

1079-57-229

**Jozef H. Przytycki\*** (przytyck@gwu.edu), Department of Mathematics, George Washington University, Washington, DC 20052. *Conway algebras, Tutte algebras, and invariants of links.*

A Conway algebra, introduced by Pawel Traczyk and the speaker in December 1984, is a magma  $(A, *)$  with invertible  $*$  :  $X \times X \rightarrow X$  (that is  $*$  :  $A \times \{b\} \rightarrow A$  is invertible), satisfying entropic condition  $(a * b) * (c * d) = (a * c) * (b * d)$ , with a sequence of constants  $a_n \in A$  satisfying  $a_n * a_{n+1} = a_n$  for every  $n$ . We demonstrated (with Traczyk) that every Conway algebra yields a link invariant (which we called algebraic invariant of Conway type). The main example is the Homflypt polynomial. In fact, the Murdoch-Toyoda theorem guarantee that if  $(A, *)$  is a quasigroup than the invariant is a variant of the Homflypt polynomial. In the joint paper with M.Niebrzydowski and M.Dabkowski we use Conway algebras and related Tutte algebras (i.e. Kauffman bracket skein relation is used in place of Conway skein relation) to approach the 4-move conjecture of Nakanishi and Kawauchi. We also discuss use of Conway algebras to study virtual links. (Received January 15, 2012)