

## INVITED TALKS ON

# The Iwahori mod $p$ LLC

### ABOUT SPEAKER



**Prof. Eknath Ghate**  
School of Mathematics,  
TIFR, Mumbai.

**About the Speaker:** Professor Eknath Ghate is currently at the Tata Institute of Fundamental Research (TIFR) serving as a senior professor in the School of Mathematics. He is a fellow of the Indian National Science Academy and Indian Academy of Sciences. He has been awarded the Shanti Swarup Bhatnagar Award for Mathematical Sciences.

Over the last decade, Professor Ghate's research has been dedicated to computing the reductions of local two-dimensional Galois representations. This work has been in collaboration with several mathematicians. Both crystalline and semi-stable cases have been considered. Professor Ghate proved his zig-zag conjecture on the reductions of crystalline representations of large exceptional weights and half-integral slopes. This uncovers a surprising alternating pattern of irreducible and reducible reductions.

**Abstract:** Langlands Correspondences connect algebra and analysis. More precisely, they connect  $n$ -dimensional representations of the Galois group and infinite-dimensional representations of the general linear group of size  $n$ . We will stick to the Local case where the base field is the field of  $p$ -adic rational numbers and the representations are defined over a field of characteristic  $p$ . This is referred to as the mod  $p$  Local Langlands Correspondence or mod  $p$  LLC.

The case  $n = 1$  is class field theory. The case  $n = 2$  was proposed about two decades ago by Breuil and made functorial by Colmez. In this talk, we will reformulate the statement of the mod  $p$  LLC using the language of Iwahori induction and some natural operators on the edges of a famous graph, namely, the Bruhat-Tits tree.

This series of 2 lectures is based on work of A-B--C (Anandavardhanan-Borisagar and Chitrao).

**30, 31** Aug  
2024

**10** am  
onwards

**S-101** First  
Floor



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