Speaker: Frauke Bleher

Title: On the module structure of holomorphic differentials in positive characteristic

Abstract: This talk is about joint work with Ted Chinburg and Aristides Kontogeorgis. Let X be a smooth projective curve over an algebraically closed field k of positive characteristic p. Suppose G is a finite group with non-trivial cyclic Sylow p-subgroups acting faithfully on X. In this talk, I will describe how to determine the kG-module structure of the module $H^0(X, \Omega^1_X)$ of holomorphic differentials of X. I will begin by reviewing some relevant facts from characteristic p representation theory of G which allow to reduce this problem to the case when G is a semidirect product of a normal cyclic p-subgroup and a cyclic prime-to-p group. In this case, one compares the radical filtration of $H^0(X, \Omega^1_X)$ to the global sections of subquotients of the radical filtration of the sheaf Ω^1_X. This leads to a description of the module structure of $H^0(X, \Omega^1_X)$ in terms of the ramification data of the cover $X \to X/G$.