



# Nuclear Emerging Technologies for Space 2022 (NETS 2022)

May 8-12, 2022 | Cleveland, OH | The Westin Cleveland Downtown

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## CALL FOR PAPERS

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### EXECUTIVE CHAIRS

**General Chair**

Bryan K. Smith (NASA)

**Assistant General Chairs:**

Timothy D. Smith (NASA)

Stephen G. Johnson (INL)

**Technical Program Chairs**

Lee Mason (NASA)

Mike Smith (ORNL)

**Publications Chair**

Austen Fradeneck (INL)

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### IMPORTANT DUE DATES

**FEBRUARY**

INITIAL ABSTRACTS OR FULL PAPERS  
SUBMITTED FOR REVIEW: **February 18, 2022**

**MARCH**

REVIEWS COMPLETED AND AUTHORS NOTIFIED: **March 11, 2022**

**MARCH**

FINAL ABSTRACTS OR FULL PAPERS DUE: **March 25, 2022**

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### ABOUT THE MEETING

Papers are solicited for the **Nuclear Emerging Technologies for Space 2022, to be held on May 8-12, 2022 in Cleveland, Ohio** and organized by the American Nuclear Society. Authors and presenters are cordially invited to participate in this event to exchange ideas and knowledge, develop strong relationships across organizations, and establish collaborations to solve challenging problems.

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### FORMATS, PRESENTATIONS, AND PUBLISHING

Paper acceptance will be based upon originality of the work, strictly implemented methods or models, quality of results, and impact of the scientific advances to the field of Nuclear Emerging Technologies for Space.

There are two options for submittal, using the Electronic Paper Submittal and Review (EPSR) system:

**Full Paper Presentation Option**

- Submit a full 4-8 page paper, which will be presented orally if accepted

**Abstract/Lightning Talk Option**

- Submit a 1-page abstract only, which will be presented in a Lightning Talk if accepted

Previous NETS conferences have included multiple deadline extensions. This will not be the case for NETS 2022. February 18th will be the first and final paper submission date. Thank you for your understanding and please plan accordingly.

Templates for abstracts and papers can be found at <https://www.ans.org/meetings/view-nets2022/>

Authors of select papers will be invited to submit those papers to a special edition of *Nuclear Technology* or *Nuclear Science and Engineering*. Those papers may be edited through the journal review process.

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### SUBMIT AN ABSTRACT OR FULL PAPER

<https://epsr.ans.org/meeting/?m=382>

### PROGRAM SPECIALIST

Janet Davis

708-579-8253

[jdavis@ans.org](mailto:jdavis@ans.org)



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## NETS 2022 TRACK NARRATIVES & SESSION DESCRIPTIONS

### CELEBRATING THE PAST AND PRESENT

This track is inviting papers that discuss historic and current aspects of nuclear space power. Papers are solicited that describe past nuclear-powered missions and nuclear technology development programs, as well as current missions in progress. The goal is to provide an opportunity to communicate the state-of-the-art of the nuclear-space community to our colleagues and the world.

- **Past Missions:** New observations, narratives, and revelations regarding historic nuclear space missions – fission, radioisotope, power, and propulsion.
- **Current Missions:** Topics addressing current missions supported by nuclear space technologies.

### KEY INFLUENCES:

This track is inviting papers that cover nuclear-space topics including safety and policy, ground testing, adapting terrestrial technologies for spaceflight, and international activities. Papers presenting commercial, political, and educational perspectives are all welcomed. Although suggestions here encompass a diverse range of exciting topics, specific activities of other related nuclear-space advancements are also welcomed.

- **Safety & Policy:** Insights, updates, and activities involving nuclear space safety and policy.
- **International:** Topics discussing international influences and activities in the nuclear space community.
- **Ground Testing:** Ground testing activities of nuclear space power and propulsion technologies – programmatic and technical.

### TO THE MOON TO STAY:

This track is inviting papers specific to nuclear-space developments relevant to the moon. Specific interest in Commercial Lander Payload Services, Artemis, defense and commercial activities, and any extended-stay efforts leveraging nuclear power or propulsion are solicited. However, papers are welcomed that present other nuclear-space topics in the context of manned and robotic lunar mission architectures, including the Global Exploration Roadmap.

- **Extended Presence:** Topics addressing nuclear needs for an extended, established, and permanent presence on the moon.
- **Commercial Economy:** Topics discussing the growing demand and desire to establish commercial and economic architectures for lunar sustained operations – nuclear and non-nuclear.

### MARS AND BEYOND:

This track is inviting papers specific to nuclear-space developments relevant to Mars missions and beyond. Specific interest in Mars transportation architectures, surface operations, advanced power and propulsion, and innovative advanced mission concepts are solicited, but all topics proposing a synergy of nuclear-space technologies and manned and robotic outer planet mission architectures are welcomed.

- **Human Mars:** Topics discussing the technologies, human factors, and mission operations of future manned missions to Mars – nuclear and non-nuclear.
- **Advanced Propulsion:** Advanced nuclear propulsion technologies and concepts relevant to space missions beyond Mars.
- **Innovative Advanced Concepts:** Topics relevant to the NASA Innovative Advanced Concepts (NIAC) Program.

### DEVELOPING NEW SYSTEMS:

This track is inviting papers specific to current technology and design developments for radioisotope power systems (RPS) and fission power and propulsion systems. RPS papers for advances in energy conversion (e.g., thermoelectrics and dynamic power convertors), radioisotope fuels, cladding and protective components, modeling, and overall system design and development are solicited. Fission power and propulsion papers on advances in fuels, core design, system integration, thermal hydraulics, modeling, and overall system design and development are solicited. Although specific examples are provided here, papers presenting work on any aspect of advances in RPS, or fission power and propulsion are welcomed.

- **RPS I:** Developments in solid-state energy conversion for RPS – thermoelectrics, materials, fabrication, optimization, technologies, new generator designs, performance updates and technological insights.
- **RPS II:** Developments in dynamic energy conversion for RPS –convertor technologies, generator designs, performance updates, and technological insights.
- **RPS III:** Topics and activities related to radioisotope fuels, cladding, aeroshells and other fuel-related components used in RPS.
- **Fission Power I:** Concepts and developments for nuclear fission power – fuels and components.
- **Fission Power II:** Concepts and developments for nuclear fission power – systems, operations, transportation, and modeling.
- **Fission Propulsion I:** Topics covering all aspects of nuclear electric propulsion (NEP).
- **Fission Propulsion II:** Topics covering all aspects of nuclear thermal propulsion (NTP).