

# Seminar on Scholze's Work

Speakers: Chen, Miaofen (ECNU) and Chen, Ke (USTC)

Thursday and Friday, 10–11:30am, Room 2201

## **Title: Perfectoid Spaces, after Scholze**

### **Talk 1: Introduction**

Nov. 7 (Thur), 10-11:30, Speaker: Chen, Miaofen

Abstract: Will briefly review of the ideas of Tate, Fontaine, Wintenberger, Faltings, etc., and state the main results. If time permits, will begin introducing perfectoid fields.

### **Talk 2: Perfectoid Ring Theory**

Nov. 8 (Fri), 10-11:30, Speaker: Chen, Miaofen

Abstract: Will introduce perfectoid algebras, tilting and the inputs from almost ring theory.

### **Talk 3: Perfectoid Spaces**

Nov. 14 (Thur), 10-11:30, Speaker: Chen, Miaofen

Abstract: Will introduce Huber's adic spaces and perfectoid spaces.

### **Talk 4: Analytic Topology on Perfectoid Spaces**

Nov. 15 (Fri), 10-11:30, Speaker: Chen, Ke

Abstract: Will introduce the analytic topology of perfectoid spaces. Various results will be explained in parallel with rigid analytic geometry, like Tate acyclicity, etc.

### **Talk 5: Etale Topology of Perfectoid Spaces**

Nov. 28 (Thur), 10-11:30, Speaker: Chen, Ke

Abstract: Will explain the basic results on the etale cohomology of a perfectoid space with torsion coefficients; the idea of pro-etale site introduced by Scholze.

## **Talk 6: Weight-Monodromy Conjecture in the Toric Case**

Nov. 29 (Fri), 10-11:30, Speaker: Chen, Ke

Abstract: For a proper smooth variety over a local field with semi-stable reduction, it was conjectured that the weight filtration and the monodromy filtration on the étale cohomology of the variety differ by a shift. In this talk we explain the perfectoidification of toric varieties and the proof of Scholze of the weight-monodromy conjecture for proper smooth toric varieties in characteristic zero by reduction to the equal characteristic case proved by Deligne and Ito.