

**Speaker:** Ruochuan Liu

**Title:** Relative  $p$ -adic Hodge theory

**Abstract:** The theory of  $(\varphi, \Gamma)$ -modules, which was introduced by Fontaine in the early 90's, classifies local Galois representations into modules over certain power series rings carrying certain extra structures ( $\varphi$  and  $\Gamma$ ). In a recent joint work with Kedlaya, we generalize Fontaine's theory to geometric families of local Galois representations. Namely, we exhibit an equivalence between étale local systems over nonarchimedean analytic spaces and certain modules over commutative period rings carrying similar extra structures. In this talk, I will explain some of the basic ideas and constructions of this work.