Within the scope of the 10-day school, the following topics will be addressed in an integrated fashion:

- Reactor Physics Modeling and Analysis Methods;
- Nuclear Data Theory, Measurements, and Evaluation;
- Multiphysics (thermal hydraulics, neutronics, materials, fuels, I&C) of plant dynamics in operational, abnormal transients, and accidents;
- Basics and advances in nuclear energy systems modeling and simulation that encompass critical review of equations and numerical methods;
- Experimental measurements of reactor physics behavior;
- Sensitivity analysis, uncertainty quantification, and data assimilation methods; and
- Advanced verification and validation methods.

Students are grouped in teams to work on course assignments that build on the lecture materials and address challenging questions on reactor physics and safety.

Each team will be working closely with and mentored by senior scientists and professors who are leaders in the field. Successful students will take away a solid theoretical foundation, as well as a set of practical examples to guide their future work on experimental design, model development, and validation.

In the evening sessions, the students have an opportunity to interact with MeV Summer School lecturers and senior scientists from national laboratories.

The program also includes a special event on "Design and Safety Analysis of Advanced Nuclear Reactors: Future Direction and R&D Needs in MeV," with plenary talks by a distinguished panel, including representatives from nuclear industry, academia, and government. The panel will be open for questions/answers and interaction with the panelists.

Classroom instruction will be augmented by tours to the Exelon Dresden Generation Station (nuclear plant), in Morris, Illinois, and to the Advanced Photon Source (APS) Facility at Argonne National Laboratory.

Organization and Faculty

The MeV Summer School is intended to fill a critical educational gap for engineers and applied scientists involved in the design, licensing, and operation of 21st century nuclear power plants. With the nuclear renaissance comes the expectation that hundreds of reactors will be operating worldwide by mid-century. Ensuring the safe and efficient operation of those plants, most of which will run for over 60 years, is a challenge worthy of the most dedicated professionals. The MeV experience will provide them with better tools for that task.

The school is being organized through the cooperation of national laboratories and universities that share the goal of building a strong workforce to support global nuclear expansion. The faculty will be drawn from the top experts in universities and laboratories. The general organization and conduct of the school will be overseen by an international board of senior experts. A local secretariat will provide technical, logistical, and administrative support to students and faculty.

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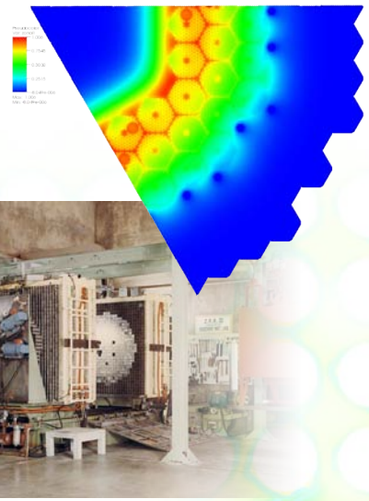
Baldev Raj
Glen Sjoden
Kord Smith
Bob Speranzini
Toshikazu Takeda
Karen Vierow
Paul Wilson

*past school focused on reactor safety

MeV
Modeling, Experimentation, & Validation
SUMMER SCHOOL
www.MeVSchool.org

Reactor Physics Computations, Validation, and Integration in Multiphysics Codes

July 19–28, 2011
Argonne National Laboratory, Argonne, IL, USA



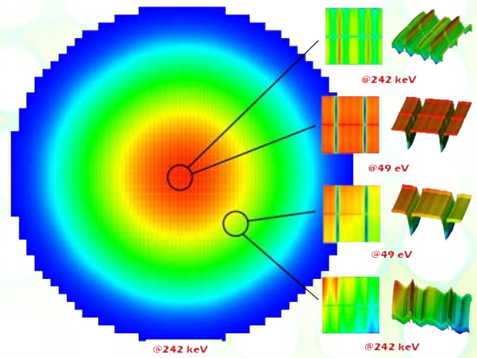
Argonne NATIONAL LABORATORY
Idaho State UNIVERSITY
CAES Center for Advanced Energy Studies
INL Idaho National Laboratory
OAK RIDGE National Laboratory
U.S. DEPARTMENT OF ENERGY

The MeV Summer School will provide early career nuclear engineers with advanced studies in integrated modeling, experimentation, and validation to prepare them for some of the key challenges and demands facing the nuclear energy renaissance. Successful students will leave with a holistic, forward-looking view of MeV that cannot be provided by any other current curriculum. The school provides a forum for drawing the best topical expertise from around the globe. It is the aim of the school to foster the development of a next-generation network of engineering scientists capable of leading the cultural transformation to design, operation, and safety of advanced nuclear power plants.

The MeV Summer School integrates a wide range of teaching and mentoring expertise, deeply underpinned by knowledge, skills, and experience. The 2011 central theme is reactor physics computations, validation, and integration in multiphysics codes.

The courses are designed to broaden students' knowledge and equip them with modern approaches to reactor physics analysis of nuclear systems; emphasis is placed on anticipating future needs of the profession. Graduate credit will be awarded for the successful completion of the MeV Summer School.

MeV was founded by Idaho National Laboratory in cooperation with Argonne National Laboratory and Idaho State University in 2009. Starting in 2011, the school will rotate between Argonne National Laboratory, Idaho National Laboratory, and Oak Ridge National Laboratory.



Draft Curriculum *(subject to change)*

Reactor Physics: Overview, History, and Trend — 6.5 hours

- Evolution of Reactor Physics Modeling and Analysis — 1.5
- Elements of Nuclear Reactor Physics Modeling Overview — 1.5
- Overview of Neutron Transport Theory and Approximations — 2.0
- Nuclear Reactor Safety Overview — 1.5

Nuclear Data Theory, Measurements, and Evaluation — 6.0 hours

- Nuclear Data Theory and Measurement — 1.5
- Nuclear Data Evaluations and Libraries — 1.5
- Covariance Data — 1.5
- Sensitivity Analysis and Uncertainty Quantification — 1.5

Reactor Physics Modeling and Analysis Methods — 6.0 hours

- Core Physics Modeling — 1.5
- Fuel Cycle Modeling — 1.5
- Neutron Shielding: Simulation and Validation Experiments — 1.5
- Time-Dependent Reactor Physics Methods: Operational Transients, Depletion, and Reactor Kinetics — 1.5

Multiphysics Computations and Computation Methods — 10 hours

- Advanced Simulation and Challenges of Light-Water Reactors — 1.5
- Advanced Simulation and Challenges of Fast Reactors — 1.5
- Advanced Simulation and Challenges of Very High-Temperature Gas-Cooled Reactors — 1.5
- Advanced Simulation and Challenges of Sub-critical Nuclear Systems — 1.5
- Multiphysics Simulation for Nuclear Reactor Design and Safety — 1.5
- High-Performance Computing for Multi-physics Methods — 1.0
- Reactor Physics Simulation on Leadership Computing Facilities — 1.5

Experimental Methods — 4.5 hours

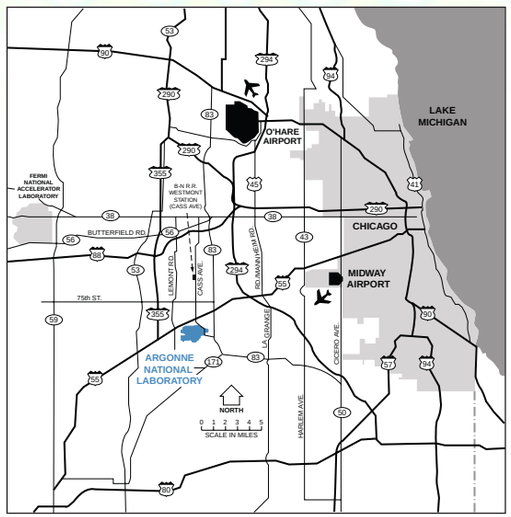
- Critical Facilities and Integral Measurements — 1.5
- Startup Physics Measurements and Operational Tests — 1.5
- Advanced Experiments to Support Reactor Physics Modeling and Analysis — 1.5

Reactor Physics Methods Validation — 6.0 hours

- Validation and Uncertainty Analysis: Overview, History, and Trend — 1.5
- Integral Experiments for Reactor Physics Validation — 1.5
- Regulatory Perspective on Advanced Tools Validation — 1.5
- Roles of Research Reactors in Methods Validation — 1.5

Venue

The MeV Summer School will be held at the Advanced Photon Source (APS) Facility, Argonne National Laboratory, Argonne, IL, USA



Information

For detailed program information, registration procedures, fees, etc., please visit www.mevschool.org or contact:

Ms. Brea Grischkat
Argonne National Laboratory
9700 South Cass Avenue
Argonne, IL 60439
(630) 252-1456
breag@anl.gov

Program Sponsors

Argonne National Laboratory
Idaho National Laboratory
Idaho State University
Oak Ridge National Laboratory
Center for Advanced Energy Studies

Application Form

2011 MeV Modeling, Experimentation & Validation Summer School

Reactor Physics Computations, Validation, and Integration in Multiphysics Codes

July 19–28, 2011

Application deadline March 28, 2011
Acceptance notification April 22, 2011

Held at the Advanced Photon Source (APS) Facility, Argonne National Laboratory, Argonne, IL, USA

Name: _____

Title: _____

Employer/University: _____

_____

Address: _____

_____

_____

Country: _____

Country of Birth & Citizenship: _____

Telephone: _____

Fax: _____

e-mail: _____

Application package is to include a short motivation letter, curriculum vita, and completed application. Mail the application package to Ms. Brea Grischkat.

Tuition: $3,000 USD

Tuition includes room and board.