

## **Algebraic Algorithms: The era of computational non-linear algebra**

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Algebraic algorithms provide the research community with extremely powerful tools for computing with the solution set of polynomials in many variables. These tools allow us, on the one hand to tackle theoretical problems involving non-linear

objects, and on the other to develop efficient implementations. The mixture of computational non-linear algebra with symbolic-numeric techniques and dedicated tools

that exploit the geometry, the sparsity, and the structure of the problem at hand, provides us the means to tackle problems that otherwise it would have been difficult, if possible at all, to consider.

In this context we will survey results and algorithms for the representation of the isolated roots of a polynomial system, for separation bounds, that is the minimum distance between two roots, for sparse Groebner basis and resultant computations, and their applications in various domains.