Radiation Safety Information Computational Center

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

No. 595 December 2014

"The common question that gets asked in business is, 'why?' That's a good question, but an equally valid question is, 'why not?'

Jeff Bezos

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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.

CCC-581/FOTELP-2014

The Institute of Nuclear Sciences VINCA, Physics Laboratory, Beograd, Serbia, through the NEA Data Bank, Issy-les-Moulineaux, France, contributed FOTELP-2014. This is a new compact general purpose version of the previous FOTELP-2K6 code designed to simulate the transport of photons, electrons and positrons through three-dimensional material and sources geometry by Monte Carlo techniques, using subroutine package PENGEOM from the PENELOPE code under Linux-based and Windows OS. This new version includes routine ELMAG for electron and positron transport simulation in electric and magnetic fields, RESUME option and routine TIMER for obtaining starting random number and for measuring the time of simulation.

Physical rigor is maximized by employing the best available cross sections and high speed routines for random values sampling from their distributions, and the most complete physical model for describing the transport and production of the photon/electron/positron cascade from 100.0 MeV down to 1.0 keV. FOTELP-2014 is developed for numerical experiments by Monte Carlo techniques for dosimetry, radiation damage, radiation therapy and other actual applications of these particles.

The FOTELP codes are written in double precision Fortran. Current versions are complete revisions of previous versions. Compaq Visual Fortran 6.5 was used to create the developers' Windows executables, which are included in the package. Alternately, the GNU Fortran compiler can be used. The package is transmitted on a CD which contains documentation, Fortran sources, Windows executable and test cases. The package is distributed in two formats: Windows and Unix/Linux. Reference: Radovan D. Ilic, FOTELP-2014 - Photons, Electrons and Positrons Monte Carlo Transport Simulation - User's manual (September 2014). Fortran 77; Linux and Windows PC (C00581MNYCP04).

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.

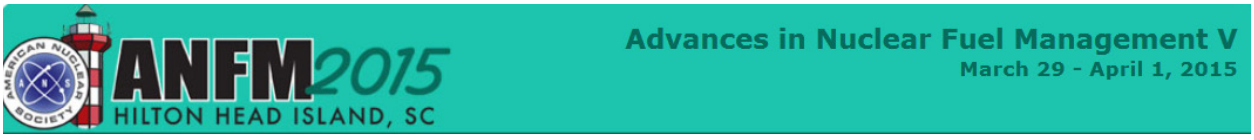
All levels of participants from undergraduates to faculty are encouraged to publish research papers with their mentors. Please browse through the Research Profiles on the different participants and their research experiences at the right hand side of the bottom of the web site listed above. Also, there 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



Advances in Nuclear Fuel Management V

The American Nuclear Society's ANFM2015 meeting will be held on Hilton Head Island, South Carolina, **March 29 – April 1, 2015**. The meeting is a forum for addressing a broad spectrum of front-end nuclear fuel management activities, within the context of reactor physics and fuel cycle economics.

Topics will range from methods development and verification to design and implementation of new in-core fuel products and strategies.

For up-to-date information about this conference, visit their website at http://anfm2015.org.

CHEP2015

The 21st International Conference on Computing in High Energy and Nuclear Physics (CHEP2015) will be held in Okinawa Japan, **April 13-17, 2015**.

For up-to-date information about this conference, visit their website at http://chep2015.kek.jp/.

M&C + SNA + MC 2015

The Oak Ridge/Knoxville Section of the American Nuclear Society (ANS) will host and sponsor the FIRST combined Mathematics and Computations (M&C) ANS topical, Supercomputing in Nuclear Applications (SNA), and Monte Carlo (MC) 2015. The joint international conference will be held at the Sheraton Music City in Nashville, Tennessee during the week of A**pril 19-23, 2015**. M&C is the latest in the series organized by the Mathematics and Computation Division of the American Nuclear Society. Prior to 2010, SNA and MC existed as separate conferences. In 2010, SNA and MC combined and held SNA+MC 2010 in Tokyo, Japan. This was followed by SNA+MC 2013 held in Paris, France.

For up-to-date information about this conference, visit their website at http://mc2015.org.

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

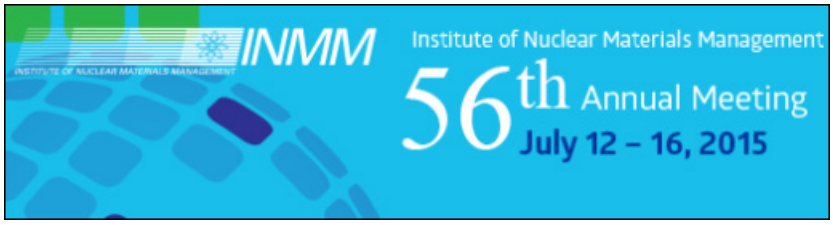
The OECD Nuclear Energy Agency (NEA) Committee on the Safety of Nuclear Installations (CSNI) Working Group on Fuel Cycle Safety (WGFCS) will hold an international workshop on Operational and Regulatory Aspects of Criticality Safety (ORACS). The workshop will be hosted jointly by the United States Nuclear 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/.

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
Feb. 23-27, 2015 Los Alamos, NM	Introduction to MCNP6 Non-US citizens must register by 2014-12-19 | Mon 10:30 - Fri 12:00	$1800 or $1500*
Mar 2-4, 2015 Los Alamos, NM	Unstructured Mesh with Attila4MC Non-US citizens must register by 2014-12-26 | Mon 12:30 - Wed 4:30	$1000 or $800*
Mar 23-27, 2015 Los Alamos, NM	Criticality Calculations with MCNP6 Non-US citizens must register by 2015-01-16 | Mon 10:30 - Fri 12:00	$1800 or $1500*
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 few 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		
January 5-9, 2015	Beginning Visual MCNP6	Las Vegas, NV
January 19-23, 2015	Intermediate Visual MCNP6	Las Vegas, NV
February 2-6, 2015	Beginning Visual MCNP6	Seoul, Korea
February 9-13, 2015	Intermediate Visual MCNP6	Seoul, Korea
February 16-20, 2015	Beginning Visual MCNP6	Sydney, Australia
February 23-27, 2015	Visual MCNP6 for Shielding Calculations (class size limited to 6) (New Workshop - **Click here** to see workshop content!)	Richland, WA
March 2-6, 2015	Visual MCNP6 for Criticality Calculations (class size limited to 6). (New Workshop - **Click here** to see workshop content!)	Richland, WA

March 16-20, 2015	Beginning Visual MCNP6	Paris, France
March 30-April 3, 2015	Intermediate Visual MCNP6	Barcelona, Spain
April 13-17, 2015	Intermediate Visual MCNP6 for Medical Physics Calculations (Class size limited to 6)	Richland, WA
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		
January 12-16, 2015	MCNP6 Intermediate Workshop	Las Vegas, NV
March 23-27, 2015	MCNP6 Intermediate Workshop	Paris, France
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.

NEA Nuclear Energy Agency

Class sizes are limited and courses may be cancelled if minimum enrollment is not obtained one month prior to course. Course fees paid are refundable up to one month before each class.

Please note that all attendees must be registered users.

Date	Class	Course Content	Price	Location
2-6 March 2015	SCALE/KENO-MAVRIC Criticality Safety and Radiation Shielding Course	Course description To register, click here	2000 Euros	Paris, France
9-13 March 2015	SCALE/TSUNAMI Sensitivity and Uncertainty Calculations Course	Course description To register, click here	2000 Euros	Paris, France
16-20 March 2015	Introduction to MCNP6 using the Visual Editor	Course description To register, click here	2000 Euros	Paris, France

23-27 March 2015	MCNP6 Intermediate	Course description To register, click here	2000 Euros	Paris, France

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

Contact: programs@oecd-nea.org

SCALE Training Courses – 2015

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
February 2-6, 2015	**SCALE Criticality Safety and Radiation Shielding Course** Basic criticality calculations with KENO-VI; shielding analysis with automated variance reduction using MAVRIC; criticality accident alarm system analysis	ORNL Oak Ridge, TN USA	$2000*
February 9-13, 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*
February 16-20, 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*
March 2-6, 2015	**SCALE Criticality Safety and Radiation Shielding Course** Basic criticality calculations with KENO-VI; shielding analysis with automated variance reduction using MAVRIC; criticality accident alarm system analysis	OECD/NEA Data Bank, Paris, France	2000 Euro

March 9-13, 2015	**SCALE Sensitivity and Uncertainty Calculations** 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	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 $\mathbf{k_{eff}}$ 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; $\mathbf{k_{eff}}$ 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

SYMPOSIA

2015 CALENDAR

February

9th International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human Machine Interface Technologies (NPIC&HMIT 2015), February 22-26, 2015, Charlotte, NC. For up-to-date information about this conference, visit their website at http://www.npic-hmit2015.org/.

Health Physics Society 48th Midyear Topical Meeting, February 1-4, 2015, Norfolk, VA. For up-to-date information about this conference, visit their website at http://hps.org/meetings/meeting41.html.

March

Regulatory Information Conference (RIC) 2015, March 10-12, 2015, North Bethesda, MD. For up-to-date information about this conference, visit their website at http://www.nrc.gov/public-involve/conference-symposia/ric/

April

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/.

May

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.

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

Used Fuel Management Conference, May 5-7, 2015, Orlando, FL. Website not yet available.

June

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.

ANS Annual Meeting: Nuclear Technology: An Essential Part of the Solution, June 7-11, 2015, San Antonio, TX. Website not yet available.

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.

July

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

INMM 56th Annual Meeting, July 12-16, 2015, Indian Wells, CA. Website not yet available.

Health Physics Society 60th Annual Meeting, July 12-16, 2015, Indianapolis, IN. 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

ANS Winter Meeting and Nuclear Technology Expo, November 8-12, 2015, Washington, **DC.** Website not yet available.

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