Title: Support variety theory for finite dimensional algebras

Support is a fundamental concept to provide a geometric approach for studying all kinds of algebraic structure. Based on Quillen's work, the description of the algebraic varieties corresponding to the cohomology ring of a finite group, Carlson introduced a support variety of any finitely generated module over a finite group G whose dimension is given by the complexity of the module. The support variety of a module is a powerful invariant in the modular representation theory of a finite group, and contains a lot of deep structure information about modular representations of finite groups. The very active direction in this field is to develop and generalize the theory of support varieties to finite dimensional algebras (due to Snashall and Solberg), and read off homological information on the module itself. This needs a non-trivial assumption which is known as the (**Fg**) condition.

- (**Fg 1**) There exists a noetherian graded subring H of $\mathrm{HH}^*(A)$.

- (**Fg 2**) $\mathrm{Ext}^*_A(X,Y)$ is a finitely generated H-module for all $X,Y \in A-\mathrm{mod}$.

In this talk, we will give a new approach to support varieties. As applications, we will show that all skew-gentle algebras satisfy the (**Fg**) condition, and the support variety of any indecomposable module over a skew-gentle algebra is point or a curve. It follows that the complexity of any module over a skew-gentle algebra is at most one. This is a joint work with Steffen Koenig.