

Algèbres non commutatives, théorie des représentations et fonctions  
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Non-commutative algebras, representation theory and special functions  
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**Nicolas Crampé**  
(CNRS, Université de Tours)

## **Representations of the higher rank Racah algebra**

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The definition of the higher rank Racah algebra are recalled as well as the ones of its quotient called soical Racah algebra. We prove the isomorphism with the centralizer of the quantum group of  $sl(2)$ . Then, I show that the automorphism group of  $R(4)$  can be understood thanks to a polyhedron, called the icosidodecahedron. Some representations are then computed and their conjugacy classes are studied. Relations of type Racah or Biedenharn–Elliot between the Racah polynomials are recovered. The icosidodecahedron structure of the automorphism group allows us to define bivariate Racah polynomials. We provide their recurrence and difference relations as well as their orthogonality property.