Almost normally torsionfree ideals

We describe all connected graphs whose edge ideals are almost normally torsion-free. We also prove that the facet ideal of a special odd cycle is almost normally torsionfree. Finally, we determine the $t$-spread principal Borel ideals generated in degree 3 which are almost normally torsionfree.

On the regularity of binomial edge ideals of block graphs

In this talk we compute one of the distinguished extremal Betti number of the binomial edge ideal of a block graph, and classify all block graphs admitting precisely one extremal Betti number. Moreover we give a lower bound for the Castelnuovo-Mumford regularity of binomial edge ideals of block graphs by computing the two distinguished extremal Betti numbers of a new family of block graphs, called flower graphs. At the end we present a linear time algorithm to compute the Castelnuovo-Mumford regularity of the binomial edge ideal of a block graph.

Bibliography:


Cohen-Macaulay criteria for projective monomial curves via Gröbner bases

We present new criteria for deciding the Cohen-Macaulay property for projective monomial curves using Gröbner bases. This is joint work with Juergen Herzog.
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*Level squarefree monomial ideals with height three and with Cohen-Macaulay type two*

Via computer-aided classification we show that the following three conditions are equivalent for level* squarefree monomial ideals $I$ with codimension 3, with Cohen-Macaulay type 2 and with $\dim S/I \leq 4$:

1. $IS_\mathfrak{m}$ is licci,
2. the twisted conormal module of $I$ is Cohen-Macaulay,
3. $S/I^{(2)}$ is Cohen-Macaulay,

where $S$ is a polynomial ring and $\mathfrak{m}$ is its graded maximal ideal.

(This is based on a joint work with G.Rinaldo and K. Yoshida.)