Number Theory Seminar

Lifting automorphisms of power series from characteristic $p$

to characteristic 0

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WHERE: Chase 319

ABSTRACT:

Let $k$ be an algebraically closed field of positive characteristic $p > 0$. Lifting problems ask when objects defined over $k$ come from objects defined over a local ring $R$ with unique maximal ideal $\mathfrak{m}$ such that $R/\mathfrak{m} = k$. In this talk, I introduce lifting problems for finite order automorphisms of the ring of formal power series $k[[t]]$. We will see that this problem becomes very difficult when $R$ is of characteristic 0 and the order of the automorphism is divided by $p$. In fact, it is very much related to the theory of wild ramification of ring extensions, a branch of algebraic number theory that has lately undergone very fast developments. I will not go into the technicalities of this theory, but rather show with examples some of its features, by solving positively lifting problems for automorphisms of order $p$ and showing negative results about liftings of elementary abelian subgroups of $\text{Aut}(k[[t]])$.

Any questions, please e-mail the organizer Lin Jiu: Lin.Jiu@dal.ca