# BETWIXT AND BETWEEN, NEITHER A BRACE NOR A RING.

TOMASZ BREZIŃSKI

The notion of a brace was introduced by Rump in the context of solving set-theoretic Yang-Baxter equation. In a formulation of Cedó, Jespers and Okniński, a (left) brace consists of a set $A$ with two binary operations $\circ$ and $+$, such that $(A,+)$ is an abelian group, $(A,\circ)$ is a group, and operations connected by the following *brace distributive law*:

$$a \circ (b + c) = a \circ b + a \circ c - a.$$

In this talk we probe a possibility of modifying the brace distributive law in a way that connects it with the usual distributive law for rings. Thus we study a set $A$ with two operations connected by

$$a \circ (b + c) = a \circ b + a \circ c - \sigma(a),$$

where $\sigma$ is any function $A \to A$. We study the restrictions that need to be put on binary operations and on $\sigma$, and show that the brace distributive law is characterised by a particular robustness. We place this discussion in a more general context of skew braces and Hopf braces introduced by Guarnieri and Vendramin, and Angiono, Galindo and Vendramin, respectively.