PREFACE

The Thirty-third Annual International Solid Freeform Fabrication (SFF) Symposium – An Additive Manufacturing Conference, was held on July 25-27, 2022. Since the COVID pandemic was abating, the meeting was in-person only, the first time since 2019. There were 616 registrants from 13 countries, including 274 students. The total number of oral and poster presentations was 504. The meeting consisted of a Monday morning plenary, 55 parallel technical sessions and a poster session. The plenary session, "Emerging Women Leaders in AM" featured six outstanding mid-career researchers. Following the plenary session was a panel during which the plenary leaders discussed aspects of their research further.

Two special events took place. First was a session sponsored by America Makes. The purpose was to describe applied research opportunities, and also to identify scientific and technological development opportunities to foster alignment between the needs of industry and the expertise, skills, and capabilities of the academic community. As part of his NSF CAREER award, Dr. Nicholas Meisel from Penn State University organized a half-day workshop on Early Stage Design in AM.

The recipient of the 2022 International Outstanding Young Researcher in Freeform and Additive Manufacturing Award was **Dr. Filomeno Martina**, CEO of WAAM3D. **Dr. Behrokh Khoshnevis** from the University of Southern California won the International Freeform and Additive Manufacturing Excellence (FAME) Award.

There are over 130 papers in this conference proceedings. Papers marked "REVIEWED" in the title area were peer reviewed by two external reviewers. The Table of Contents file and Author-Attendee file have links to all the papers. We have sequentially numbered the pages of the papers to facilitate citation. Manuscripts for this and all preceding SFF Symposia are available for free download at the conference website: https://www.sffsymposium.org/; select the "Proceedings Archive" pull-down menu item.

The editors would like to thank the Organizing Committee, the session chairs, the attendees for their enthusiastic participation, and the speakers both for their significant contribution to the meeting and for the relatively prompt delivery of the manuscripts comprising this volume. We are grateful to TMS conference management staff for their significant contributions to the meeting planning and proceedings production, particularly Trudi Dunlap and Tess De Jong. We also are grateful to Christy Hall from The Hutton Group for handling venue logistics. We look forward to the continued close cooperation of the additive manufacturing community in organizing the Symposium. We also want to thank the National Science Foundation (CMMI- 2226705) for supporting this meeting financially by providing 94 student registration fee waivers. Funding from the Office of Naval Research is also gratefully acknowledged. The meeting was organized within the Walker Department of Mechanical Engineering and the Center for Additive Manufacturing and Design Innovation (CAMDI) at The University of Texas at Austin.

Dave Bourell has been a member of the Conference Organizing Committee from the beginning in 1990. In 1995, he took over as the Chair of the Organizing Committee, a position he has held for 28 years, through this 2022 meeting. He has retired from The University of Texas at Austin effective September 1, 2022. He also stepped down as the Conference Chair. Dave expressed gratitude to the AM community for its commitment to the SFF Symposium over the years and for all the excellent connections made at the conference. Professor Joe Beaman took over as the Chair of the Organizing Committee effective September 1, 2022.

The next SFF Symposium is planned to be in person on August 14-16, 2023 at the Hilton Austin Hotel in Austin, Texas USA. The conference website will become active in mid-January 2023.

The editors.