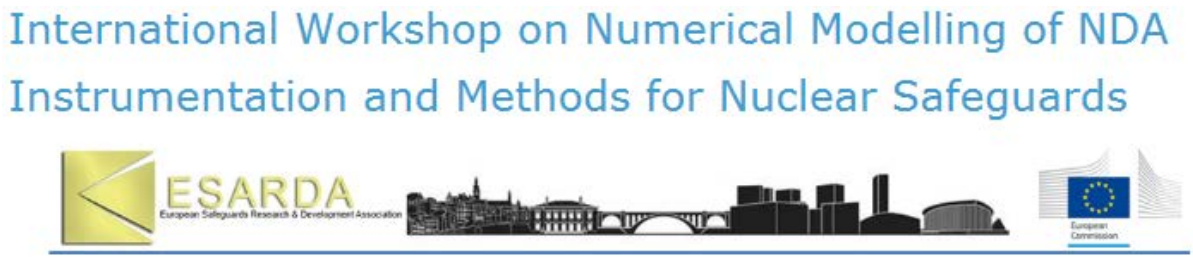
CONFERENCES, TRAINING COURSES, SYMPOSIA

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 for RSICC Newsletter**" in the subject line by the 15th 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

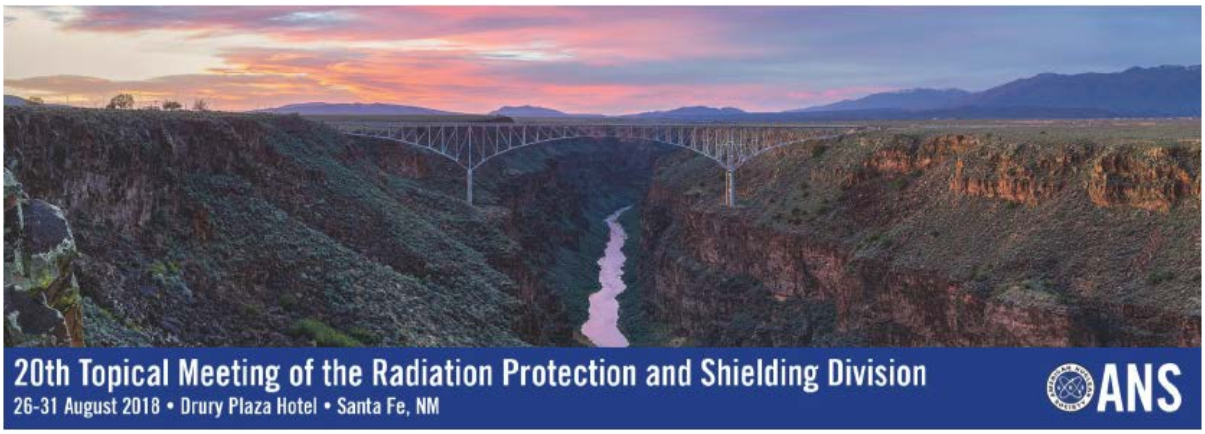
BEPU 2018

The Best Estimate Plus Uncertainty International Conference will be held **May 13-19, 2018**, in Lucca, Italy. The objective of the Conference is to provide a forum to exchange experience and views among professionals in the nuclear industry in the development and use of Best Estimate Plus Uncertainty (BEPU) methods in safety analyses and design of nuclear installations. Please see the website for more information www.nineeng.com/bepu.



ESARDA Workshop on Numerical Modelling

The ESARDA Non-Destructive Assay (NDA) Working Group is organizing an international workshop on the topics of computer simulation applied to the modelling of NDA instrumentation and methods for nuclear safeguards applications. It will be held **May 17-18, 2018** in Luxembourg. The two-day event aims to cover a broad range of topics and present a unique opportunity for the safeguards community interested in recent advances and in lessons learned from practical cases. The information about the event can be found at http://www.nusaset.org/index.php?option=com_content&view=article&id=878&Itemid=470.

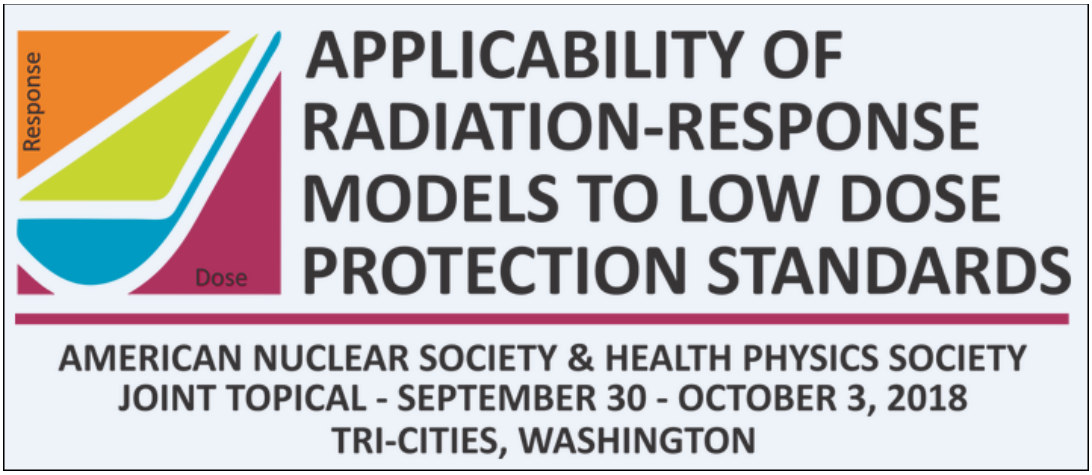


20th Topical Meeting of the Radiation Protection and Shielding Division

This meeting will be held **August 26-31, 2018** in Santa Fe, New Mexico. Please visit the website http://rpsd2018.ans.org/ for more information. If questions, please contact Michael Rising, LANL at mrising@lanl.gov.

PHYTRA4

The Fourth International Conference on Physics and Technology of Reactors and Applications will be held **September 17-19, 2018,** in Marrakech, Morocco. This conference will be organized by the Moroccan Association for Nuclear Engineering and Reactor Technology (GMTR) with the collaboration of the National Centre for Energy, Sciences and Nuclear Techniques (CNESTEN) and the Moroccan Agency for Nuclear and Radiological Safety and Security (AMSSNuR) after the resounding success which the previous editions had met. Please see their website for more information at http://phytra4.gmtr.ma/.



American Nuclear Society & Health Physics Society Joint Topical

The American Nuclear Society and Health Physics Society are co-sponsoring a scientific conference on "Radiation Response Models to Low Dose Protection Standards," in Pasco, Washington, **September 30 - October 3, 2018**. For additional information contact Alan Waltar, conference chair, alan.waltar@gmail.com, or Darrell Fisher, technical program co-chair, at darrell.fisher@versantphysics.com.

NURER 2018

The 6th International Conference on Nuclear and Renewable Energy Resources (NURER2018) will be held **September 30 - October 3, 2018,** in Juju, Korea. This is recognized as one of the major international conferences for the exchange of information on scientific, engineering, and other technical aspects of innovative nuclear and renewable energy science and technology. For more details on this conference, please visit their website at http://nurer2018.org.

TRAINING COURSES

LANL MCNP6 Class Schedule

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

May 15-18, 2018 Los Alamos, NM	Unstructured Mesh with Attila4MC Non-US citizens must register by 2018-02-19 | Tues 12:30 - Fri 4:30	$1500 or $1200*
June 4-8, 2018 Los Alamos, NM	Introduction to MCNP6 –FULL— Non-US citizens must register by 2018-03-12 | Mon 10:00 - Fri 12:00	$1800 --FULL--
Aug 6-10, 2018 Los Alamos, NM	Criticality Calculations with MCNP6 Non-US citizens must register by 2018-05-14 | Mon 10:00 - Fri 12:00	$1800 or $1500*
Aug 13-17, 2018 Los Alamos, NM	Introduction to MCNP6 Non-US citizens must register by 2018-05-21 | Mon 10:00 - Fri 12:00	$1800 or $1500*
Aug 20-24, 2018 Los Alamos, NM	Variance Reduction with MCNP6 Non-US citizens must register by 2018-05-28 | Mon 10:00 - Fri 12:00	$1800 or $1500*
Nov 27-29, 2018 Los Alamos, NM	Using NJOY to Create MCNP® ACE Files & Visualize Nuclear Data Non-US citizens must register by 2018-09-03 | Tues 10:00 - Fri 5:00	$1200 or $900*
Dec 3-7, 2018 Los Alamos, NM	Introduction to MCNP6 Non-US citizens must register by 2018-09-10 | Mon 10:00 - Fri 12:00	$1800 or $1500*

MCNP6 Training

For more information, see the website: http://mcnpvised.com/train_mcnp.html

Current Classes **(tuition for all US classes is $2800 with an early payment discount of $300)**			
Date (Click Date for Info)	**Class**	**Course Content**	**Location**
September 10-14, 2018	**Intermediate MCNP6 Workshop**		**Seattle, WA**
October 22-26, 2018	**MCNP6 Intermediate Workshop**	**To see an outline for the course, Click Here.**	**Paris, France**

Beginning/Advanced Visual Editor Training

For more information, see the website: http://mcnpvised.com/train.html

Click Date for Info)	**Workshop** (40 Cont. Ed. credits through American Academy of Health Physics. Click here for AAHP Site. Class number is 2008-00-026 for Vised classes and 2011-00-022 for MCNPX Team Workshops)	**Level of Difficulty**	**Workshop Content**	**Location**
June 4-8, 2018	**Intermediate MCNP6 Using Nucwiz**		**Detailed Desctiption**	**Prague, Czech Republic**
June 11-15, 2018	**Advanced Visual Editor with Applications in Mesh Tallies and Variance Reduction**		Detailed Description	**Prague, Czech Republic**
July 30 - August 3, 2018	**Advanced MCNP® Training with Applications for Nuclear Reactor Decommissioning**		**Custom for Ulsan National Institute of Science and Tech.**	**Ulsan, South Korea**
September 17-21, 2018	**Intermediate MCNP6 Using Nucwiz**		**Detailed Desctiption**	**Richland, WA**
September 24-28, 2018	**Beginning Visual Editor**		Detailed Description	**Las Vegas, NV**
October 1-5, 2018	**Advanced Visual Editor with Applications in Mesh Tallies and Variance Reduction**		Detailed Description	**Las Vegas, NV**
October 15-19, 2018	**Beginning Visual Editor** **The NEA handles registration for this workshop.**		Detailed Description	**Paris, France**

Safety Analysis Report for Packaging (SARP)

Shielding/Criticality Safety Generalist and Analyst Courses

Developed and Conducted by Oak Ridge National Laboratory

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** will be held at the National Transportation Research Center, Oak Ridge National Laboratory, Oak Ridge, TN, **June 4 -8**, **2018.** This 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 registration cost for all students is $2000. Those interested can register for the course at the following website, https://utconferences.eventsair.com/safety-analysis-report-for-packaging-sarp-shielding-criticality-safety-generalist-course/sarp/Site/Register.

The **SARP Analyst Course** is scheduled for **September 17 - 21, 2018** at the National Transportation Research Center, Oak Ridge National Laboratory, Oak Ridge, TN. This 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. Regarding the in-class exercises, analysis teams will be faced with "staged" SARP examples in which important decision processes in the generation of a SARP will be demonstrated and discussed. The registration cost for all students is $2000. Information regarding the course is available at the following website, https://public.ornl.gov/conferences/sarp/index.shtml.

Please contact the ORNL SARP Course Point-of-Contact if you have questions about the courses. Douglas G. Bowen, Oak Ridge National Laboratory, bowendg@ornl.gov,(865) 576-0315.

SYMPOSIA

2018 CALENDAR

June

2018 American Nuclear Society (ANS) Annual Meeting, June 17-21, 2018, Philadelphia, Pennsylvania. Website: http://www.ans.org/meetings/c_1.

July

HPS 63rd Annual Meeting, July 15-19, 2018, Cleveland. Ohio. Website: http://hps.org/meetings/meeting46.html.

26th International Conference on Nuclear Engineering - ICONE, July 22-26, 2018, London, England. Website: http://www.asme.org/events/icone.

August

20th Topical Meeting of the Radiation Protection & Shielding Division of ANS (RPSD-2018), August 26-31, 2018, Santa Fe, New Mexico. Website: http://rpsd2018.ans.org.

September

Pacific Basin Nuclear Conference, September 30-October 5, 2018, San Francisco, California. Website: http://pbnc.ans.org.

November

IEEE Nuclear Science Symposium, November 11-17, 2018, Sydney, Australia. Website: http://www.nssmic.org/2018/.

2018 American Nuclear Society (ANS) Winter Meeting, November 11-15, 2018, Orlando, Florida. Website: http://www.ans.org/meetings/c_1.

2019 CALENDAR

June

2019 American Nuclear Society (ANS) Annual Meeting, June 9-13, 2019, Minneapolis, Minnesota. Website: http://www.ans.org/meetings/c_1.