ANDREA BURGESS, University of New Brunswick

Cyclic cycle systems of complete equipartite graphs

A *cycle system* of a graph Γ is a partition of the edges of Γ into cycles. For a graph Γ with vertex set $\mathbb{Z}_v$, we say that a cycle system $\mathcal{D}$ of Γ is *cyclic* if, for any cycle $(c_1, c_2, \ldots, c_\ell)$ of $\mathcal{D}$, we have that $(c_1 + 1, c_2 + 1, \ldots, c_\ell + 1)$ is also a cycle of $\mathcal{D}$.

In this talk, we consider cycle systems of the complete multipartite graph $K_m[n]$ with m parts of size n. We determine necessary and sufficient conditions for the existence of a cyclic ℓ-cycle system of $K_m[n]$ when $2\ell \mid (m-1)n$; this is a natural case to consider, as it allows us to construct cyclic cycle systems with no short-orbit cycles.

This is joint work with Francesca Merola and Tommaso Traetta.