

## SEMINARIO

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# ***Multivariate cryptography and the complexity of solving random polynomial systems***

### **Abstract:**

The study of the complexity of solving a system of polynomial equations over a finite field is a central problem in symbolic computation, with a wide range of applications. In this talk, we focus on the applications to post-quantum cryptography, more specifically to multivariate cryptography. In multivariate cryptography, the security of the cryptosystem relies on the computational hardness of finding the solutions of a system of polynomial equations over a finite field. Therefore, estimating the complexity of solving a given system of polynomial equations produces an estimate for the security of the corresponding cryptosystem. Often, in their analysis, cryptographers make the assumption that the systems that they analyze are "random". In this talk, we discuss two distinct mathematical formulations for randomness of a system of equations. For each of them, we show estimates on the complexity of system solving by means of Groebner bases techniques. The new results that we present are joint work with M. Bigdeli, E. De Negri, M. Dizdarevic, R. Minko, and S. Tsakou.

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**Martes 6 de Octubre de 2020 (16:00)**

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