教員名：譚　福成（Tan, Fucheng）

教員の大分野名：Algebra

教員の小分野名：Arithmetic Geometry, Number Theory

分野のキーワード：p-adic Hodge Theory, Galois Representation, Modular Form, Anabelian Geometry

研究分野紹介: I currently focus on the study of p-adic Hodge theory, anabelian geometry, and modularity of Galois representations.

In Langlands Program, a central question is: Which Galois representations come from algebraic geometry? It is conjectured by Fontaine and Mazur that the key condition is “potentially log-crystalline” in p-adic Hodge theory. The first highly non-trivial case of this conjecture was proven by Wiles, namely the Taniyama-Shimura conjecture. Today, the Fontaine-Mazur conjecture in dimension two for the rational field is almost settled, as a result of various works in the past decades, including my joint work with Y. Hu.

In fact, the condition “log-crystalline” was rooted in the study of comparison between etale cohomology and crystalline cohomology, initially known as Grothendieck's mysterious functor. Such theorems were proven in various generalities. Together with J. Tong, I prove the comparison for cohomologies with non-trivial coefficients, as well as in the relative setting.

P-adic Hodge theory plays an essential role in Mochizuki's proof of Grothendieck's Anabelian Conjecture. Recently, I have been studying anabeian geometry and Mochizuki's Inter-universal Teichmuller theory, which is in certain sense a global simulation of p-adic comparison theorem.

More information can be found on the RIMS webpage: http://www.kurims.kyoto-u.ac.jp/ja/list/tan.html

志望者に期待すること: Please prepare in order to study about such things after enrollment:

Local Galois groups, as in Serre’s book “Local Fields”;

Class field theory, as in the book “Algebraic Number Theory” ed. by Cassal and Froehlich;

Scheme theory and cohomology, as in Hartshorne’s book “Algebraic Geometry”.