



# ANS

# 2019 ANS Annual Meeting

## The Value of Nuclear

June 9-13, 2019 | Minneapolis, MN, USA | Hyatt Regency Minneapolis

## CALL FOR PAPERS

### EXECUTIVE CHAIRS

#### General Chair

Timothy O'Connor, Xcel Energy

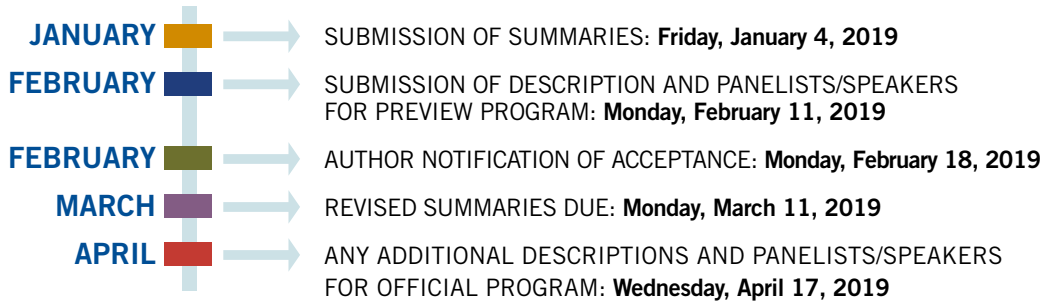
#### Technical Program Chairs

Sue Aggarwal, NMNTI

#### Assistant Technical Program Chairs

James J. Byrne, Byrne & Associates

### SUMMARY DEADLINE: FRIDAY, JANUARY 4, 2019



### 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 or original Microsoft Word documents and the ANS Electronic Paper Submission and Review 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. The minimum length is one full page.
2. The maximum length is four pages, including references, tables, and figures.
3. Limit title to ten words; limit listing authors to three or fewer if possible.

### PAGE CHARGE

ANS charges \$100 per final printed page 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

[ans.org/pubs/transactions](http://ans.org/pubs/transactions)

### SUBMIT A SUMMARY

[ans.org/meetings](http://ans.org/meetings)

### TRANSACTIONS COORDINATOR

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## 2019 ANNUAL MEETING: SESSION TITLES BY DIVISION (P) = Panel

1. **ACCELERATOR APPLICATIONS (AAD)**
  - 1a. Accelerator Applications: General
2. **AEROSPACE NUCLEAR SCIENCE AND TECHNOLOGY (ANSTD)**
  - 2a. Aerospace Nuclear Science and Technology: General
3. **BIOLOGY AND MEDICINE (BMD)**
  - 3a. Biology and Medicine: General
4. **DECOMMISSIONING AND ENVIRONMENTAL SCIENCES (DESD)**
  - 4a. General Topics in Decommissioning
  - 4b. Closing the Nuclear Fuel Cycle (P)
  - 4c. License Transfers for Decommissioning (P)
  - 4d. First Steps of D&D. Lessons Learned from the Recent Wave of Plant Closures (P)
  - 4e. Water Technologies and Nuclear Power Update (P)
  - 4f. Overview of the Various Environmental Standards Projects (P)
  - 4g. Decommissioning Experience in the Midwest (P)
5. **EDUCATION, TRAINING, AND WORKFORCE DEVELOPMENT (ETWDD)**
  - 5a. Training, Human Performance and Workforce Development
  - 5b. Cutting Edge Techniques in Education, Training and Distance Education
  - 5c. ANS Nuclear Grand Challenges
  - 5d. Best of ANS Student Conference
  - 5e. Focus on Communications—I (P)
  - 5f. Focus on Communications—II (P)
  - 5g. Young Faculty Development (P)
6. **FUEL CYCLE AND WASTE MANAGEMENT (FCWMD)**
  - 6a. Prospects for a Commercial High-Assay Low Enriched Uranium Supply to Support Advanced Reactors and Advanced LWR Fuel Applications (P)
  - 6b. Molten Salt Chemistry and Corrosion
  - 6c. Advances in Off-Gas Management of Fuel Cycle Operations
  - 6d. Back End of the Fuel Cycle for Enhanced Accident Tolerant Fuels (extended storage, transportation, disposal)
  - 6e. Advancement of On-Line Monitoring Systems for Operations in Nuclear Fuel Recycling Applications
  - 6f. Fuel Cycle and Waste Management: General
  - 6g. Recycle and Reuse of Used Nuclear Fuel Resources
  - 6h. University Research in Fuel Cycle and Waste Management
  - 6i. The WIPP—20th Anniversary (P)
  - 6j. Progress in Consolidated Interim Storage and Next Steps (P)
  - 6k. The Importance of Future Fuel Cycle Options in Addressing Growing Worldwide Energy Demand (P)
  - 6l. Challenges Associated with Material Transport into and Waste Removal from Hot Cell R&D Facilities Worldwide (P)
7. **FUSION ENERGY (FED)**
  - 7a. Best of 2018 TOFE
  - 7b. Fusion Energy Applications
8. **HUMAN FACTORS, INSTRUMENTATION, AND CONTROLS (HFICD)**
  - 8a. Best of 11th NPIC-HMIT Conference
  - 8b. General Topics in Human Factors Engineering
  - 8c. General Topics in Instrumentation and Control
9. **ISOTOPES AND RADIATION (IRD)**
  - 9a. Isotopes and Radiation: General
10. **MATERIALS SCIENCE AND TECHNOLOGY (MSTD)**
  - 10a. Transient Fuel Performance
  - 10b. Advanced Manufacturing
  - 10c. Post-Irradiation Examination
  - 10d. Advanced Measurement Techniques
  - 10e. Nuclear Science User Facilities
  - 10f. Nuclear Fuels and Materials in Fast Reactors
  - 10g. Accident Tolerant Fuels
  - 10h. Nuclear Fuels
  - 10i. Fuels and Materials for Small Modular Reactors
  - 10j. Fuels and Materials for Molten Salt Reactors
  - 10k. Challenges and Opportunities with Accelerated Qualification of LWR ATF Cladding and Fuel Materials
11. **MATHEMATICS AND COMPUTATION (MCD)**
  - 11a. Current Issues in Computational Methods – Roundtable (P)
  - 11b. Transport Methods
  - 11c. Computational Methods
  - 11d. Mathematical Modeling
  - 11e. Uncertainty Quantification and Sensitivity Analysis
12. **NUCLEAR CRITICALITY SAFETY (NCS D)**
  - 12a. Sharing of Good Industry Practices and/or Lessons Learned in Nuclear Criticality Safety (P)
  - 12b. ANS-8 Standards Forum (P)
  - 12c. Credible Accident Sequences in NCS (P)
  - 12d. Operational Reviews: How Facilities Meet ANSI/ANS-8.1 Section 4.1.6 (P)
  - 12e. Historical Experiments that Supported Nuclear Criticality Safety (P)
  - 12f. Rejuvenate Nuclear Technology Infrastructure and Facilities (P)
  - 12g. Real World Applications of Sensitivity/Uncertainty
  - 12h. Data, Analysis and Operations in Nuclear Criticality Safety
13. **NUCLEAR INSTALLATIONS SAFETY (NIS D)**
  - 13a. Highlights of 2019 ANS Probabilistic Safety Assessment and Analysis (PSA 2019) (P)
  - 13b. Safety Aspects of Accident Tolerant Fuel Critical Heat Flux
  - 13c. Emergent Topics in Consensus Standards
  - 13d. Current Topics in Risk Analysis
  - 13e. Nuclear Installations Safety: General
14. **NUCLEAR NONPROLIFERATION POLICY (NNPD)**
  - 14a. The Domestic Conversion and Enrichment Enterprise—Past, Present, Future
  - 14b. Nuclear Nonproliferation Policy Division: General



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## 2019 ANNUAL MEETING: SESSION TITLES BY DIVISION CONTINUED (P) = Panel

### 15. OPERATIONS AND POWER (OPD)

- 15a. Thermal Energy Storage Systems
- 15b. Advanced/Gen-IV Reactors
- 15c. Cyber Security (P)
- 15d. New Nuclear Construction Around the World—Status Report (P)
- 15e. Advanced and Small Modular Reactors (ASMR): 3 Pathways for Deployment (P)

### 16. RADIATION PROTECTION AND SHIELDING (RPSD)

- 16a. Highlights of RPSD-2018
- 16b. Computational Tools for Radiation Protection and Shielding
- 16c. Radiation Protection and Shielding: General
- 16d. Unstructured Mesh for Transport Analysis (P)

### 17. REACTOR PHYSICS (RPD)

- 17a. Reactor Physics: General
- 17b. Reactor Analysis Methods
- 17c. Reactor Physics Design, Validation and Operational Experience
- 17d. Molten Salt Reactors
- 17e. The Nuclear Energy Advance Modeling and Simulation (NEAMS) Workbench
- 17f. Overview of the Versatile Test Reactor
- 17g. The Consortium for the Advanced Simulation of Light Water Reactors

### 18. ROBOTICS AND REMOTE SYSTEMS (RRSD)

- 18a. Robotics and Remote Systems: General

### 19. THERMAL HYDRAULICS (THD)

- 19a. Severe Accident Thermal Hydraulics
- 19b. Large Eddy Simulation (LES) and Direct Numerical Simulation (DNS)
- 19c. Scaling Methodologies for SET and IET (P)
- 19d. Thermal Hydraulics of Accident-Tolerant Fuels
- 19e. Experiments on Two-Phase Flow and Heat Transfer Fundamentals
- 19f. Multiphase Computational Fluid Dynamics
- 19g. Data-Driven Modeling
- 19h. Thermal Hydraulics and Mass Transport in FHRs and MSRs
- 19i. Advances in Instrumentation for TH Experiments
- 19j. Computational Thermal Hydraulics
- 19k. Experimental Thermal Hydraulics
- 19l. General Thermal Hydraulics

## 2019 ANNUAL MEETING: TECHNICAL DIVISIONS

### ACCELERATOR APPLICATIONS (AAD)

Peter Hosemann, peterh@berkeley.edu

### AEROSPACE NUCLEAR SCIENCE AND TECHNOLOGY (ANST)

Robert O'Brien, robert.obrien@inl.gov

### BIOLOGY AND MEDICINE (BMD)

Robert G. Downing, downing@nist.gov

### EDUCATION, TRAINING, AND WORKFORCE DEVELOPMENT (ETWDD)

Lisa Marshall, lisa.marshall@ncsu.edu

### DECOMMISSIONING AND ENVIRONMENTAL SCIENCES (ESD)

James J. Byrne, jbyrne4424@comcast.net

### FUEL CYCLE AND WASTE MANAGEMENT (FCWMD)

Stephanie Bruffey, bruffeysh@ornl.gov

### FUSION ENERGY (FED)

Arnold Lumsdaine, lumsdaine@ornl.gov

### HUMAN FACTORS, INSTRUMENTATION, AND CONTROLS (HFICD)

Jamie Coble Baalis, jcoble1@utk.edu

### ISOTOPES AND RADIATION (IRD)

Kenan Unlu, K-unlu@psu.edu

### MATERIALS SCIENCE AND TECHNOLOGY (MSTD)

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### MATHEMATICS AND COMPUTATION (MCD)

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### NUCLEAR CRITICALITY SAFETY (NCSD)

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### NUCLEAR INSTALLATIONS SAFETY (NISD)

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### NUCLEAR NONPROLIFERATION POLICY (NNPD)

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### OPERATIONS AND POWER (OPD)

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### RADIATION PROTECTION AND SHIELDING (RPSD)

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### REACTOR PHYSICS (RPD)

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### ROBOTICS AND REMOTE SYSTEMS (RRSD)

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### THERMAL HYDRAULICS (THD)

Elia Merzari, pcchair@thd-ans.org

### YOUNG MEMBERS GROUP (YMG)

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