

***Computing the homology of real projective sets***

Dimecres 14 de setembre de 2016

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Computational problems dealing with algebraic (or semialgebraic) sets are, with a few exceptions, difficult to solve. Feasibility problems are NP-complete and problems such as counting the number of solutions in a zero-dimensional set or computing the Euler characteristic are #P-complete. These results suggest that there is no hope of polynomial time algorithms. For the (clearly more complicated) problem of computing the homology groups of an algebraic set, the fastest algorithm remains the cylindrical algebraic decomposition, which has a doubly exponential cost. In the talk we will describe an algorithm doing the job for real projective sets with single exponential cost.

**Lloc:** Aula T1, Facultat de Matemàtiques, UB**Hora:** 12.10[www.imub.ub.edu](http://www.imub.ub.edu)