Foreword

Special issue featuring papers from the 2022 International Conference on Physics of Reactors (PHYSOR 2022)

Guest Editor

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The American Nuclear Society (ANS) 2022 International Conference on Physics of Reactors (PHYSOR) followed the success of the past meetings in the series. Focusing on reactor physics advancements, PHYSOR 2022 provided a platform for showcasing pioneering concepts, methods, and products and brought together international experts from research laboratories, universities, nuclear vendors, and utilities.

The theme of PHYSOR 2022 was "Making Virtual a Reality: Advancements in Reactor Physics to Leap Forward Reactor Operation and Deployment." The conference covered a broad range of topics in standard and special session tracks and panel sessions. Innovative reactor physics methodologies were presented with an emphasis on operational and economic performance improvements in current light water reactors (LWRs), as well as the development and deployment of microreactors, small modular reactors, and advanced reactors. Plenary sessions highlighted the role of reactor physics in global advanced reactor development programs and international research laboratories and facilities. Workshop participants learned about state-of-the-art computational tools and methods.

The technical tracks at PHYSOR 2022 covered a large range of topics, including deterministic and Monte Carlo transport methods, multiphysics reactor simulations, validation and uncertainty quantification, LWR and advanced reactor core analysis methods, transient systems and analysis, fuel management and optimization, fuel cycle physics, nuclear criticality and safety, neutronics benchmarks, high-enrichment high-burnup applications, microreactor design and analysis, machine learning and artificial intelligence applications, space nuclear methods and applications, and fusion reactor methods. Panel discussion topics included industry core simulators, advanced reactor development, LWR core development and design, and research reactors for reactor physics analysis and simulation. Memorial technical sessions were held at the conference for Massimo Salvatores with several presentations from his colleagues and students.

PHYSOR 2022 was one of the first in-person ANS meetings after loosening of COVID restrictions. It attracted 476 participants (113 of whom were students). The technical program included 359 technical papers (301 presented in 78 technical sessions and 58 in a poster session). A total of 151 different organizations were represented at the conference. International representation was strong, with 200 participants traveling to attend the conference from 30 countries.

For this special issue of *Nuclear Science and Engineering* (NSE) dedicated to PHYSOR 2022, all conference authors were invited to submit their works for consideration. The journal manuscripts were required to be different from the conference papers, to include updated results, and to undergo additional peer review to meet the criteria for publication. This culminated in the 44 high-quality works that appear in this issue.

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