

---

**VLADISLAV KHARCHENKO**, Universidad Nacional Autónoma de México  
*Free braided nonassociative Hopf algebras and Sabinin  $\tau$ -algebras*

This is a joint work with UALBAI UMIRBAEV (Eurasian National University, Astana, Kazakhstan; Wayne State University, Detroit, USA). Let  $V$  be a linear space over a field  $\mathbf{k}$  with a braiding  $\tau : V \otimes V \rightarrow V \otimes V$ . We prove that the braiding  $\tau$  has a unique extension on the free nonassociative algebra  $\mathbf{k}\{V\}$  freely generated by  $V$  so that  $\mathbf{k}\{V\}$  is a braided algebra. Moreover, we prove that the free braided algebra  $\mathbf{k}\{V\}$  has a natural structure of a braided nonassociative Hopf algebra ( $H$ -bialgebra in sense of Pérez-Izquierdo) such that every element of the space of generators  $V$  is primitive. In the case of involutive braidings,  $\tau^2 = \text{id}$ , we describe braided analogues of Shestakov-Umirbaev operations and prove that these operations are primitive operations. We introduce a braided version of Sabinin algebras and prove that the set of all primitive elements of a nonassociative  $\tau$ -algebra is a Sabinin  $\tau$ -algebra.