
Radiation Safety Information Computational Center



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There is no reader so parochial as the one who reads none but this morning's books. Books are not rolls, to be devoured only when they are hot and fresh. A good book retains its interior heat and will warm a generation yet unborn.—
Clifton Fadiman

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A SIGNAL HONOR FROM THE INTERNATIONAL SCIENTIFIC COMMUNITY

Alvin Weinberg, scientist-scholar, won many awards throughout his career. He deeply appreciated the one offered by an organization in which he had served as a founder and president. The American Nuclear Society established an international award in his honor, cited Weinberg as the first recipient, and devised the award such that each time it is awarded, ANS again honors him. It is called the *Alvin M. Weinberg Award*, but it is better known as the *Weinberg Medal*.

The award was established in 1995 to honor Dr. Weinberg and to provide international recognition for contributions to the understanding of the social implications of nuclear technology. The candidate for the award must have demonstrated such achievements over a sustained period of several years. The award consists of an engraved medal, certificate and a monetary honorarium. It is funded by monies from the Vietnamese-American Scholarship Fund and PAI Corporation given on the occasion of Dr. Weinberg's 80th birthday.

The award can be given annually if a suitable candidate is selected by an ANS Honors and Awards Committee. It has only been conferred five times since the initial award to Dr. Weinberg in 1996. The awardees and their citations follow.

1999: **Wolf Haefele** – for a lifetime of achievement as reactor physicist, leader of the German Fast Breeder, author of *Energy in a Finite World*, and philosopher of energy in relation to human affairs.

- 2001: **Alvin Radkovsky** – for seminal contributions and innovations in the engineering development of nuclear power. (Dr. Radkovsky served as Admiral Rickover’s chief physicist in developing the nuclear navy).
- 2002: **Ralph E. Lapp** – in recognition of lifetime achievement in providing public understanding to the social implications of nuclear energy. (He signed with others supporting the Einstein letter to President Roosevelt urging nuclear research in support of WWII).
- 2003: **Betty F. Maskewitz** – in recognition of an outstanding career devoted to effectively sharing radiation shielding technology throughout the world as a means of exploiting nuclear energy for the benefit of mankind. (Maskewitz was a founder and director of the international Radiation Shielding Information Center (RSIC) which was established at ORNL on principles promoted by Dr. Weinberg).
- 2004: **Mihail Balanescu** – for singular contributions in and major development of nuclear technology in Romania, and for national and international environmental protection.

No acceptable candidate was selected nor award presented in 2005 and 2006.

Betty F. Maskewitz

Obituary – TSF-SNAP Reactor

The TSF-SNAP was a SNAP 10A reactor, designed and built by Atomics International of Canoga Park, California, and assembled and operated by the Neutron Physics Division of Oak Ridge National Laboratory. Under the Systems for Nuclear Auxiliary Power (SNAP) program, the TSF-SNAP was dedicated to radiation leakage and shielding measurements at ORNL’s Tower Shielding Facility (TSF) site. It was preceded by the SNAP 2 SNAP Experimental Reactor (SER) and SNAP Demonstration Reactor (SDR), both operated at Atomics International’s Santa Susanna site. Siblings included the FS-3, FS-4 and FS-5 “flight system” reactors, along with SNAP transient relatives SNAPTRAN 1/2 and SNAPTRAN 3, each briefly operated at the National Reactor Testing Station in Idaho.

The TSF-SNAP was not operated on the large tower located at the TSF site, but rather on a special rotator-locator boom assembly. First “dry” criticality, without coolant, was achieved on April 7, 1967. Early “dry” studies were used to confirm neutron flux distributions inside the reactor assembly. TSF-SNAP then began its primary career fully assembled and cooled with NaK on September 11, 1967. As with all SNAP 10A reactors, TSF-SNAP had a 37-position core array, using a zirconium-uranium fuel alloy infused with hydrogen, and was moderated by the eutectic potassium-sodium alloy commonly termed NaK. Unlike its siblings destined for operation in space (or a simulated space environment), TSF-SNAP was constructed with an air-cooled heat exchanger assembly. Since the total burnup was expected to be low, its central fuel rod was replaced with a steel rod containing 14 g of boron carbide.

TSF-SNAP did not accumulate the operating hours of the FS-3 ground test reactor, nor did it share the excitement of space flight experienced by FS-4. Likewise, TSF-SNAP did not experience the rapid and explosive mission of the SNAPTRAN excursions. Instead, it steadily and reliably served to confirm the analytical techniques used to evaluate space reactors and shields in the 1960s and 1970s. Typical publications include *Measurements of the Absolute Power and Fission Distribution in the TSF-SNAP Reactor and Comparison with Monte Carlo and Discrete Ordinates Calculations* (ORNL/TM-2265) and *Methods for Calculating Fast-Neutron Leakage from the SNAP-TSF Reactor and Preliminary Results* (ORNL/TM-1666). TSF-SNAP was viewed with a collimated detector located several feet away from either the bare reactor, or through a small, lightweight space reactor shield. As such, a typical run was at very low power, and only of sufficient duration to obtain statistically significant data at the detector. Most runs were under 100 W, well below the 10 kW design basis, and many were at only a few μ W. After each run the detector would be repositioned, and another run began. As many as 18 runs would be performed

in a single day. After six years of operation, its total burnup reached only 5 kW-h! Still, this is more than achieved by the spare flight reactor FS-5, which survives it (although defueled) at the U.S. Space and Rocket Center in Huntsville, AL.

As its career at the Tower Shielding site continued, TSF-SNAP performed some experiments in support of the liquid metal breeder reactor. Although physically small (slightly larger than a football), its NaK coolant offered some spectral features similar to the sodium-cooled reactors being studied at the time. However, when the overall SNAP reactor program ended in 1973, TSF-SNAP accepted an early retirement from ORNL. Its final operation was performed on February 18, 1973.

Other potential career opportunities as a university reactor or at another government facility never materialized. TSF-SNAP passed most of its retirement years at the Y-12 facility in Oak Ridge, in a highly-enriched uranium storage facility. Now managed by the HEU Disposition Program, the time had come for its passing, so that the HEU present in its fuel elements could be downblended for use in other reactors.

TSF-SNAP was brought back to ORNL from Y-12 on June 24. In a series of eight procedures, it was fully dismantled by July 11, and the fuel elements were returned to Y-12 in the following days. The final procedure, reaction of the bulk NaK coolant, was performed on September 14.

In its passing, the TSF-SNAP has reconnected us with the space reactor technology developed in the 1960s and 1970s. A production and decay model was performed, replicating the operation of the reactor and quantifying the current radioisotope inventory. Extensive criticality safety reviews were performed in support of the final handling of its nuclear fuel. A total of 73 criticality experiments performed by Atomics International in the 1960s were evaluated using the current [MCNP5](#) code, validating the use of MCNP5 for the establishment of safety margins for the TSF-SNAP dismantlement. This work is documented in *Experimental Criticality Benchmarks for SNAP 10A/2 Reactor Cores* (ORNL/TM-2005/54).

The final work with TSF-SNAP re-acquainted ORNL staff with all of the project elements associated with working with space reactor assemblies. It provided practical experience in the handling, cleanup and disposal of the NaK coolant. Formal safety documentation for the dismantlement operations, as well as the two transportation activities, was developed and approved. Security and nuclear material controls were identified and implemented. Specialty tooling was designed, built and tested, as required for physical handling of the TSF-SNAP reactor assembly, draining of the NaK, processing of both the drained NaK and the residual NaK in the TSF-SNAP itself, and dismantlement of the reactor vessel. Formal procedures were developed, and operators were trained in their execution. A structured readiness assessment process was implemented, resulting in formal authorization to proceed from DOE. And finally, a host of chemical and industrial hazards were addressed.

All of us that were privileged to be part of this activity took away much from the experience, and will never forget it. Anyone interested in further information on the TSF-SNAP dismantlement project, or in a discussion of SNAP 10A technology in general, should contact Fred Peretz (phone 865-576-5516).

[Fred J. Peretz](#)

Change to the Computer Code and Data Collection

[CCC-728/GENII-LIN Release 2.0](#)

Laboratorio di Montecuccolino, Bologna University, Bologna, Italy, contributed GENII-LIN Release 2.0, a multipurpose health physics code system with a new object-oriented interface based on GENII-1.485, which was developed at Pacific Northwest Laboratory, Richland, Washington. GENII-LIN is the result of implementing the GENII software package (RSICC package identifier: C006011BMPC02) on the Linux platform. The GENII portion of the GENII-LIN package contains the program which was

developed to incorporate the internal dosimetry models recommended by the International Commission on Radiological Protection (ICRP) into the environmental pathway analysis models used at Hanford. GENII, is a coupled system of six programs (ENV, ENVIN, DOSE, INTDF, EXTDF, DITTY) and the associated data libraries that comprise the Hanford Dosimetry System (Generation II) to estimate potential radiation doses to individuals or populations from both routine and accidental releases of radionuclides to air or water and residual contamination from spills or decontamination operations.

General features of the GENII-LIN system include:

- capabilities for calculating radiation dose both for acute and chronic releases, with options for annual dose, committed dose and accumulated dose; and
- capabilities for evaluating exposure pathways including direct exposure via water (swimming, boat, fishing), soil (buried and surface sources) and air (semi-infinite cloud and finite cloud model), inhalation pathways and ingestion pathways.

The release scenarios considered are:

- acute release to air, from ground level or elevated sources, or to water;
- chronic release to air, from ground level or elevated sources, or to water; and
- initial contamination of soil or surfaces.

GENII-LIN 2.0 comes with a new set of programs (ENV13, INTDF13, EXTDF13, DOSE13) and associated data libraries. It keeps all the capabilities of GENII-1.485 and incorporates into the existing environmental pathway analysis models the more recent internal dosimetry models recommended by the ICRP 72 and the radiological risk estimating procedures of FGR13.

GENII-LIN runs under Linux on an Intel Pentium or equivalent PC; both 32bit and 64bit systems are supported. Required software includes g77, for the GENII portion of the code, and GNU C++ COMPILER, g++, for the GUI; Qt3 libraries by Trolltech version 3.3.3 or higher. Both g77 and g++compilers are part of the GNU Compiler suite (version 3.3.3 or later is recommended). GENII-LIN has been successfully built with Qt 3.3.1 and Qt 3.3.2; however a full test has been performed only with Qt 3.3.3 through Qt 3.3.6. Use earlier versions at your own risk. The package is transmitted on a CD in a GNU compressed tar file which includes source codes, executables, scripts and instructions. References: Informal paper (November 2004), PNL-6584 Vol. 1 (December 1988). and PNL-6584 Vol. 2 (November 1988). Pentium PC; Fortran77; C++ (C00728PC58600).

[CCC-732/SCALE 5.1 and ORIGEN-ARP 5.1](#)

Oak Ridge National Laboratory, Oak Ridge, Tennessee, contributed a newly frozen version of this modular code system for performing Standardized Computer Analyses for Licensing Evaluation. SCALE 5.1 includes numerous enhancements and corrections. New data libraries include: ENDF/B-VI derived cross-section libraries, both multigroup and continuous energy; seven PWR, nine BWR and five VVER libraries for ORIGEN-ARP based on 2-D models; and TSUNAMI covariance libraries with data for nearly all nuclides in ENDF/B-V and -VI. See the developers' website and the SCALE 5 electronic notebook for details on updates and tips on running the code.

What's New in SCALE5.1? http://rsicc.ornl.gov/rsicnew/SCALE5.1_WhatsNew.pdf

SCALE website <http://www.ornl.gov/sci/scale>

Electronic notebook: <http://rsicc.ornl.gov/rsicnew/CFDOCS/scale5notebook.cfm>

The SCALE system was developed for the Nuclear Regulatory Commission to satisfy a need for a standardized method of analysis for the evaluation of nuclear fuel facility and package designs. In its present form, the system has the capability to perform criticality, shielding, radiation source term, spent

fuel depletion/decay, and reactor physics analyses using well established functional modules in automated sequences designed for ease of use.

ORIGEN ARP is an automated depletion decay sequence for both Windows and Unix/Linux systems. ORIGEN-ARP supercedes the old ORIGEN2 code. It includes a Windows graphical user interface (GUI) for ORIGEN S and ARP (Automated Rapid Processing), which automatically interpolates cross sections on enrichment, burnup, and optionally moderator density using a set of standard basic cross section libraries for LWR and MOX fuel assembly designs. The interpolated cross sections are passed to ORIGEN S. Utility codes are provided so SCALE users can generate their own ORIGEN ARP basic cross section libraries via TRITON or SAS2H.

An advanced HTML-formatted output interface has been developed for the KENO V.a Monte Carlo code. In addition to easily navigated and color-coded tables of data, interactive plotting capabilities are available. A version of the SCALE 5 data plotting code Javapeno has been developed that executes within the web browser as a Java applet. Javapeno compatible data files are created by KENO V.a. so that the user may view data in colorful, interactive, and customizable plots.

KENO-VI has been enhanced to remove the restriction on the intersection of nested array boundaries. This enhancement allows the user to set up complex problems much more simply and avoids the possibility of erroneous keff calculations.

The TSUNAMI (Tools for Sensitivity and Uncertainty Analysis Methodology Implementation) sensitivity and uncertainty (S/U) analysis capabilities for criticality safety have been enhanced:

- analysis of models with more than 50 nuclides with resolved-resonance data;
- processing of ENDF/B-V and -VI data with the new sensitivity version of CENTRM known as CENTRMST;
- complete cross-section covariance data libraries for use with END/B-V and ENDF/B-VI.

The TRITON fuel depletion module now has the capability to perform 3-D depletion calculations using the KENO V.a or KENO-VI Monte Carlo codes. In addition, the geometry input for NEWT, the discrete ordinates code used by TRITON for 2-D depletion, has been replaced with the more versatile SCALE Generalized Geometry Package (SGGP) in KENO-VI. This upgrade improves the portability of input between NEWT and KENO, makes NEWT input for arrays easier, and reduces the input learning requirements for users.

Other automated criticality safety related sequences include the STARBUCS 3-D burnup credit sequence (combining ORIGEN-ARP with KENO V.a or KENO-VI) and the SMORES 1-D material optimization sequence for criticality safety.

SCALE 5.1 runs on Windows XP and Unix, including Linux and Intel Mac OS/X. Unix/Linux/MAC and Windows versions including binary data libraries are included on one DVD each.

The Windows version contains Fortran source and executable files created with Version 7.1 of the Lahey F95 compiler on a Pentium 4 (32-bit) running Windows XP Service Pack 2. Windows XP or later is supported. Earlier versions of Windows are not supported. The Windows version runs on Pentium personal computers with a minimum of 512 MB RAM (1 GB or more is recommended). Nominal hard disk requirements are 5 GB for a complete installation, including space for running sample problems.

The UNIX version of SCALE was tested on HP/Compaq Alpha, Linux, and Intel Mac OS/X workstations and requires approximately 5 GB of disk space to create executables and data libraries and run sample problems. More than 1 GB RAM may be required to run TSUNAMI on some operating systems. This distribution includes Fortran 95 and C source codes, data libraries, test cases, and Makefiles necessary to build and test the entire system. The Unix DVD includes **Linux executables** compiled with Intel ifort version 9.1.039 on an AMD Opteron running the RedHat Enterprise Linux 4 and **Intel Mac**

OSX executables created with Intel ifort compiler 9.1. Fortran 95 and C compilers are required on all other Unix systems. Flags are included for IBM RS/6000, HP, and SUN/Solaris although SCALE 5.1 was not fully implemented on these computers at the time of the release because the developers' access was limited to older systems with insufficient memory and compilers that did not fully implement current Fortran standards. Users are advised to check the SCALE Notebook for possible solutions if they encounter problems while compiling the system. Reference: ORNL/TM-2005/39, Version 5.1, Vols. I-III, November 2006. Fortran 90/95 and C; HP/Compaq Alpha, Linux, Mac OS X and Windows XP (C00732/MNYCP/00).

[PSR-158/SAMMY-7](#)

Oak Ridge National Laboratory, Oak Ridge, Tennessee, contributed a newly frozen version of this multilevel, multichannel R-matrix code. The purpose of the code is to analyze time-of-flight cross section data in the resolved and unresolved resonance regions, where the incident particle is either a neutron or a charged particle (p, α , d, ...). Energy-differential cross sections and angular-distribution data are treated, as are certain forms of energy-integrated data. Numerous modifications, additions, and improvements were made in SAMMY-7.0.0. See the SAMMY home page http://www.ornl.gov/sci/nuclear_science_technology/nuclear_data/ for more details on capabilities and new features.

In the resolved resonance region (RRR), theoretical cross sections are generated using the Reich-Moore approximation to R-matrix theory (and extensions thereof). Sophisticated models are used to describe the experimental situation: data-reduction parameters (e.g. normalization, background, sample thickness) are included. Several options are available for both resolution and Doppler broadening, including a crystal-lattice model for Doppler broadening. Self-shielding and multiple-scattering correction options are available for analysis of capture cross sections. Multiple isotopes and impurities within a sample are handled accurately.

Cross sections in the unresolved resonance region (URR) can also be analyzed using SAMMY. The capability was borrowed from Froehner's FITACS code; SAMMY modifications for the URR include more exact calculation of partial derivatives, normalization options for the experimental data, increased flexibility for input of experimental data, introduction of user-friendly input options.

In both energy regions, values for resonance parameters and for data-related parameters (such as normalization, sample thickness, effective temperature, resolution parameters) are determined via fits to the experimental data using Bayes' method. Final results may be reported in ENDF format for inclusion in the evaluated nuclear data files.

All Unix and Linux systems require a Fortran compiler to create executables. Windows users may run included PC executables (found in subdirectory /Windows), which were created on a Dell Dimension 4100 operating under Windows 2000 SP4 with Compaq Visual Fortran Professional Edition 6.6.B; alternatively, they may create their own executables using information provided in that same subdirectory. SAMMY-7 was tested on the following machines:

Pentium running Windows 2000 SP2 with Compaq Visual Fortran Professional Ed. 6.6B

Pentium under WindowsXP using included executables

Alpha Compaq Unix Tru64 V5.1A with HP Fortran V5.5A-3548-48D88

Alpha Compaq Unix Tru64 V5.1A with Compaq f77 V5.4A

Alpha Digital Unix 4.0F with Compaq V 5.5-1877

AMD Athlon running RedHat Linux 7 with G77 Version 0.5.26

AMD Opteron under RedHat Enterprise Linux 4 with Portland Group, Inc. 6.1-6 32-bit compiler

IBM RS/6000 running AIX 5.1 with IBM XL Fortran for AIX Version 8.01.0000.0003

The package is distributed on CD which contains the referenced document in PDF format and a compressed Unix tar file with the source code, Windows executable files, tutorials, scripts, and test cases. WinZIP 8.0 is required to expand this file under Windows. Reference: ORNL/TM-9179/R7 (September 2006). Fortran; DEC Alpha, IBM RS/6000; PC Linux and Windows (P00158/MNYCP/10).

ANS News

2007 Candidates Selected

The 2007 slate of officers for the ANS has been selected by the nominating committee. They are:

Vice President / President-Elect Candidates—*William E. Burchill* (Texas A&M University); and *Andrew C. Klein* (Oregon State University).

Treasurer Candidates (a two-year term)—*Michaele C. Brady-Raap* (Battelle - PNNL), *Eric P. Loewen* (General Electric).

Board of Directors: Members of the ANS Board of Directors each serve a three year term that begins and ends during an ANS Annual Meeting. The ANS Bylaws and Rules require that U.S. and non U.S. members be proportionately represented; therefore, in the 2007 election, there are four U.S. Director at-Large, and one non-U.S. Director at-Large positions to be filled.

- The nominees for the U.S. Director at-Large positions are *Sama Bilbao y Leon* (Dominion Resources), *Joe F. Colvin* (Nuclear Energy Institute - ret.), *James Klapproth* (General Electric Nuclear Energy), *John F. Kotek* (Washington Policy & Analysis, Inc.), *Alan E. Levin* (Areva NP Inc.), *David J. Modeen* (EPRI), *Jose N. Reyes, Jr.* (Oregon State University), and *Paul P. Wilson* (University of Wisconsin - Madison).
- The Non-U.S. Director at-Large Position Candidates are *Gustavo Alonso* (National Institute of Nuclear Technology) and *Juan Luis Francois* (University of Mexico).

Ballots for the 2007–2008 election will be mailed on March 12, 2007, and must be returned and received by ANS no later than 12 noon on Tuesday, April 23, 2007.

2007 Special Award Candidates Sought

“Forwarding and Implementing the Nuclear Renaissance” is the topic for the 2007 ANS Special Award. Candidates should demonstrate that they played an outstanding role in the necessary research and analysis and/or in the interpretation and leadership associated with furthering the overall understanding of this important effort. Nominations are due April 1, 2007. For more information and a nomination form, go to <http://www.ans.org/honors/va-special>.

ANS Testimonials

Did you know that the ANS website has a page for testimonials? A diverse group of members have shared how ANS membership has helped to shape and enhance their careers, while also providing an organization through which to network with researchers and others in the field both nationally and internationally. Consider submitting your own testimonial at <http://www.ans.org/memberinfo/testimonials.html>. Perhaps it will inspire someone new to the industry to join.

ANS Scholarships

A number of 2007 scholarships are available through the ANS. Descriptions of the scholarships and applications are located at <http://www.ans.org/goto/nad.cgi?id=1162533600-10>.

Speakers Bureau

If you enjoy educating, informing and speaking with school children, the public, decision makers, community leaders and members of the media, join the ANS Speakers Bureau and help provide expert information about nuclear science and technology. To learn more and join go to <http://www.ans.org/goto/nad.cgi?id=1162533600-12>.

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 riceaf@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.

MCNPX Workshops

Lead Teachers: Drs. John Hendricks, Gregg McKinney, Laurie Waters

Organizer: HQC Professional Services

Contact: bill@mcnpxworkshops.com

Information: <http://mcnpxworkshops.com> and MCNPX homepage: <http://mcnpx.lanl.gov>

2006 Schedule		
Nov. 27–Dec. 3	Santa Fe, NM	Intermediate/Advanced
2007 Schedule		
Jan. 8–12	Las Vegas, NV	Advanced
Jan 29–Feb 2	Paris, France	Introductory
Mar 12–16	San Francisco, CA	Intermediate
Apr 30–4 May	Honolulu, HI	Introductory
June 4–8	Santa Fe, NM	Introductory
Sept 17–21	Santa Fe, NM	Advanced
October 22–26	Europe	Intermediate

MCNPX is packed with new and exciting plotting features, including numerous mesh tally options which can be superimposed on your geometry plot and plotted within the MCNPX run, eliminating the need for post-processing and costly additional plotting package(s). You can plot particle flux, tracks, dosage, and energy deposition as well as source points and many others.

The workshops include hands-on instruction, generally on PC Windows machines. Subject to participant export approval from the MCNPX beta test team, participants will be able to access the Fortran 90 version of MCNPX 2.6, the LA150 (150 MeV) cross-section data libraries for over 40 isotopes for incident neutrons and protons and 12 for photonuclear interactions, and a notebook of viewgraphs.

Follow-up consultation for class participants will be provided.

The classes are taught by experienced MCNPX code developers and instructors. More information on code versions and capabilities is available at MCNPX Workshops web site <http://mcnpworkshops.com>.

To register go to <http://mcnpworkshops.com/regform.html>.

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Conference on Nuclear Training and Education (CONTE III)

CONTE III is an ANS Topical Conference which will be held in Jacksonville, Florida, February 4–7, 2007. The program supports the conference mission to be an “international forum on nuclear energy training and education and workforce issues facing a renewed nuclear energy option.” The program track includes:

- Human Performance Improvement
- Workforce Planning/Recruiting/Diversity
- Personnel Training/Qualification/Education
- Knowledge Retention
- New Educational Partnerships – University/Industry/Government
- Engineering Education – Distance Learning
- Leadership Development/Succession Planning
- International Perspectives

Relevant conference information is posted at <http://www.ans.org/meetings/calendar.cgi?d=2-4-2007>

33rd Waste Management Conference



The 33rd Waste Management Conference (WM'07) will be held February 25–March 1, 2007, in Tucson, Arizona. The conference is organized by WM Symposia, Inc., an Arizona non-profit corporation and hosted by the University of Arizona.

Sponsoring organizations include the American Nuclear Society, the American Society of Mechanical Engineers, New Mexico State University Waste-Management Education and Research Consortium (WERC) and OECD/NEA. The conference is also organized in cooperation with the US Department of Energy (DOE), Nuclear Regulatory Commission (NRC), Environmental Protection Agency (EPA) and International Atomic Energy Agency (IAEA). Information relevant to the conference is available on the website (<http://www.wmsym.org/>).

PHYTRA1

The First International Conference on Physics and Technology of Reactors and Applications (PHYTRA1) will be held March 14–16, 2007, in Marrakech City, Morocco. This is the first International Conference organized by the Moroccan Association for Nuclear Engineering and Reactor Technology “GMTR” after a series of three national conferences. The objective is to provide scientists and engineers from different countries an opportunity to present their recent work in reactor physics and nuclear technology. Industrial vendors may exhibit their products and innovations in different domains related to reactor physics and nuclear technology. The PHYTRA1 conference will also be a celebration for the operation of the first research reactor (TRIGA Mark II) in Morocco which is expected to be commissioned in 2006.

Conference topics include:

- Deterministic and Monte Carlo Transport Theory Methods
- Reactor Core and Lattice Physics Methods
- Physics and Computational Methods for Advanced Reactors
- Reactor Theory and Reactor Concepts
- Neutron Kinetics and Dynamics
- Criticality and Safety Analysis
- Fuel Loading Optimization and Fuel Design
- Nuclear Data Analysis and Methods
- Computer Codes and Benchmarks
- Computational Methods for Research Reactors
- High Temperature Reactor Physics and Methods
- Reactor Thermal Hydraulics
- Radioactive Waste Management
- Research Reactor Utilization
- Reactor Dosimetry and Reactor Shielding

Information on the conference can be found at the website, <http://www.fst.ac.ma/gmtr/phytra1/phytra1.html>, or by contacting Pr. A. Jehouani, Faculty of Sciences SEMLALIA, Dept. of Physics, University Cadi Ayyad- Marrakech, Morocco (email PHYTRA1@fsr.ac.ma or jehouani@ucam.ac.ma, fax 212-44-43-74-10) or Pr. L. Erradi, GMTR President, Mohammed V Agdal University, Faculty of Sciences, Department of Physics, B. P. 1014 Rabat, Morocco (email erradi@fsr.ac.ma or fax 212-0-37-77-89-73).

National Physical Laboratory (UK) Hosts Two MC Events

The National Physical Laboratory (NPL) will host two Monte Carlo events in March 2007. The International Workshop on Monte Carlo Codes, a two-day workshop devoted to some of the most popular Monte Carlo radiation transport codes, will be held at NPL on March 26–27, 2007. It will include sessions on the following codes: EGSnrc, Geant4, MCNPX, and PENELOPE. Presentations will cover the important features, capabilities and recent developments of each code, as well as one or more demonstrations of real applications. There will also be several introductory lectures on general Monte Carlo techniques for novice users that are applicable to all radiation transport codes. At the end of the first day, there will be a session during which delegates may demonstrate their own applications and problems.

The workshop will be followed by the 13th UK Monte Carlo User Group Meeting (MCNEG 2007) March 28–29. The MCNEG 2007 meeting will provide delegates with the opportunity to present and discuss their applications and recent developments of Monte Carlo in radiotherapy, radiation protection, radioactivity, the nuclear and other industries. The meeting format will encourage extensive discussion and feedback on recent topics in these areas of Monte Carlo. The meeting will include several talks from the invited speakers on recent Monte Carlo topics, presentations by delegates on submitted topics, and tours of the new state-of-the-art radiation facilities at NPL.

Questions regarding the Monte Carlo workshop and MCNEG 2007 may be directed to one of the local organisers: David Shipley (phone +44 (0) 20 8943 6252, fax +44 (0) 20 8943 6070, email david.shipley@npl.co.uk), Mark Bailey (phone +44 (0) 20 8943 6797, fax +44 (0) 20 8943 6070, email mark.bailey@npl.co.uk) or Alan DuSautoy (phone +44 (0) 20 8943 6563, fax +44 (0) 20 8943 6070, email alan.dusautoy@npl.co.uk). Relevant information for both events can be found at <http://www.npl.co.uk/ionrad/training/montecarlo/>. Mail can be sent to National Physical Laboratory, Hampton Road, Teddington, Middlesex, United Kingdom TW11 0LW.

M&C + SNA 2007

The Joint International Topical Meeting on Mathematics & Computations and Supercomputing in Nuclear Applications (M&C+SNA) will be held April 15–19, 2007, in Monterey, California. The

conference will provide an international forum to review recent research results, and the status and trends in high performance computing, numerical simulation and physical modeling of current and advanced nuclear systems. Topics include:

- Computational Methods Using High Performance Computers
- Computational Reactor Physics and Particle Transport
- Nuclear Reactor Analysis
- Computational Biomedical Applications
- Computational Nuclear Fuel Cycle/Repository Performance
- Computational Plasma Physics/Fusion
- Computational Thermal Hydraulics
- Computational Materials Sciences
- Computational Science
- Planned Special Sessions
 - Domain Representation for Advanced Nuclear Applications
 - Nuclear Methods for Nonproliferation and Homeland Security
 - Analytical Benchmarks
 - Tomographic Phantoms
 - Stochastic Considerations in Particle Transport

Program, registration, and other significant information about the conference may be found at the website, <http://mc-sna07.nuc.berkeley.edu/>. General questions about the conference may be addressed to mcinfo@nuc.berkeley.edu and questions regarding the program should be submitted to vujic@nuc.berkeley.edu.

[ND2007](#)

The International Conference on Nuclear Data for Science and Technology will be held April 22–27, 2007, in Nice, France. The conference is organized by the Commissariat à l'Énergie Atomique (CEA) under the auspices of the OECD Nuclear Energy Agency (NEA). The General Chairs are B. Bigot, Haut-commissaire à l'Énergie Atomique and L. Echávarri, NEA Director-General. The technical program includes the following topics:

- Nuclear structure and decay data
- Experimental facilities and detection techniques
- Nuclear data measurements and analysis
- Nuclear theories, models and data evaluation
- Standards
- Evaluated nuclear data libraries and processing
- Validation, benchmarking of evaluated data
- Integral experiments
- Uncertainties quantification
- Data dissemination and international collaboration
- Fission energy applications
- Accelerator-related applications
- Fusion technology applications
- Dosimetry and shielding applications
- Safeguards and security
- Space, cosmic-ray applications, radiation effects on electronics
- Astrophysics and cosmology applications
- Medical and environmental applications

The most current information will be posted on the website at http://www-dapnia.cea.fr/Sphn/nd2007/site_nd2007/ and questions or comments may be addressed to nd2007@cea.fr.

WIN Global 2007

NOTE: This is a change in the date and location for this meeting.

The Women in Nuclear (WIN) Global Conference 2007 will be held in Bali, Indonesia, April 22-27, 2007. Bookmark <http://win-global.org/> and check it often for details of the conference. Begin now to plan and budget to attend this important conference.

International Conference on Emerging Nuclear Energy Systems (ICENES 2007)

The committee for the 13th International Conference on Emerging Nuclear Energy Systems (ICENES 2007) has issued a call for papers for the conference to be held June 3–8, 2007, at Gazi University in Istanbul.

The main objective of ICENES is to provide a broad review and discussion of various advanced, innovative and non-conventional nuclear energy production systems to scientists, engineers, industry leaders, policy makers, decision makers and young professionals who will shape future energy supply and technology. ICENES 2007 will also open the forum to innovative non-nuclear technologies, such as hydrogen energy, solar energy, deep space exploration, etc. with an emphasis on *unthinkable ideas* with a sound scientific-technical basis. The program will include invited papers, submitted contributions in oral and poster sessions, as well as an industrial exhibition and social tours. Topical areas include:

- Advanced Fission Systems
- Fusion Energy Systems
- Accelerator Driven Systems
- Exotic Nuclear Reactor Concepts
- Transmutation and Fuel Cycle
- Co-Generation and Non-Electricity Production Applications
- Generation IV Reactors
- Space Power and Propulsion
- Deep Space Exploration, general
- Nuclear Hydrogen Production
- Radiation Protection & Shielding
- Hydrogen Energy, general including non-nuclear applications
- Solar Energy
- Other Alternative Energies
- Societal Issues

The official language of the conference will be English. The proceedings will be produced on an interactive CD-ROM with an ISBN registration number. A selection of ICENES 2007 papers will be published in a special edition of the journal *Energy Conversion & Management*. Scientific and technical inquiries may be directed to Prof Dr. Sümer Şahin, Gazi University 06500 ANKARA/TURKEY (phone +90 (312) 212 43 04, fax +90 (312) 212 43 04, email sumersahin@icenes2007.org). Updated information will be posted to <http://www.icenes2007.org/>.

ANS Call for Papers

The organizing committee has issued the call for papers for the 2007 Annual Meeting to be held June 24–28, 2007, in Boston. The meeting theme is “It’s all About the People: The Future of Nuclear.” The meeting is organized around the following tracks:

1. Meeting Theme—It’s All About the People: The Future of Nuclear
2. Nuclear Power and New Construction of Nuclear Systems
3. Fuel Cycle, Waste Management, and Decommissioning Technologies
4. Nuclear Facility and Criticality Safety
5. Environmental Science and Technologies
6. Medical and Nonpower Applications of Radiation

7. Nuclear Science and Engineering
8. Advanced Energy Research and Emerging Technologies
9. Education, Training, and Communication with the Public
10. Nuclear Nonproliferation and Security
11. Professional Development

Summaries of 450–900 words using the ANS Template and “Guidelines for *TRANSACTIONS* Summary Preparation” may be submitted between November 1, 2006 and January 12, 2007. Summaries must be submitted electronically using Adobe Acrobat (PDF) files and original Microsoft Word documents and the ANS Electronic Submission System. Summaries not based on the ANS Template will be rejected. Summary guidelines and templates can be found at <http://www.ans.org/pubs/transactions/>; summaries are to be submitted to <http://www.ans.org/meetings/>.

Space Nuclear Conference 2007 (SNC '07)

The second topical meeting organized by the Aerospace Nuclear Science and Technology (ANST) technical group, Space Nuclear Conference 2007 (SNC '07), will take place June 24–27, 2007, in Boston. NASA funding has been established to develop capabilities for unmanned and manned missions to the moon, Mars, and beyond. Strategies implementing nuclear based power and propulsion technology, as well as radiation shielding protection, will be an integral part of these missions.

The purpose of the meeting is to bring together research and management personnel from government, industry, academia, and the national laboratory system and provide a forum for information exchange for those who are involved in space projects. The meeting will include topics ranging from overviews of current programs and plans to detailed issues related to space travel, such as nuclear-based power and propulsion systems designs, materials, testing, safety, space environmental effects and nuclear power system radiation shielding for humans and electronic components, and human factor strategies for the safe and reliable operation of nuclear power and propulsion plants. Full-length, peer-reviewed technical papers will be published on a CD, which will be available at the conference. The call for papers and other information relevant to the conference is available at the website, <http://www3.inspi.ufl.edu/space07/>, or contact Lynne Schreiber, Conference Administrator, (phone 352-392-9722, fax 352-392-8656, email space@ans.org).

WNU Summer Institute

The 2007 WNU Summer Institute will be held July 14–August 24, near Daejeon, South Korea. It will be hosted by the Korea Atomic Energy Research Institute (KAERI) and Korea Hydro & Nuclear Power Co. (KHNP). The institute was developed by the World Nuclear University in partnership with world institutions who lead in nuclear learning. Applications are invited for this intensive six-week training experience in a broad spectrum of nuclear energy issues through lectures and tutorials presented by some of the world's foremost authorities on global environment, sustainable development, nuclear-related technology and innovation, non-proliferation and nuclear industry practices. The program will also include technical tours of nuclear and industrial facilities as well as cultural and social events. As a result of the inaugural Institute in the USA in 2005 and the 2006 Institute held in Sweden and France, WNU Fellows from more than 30 countries have become part of a growing global network of future leaders in the nuclear profession. Ninety WNU Fellows will be selected from among nuclear students and young professionals to participate in the 2007 Institute. WNU Fellowship qualification criteria and application forms are available on the WNU website (www.world-nuclear-university.org), and should be submitted to the WNU Coordinating Centre no later than November 30, 2006.

AccApp'07

The jointly sponsored ANS/IAEA International Conference on Applications and Utilization of Accelerators (AccApp'07) will take place in Pocatello, Idaho, on July 30-August 2, 2007, and will be hosted by Idaho State University and the Idaho Accelerator Center.

There will be plenary sessions and a separate embedded Accelerator-Driven Subcritical System Experiments Workshop of five sessions. The organizing committee is asking for volunteers to be topic organizers and co-organizers. Contact Phil Cole, cole@athena.physics.isu.edu, and copy Phil Ferguson fergusonpd@ornl.gov and Alex Stanculescu A.Stanculescu@iaea.org on your message if you wish to volunteer.

Global '07

The main focus of the Global '07 will be "Advanced Nuclear Fuel Cycles and Systems." The conference, to be held September 9–13, 2007, in Boise, Idaho, is jointly sponsored by the Idaho National Laboratory, American Nuclear Society, Idaho Section of American Nuclear Society, European Nuclear Society and Atomic Energy Society of Japan. Summaries are due January 26, 2007, and should support the conference topics which are:

- Advanced Integrated Fuel Cycle Concepts
- Spent Nuclear Fuel Reprocessing
- Advanced Reprocessing Technology
- Advanced Fuels and Materials
- Advanced Waste Management Technology
- Novel Concepts for Waste Disposal and Repository Development
- Advanced Reactors
- Partitioning and Transmutation
- Hydrogen Production with Nuclear Energy
- Developments in Nuclear Nonproliferation Technology, Policy, and Implementation
- Sustainability and Expanded Global Utilization of Nuclear Energy
- International Cooperation on Nuclear Energy

Conference and registration information is posted to <http://nuclear.inel.gov/global07/index.shtml>.

Regional Congress for Central and Eastern Europe



The International Radiation Protection Association (IRPA) Regional Congress for Central and Eastern Europe will be held in Brasov, Romania, September 24–28, 2007. It will be organized by the Romanian Society for Radiological Protection (RSRP). This Regional Congress will present an opportunity to debate those subjects which will determine the future of this specialty, ranging from the science of biological radiation effects to the regulation and practice of radiation protection, which includes the control of natural, occupational and medical exposures, the development of the radiological protection system, protection against non-ionizing radiation and the participation of the public. The Congress technical program will be led by renowned experts as invited speakers, with refresher courses and poster sessions, some of which will be selected for oral presentations. There will be an IRPA Associated Societies Forum and a Technical Exhibition, and the Third Workshop of the Regional East European and Central Asian Countries ALARA Network, which is supported by the IAEA, will take place during the same period. Topics include:

- Radiation biology
- Health effects of ionizing radiation
- Radiological protection infrastructure, regulation and policy
- From legal requirements to practical regional aspects
- Dosimetry and instrumentation
- Education and training
- Radiation protection at workplaces
- Radiation protection of patients
- Radiation protection, environment and public
- Waste management and treatment
- Decommissioning and site remediation
- Incidents, accidents and post accident
- Non-ionizing radiations
- Radiation protection and safety in nuclear fuel cycle

Complete and updated information can be found at <http://www.irpa2007romania.com/>.

CONRAD-WP4

The European Radiation Dosimetry Group (EURADOS) is sponsoring the CONRAD WP4 workshop on “Uncertainty Assessment in Computational Dosimetry: A Comparison of Approaches.” The workshop will be held in Bologna, Italy, October 1–3, 2007. The aims of the workshop are to discuss the results of a questionnaire on the expression of uncertainties in dosimetry measurements and calculations and to present contributions of general relevance within the scope of the WP4 action. Summaries of the results will be presented together with oral and poster communications by the participants on the following topics:

Recoil-proton telescope detector
 Bonner sphere spectrometer
 Sigma simulated workplace neutron field
 Photon irradiation facility
 Manganese bath
 Iron sphere experiments
 Energy response characteristics of a RadFET radiation detector
 Recoil-proton telescope detector; sensitivity and uncertainty analysis

The deadline for the submission of problem solutions is December 15, 2006. The workshop chairman is Dr Gianfranco Gualdrini, ENEA-Instituto di Radioprotezione, 16 Via dei colli, 40136 Bologna (BO) ITALY (email guald@bologna.enea.it. Phone 39 051-6098350, fax 39 051-6098003). Preliminary registration will begin February 15, 2007. Details and the latest news regarding the workshop can be found at <http://www.eurados.org/>.

CALENDAR

November 2006

International Conference on Radiation Biology/8th Annual Meeting of the Indian Society of Radiation Biology, Nov. 20–22, 2006, Varanasi, India. Contact: Y. B. Tripathi, Dept. of Medicinal Chemistry, Inst. of Medical Sciences, Banaras Hindu University, Varanasi-221005, India (isrbhbhu@yahoo.com) url www.bhu.ac.in or www.isrb-india.com.

Europe Invests Again in Nuclear Energy, Nov. 22–23, 2006, Berlin, Germany. Contact: dcbm through www.energyineurope.eu/en_register.htm.

92nd Scientific Assembly and Annual Meeting, Nov. 26–Dec. 1, 2006, Chicago, Illinois, sponsored by the Radiological Society of North America. Registration and program information can be found at <http://rsna2006.rsna.org>.

MCNPX Intermediate/Advanced Workshop, Nov. 27–Dec. 3, Santa Fe, New Mexico. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com) url <http://mcnpxworkshops.com>.

December 2006

Region I Conference 2006 – “Women in Nuclear and the Nuclear Renaissance,” December 4-5, 2006, Radisson Lackawanna Station Hotel, Scranton, PA. Contact: Nancy Bulkeley at 860-444-5581 or nancy_h_bulkeley@dom.com, url <http://www.winus.org/>.

International Conference on Lessons Learned from Decommissioning of Nuclear Facilities and the Safe Termination of Nuclear Activities, Dec. 11–15, 2006, Athens, Greece, sponsored by the International Atomic Energy Agency. Contact: Dennis Reisenweaver, Div. of Radiation, Transport and Waste Safety, IAEA, P.O. Box 100, Wagramer Strasse, A-1400 Vienna, Austria. (phone 43-1-2600-22852, fax 43-1-26007, email d.reisenweaver@iaea.org).

January 2007

MCNPX Advanced Workshop, Jan. 8–12, 2007, Las Vegas, Nevada. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com) url <http://mcnpxworkshops.com>.

3D S.UN.COP 2007, Jan. 22–9 Feb. 2007, Texas A&M University, College Station, Texas. Contact: Alessandro Petruzzi (email a.petruzzi@ing.unipi.it) url <http://dimnp.ing.unipi.it/3dsuncop>.

MCNPX Introductory Workshop, Jan 29–Feb 2, Paris, France. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com) url <http://mcnpxworkshops.com>.

Safety Cases for the Deep Disposal of Radioactive Waste—Where Do We Stand? International symposium organized by the OECD NEA, Jan. 23–25, 2007, Paris. Contact: Betsy Forinash, NEA Radioactive, 12 Blvd. des Îles, 92130 Issy-les-Moulineaux, France (email igsc@oecd.org).

February 2007

Conference on Nuclear Training and Education (CONTE III), Feb. 4–7, 2007, Jacksonville, FL. Registration and Meeting Information: <http://www.ans.org/goto/nad.cgi?id=1157691600-16>.

Waste Management 2007 (WM 2007), Feb. 25–March 1, 2007, Tucson, Arizona. Contact: Gary Benda (phone 803-345-2170 or email gbenda@wmarizona.org) url www.wmsym.org.

March 2007

WIN Region II Conference 2007, March 5–6, 2007, Atlanta, GA. Contact: Equilla Minga at mingabe@inpo.org, url <http://www.winus.org/>.

MCNPX Intermediate Workshop, Mar 12–16, 2007, San Francisco, California. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com) url <http://mcnpxworkshops.com>.

First International Conference on Physics and Technology of Reactors and Applications (PHYTRA1), March 14–16, 2007, Marrakech City, Morocco. Contact: Pr. A. Jehouani, Faculty of Sciences Semlalia, Dept. of Physics, University Cadi Ayyad- Marrakech, Morocco (email phytra@ucam.ac.ma or jehouani@yahoo.com, fax 212 44 43 74 10) or Pr. L. Erradi, GMTR President, Mohammed V. Agdal University, Faculty of Sciences, Department of Physics, B. P. 1014 Rabat, Morocco (email erradi@fsr.ac.ma or erradi@hotmail.com, fax 212-0-37-77-89-73) url <http://www.fst.ac.ma/gmtr/phytra1/phytra1.html>.

International Workshop on Monte Carlo Codes, March 26–27, 2007, NPL, Teddington, UK. Contact: David Shipley (phone +44 (0) 20 8943 6252, fax +44 (0) 20 8943 6070, email david.shipley@npl.co.uk), Mark Bailey (phone +44 (0) 20 8943 6797, fax +44 (0) 20 8943 6070, email mark.bailey@npl.co.uk) or Alan DuSautoy (phone +44 (0) 20 8943 6563, fax +44 (0) 20 8943 6070, email alan.dusautoy@npl.co.uk) url <http://www.npl.co.uk/ionrad/training/montecarlo/>.

13th UK Monte Carlo User Group Meeting (MCNEG 2007), March 28–29, 2007, NPL, Teddington, UK. Contact: David Shipley (phone +44 (0) 20 8943 6252, fax +44 (0) 20 8943 6070, email david.shipley@npl.co.uk), Mark Bailey (phone +44 (0) 20 8943 6797, fax +44 (0) 20 8943 6070, email mark.bailey@npl.co.uk) or Alan DuSautoy (phone +44 (0) 20 8943 6563, fax +44 (0) 20 8943 6070, email alan.dusautoy@npl.co.uk) url <http://www.npl.co.uk/ionrad/training/montecarlo/>.

April 2007

Joint International Topical Meeting on Mathematics & Computations and Supercomputing in Nuclear Applications (M&C+SNA), April 15–19, 2007, in Monterey, California. Contact: general questions (mcinfo@nuc.berkeley.edu); submit questions regarding the program (vujic@nuc.berkeley.edu) url <http://mc-sna07.nuc.berkeley.edu/>.

Women in Nuclear (WIN) Global Conference 2007, April 22-27, 2007, Bali, Indonesia. Information: <http://win-global.org/>.

MCNPX Introductory Workshop, April 30–4 May, 2007, Honolulu, Hawaii. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com) url <http://mcnpxworkshops.com>.

June 2007

ICENES 2007, June 3–8, 2007, Istanbul. Contact: Prof Dr. Sümer Şahin, Gazi University 06500 Ankara/Turkey Contact: Prof Dr. Sümer Şahin, Gazi University 06500 Ankara/Turkey (phone +90 312 212 43 04, fax +90 312 212 43 04, email sumersahin@icenes2007.org) url <http://www.icenes2007.org/>.

MCNPX Introductory Workshop, June 4–8, 2007, Santa Fe, New Mexico. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com) url <http://mcnpxworkshops.com>.

ANS Annual Meeting, “It’s All About the People: The Future of Nuclear,” June 24–28, 2007, Boston, Massachusetts. The url is <http://www.ans.org/meetings/>.

Space Nuclear Conference 2007 (SNC '07), an embedded topical of the ANS Annual Meeting, June 24–28, 2007, Boston. Contact: Lynne Schreiber, Conference Administrator, (phone 352-392-9722, fax 352-392-8656, email space@ans.org) url www.ans.org/goto/space07.

July 2007

U.S. Women in Nuclear Conference 2007, July 15-17, 2007, Anaheim, Calif. URL <http://www.winus.org/>.

September 2007

Global '07 “Advanced Nuclear Fuel Cycles and Systems” Sept. 9–13, 2007, Boise, Idaho. Information is posted at <http://nuclear.inel.gov/global07/contacts.shtml>.

MCNPX Advanced Workshop, Sept 17–21, 2007, Santa Fe, New Mexico. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com) url <http://mcnpxworkshops.com>.

October 2007

MCNPX Intermediate Workshop, October 22–26, 2007, Europe. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com) url <http://mcnpxworkshops.com>.