Introduction

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This issue of CMUC consists of papers that were presented at the international conference Loops'03 which was held on the campus of the Czech Agricultural University in Prague, 10 August – 17 August 2003. Seventy four mathematicians from twenty two countries attended the conference, as well as about fifteen family members and partners. The conference continued the tradition started by Loops'99, with an aim to establish, every four years, a major forum open to all aspects of loop and quasigroup theory.

Jonathan D.H. Smith's opening address surveyed the current state of the theory of permutation representations of finite quasigroups. The other main lectures addressed various algebraic, combinatorial and geometrical topics related to the theory of quasigroups and loops. The conference emphasized a special link between the algebra of quasigroups and the combinatorics of Latin squares; this was reflected in both Charles C. Lindner's main talk on *Quasigroups constructed from cycle systems*, and Gary L. Mullen's main talk on *Latin hypercubes and related designs*. Galina B. Belyavskaya's main talk on *Check character systems over quasigroups and loops* also had a combinatorial flavor.

Three of main talks focused on geometrical aspects of quasigroups and loops. Michihiko Kikkawa followed the development of the notion with which his name is associated in the talk *Kikkawa loops and homogeneous loops*. Alexander Kreuzer described how one can construct Bol loops in incidence spaces with hyperbolic structure in his talk *Reflection geometries and loops*. Scheerer extensions of Bol loops were the main theme of the talk *Loop extensions and their topological aspects* by Peter T. Nagy.

There were also two main talks one could label as purely algebraic. Alexander N. Grishkov reported on a *Lagrange theorem for Moufang loops*, whose validity he and A. Zavarnitsine proved recently. Kenneth K. Kunen surveyed recent results on conjugacy closed loops in his talk *CC-loops and G-loops*.

The contributed talks at the conference reported, in most cases, the recent research of the authors; many of these papers are presented in this issue. The organizers suggested to the main speakers that they prepare their lectures in written form in advance in order to distribute them during the conference. Three of them agreed, and so the lectures of Belyavskaya, Lindner and Smith can be found in a special volume of the journal Quasigroups and Related Systems (volume 10, 2003). Two main speakers (Kikkawa, Kreuzer) sent the corresponding texts later; they can be found in this issue. Those two papers are the only ones in the issue that are of survey character.

The limited size of this issue of CMUC led to a scrupulous editorial process and so some papers had to be rejected. We hope that these proceedings bears witness

to the richness and diversity of work in the theory of loops and quasigroups.

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.

We also thank Professor Václav Slavík for lending his support to the conference so that the premises of the Czech Agricultural University could be used. (Professor Slavík is the Vice Rector of the University and Head of the mathematical department of its Technical Faculty.)

It should be mentioned that the conference proper was preceded by Workshops Loops'03, from August 5 to August 10. It consisted of six lecture series that presented a certain area of loop and quasigroup theory in detail. Their list follows. Cesar Polcino Milies: *Loop rings*, Tomáš Kepka and Petr Němec: *Selfdistributive quasigroups, trilinear constructions and cocyclic modules*, Gábor Nagy and Petr Vojtěchovský: *Moufang loops and 3-nets*, Aleš Drápal: *Latin trades and Hamming distances*, J.D. Phillips: *Automated reasoning in loop theory*, and Michael Kinyon: *Introduction to smooth loops*. The lecture by G. Nagy and P. Vojtěchovský, and the lecture by J.D. Phillips is available in printed form in the above mentioned special issue of Quasigroups and Related Systems.

The Program and Organizing Committee consisted of David Bedford, Orin Chein, Aleš Drápal (secretary), Michael Kinyon, Gábor Nagy, Markku Niemenmaa, Hala Pflugfelder (honorary chair), J.D. Phillips, Victor Shcherbacov and Petr Vojtěchovský. Petr Vojtěchovský developed (together with David Stanovský) web pages for the conference.

Additional local organizers included Štěpán Holub (social program), Přemysl Jedlička (visas), Tomáš Kepka (finances), Petr Němec (accommodation) and David Stanovský (website and abstracts).

More information about the conference can be found at
http://www.karlin.mff.cuni.cz/ loops03/ .
This site contains, amongst other things, a complete list of participants, the schedule of the conference, the booklet of abstracts of talks, and a list of problems presented to the conference.

Warm thanks for collaboration are extended also to all editors of Commentationes Mathematicae Universitatis Carolinae, specifically to Ivan Netuka (Editor-in-Chief), Jan Rataj (Executive Editor) and Anna Najmanová (Technical Editor).

Since the proceedings appear as a regular issue of the journal, they will be cited in a standard way. However, where they are cited as proceedings, the editorial credit should go to A. Drápal, M. Kinyon and J.D. Phillips (who are also the authors of this introduction).