Preface

This issue consists of papers that were presented at the international conference Loops '19, which was held at the Budapest University of Technology and Economics, Hungary, 07 July–13 July, 2019. The event was attended by fifty seven mathematicians from twenty one countries and by a dozen accompanying persons. The conference continued the tradition started by Loops '99, with the aim to establish, every four years, a major forum open to all aspects of loop and quasigroup theory.

Quasigroups can be regarded as an algebraic expression of Latin squares. One of the main talks, by Nicholas Cavenagh, dealt with a closely related subject, as witnessed by the title *Trades and defining sets in Latin squares and related combinatorial arrays.* Combinatorial aspects of quasigroups have applications in cryptography. This topic was surveyed in the invited talk of Simona Samardjiska titled *Quasigroups for cryptography.* One of the areas where quasigroups meet cryptography are semifields. This was the focus of the invited talk *Semifields, planar functions and MRD codes* by Yue Zhou. The interaction of quasigroups with the left distributive law, in particular with quandles, is a matter of lively research, as reflected in the invited talks of Petr Vojtěchovský *Enumeration of racks, quandles and Bruck loops* and David Stanovský *Quasigroups and the Yang-Baxter equation.* The remaining invited talks were concerned with connections of loops and quasigroups to further research areas. Jonathan D. H. Smith delivered the talk *Augmented quasigroups: From group duals to Heyting algebras* and José María Pérez-Izquierdo spoke on *Applications of nonassociative Hopf algebras to loop theory.*

Out of the 37 contributed talks, 12 were concerned with structural loop theory, 8 with quandles and related structures, 1 with connections to probability, 2 talks had a strong geometric connection, 8 were of combinatorial flavour, 3 were motivated by cryptography and 3 were about certain related algebraic structures.

An additional talk by Petr Vojtěchovský, *Highlights from the research of Jonathan D. H. Smith*, reflected the extensive and influential work of Prof. Smith, who was soon to celebrate his 70th birthday. Much of his long mathematical career has been dedicated to quasigroup theory.

DOI 10.14712/1213-7243.2020.042

The Scientific Board of the conference consisted of Piroska Csörgő, Ágota Figula, Alexander Grishkov, Michael Kinyon, Alexander Pott, Victor Shcherbacov, Jonathan D. H. Smith, David Stanovský, Petr Vojtěchovský and Ian Wanless.

The main local organizer was Gábor P. Nagy, who is to be thanked for his excellent work. The conference was sponsored by the Algebra Department of the Budapest University of Technology and Economics and by the Bolyai Institute of the University of Szeged. The conference was very well prepared and ran in a casual and warm atmosphere.

More information about the conference can be found at `http://algebra.math.bme.hu/LOOPS19/` . This site contains amongst other things, a complete list of participants, the schedule of the conference, the booklet of abstracts of talks, conference photos and, most importantly, the slides of 43 presentations.

We warmly thank the editorial board of Commentationes Mathematicae Universitatis Carolinae for making it possible to publish the proceedings of the conference in their journal. Special thanks go to Jan Rataj (Editor-In-Chief), and Zdeňka Crkalová (Executive Editor).

Some of the contributions in this volume are from authors who intended to attend the conference but were in the end unable to do so. Since the proceedings appear as a regular issue of the journal, individual papers can be cited in the standard way. However, whenever they are cited as proceedings papers, the editorial credit should go to A. Drápal, P. Jedlička and D. Stanovský (who are also the authors of this preface).