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Matroids Over Rings

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(Joint with the Algebra Seminar)

Matroids are widely used objects in combinatorics, arising naturally in many situations featuring vector configurations over a field. But in some contexts the natural data are objects in a module over a ring, and there is more than simply a matroid to be extracted. Luca Moci and I have defined the notion of matroid over a ring to fill this niche. I will discuss two examples of situations producing these enriched objects, one relating to subtorus arrangements producing matroids over the integers, and one related to tropical geometry producing matroids over a valuation ring.

Time permitting, I'll also discuss the analogue of the Tutte invariant.
