- Paula Carvalho (Porto) - Critical and Injective modules over skew polynomial rings.

Abstract: A Noetherian ring S whose simple modules have the property that their finitely generated essential extensions are Artinian is said to satisfy property ($\diamond$). For commutative Noetherian rings the validity of ($\diamond$) is due to Matlis (1958). In this talk we will discuss ($\diamond$) for skew polynomial rings $S=R[\theta; \alpha]$ where R is a commutative Noetherian ring and α an automorphism of R, with a special focus on the case when R is a local k-algebra of Krull dimension one, k a field and α a k-algebra automorphism of R. Under some additional assumptions on R we obtain a criterion for S to satisfy property $(\diamond)$. It is easy and well known that if α is of finite order, then S has this property, but in order to get the criterion if α has infinite order we found it necessary to classify all cyclic (Krull) critical S-modules. As an application we show that $\widehat{S}=k[[X]][\theta, \alpha]$ satisfies $(\diamond)$ for all k-algebra automorphisms α of $k[[X]]$.

This talk is based on joint work with Ken Brown and Jerzy Matczuk.