FRAUKE BLEHER, University of Iowa
Orbit closures, rational surfaces, and Euler characteristics

This talk is about joint work with Ted Chinburg and Birge Huisgen-Zimmermann. We study the Grassmannian of submodules C of a given dimension inside a finitely generated projective module P for a finite dimensional algebra Λ over an algebraically closed field k. The orbit of such a submodule C under the action of $\mathrm{Aut}_\Lambda(P)$ has been considered by a number of authors. We study the problem of bounding the geometry of the closure of this orbit in terms of representation theoretic data. We concentrate on the case when the orbit of C is an affine plane $\mathbb{A}_k^2$. We bound the geometry of the orbit closure of such a C, using "good blow ups" of relatively minimal smooth projective surfaces, such that the bounds only depend on k and $\dim_k(C)$. As a consequence we obtain that the Euler characteristic of the orbit closure of C is bounded above by a function depending on k and $\dim_k(C)$.