Algebraic structures connected with pairs of compatible associative algebras

Alexander Odesskii (Manchester)

We study associative multiplications in semi-simple associative algebras over \( \mathbb{C} \) compatible with the usual one or, in other words, linear deformations of semi-simple associative algebras over \( \mathbb{C} \). It turns out that these deformations are in one-to-one correspondence with representations of certain algebraic structures, which we call M-structures in the matrix case and PM-structures in the case of direct sums of several matrix algebras. We also investigate various properties of PM-structures, provide numerous examples and describe an important class of PM-structures. The classification of these PM-structures naturally leads to affine Dynkin diagrams of ADE-type.