1012-13-182 **Mauricio F Velasco*** (velasco@math.cornell.edu), 120 Malott Hall, Ithaca, NY 14853. *Some monomial ideals associated to simplicial complexes.*

This talk is about the structure of minimal free resolutions of monomial ideals in the ring of polynomials over a field. There are very few classes of ideals for which this structure is known. The main ones are monomial regular sequences, Borel ideals and Scarf ideals.

We introduce a new class -nearly Scarf ideals- and describe their minimal free resolutions. These resolutions are intimately related with the combinatorial structure of their Scarf complexes.

Using these ideals we:

1. Show that the total betti numbers of Scarf ideals correspond to the f-vectors of acyclic simplicial complexes.
2. Prove that the total betti numbers of all ideals with a fixed Scarf complex are bounded below by those of a nearly Scarf ideal (this bound is sharp).
3. Describe the minimal free resolutions of all ideals with smallest betti numbers in their Scarf class.
4. Construct monomial ideals whose minimal free resolutions do not admit any cellular structure (that is, resolutions not supported by any CW complex). The fourth application answers negatively a question raised by Jollenbeck-Welker of whether every minimal monomial free resolution admits a CW-structure.

Some of these results are joint work with I. Peeva.

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