Binomial edge ideals of graphs

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In the last decades the connections between Commutative Algebra and Combinatorics have been extensively explored. In this perspective, many authors have considered classes of ideals in a polynomial ring that can be naturally associated with combinatorial objects, and have studied their algebraic invariants exploiting this combinatorial connection. In this talk I will give an introduction to the so-called "binomial edge ideals", which are ideals generated by binomials corresponding to the edges of a finite simple graph. They can be viewed also as the ideals generated by "some" minors of a generic matrix with two rows. After reviewing some results, I will focus on the Cohen-Macaulay property of binomial edge ideals. I will present a conjecture in this direction and explain the main results obtained so far. This is based on joint works with Davide Bolognini, Antonio Macchia, and Giancarlo Rinaldo.

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