

American Nuclear Society: 2009 Annual Meeting

June 14-18, 2009 • Atlanta, Georgia • Hyatt Regency Atlanta Hotel

“Advancing Nuclear Technology for a Greater Tomorrow”

and EMBEDDED TOPICAL MEETING:

Nuclear and Emerging Technologies for Space (NETS-2009, formerly Space Nuclear Conference)

(see last page for details)

SUMMARY DEADLINE: JANUARY 9, 2009

Call for Papers



Conference Chairs

General Chair

Jeffrey T. Gasser, *Southern Nuclear Operating Company*

Technical Program Chair

Bojan Petrovic, *Georgia Institute of Technology*

Assistant Technical Program Chairs

Kurshad Muftuoglu, *GE-Hitachi Nuclear Energy*

Charles (Chip) R. Martin, *Defense Nuclear Facilities Safety Board*

Deadlines: NO EXCEPTIONS

SUBMISSION OF SUMMARIES: *November 1, 2008–January 9, 2009*

AUTHOR NOTIFICATION OF ACCEPTANCE: *By February 24, 2009*

REVISED SUMMARIES DUE: *March 10, 2009*

Format

Authors are now REQUIRED to use the ANS Template and “Guidelines for TRANSACTIONS Summary Preparation” provided on the ANS Web site. 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.

Guidelines for Summaries

Please submit summaries describing work that is NEW, SIGNIFICANT, and RELEVANT to the nuclear industry. ANS will publish all accepted summaries in the TRANSACTIONS. Papers are presented orally at the meeting, and presenters are expected to register for the meeting. Completed papers may be published elsewhere, but the summaries become the property of ANS. Under no circumstances should a summary or full paper be published in any other publication prior to presentation at the ANS meeting. It is the author’s responsibility to protect classified or proprietary information.

Content

1. Introduction: State the purpose of the work.
2. Description of the actual work: Must be NEW and SIGNIFICANT.
3. Results: Discuss their significance.
4. References: If any, must be closely related published works. Minimize the number of references.
5. Do not present a bibliographical listing.

Length

1. Use at least 450 words, excluding tables and figures.
2. Use no more than 900 words, including tables and figures.
3. Count tables and figures as 150 words each. Use no more than three tables or figures.
4. Limit title to ten words; limit listing authors to three or fewer if possible.
5. Exclude references from word count.

Page Charge

ANS charges \$100 per final printed page (prorated) in the TRANSACTIONS. Authors should be prepared to provide their purchase order numbers when submitting their summaries electronically.

REQUIRED Template and “Guidelines for TRANSACTIONS Summary Preparation”: www.ans.org/pubs/transactions

Submit a Summary: www.ans.org/meetings

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ANS 2009 Annual Meeting: Session Titles by Division

[] = Cosponsoring Division

1. Accelerator Applications

- 1a. Accelerator Applications: General

2. Biology and Medicine

- 2a. Biology and Medicine: General
- 2b. Nuclear Based Imaging for Medical Diagnosis and Therapy

3. Decommissioning, Decontamination, and Reutilization

- 3a. Decommissioning, Decontamination, and Reutilization: General
- 3b. Army Corps/Formerly Utilized Sites Remedial Action Program Decommissioning and Decontamination and Commercial Nonreactor Decommissioning and Decontamination
- 3c. Groundwater Protection Initiative [ESD]
- 3d. Nuclear Material Stabilization
- 3e. The History of Manhattan Era and Early Nuclear Power Facilities: Capturing the Historical Record While Performing Needed Decommissioning and Decontamination
- 3f. Hot Topics and Emerging Issues—Panel
- 3g. Decommissioning and Decontamination at Commercial Reactor Facilities—Panel
- 3h. Redevelopment of Decommissioned Facilities—Panel

4. Education and Training

- 4a. Education and Training: General
- 4b. Accreditation Board for Engineering and Technology Harmonized Criteria: How Will it Affect Your Program?
- 4c. Research by U.S. Department of Energy—Sponsored Students
- 4d. Training, Human Performance, and Workforce Development
- 4e. Focus on Communications: The Nuclear Story and Other Tales—Panel
- 4f. Focus on Communications in the New Media—Panel

5. Environmental Sciences

- 5a. Environmental Sciences: General
- 5b. Contributions of Nuclear Science and Technology to Sustainable Development
- 5c. Environmental and Economic Aspects of Climate Change Solutions
- 5d. Environmental and Safety Aspects of International Nuclear Energy Development [NISD]
- 5e. Environmental Monitoring at Nuclear Facilities: Monitoring Results and Advances in Techniques [DDRD]
- 5f. Environmental Requirements/Siting Concerns for New Nuclear Power Facilities
- 5g. Sustainability of Nuclear Fuel Supply
- 5h. Environmental and Personnel Dose Impacts of the Linear No-Threshold (LNT) Theory—Panel

6. Fuel Cycle and Waste Management

- 6a. Fuel Cycle and Waste Management: General
- 6b. Advanced Head-End Improvements for Processing Spent Nuclear Fuels
- 6c. Advances in Nonproliferation Technology for the Nuclear Fuel Cycle of the Future
- 6d. Effluent from Nuclear Fuel Recycle
- 6e. Future Safeguards and Associated Policies for Enrichment Implementation and Reprocessing Plants—the Present through 2020
- 6f. Mixed Oxide Fuel Fabrication Facility: Construction Issues and Programmatic Changes
- 6g. Potential Recycle of Minor Actinides in Thermal Reactors
- 6h. Recycle of Reusable Components in Spent Nuclear Fuel

6. Fuel Cycle and Waste Management (continued)

- 6i. The Waste Isolation Pilot Plant: 10 Years of Operations
- 6j. Proliferation Resistance and Nuclear Globalization: Technology and Policy Dimensions—Panel
- 6k. Low-Level Radioactive Waste: Past, Present, and Future—Panel

7. Fusion Energy

- 7a. Fusion Energy: General

8. Human Factors, Instrumentation, and Controls

- 8a. Human Factors, Instrumentation, and Controls: General
- 8b. Digital Instrumentation and Controls Regulatory Issues
- 8c. Highlights of NPIC&HMIT 2009

9. Isotopes and Radiation

- 9a. Isotopes and Radiation: General
- 9b. Medical Applications of Radioisotopes [BMD]
- 9c. Neutron Imaging: Neutron Radiography and Neutron Computed Tomography
- 9d. Nuclear Research Reactors: Utilizations and Applications of Nuclear Methods

10. Materials Science and Technology

- 10a. Materials Science and Technology: General
- 10b. Computational Modeling of Fuels and Materials
- 10c. Plutonium and Actinide Based Fuels
- 10d. Reactor Fuels and Materials
- 10e. Space Reactor Fuel and Materials

11. Mathematics and Computation

- 11a. Computational Methods: General
- 11b. Mathematical Modeling: General
- 11c. Transport Methods: General
- 11d. Advanced Energy (Frequency) Discretizations and Acceleration Techniques for Transport
- 11e. Global Variance Reduction Methods for Monte Carlo Transport
- 11f. Current Issues in Computational Methods—Roundtable

12. Nuclear Criticality Safety

- 12a. Nuclear Criticality Safety: General
- 12b. Advances in Nuclear Criticality Accident Excursions Analysis
- 12c. Data, Analysis, and Operations for Nuclear Criticality Safety
- 12d. Integration of Nuclear Criticality Safety into New Facility Design
- 12e. Nuclear Criticality Safety Staff and Operations Interface
- 12f. Nuclear Criticality Safety Standards—Forum

13. Nuclear Installations Safety

- 13a. Nuclear Installations Safety: General
- 13b. Current Issues in Reactor Safety
- 13c. Emerging Issues in Nuclear Facility Safety
- 13d. Generation-IV Reactors—Findings from American Society of Mechanical Engineers/U.S. Department of Energy Materials Project
- 13e. Generic Aging Lessons Learned in Nuclear Power Plant License Renewal
- 13f. Next Generation Nuclear Plant Licensing Strategy
- 13g. Practical Life Extension for Older Nuclear Facilities
- 13h. Proactive Management of Materials Degradation
- 13i. Progress in Regulation of Safety Culture
- 13j. Safety for Reprocessing Plants: Modeling Safety Issues of Fuel Reprocessing
- 13k. Safety of Gas-Cooled Reactors

ANS 2009 Annual Meeting: Session Titles by Division

14. Operations and Power

- 14a. Operations and Power: General
- 14b. Advanced/Generation-IV Reactors
- 14c. Online Plant Monitoring and Diagnostics Methods for Next Generation Reactors
- 14d. Strategies for Attracting, Developing, and Retaining Talent in a Growing Nuclear Industry
- 14e. The Global Nuclear Energy Partnership—Advances and Innovations
- 14f. Living the Renaissance: Status of New Plant Licensing—Panel
- 14g. Status Report on Readiness for and Implementation of New Construction Inspection—Panel

15. Radiation Protection and Shielding

- 15a. Radiation Protection and Shielding: General
- 15b. The Utility Sector in Radiation Protection and Shielding
- 15c. Computational Resources for Radiation Modeling—Panel
- 15d. Safety and Security of Radiation Sources—Panel
- 15e. MCNP/X Depletion/Burnup with VESTA
- 15f. Introduction to Monte Carlo—Tutorial
- 15g. MCNP Variance Reduction—Tutorial
- 15h. NJOY—Tutorial
- 15i. VISED—Tutorial
- 15j. Monte Carlo Dice Seminar
- 15k. Current Topics in Radiation Protection and Shielding—Roundtable

16. Reactor Physics

- 16a. Reactor Physics: General
- 16b. Advances in Small and Medium Sized Reactor Designs
- 16c. Reactor Analysis Methods
- 16d. Reactor Physics Design, Validation, and Operating Experience
- 16e. Current Topics for Reactor Engineers—Panel
- 16f. Recent Progress and Applications of Resonance Calculation Methods

17. Robotics and Remote Systems

- 17a. Robotics and Remote Systems: General

18. Thermal Hydraulics

- 18a. General Thermal Hydraulics
- 18b. General Two-Phase Flow
- 18c. Computational Thermal Hydraulics
- 18d. Rod Bundle Thermal Hydraulics
- 18e. Severe Accidents and Fluid-Structure Interaction
- 18f. Thermal Aspects of Nuclear Material Handling and Environmental Monitoring [ESD]
- 18g. Thermal Hydraulics of Advanced Reactors

19. Aerospace Nuclear Science and Technology Technical Group

- 19a. Aerospace Nuclear Science and Technology: General

ANS 2009 Annual Meeting: Technical Divisions

Accelerator Applications (AAD)

Denis Beller, bellerd@unlv.nevada.edu

Biology and Medicine (BMD)

Rolf Zeisler, rolf.zeisler@nist.gov

Decommissioning, Decontamination, and Reutilization (DDR)

Nadia S. Glucksberg, nsglucksberg@mactec.com

Education and Training (ETD)

Peter F. Caracappa, caracp3@rpi.edu

Environmental Sciences (ESD)

Rebecca L. Steinman, rls@adventengineering.com

Fuel Cycle and Waste Management (FCWMD)

James Hardeman, jim.hardeman@dnr.state.ga.us

Fusion Energy (FED)

James P. Blanchard, blanchard@engr.wisc.edu

Human Factors, Instrumentation, and Controls (HFICD)

Richard Wood, woodrt@ornl.gov

Isotopes and Radiation (IRD)

Kenan Unlu, kxu2@psu.edu

Materials Science and Technology (MSTD)

Kenneth J. Geelhood, kenneth.geelhood@pnl.gov

Mathematics and Computation (MCD)

Todd Urbatsch, tmonster@lanl.gov

Nuclear Criticality Safety (NCS)

A. Nichole Ellis, ellis_9899@msn.com

Nuclear Installations Safety (NIS)

Stephen Schultz, spschultz@duke-energy.com

Operations and Power (OPD)

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Radiation Protection and Shielding (RPS)

Charlotta E. Sanders, sander59@unlv.nevada.edu

Reactor Physics (RPD)

Bojan Petrovic, bojan.petrovic@gatech.edu

Robotics and Remote Systems (RRSD)

Carl D. Crane, ccrane@ufl.edu

Thermal Hydraulics (THD)

Kurshad Muftuoglu, pcchair@thd-ans.org

Aerospace Nuclear Science and Technology Technical Working Group (ANST)

J. Boise Pearson, J.Boise.Pearson@nasa.gov

Young Members Group (YMG)

A. Nichole Ellis, ellis_9899@msn.com

Embedded Topical Meeting: Nuclear and Emerging Technologies for Space (NETS-2009, formerly Space Nuclear Conference)

June 14-18, 2009 • Atlanta, Georgia • Hyatt Regency Atlanta Hotel

Embedded Topical Meeting Chairs

General Chairs

Samit Bhattacharyya (*Savannah River Site*), invited

George Schmidt (*National Aeronautics and Space Administration, Glenn Research Center*)

Technical Program Chairs

Shannon Bragg-Sitton (*Texas A&M University*)

Michael Houts (*NASA Marshall Space Flight Center*)

Steven D. Howe (*Idaho National Laboratory Center for Space Nuclear Research*)

John Scott (*NASA Johnson Space Center*)

Paper Deadlines

ABSTRACTS DUE: *December 1, 2008*

DRAFT PAPERS DUE: *February 27, 2009*

REVIEW NOTIFICATION: *March 30, 2009*

FINAL PAPERS DUE: *April 10, 2009*

Submit Abstracts

Submit abstracts at www.ans.org/meetings/nets. Format requirements for abstracts and full papers will be available at <http://anst.ans.org>.

About the Meeting

For 25 years, the space nuclear community has gathered in Albuquerque, New Mexico each February for the Symposium on Space Nuclear Power and Propulsion, which in recent years has been joined by other conferences on advanced technologies for space to form the Space Technologies and Applications International Forum (STAIF). The space nuclear community has recently become aware that STAIF will not be held in 2009. Not wishing to lose the momentum and positive collaborative environment established by STAIF for professionals working in the field of advanced space power and propulsion systems, the Aerospace Nuclear Science and Technology Technical Group is pouring a great deal of effort into organizing a top-notch embedded topical meeting in 2009. To best meet the needs of the space nuclear community, and to ensure that the synergistic environment established by STAIF is maintained, former sub-conferences incorporated in the STAIF umbrella are encouraged to participate in the NETS-09 conference.

NETS-2009 will be the third topical meeting organized by the Aerospace Nuclear Science and Technology technical group, following the 2005 and 2007 Space Nuclear Conferences. NASA is currently developing 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 successful missions of these types.

The purpose of the meeting is to bring together and provide a communications network and forum for information exchange for the wide cross section of research and management personnel from government, industry, academia, and the national laboratory system that are involved in the initiative. To this end, the meeting will address 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. This conference will have full-length, peer-reviewed technical papers that will be published on a CD-ROM, available at the meeting. Papers of archival quality will be recommended for publication in a special issue of Nuclear Technology.

NETS-2009 is organized into four primary tracks, each of which will have a plenary session. An overview of each track is provided below. Abstracts should be submitted to the desired track for initial review; specific sessions will be identified following close of the abstract submission window. Papers describing analytical studies or experimental results are encouraged. Potential themes to consider include affordability, technology readiness, system integration, environmental interactions, and application of terrestrial technology to space applications.

Topics

Track I: Fission Surface Power

The Fission Surface Power track will include papers that consider the use of nuclear power sources to advance our ability to further explore the Solar System in support of the NASA Vision for Space Exploration. Technical work reported may include computational investigations, experimental research, or development activities at the component or system level. Specific sessions may include, but are not limited to:

1. Fission surface power system and component design
2. Simulation and modeling
3. Hardware fabrication and testing
4. Component or integrated system operation
5. Power conversion technologies
6. Instrumentation and control system design
7. Integration and utilization of surface fission energy sources.

Papers focused on the economic or political implications of space nuclear power development will also be considered in this track.

Track II: Radioisotope Power Systems

The Radioisotope Power Systems track will include papers that cover the use of radioisotopes for in-space or surface power systems. A key area of concern to radioisotope power system development and application is the limited domestic supply of ^{238}Pu . Technical work reported may include computational or experimental investigations of alternate radioisotopes, advanced power conversion systems, or applications of radioisotope power systems. Specific sessions may include, but are not limited to:

1. Radioisotope power systems technology and development
2. Near-term radioisotope power systems applications and missions
3. Options, production, and processing of radioisotope fuels
4. Thermoelectric power conversion technology and applications
5. Dynamic power conversion.

Track III: Nuclear Thermal Propulsion

The Nuclear Thermal Propulsion (NTP) track will encourage submission of papers related to NTP technology, components, subsystems, integrated system design, testing, performance, and mission analysis. Historical papers and papers on topics of interest to exploration and utilization of the Moon and Mars are also encouraged. Specific sessions may include, but are not limited to:

1. Nuclear thermal rocket technology and integration
2. Nuclear and nonnuclear testing in support of NTP development
3. Structural materials for reactor core design
4. Advanced materials and fuels for future high performance systems.

Track IV: Space Nuclear Missions and Architectures

The Space Nuclear Missions and Architectures track will provide an overarching view of how nuclear power sources could be employed for space power and propulsion, providing an enabling technology for a variety of missions. Mission architectures should consider both manned and unmanned missions to the moon and Mars; other deep space missions may also be discussed. Specific sessions may include, but are not limited to:

1. Lunar and Mars exploration architecture studies
2. Considerations for space bases on the moon and Mars
3. Technologies for lunar surface operations and lunar surface power systems
4. Thermal control, including thermal energy transport and heat rejection technologies
5. In situ resource utilization, including power and energy requirements
6. Radiation shielding considerations
7. Major challenges and opportunities for space exploration.

Space Nuclear Propulsion Discussion Forum

NETS-2009 will additionally host a full-day discussion forum on Space Nuclear Propulsion on the final day of the conference. This forum will include invited presentations given by leaders in the field and will encourage interactive discussions between presenters and attendees. Updated details on the forum agenda will be available at <http://anst.ans.org>. Attendance at the discussion forum will require separate registration, at no additional cost to participants, to allow forum coordinators to make the necessary preparations.