

FOREWORD

SPECIAL ISSUE ON THE 2007 SPACE NUCLEAR CONFERENCE

Special Issue Guest Editor

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This special issue of *Nuclear Technology* is devoted to exceptional papers presented at the 2007 Space Nuclear Conference (SNC '07), an embedded topical in the 2007 Annual Meeting of the American Nuclear Society (ANS) in Boston, Massachusetts, June 24–28, 2007.

Advanced planetary and space exploration will require the development and use of nuclear power and propulsion systems. These systems may range from tens of kilowatts to megawatts of power and could be used to power small landing craft or large manned or unmanned bases, or to propel vehicles in space. Although work in space nuclear power and propulsion has waxed and waned over the decades, it continues to be researched and developed for a variety of space missions. Ongoing activities in the United States cover the full range of nuclear applications, including radioisotope thermoelectric generators, fission surface power, and nuclear thermal propulsion. Research and development (R&D) require collaboration of various laboratories and research centers, including those at the National Aeronautics and Space Administration (NASA), U.S. Department of Energy (DOE), industry, and universities. Although the amount of R&D has dropped since the peak of the most recent effort, the Jupiter Icy Moons Orbiter (JIMO) program under Project Prometheus, there remains interest and ongoing investment from the broader space (and nuclear) community to further develop and utilize nuclear power in lunar, martian, and interplanetary missions. 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.

Designed to provide a communications network and forum for information exchange for professionals throughout the wide cross section of research and management personnel from government, industry, academia, and the national laboratory system that are involved in the initiative, SNC '07 was the second topical meeting organized by the Aerospace Nuclear Science and Technology (ANST) technical group of the ANS. The first Space Nuclear Conference was held in 2005 at the peak of the JIMO program. At SNC '05, we saw a significant interest in space nuclear applications from the broader nuclear community, and SNC '05 hosted almost 100 technical presentations. Although the size of the space nuclear programs in the United States has waned since 2005, SNC '07 hosted approximately 60 technical presentations and more than a dozen key speakers. Speakers hailed from various laboratories within NASA, DOE, industry, and universities from both the United States and abroad. This success is evidence alone that space nuclear technology remains a potential contributor to future space exploration! In 2009 ANST will sponsor the third topical meeting in this series, Nuclear and Emerging Technologies for Space (NETS-2009), renamed to better encompass the broad community of researchers developing advanced space power and propulsion systems.

The papers contained in this special issue represent the most exceptional archival work that was presented at the SNC '07 meeting. Because of the in-depth review process, which has ensured high-quality papers, and the important topics that are discussed, we hope that this special issue will be a valuable addition to the library of nuclear and aerospace engineers and scientists.

The SNC '07 Cochairs wish to express sincere thanks to the many session organizers and reviewers for their outstanding efforts in preparing the SNC '07 sessions and proceedings, making the publication of this special topical issue possible.