Mile High Conference on Quasigroups, Loops, and Nonassociative Systems
OPEN PROBLEMS

Bol 1) Find a finite simple Bol loop that is not Moufang, or show that none exists.

Bol 2) Find a finite simple Bruck loop that is not Moufang, or show that none exists.

Bol 3) Are Bol loops of odd order solvable?

Bol 4) Determine the Campbell-Hausdorff series for analytic Bol loops.

Bol 5) For a left Bol loop Q, find some relation between the nilpotency degree of the left multiplication group of Q and the structure of Q.

Bol 6) Is there a finite non-Moufang left Bol loop with trivial right nucleus?

Moufang 1) [Phillips' problem] Is there a Moufang loop of odd order with trivial nucleus?

Moufang 2) [Doro's conjecture] Does a Moufang loop with trivial nucleus necessarily have normal commutant? (Commutant is the set of all x such that $xy = yx$ for every y.)

Moufang 3) Exhibit an example of a Moufang loop with non-normal commutant.

Moufang 4) Construct the free Moufang loop with generating set X.

Moufang 5) Count Moufang loops of order 64.

Buchsteiner 1) A loop is called *Buchsteiner* if it satisfies the Buchsteiner identity

$$x \setminus (xy \cdot z) = (y \cdot zx)/x.$$

Is there a Buchsteiner loop that is not conjugacy closed (CC)? If so, is there a finite simple non-CC Buchsteiner loop?

Mlt 1) Is $|\mathrm{Mlt}(Q)| < f(|Q|)$ for some variety of loops and for some polynomial f?

A 1) Find a finite simple proper A-loop, or show that none exists. (It is known that if the order of such a loop is odd then the loop must have exponent p.)

Alt 1) Does every finite alternative loop have 2-sided inverses?