

Foreword

Special issue featuring papers from the 2023 International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering (M&C 2023)

Guest Editors

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The 2023 International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering (M&C 2023) is part of a series of topical meetings organized by the Mathematics and Computation Division of the American Nuclear Society (ANS). For M&C 2023, the Canadian Nuclear Society had the privilege of hosting the conference, August 13–17, 2023, in Niagara Falls, Ontario, Canada.

Being the first post-COVID-19 pandemic, in-person M&C conference, it was really encouraging to see the large number of participants from around the globe in attendance. Moreover, the excitement about the newly emerging nuclear renaissance around the world was palpable at the conference. Realizing that nuclear energy is one of the most reliable and clean sources of energy, many nations are starting to embrace nuclear power to actively help in the universal fight against climate change. New reactor designs, small and large, are being developed and licensed in many parts of the world, with a clear hope that they could be deployed in a not-so-distant future. Needless to say, many papers contributed to M&C 2023 will be instrumental in moving the development of these new designs forward.

This special issue of *Nuclear Science and Engineering* (NSE) comprises many papers from M&C 2023 representative of its wide range of topics of interest, such as machine learning and artificial intelligence; deterministic transport methods and applications; Monte Carlo methods and applications; high-performance computing; computer codes (modeling and simulation); multiscale, multiphysics simulations; computational fluid dynamics; computational materials science and fuel technology; simulations for

small modular reactors and Generation IV reactors; sensitivity analysis and uncertainty qualification; modeling and simulations in high-energy-density and plasma physics; reactor operation and safety; subcritical systems; radiation protection and shielding; nonproliferation and safeguards; advanced reactors and fusion energy systems; nuclear fuel and fuel cycles; refurbishment and commissioning simulations; verification and validation; and nuclear data and nuclear data evaluations.

The participants at M&C 2023 were given a plethora of options regarding talks to attend: any of the ten different blocks of six parallel sessions. With approximately five presentations in each session, the conference hosted close to 300 oral presentations. Moreover, M&C 2023 held a poster session with 60 posters, which went through the same rigorous review process as the papers but were opted for this alternate presentation format primarily due to the limited time slots available for oral presentations. The conference also hosted several social events, including a Wednesday evening banquet with live entertainment, which provided additional networking opportunities for the participants.

It is our hope that this special issue of NSE will serve as a long-term commemoration of the hard work put in, by not only the organizing committee but also the participants, to make the conference a very successful one. Finally, we would like to express our gratitude to Farzad Rahnema (editor of NSE), David Strutz (production manager at ANS), and Faith Michal (peer review specialist at ANS) for their guidance, professional service, and patience throughout the production of this special issue.