Foreword

Selected papers from the 19th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-19)

Guest Editors

Elia Merzari,[a] Ferry Roelofs,[b] W. David Pointer,[c] and Chul-Hwa Song[d]

[a]*Pennsylvania State University, NURETH-19 Technical Program Chair*
[b]*NRG, NURETH-19 Technical Program Cochair*
[c]*Oak Ridge National Laboratory, NURETH-19 Technical Program Cochair*
[d]*Korea Atomic Energy Research Institute, NURETH-19 Technical Program Cochair*

This issue is part of a combined set of special issues of *Nuclear Technology* and *Nuclear Science and Engineering* that contain full-length, peer-reviewed papers presented at the 19th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-19), held virtually March 6–12, 2022. Meetings in the NURETH series are held every two years and allow experts from all over the world the opportunity to discuss and explore the state of the art in nuclear reactor thermal hydraulics. Held since 1980, NURETH is widely recognized as the leading meeting for the worldwide nuclear thermal hydraulics community. It is also the flagship of the Thermal Hydraulics Division of the American Nuclear Society.

The 19th edition of NURETH was scheduled to take place in August 2021, but due to the ongoing COVID-19 pandemic, it was postponed to 2022 and then moved to a virtual setting. NURETH-19 included a wide range of topics in the field of thermal hydraulics associated with current and future nuclear reactors. More than 1000 abstracts and 800 draft papers were submitted to the meeting, boiling down to 615 oral presentations delivered in five full days, spread over six parallel technical sessions. Papers were arranged into eight technical tracks, including fundamental thermal hydraulics, computational thermal hydraulics, verification and validation and uncertainty quantification, water-cooled reactor operation and safety, severe accidents, liquid metal thermal hydraulics, and advanced reactors. The eighth track included emerging topical areas of interest, and for NURETH-19, these topics ranged from microreactor thermal hydraulics to machine learning in thermal hydraulics. The opening plenary revolved around the conference's theme, "Lead the Flow." Eleven keynote speakers highlighted state-of-the-art developments in innovative areas. The conference also hosted the Bal-Raj Sehgal Memorial Award inaugural ceremony.

After the conference, the technical program committee had the difficult task of down-selecting the list of papers for these special issues. The committee combined the recommendations of reviewers and session chairs. The result of this process was selection of the 26 articles appearing across these two special issues, which represent an exciting collection of cutting-edge research in thermal hydraulics. Topics in these issues include experimental, computational, and analytical evaluations of various aspects of thermal-hydraulic phenomena related to the practical application of nuclear science and technology. Papers have been revised from their original form and expanded to include additional content. Readers will find these topics of great interest and derive significant value from this compilation.

Finally, we would like to thank the reviewers who volunteered their time and expertise to review the papers for these special issues of *Nuclear Technology* and *Nuclear Science and Engineering*. We would also like to thank Dr. Andy Klein, Dr. Farzad Rahnema, and Dr. Michael Corradini for supporting and spearheading these special issues and Mr. David Strutz, who has been instrumental in getting these issues published on a timely basis. Finally, we would like to thank the attendees and authors of NURETH-19, which have made this conference an incredible success.