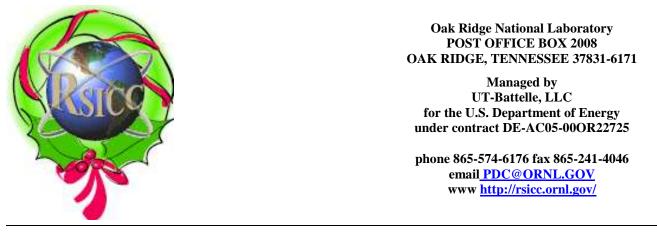# Radiation Safety Information Computational Center

No. 561   **December 2011**

The first great gift we can bestow on others is a good example.—Morell

RSICC will observe the holiday season beginning December 23, 2011, through January 2, 2012. We will respond to your requests upon return.

Merry Christmas and Happy 2012!

New Year, New RSICC Leadership

The New Year will bring changes in RSICC's organization. Bernadette Kirk will retire at the end of the year. She has been on the RSICC staff since 1983 and has led the Center since 2000. Effective January 1, Dr. Tim Valentine will become the Director of RSICC.

> "Under Bernie's leadership, RSICC has become one of the leading organizations for software collection and dissemination along with becoming a conduit for international collaboration in software and data development. Bernie's leadership of RSICC and in particular her leadership in promoting educational outreach through RSICC has garnered the gratitude of the laboratory management and the many sponsors of RSICC.
>
> Tim has been involved with RSICC for many years having first worked with RSICC when it was managed by Bob Roussin and worked closely with Bernie on nuclear data and codes in the former Engineering, Physics and Mathematics Division. He has released codes through RSICC and has served as a software reviewer for RSICC in the past. Tim looks forward to maintaining and enhancing RSICC's roles for a variety of federal sponsors and agencies."
> *Cecil V. Parks, Director*
> *Reactor and Nuclear Systems Division*

This will also be the last issue of the Newsletter prepared by Alice Rice, who is also retiring. Anita Benn will become the editor with the January 2012 issue.

> "The first issue I published was the January 1982 issue. It was prepared with an IBM Mag Card Typewriter using VERSACOMP software, which prepared the type for an Aps μ5 phototypesetter."
> *Alice Rice, Editor, RSICC Newsletter*

RSICC will continue operating within the Reactor and Nuclear Systems Division of Oak Ridge National Laboratory.

CHANGES TO THE RSICC CODE AND DATA COLLECTION

CCC-771/FSKY4C

CCC-771 / FSKY4C, Gamma Ray Skyshine Analysis Code, was contributed by the Institute of Nuclear Safety System, Sata 64, Mihama-cho, Mikata-gun, Fukui, Japan, and the Radiation Dose Analysis Network, Kita-machi 4-13-14, Kokubunji-city, Tokyo, Japan, through the OECD NEA Data Bank, Issy-les-Moulineaux, France. FSKY4C computes skyshine gamma ray dose for a system consisting of point sources, multilayer shields simulating a reactor containment vessel and an infinite homogeneous medium of air. The output includes both the exposure dose and the effective dose of gamma ray at points of detection arranged on the horizontal plane in the medium of air. FSKY4C can be applied to shields with 3 types of geometry including upper spherical shell (spherical dome), upper slab, and side cylinder and their combination up to 3 layers. It is assumed that all shields are symmetric against rotation with respect to the Z axis perpendicular to the plane including points of detection for skyshine dose, and that all sources locate along the Z axis.

FSKY4C version 1.0 corrects problems in:

- calculation of radiation penetrating through multilayer shields for the energy spectrum of a source specified by users.

- calculation of radiation penetrating through multilayer shields for an angular limit specified by users, and

- calculation of edge correction factor.

Included in the package is a CD in a Windows self-extracting file which includes an installation procedure, executables, scripts, data files, documentation, and sample problems. WINDOWS, X86 (C00771PCX8600).

CCC-772 PREP/SPOP

The Division of Radiochemistry, Joint Research Centre of the European Communities I-21020, Ispra, Italy, through the OECD NEA Data Bank, Issy-les-Moulineaux, France, contributed SPOP-4, an uncertainty and sensitivity analysis Monte Carlo program, and PREP, the input preparation program for SPOP. The PREP program (data PRE Processing Unit) prepares samples for a Monte Carlo simulation using the distribution functions of the input variables. Any degree of correlation among the variables can be requested in the input. The SPOP program (Statistics Post Processing Unit) is used for performing uncertainty analysis and sensitivity analysis on the output of the simulation runs. For each output variable SPOP provides:

- a histogram and cumulative distribution,

- confidence bounds on the cumulative distribution,

- mean and confidence bounds on the mean, and

- estimates of the sensitivity of each output variable to card input variable.

The package includes a CD with files in a zipped tar format (uncompressible with GNU utilities or WinZip) which includes an installation procedure, source, scripts, data files and documentation. Fortran 77 (C00772MNYCP00).

DLC-249/SERPENT117-ACELIB

SERPENT117-ACELIB, Continuous-Energy X-Sec Library, Radioactive Decay, Fission Yield Data for SERPENT in ACE, was contributed by the Helsinki University of Technology, Department of Applied Physics, Espoo, Finland, and VTT Technical Research Centre of Finland, Nuclear Energy, Espoo, Finland, through the Nuclear Energy Agency Data Bank, Issy-les-Moulineaux, France. SERPENT117-ACELIB is for continuous-energy cross section libraries and radioactive decay and fission yield data for the SERPENT Monte Carlo reactor physics burnup calculation code. These data contain unresolved resonance probability tables (when available) and replaces the data libraries distributed with the SERPENT installation package (C00757MNYWS00). The cross section libraries can also be used with MCNP. SERPENT117-ACELIB contains separate libraries for JEF-2.2, JEFF-3.1, JEFF-3.1.1, ENDF/B-VI.8, and ENDF/B-VII. Each library contains ACE format cross section data for 432 nuclides with missing data complemented from other evaluations. Radioactive decay and fission yield data are in standard ENDF format. The package is transmitted on 2 DVDs which contain the references, Perl Script, and data files. Perl (D00249MNYCP00).

DLC-250/ADS-LIB/V2.0

ADS-LIB/V2.0 was contributed by the Nuclear Data Section, International Atomic Energy Agency, Vienna, Austria, through the Nuclear Energy Agency Data Bank, Issy-les-Moulineaux, France. Research groups exploring the utilization of Accelerator Driven Systems (ADS) for power generation and the transmutation of actinide and fission product waste require well-defined cross-section libraries suitable for their transport calculations. Thus, a test library has been further developed and re-assembled to meet this request and assist benchmarking studies linked to ADS experiments and design concepts. The ADS-2.0 library has been prepared from the ENDF/B-VII.0 library and the JENDL/AC actinoid and IAEA-NDS tungsten files, and processed in suitable forms for Monte Carlo and deterministic transport codes used in the analysis of ADS. The resulting data package can also be applied to criticality calculations for new reactor designs, particularly for high-temperature systems (core materials up to 1800K). The package

is transmitted on a CD which contains the report, HTML pages and data files. HTML, JAVASCRIPT (D00250MNYCP00).

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.

Individuals who choose an internship or research opportunity at ORNL are paired with world-class scientists to solve real-world problems. 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 have catapulted their careers in science and technology. You can find it on YouTube at http://ow.ly/2EQLz.

Obituary

Mihran "Jack" Ohanian

With great sadness we report the death of Jack Ohanian on October 31, 2011, in Gainesville, Florida. Dr. Ohanian retired from the University of Florida in 2001 as Professor Emeritus. Prof. Ohanian was born to Armenian parents on August 7, 1933, in Istanbul, Turkey. He graduated Magna Cum Laude from Robert College in Istanbul with a BS degree in electrical engineering. He continued his education in the United States, earning both a Master's and Ph.D. in nuclear science and engineering at Rensselaer Polytechnic Institute. He then joined the faculty of the new Nuclear Engineering Department at the University of Florida. While at the university he attained U.S. citizenship in 1967. He went on to serve the university as professor, Department Chairman, Assoc. Dean for Research, Interim Vice President for Research, Dean of the Graduate School for the University and Interim Dean for the College of Engineering.

Ohanian was also very active in several professional organizations, including the American Nuclear Society, where he served as president from 1990–91. He also served as chair of the American Association of Engineering Societies (AAES). Dr. Ohanian published over 60 documents on nuclear engineering and continued to promote nuclear power by writing articles for newspapers after his retirement.

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 bennas@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.

TRAINING

MCNPX and 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.

2012 Classes for Visual Editor		
February 6–10	Intermediate MCNPX Visual Editor with a special emphasis on tallies and variance reduction	Richland, WA
February 20–24	Introduction to MCNP/MCNPX using the MCNPX Visual Editor	Paris, France
April 16–20	Introduction to MCNP/MCNPX using the MCNPX Visual Editor	Las Vegas, NV
April 23–27	Intermediate MCNPX Visual Editor with a special emphasis on tallies and variance reduction	Las Vegas, NV
May 14–18	Introduction to MCNP/MCNPX using the MCNPX Visual Editor	Honolulu, HI
July 16–20	Introduction to MCNP/MCNPX using the MCNPX Visual Editor	Livermore, CA
July 23–29	Introduction to MCNP/MCNPX using the MCNPX Visual Editor	Anaheim, CA
July 29–August 3	Intermediate MCNPX Visual Editor with a special emphasis on tallies and variance reduction	Anaheim, CA
August 6–10	Intermediate MCNPX Visual Editor with a special emphasis on tallies and variance reduction	Livermore, CA
September 10–14	Introduction to MCNP/MCNPX using the MCNPX Visual Editor	Myrtle Beach, SC
September 17–21	Intermediate MCNPX Visual Editor with a special emphasis on tallies and variance reduction	Myrtle Beach, SC

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.

MCNPX Classes 2012		
February 27–March 2	MCNP/X Intermediate Workshop	Paris, France
May 21–25	MCNP/X Intermediate Workshop	Honolulu, HI
July 2–6	MCNP/X Intermediate Workshop	Barcelona, Spain
September 24–28	MCNP/X Intermediate Workshop	Washington, DC

The MCNPX team at Los Alamos National Laboratory offers interactive workshops for training users in the capabilities of MCNPX at the intermediate level.

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

3D S.UN.COP 2012

The Nuclear Research Group of San Piero a Grado (GRNSPG) of University of Pisa (UNIPI), the Korea Atomic Energy Research Institute (KAERI), the University of Zagreb (FER) and the School of Industrial Engineering of Barcelona (ETSEIB) are jointly organizing Scaling, Uncertainty and 3D Coupled Code Calculations (3D S.UN.COP 2012).

The seminar will take place in Daejeon, South Korea, April 9–27, 2012. The seminar is divided into three parts and participants may choose to attend a one-, two- or three-week course depending on their interest in the following topics:

1) Fundamental Theoretical Aspects of the Methodologies;

2) Industrial Applications of Best Estimate Plus Uncertainty (e.g. from AECL, AREVA, Westinghouse, GEH), Foundation of Statistical Methods, Coupling Methodologies and Code Hands-on Training (e.g. RELAP, CATHENA, PARCS, TRACG, GOTHIC, RELAP5/SCDAP, Star-CD) and Special Sessions devoted to Computational Fluid Dymanics, Severe Accident Analysis, BEPU and CANDU Technologies.

3) Advanced User Training, including Code Hands-on Training for Transient Analysis

Further information may be requested from Alessandro Petruzzi at the following email address: a.petruzzi@ing.unipi.it or may be obtained from the Seminar's home page: http://grnspg.ing.unipi.it/3dsuncop.

Analytical Benchmarks: Case Studies in Neutron Transport Theory

A training course on "Analytical Benchmarks: Case Studies in Neutron Transport Theory," sponsored by the Nuclear Energy Agency Data Bank, will be held March 5–9, 2012, at the NEA, Issy-les-Moulineaux, France. Using the Handbook (including computer codes) published on "Analytical Benchmarks for Nuclear Engineering Applications (Case Studies in Neutron Transport Theory)" the course is intended for transport methods developers and those who teach reactor physics and transport theory. In addition, the course would be appropriate for anyone with an analytical interest in solving equations and the application of numerical methods to obtain extreme accuracy. Prof. Barry D. Ganapol will instruct the class.

CONFERENCES

MARC IX (Methods and Applications of Radioanalytical Chemistry) will be held March 25–30, 2012, in Kailua-Kona, Hawaii. The MARC conferences promote a broad exchange of information on radioanalytical chemistry among scientists from participating countries. The MARC VIII conference attracted participants from more than 35 countries. The central geographic location of Hawaii encourages participation and attendance of scientists from Pacific Rim countries as well as providing European scientists with easy accessibility via major US airports. The scope of the conference includes, but is not limited to, techniques such as instrumental and radiochemical activation analysis; nuclear track analysis; radionuclide production; radiochemical separation methods; alpha, beta, gamma, x-ray and other nuclear spectrometries; *in situ* and remote sensing; radiochemical tracer methods, and mass spectrometry methods for the measurement of radionuclides. The conference will include both oral and poster sessions grouped around specific topics. Poster sessions will be organized around specific themes, similar, or in addition, to those included in the oral sessions. Papers presented at the conference will be peer reviewed and published in *The Journal of Radioanalytical and Nuclear Chemistry*.

Questions concerning the scope and organization of the conference should be addressed to the General Chair, Stephen P. LaMont, LANL (phone 505-667-1008, email lamont@lanl.gov). The conference web site address is http://altmine.mie.uc.edu/nuclear/marc/, where information about the conference will be updated.

Progress in Nuclear Energy and Education

The Progress in Nuclear Energy and Education Conference will be held March 20–22, 2012, in London, UK. The conference provides a forum for nuclear scientists to discuss the cutting edge science and engineering aspects of nuclear energy together with increasingly more important safety, policy, resource and educational requirements of the industry.

The main areas of interest for this conference are advanced and evolutionary reactor designs, the safety of such plants, policy, engineering and resources, and educational challenges such as the shortfall of experience and skills in the sector.

The conference is organized by Elsevier in association with the Dalton Nuclear Institute, and endorsed by the Nuclear Industry Association. The supporting journal is *Progress in Nuclear Energy*. Visit www.progressnuclearenergy.com for more information, to submit your abstract and to register.

PHYSOR 2012

PHYSOR 2012, hosted by the ANS Oak Ridge/Knoxville Local Section, will be held April 15–20, 2012, in Knoxville, Tennessee. The technical program will meet the high standards of recent PHYSOR meetings, including timely and relevant special topics. Students will be included in all events and activities. Exciting workshops and technical tours will be offered. For further news, information, and instructions, please visit http://physor2012.org.

Monte Carlo Treatment Planning (MCTP2012)

The Third European Workshop on Monte Carlo Treatment Planning (MCTP2012) will be take place May 15–18, 2012, in Seville, Spain. The European Workgroup on MCTP is hosting the workshop. Since the first meeting in Ghent, Belgium (2006), and after the last workshop in Cardiff in 2009, the role of Monte Carlo in radiotherapy planning has continued to grow and become more relevant as more sophisticated and ambitious techniques are introduced. IGRT and 4-D planning are facing new cumulative uncertainties which require accurate calculations to justify the additional workload involved. This Workshop on MCTP of the European Workgroup (EWG-MCTP) will stimulate information exchange and generate international collaborations

Contributions accepted for the workshop will be published as a book of extended abstracts. An agreement is also in place with *Physics in Medicine and Biology*. Papers from MCTP2012 will be considered for publication in PMB and published as a "special feature" of the journal. See the "Submissions" page of the workshop website, http://www.mctp2012.com/index.php. The technical contact for the workshop is Rafael Moreno, Adriano Spain DMC, Adriano St., 26-28, 41001 Sevilla, Spain (phone +34 954 215 900, fax +34 954 216 211, email sevilla@mctp2012.com).

ICRS-12 and RPSD-2012

The 12th International Conference on Radiation Shielding (ICRS-12) and the 17th Topical Meeting of the Radiation Protection and Shielding Division of the American Nuclear Society (RPSD-2012) will be held in Nara, Japan, September 2–7, 2012. The first ICRS conference was held in 1958 at Cambridge, United Kingdom. Since then, ICRS has been held in Europe, Japan, and the United States. The ICRS series occurs every four or five years.

This conference, organized by the Atomic Energy Society of Japan, will explore the scientific, technological and engineering issues associated with particle and ionizing radiation shielding in its broadest context, including nuclear energy systems, accelerator facilities, space and other radiation environments. It is one of the premier international radiation shielding events, regularly drawing hundreds of the world's top scientists and engineers.

The conference will open with a special session summarizing the facts and circumstances surrounding the Fukushima accident and consequent environmental assessment and recovery. The special session will complement the conference topics.

The deadline for submitting abstracts is **February 29, 2012**. Check the website http://www.icrs12.org or contact ICRS-12 & RPSD-2012 Local Organizing Committee secretariat (office@icrs12.org) for further information.

[ISFO-si 9](#)

The 9th International Conference on Facility Operations- Safeguards Interface (ISFO-si 9) will be held September 23-28, 2012, in Savannah, Georgia. The topical conference program committee invites individuals with professional interest in safeguards technology and nuclear material facility operations to participate. The Conference is sponsored by the American Nuclear Society Isotopes and Radiation Division, Oak Ridge/Knoxville Local Section and is cosponsored by the Institute of Nuclear Materials Management, Central Region Chapter, Southeast Chapter.

The purpose of the conference is to foster a better understanding of the relationships of operations in nuclear facilities and the application of safeguards under national and international regimes. This ninth conference in the series will provide an international forum for exchanging ideas and experiences, as well as describing progress in the areas of safeguards implementation. The conference will be timely considering the current activities to strengthen the international safeguards regime. The four and a half day conference will be held in nine half-day sessions at which policy, technical, and scientific aspects of safeguards implementation will be discussed.

Papers are encouraged in the following areas:

- Integrated design of facility safeguards systems,
- Nuclear material accountancy,
- Materials control and accountability activities,
- Measurement and instrument techniques,
- Transparency and confidence-building measures,
- Research and development in general safeguards technology,
- Extension of safeguards in light of the threat of radiological dispersal devices,
- Preparation for and implementation of the IAEA Additional Protocol,
- Safeguards by design,
- The impact of "fully information driven safeguards" on traditional safeguards,
- Advances in process monitoring, unattended measurements/monitoring, remote measurements/monitoring,
- Application of safeguards earlier in the front end of the fuel cycle, mining and conversion.

Presentations are due by **April 1, 2012**, and should focus on current activities at nuclear materials facilities, including enrichment, weapons material utilization, mixed-oxide (MOX) fuel fabrication, reactors, spent fuel storage, reprocessing, and long-term storage of highly enriched uranium and plutonium. Conference information is posted at the website, http://ICFO-9.org.

CALENDAR

February 2012

45th Annual Midyear Meeting of the Health Physics Society: Issues in Waste Management, Feb. 5–8, 2012, Dallas, TX. Contact: Secretariat (phone 703-790-1745, fax 702-790-2672) url http://hps.org/meetings/meeting32.html.

Waste Management Conference, (WM2012), Feb. 26–March 1, 2012, Phoenix, AZ. Contact WM Symposia (phone 480-557-0263, fax 520-829-3550) url www.wmsym.org.

March 2012

European Research Reactor Conference 2012, March 18–22, 2012, Prague, Czech Republic. Contact: Kirsten Epskamp, ENS (phone 32-2-505-3054, fax 32-2-502-3902, email rrfm2012@euronuclear.org) url www.euronuclear.org/meetings/rrfm2012/index.htm.

18th Pacific Basin Nuclear Conference (PBNC 2012), March 18–23, 2012, Busan, South Korea. Contact: Technical Program Committee (phone 82-2-785-2570, fax 82-2-785-3975, email info@pbnc2012.org) url www.pbnc2012.org.

Progress in Nuclear Energy and Education Conference, March 20–22, 2012, London, UK. For details visit: http://www.progressnuclearenergy.com.

MARC IX, "Methods and Applications of Radioanalytical Chemistry," March 25–30, 2012, Kailua-Kona, Hawaii. Contact: Stephen P. LaMont, LANL (phone 505-667-1008, email lamont@lanl.gov) url http://altmine.mie.uc.edu/nuclear/marc/.

April 2012

PHYSOR 2012, April 15–20, 2012, Knoxville, Tennessee. Contact: http://physor2012.org.

May 2012

Used Fuel Management Conference, May 7-10, 2012, St. Petersburg, FL. Contact: Linda Wells, NEI (phone 207-739-8039, email registrar@nei.org) url http://www.nei.org/newsandevents/conferencesandmeetings.

International Congress of the International Radiation Protection Association (IRPA13), May 13–18, 2012, Glasgow, Scotland. Contact: Congrex UK Limited, IRPA13 Glasgow Ltd, 4B, 50 Speirs Wharf, Port Dundas, Glasgow G4 9TH (phone +44 (0)141 331 0123, fax +44 (0)141 331 0234, email info@irpa13glasgow.com) url http://www.irpa13glasgow.com.

MCTP2012, 3rd European Workshop on Monte Carlo Treatment Planning, May 15–18, 2012, Seville, Spain. Contact: Rafael Moreno, Adriano Spain DMC, Adriano St., 26-28, 41001 Sevilla, Spain (phone +34 954 215 900, fax +34 954 216 211, email sevilla@mctp2012.com) url http://www.mctp2012.com/index.php.

June 2012

2012 ANS Annual Meeting, June 24–28, 2012, Chicago, Illinois, USA. Follow the website for up-to-date information, http://www.new.ans.org/meetings/c_1.

- ICAPP '12, June 24–28, 2012, Chicago, Illinois. Contact: Lynne Schreiber, Administrator (email icapp@ans.org) url http://www.icapp.ans.org/icapp12/.
- NFSM 2012 "Nuclear Fuels and Structural Materials for the Next Generation Nuclear Reactors," June 24–28, 2012, Chicago, Illinois. Follow the website for up-to-date information, http://www.new.ans.org/meetings/c_1.
- Decommissioning, Decontamination and Reutilization and Technology Expo, June 24–28, 2012, Chicago, Illinois. Contact: Sue Aggarwal, Technical Program Chair (phone 303-984-5788, email saggarwal@nmnuclear.com) url http://ddrd.ans.org.

September 2012

ICRS-12 (12th International Conference on Radiation Shielding) and RPSD-2012 (17th Topical Meeting of the Radiation Protection and Shielding Division of the American Nuclear Society), Sept. 2–7, 2012, Nara, Japan. Contact: ICRS-12 & RPSD-2012 Local Organizing Committee secretariat (office@icrs12.org) url http://www.icrs12.org/.

November 2012

2012 ANS Winter Meeting and Nuclear Technology Expo, Nov. 11–15, 2012, San Diego, California, USA. Follow the website for up-to-date information, http://www.new.ans.org/meetings/c_1.

![Homeland Security logo]

HS-STEM Summer Internship Program

2012 Summer Internships for Undergraduate Students

- 10 week research experience; $5,000 stipend plus travel expenses

- Areas of research: Engineering, computer science, mathematics, physics, chemistry, biological/life sciences, environmental science, emergency and incident management, social sciences

- Projects offered at:

     National research laboratories: Argonne, Idaho, Lawrence Livermore, Los Alamos, Oak Ridge, Pacific Northwest, Sandia, Savannah River

     DHS laboratories: Transportation Security Laboratory

     Other research facilities, including Air Force Research Laboratory, National Institute of Standards and Technology

- Locations include CA, CO, ID, IL, MD, NM, NJ, OH, SC, TN, WA, VA

- U.S. citizenship required

- Application deadline: January 5, 2012

www.orau.gov/dhsinternships
Administered by Oak Ridge Institute for Science and Education

Homeland Security

Summer Research Team Program for Minority Serving Institutions

Summer research experiences for faculty and student teams at U.S. Department of Homeland Security Centers of Excellence

- Funding available for Summer 2012
- 10 weeks of support
- Faculty and student stipends, housing allowances, travel expenses
- Research conducted at university-based DHS Centers of Excellence nationwide
- Areas of research: homeland security related science, technology, engineering and mathematics
- Faculty apply for up to $50,000 in follow-on funding at end of summer
- U.S. citizenship required
- Faculty application deadline: **January 8, 2012**

www.orau.gov/dhsfaculty
Administered by
Oak Ridge Institute for Science and Education

MICKEY LELAND
ENERGY FELLOWSHIP
INTERN PROGRAM
2012

PROGRAM

The Mickey Leland Energy Fellowship (MLEF) is a 10-week paid summer internship with opportunities in the US Department of Energy, Office of Fossil Energy, for women and minority students who are currently enrolled in Science, Technology (IT), Engineering, and Math majors at an accredited college or university.

MLEF MISSION

Provide opportunities for educational advancement and career development through an award winning internship program for women and minority students in Science, Technology (IT), Engineering and Math.

ELIGIBILITY

- Applicants must be a US citizen.
- Undergraduate students completing their sophomore year in Spring 2012 through PhD candidates.
- Cumulative GPA of 3.0 or above,

APPLICATION

Application deadline is December 31, 2011. The start date for the summer internship program is June 4, 2012.

For more information about DOE/FE and to complete the MLEF application, please visit our webpage:

www.fossil.energy.gov/education/lelandfellowships/index.html

U.S. DEPARTMENT OF ENERGY | Office of Fossil Energy

For more information please contact the MLEF Program Office:
Email: MLEF@hq.doe.gov