

## Line arrangements via rigidity theory

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Let  $\mathcal{A} = \{\ell_1, \dots, \ell_n\} \subset \mathbb{P}^2$  be an arrangement of distinct lines. To what extent do the algebraic structures associated to  $\mathcal{A}$  depend only on its combinatorics, described by an intersection lattice, and when are they sensitive to the geometry of the arrangement? We study the formality of an arrangement, which characterizes when relations on the linear forms defining the lines are generated by local relations. In addition we study syzygies of the Jacobian of  $\mathcal{A}$ . We will see how insights from combinatorial rigidity theory can be brought to bear to study these notions and produce novel examples exhibiting special behavior.

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