Conference on p-adic Geometry and Related Topics

June 24th to June 28th, 2024

	周一	周二	周三	周四	周五
9:15-10:15	朱歆文	刘通	左康	马临全	陈苗芬
10:15-10:45	break				
10:45-11:45	闵钰	朱一飞	李时璋	李志远	许大昕
11:45-14:00	lunch				
14:00-15:00	丁一文	高辉		王宇鹏	盛茂
15:00-15:30	break				
15:30-16:30	李一笑	江元旸		胡永泉	田一超

周一（6.24）

朱歆文

Title: Stack of global Langlands parameters

Abstract: I will first review my previous work on the stack of global Langlands parameters for function fields. Then I will discuss my joint work with Emerton towards a similar (but largely conjectural) story for number fields.

闵钰

Title: Moduli stack of Laurent F-crystals and the Emerton—Gee stack

Abstract: The moduli stack of etale (phi,Gamma)-modules, introduced by Emerton—Gee, plays an important role in the conjectural categorical p-adic local Langlands correspondence and the geometric Breuil—Mezard conjecture. In this talk, we will introduce a moduli stack of Laurent F-crystals and show it is equivalent to the Emerton—Gee stack. Moreover, we will also define a derived stack of Laurent F-crystals and compare it with the left Kan extension of the Emerton—Gee stack.

丁一文

Title: A locally analytic p-adic Langlands correspondence for GLn(Qp) in the crystabelline case

Abstract: We build a one-to-one correspondence between n-dimensional generic non-critical crystabelline Gal(Qpbar/Qp)-representations of regular Hodge-Tate weights and certain locally analytic representations of GLn(Qp). We show the correspondence can be realized in subspaces of p-adic automorphic representations.

李一笑

Title: A p-adic Riemann-Hilbert functor for Zariski-constructible sheaves over rigid varieties

Abstract: Let X be a rigid variety over a p-adic number field. The Riemann-Hilbert functor for p-adic local systems has been constructed by Liu-Zhu. There is a modification of this construction which works for Zariski constructible sheaves, as indicated by Bhatt-Lurie in the case of algebraic varieties. In this talk, we construct a version of the Riemann-Hilbert functor, which sends Zariski-constructible sheaves on X to filtered $\calD$-modules, and show its basic properties.

周二（6.25）

刘通

Title: Torsion graded piece of integral filtration attached to crystalline representation.

Abstract: Let K be an unramified p-adic field and T a crystalline Z_p representation of G_K. We can construct integral filtration on the attached filtered \phi-module via the Nyggard filtration of Breuil-Kisin module. The torsion part of the graded pieces of such filtration measures how nice the Nyggrad filtration is. In this talk, we show that such torsion graded pieces only occur at the integers that are congruent to Hodge-Tate weights modulo p.

朱一飞

Title: Higher-periodic homotopy types through Lubin–Tate towers

Abstract: In their recent work, Barthel, Schlank, Stapleton, and Weinstein determined the periodic stable homotopy groups of the sphere spectrum rationally. They made an essential use of the structure afforded by perfectoid spaces for computing relevant group cohomology in the framework of condensed mathematics. These spaces appear in an equivariant isomorphism between two towers: (1) the Lubin–Tate tower that parametrizes deformations of a formal group of fixed height with level structures and (2) the Drinfeld tower that parametrizes those for shtukas. I'm obliged to introduce this exciting mathematical landscape to the greater "perfection" community, and appeal for further insights and collaborations. This also includes: (a) my ongoing joint work with Guozhen Wang which computes unstable higher-periodic homotopy types integrally, (b) Xuecai Ma's spectral realization of finite levels of the Lubin–Tate tower as non-even commutative ring spectra, which generalize Morava, Hopkins, Miller, Goerss, and Lurie's spectra at the ground level, and (c) Hongxiang Zhao's work which connects Ando's norm through homotopical descent of level structures along the tower, to Coleman's norm in the context of Lubin and Tate's explicit local class field theory.

高辉

Title: Prismatic crystals and p-adic Riemann--Hilbert correspondence

Abstract: We discuss prismatic crystals defined over the de Rham period sheaf on a formal scheme. We first classify them by certain enhanced connections. Using a p-adic Riemann--Hilbert functor and Sen theory over the Kummer tower, we further classify them by nearly de Rham B_{dR}^+-local systems. This is joint work (in progress) with Yu Min and Yupeng Wang.

江元旸

Title: Partial Classicality of Hilbert modular forms

Abstract: We define a notion of "partial classical Hilbert modular forms", which is an intermediate object between the classical Hilbert modular forms and the p-adic overconvergent ones. Moreover, we prove under some condition on weights, the partial de Rhamness condition on the Galois representation is equivalent to the partial classicality of the forms, which is consistent with the philosophy of Fontaine-Mazur conjecture. The key ingredient for the proof is the computation of the Fontaine operator, following the idea of Lue Pan in the modular curve case.

周三（6.26）

左康

Title: On Simpson correspondence for p-adic uniformizing Higgs bundle.

Abstract: We review the complex Teichmueller theory via uniformizing Higgs bundle on hyperbolic Riemann surface due to Hitchin. We propose then a p-adic analogue and its relation to Grothendieck anabelian geometry. This is a joint project with Jinbang Yang.

李时璋

Title: On cohomology of BG

Abstract: We will report some progress made with Dmitry Kubrak and Shubhodip Mondal concerning cohomology of classifying stacks of finite commutative group schemes. Specific results to be presented can depend on audience's interests.

周四（6.27）

马临全

Title: Test ideals in mixed characteristic

Abstract: Multiplier ideals in characteristic zero and test ideals in positive characteristic are fundamental objects in the study of birational geometry and commutative algebra in equal characteristic. We introduce a mixed characteristic version of the multiplier / test ideal using recent advances in p-adic Hodge theory, in particular the p-adic Riemann-Hilbert functor of Bhatt--Lurie. This mixed characteristic test ideal satisfies expected properties. Based on joint work with Bhargav Bhatt, Zsolt Patakfalvi, Karl Schwede, Kevin Tucker, Joe Waldron, and Jakub Witaszek.

李志远

Title: Supersingular Tate conjecture for Hyper-Kähler varieties

Abstract: The Tate conjecture asserts that all Tate classes on a smooth projective variety are algebraic. In this lecture, I will talk about so called supersingular Tate conjecture for Hyper-Kähler varieties, which predicts that all cohomology classes of a supersingular Hyper-Kähler variety are algebraic. This is motivated from the work of Artin and Shioda on supersingular K3 surfaces. I will foucs on Hyper-Kähler varieties of known types and confirm this conjecture over fields with large characteristic.

王宇鹏

Title：A p-adic Riemann-Hilbert correspondence over Robba ring.

Abstract：Let X be a smooth formal scheme over W with the generic fiber X_{η}. We shall establish an equivalence between the category of certain vector bundles over the Robba ring $\tilde{C}^I$ and the category of certain flat connections with coefficients in $\mathcal{O}_X\otimes \tilde{C}^I$. This is based on a joint work with Zekun Chen, Ruochuan Liu and Xinwen Zhu.

胡永泉

Title: On p-adic Jacquet-Langlands Correspondence for GL(2,Qp)

Abstract: The classical Jacquet-Langlands (J-L) correspondence relates complex smooth representations of GL(n) and that of its inner forms. It was proved in 1970's and provides one of the first examples of the functoriality conjecture in Langlands program. However, when we consider representations with p-adic or mod p coefficients, the analogue of J-L correspondence is still poorly understood, even in the simplest case of GL(2,Qp). In this talk, I will report some recent progress on the p-adic and mod p local J-L correspondence for GL(2,Qp). This is joint work with Haoran Wang.

周五（6.28）

陈苗芬

Title: Extensions of Vector bundles and Non-emptiness of Newton stratification in p-adic Hodge theory

Abstract: A p-adic period domain is an open subspace inside the rigid analytic p-adic flag varieties introduced by Rapoport and Zink which interpolates a family of crystalline representations. Newton stratification is a stratification on the rigid analytic p-adic flag varieties which has p-adic period domain as its unique open stratum. In this talk, we will study the non-emptiness of a Newton stratum which is closely related to the classification of extensions of vector bundles on the Fargues-Fontaine curve. It's a joint work with Jilong Tong.

许大昕

Title: On C_p representations of the fundamental group in the p-adic Simpson correspondence

Abstract: In the p-adic Simpson correspondence, an important question is to understand the essential image of the C_p representations of the geometric fundamental group under this correspondence. We will review the previous work of Deninger--Werner and myself on this question and discuss some recent progress.

盛茂

Title: Constructing crystalline G-representations of algebraic fundamental groups via Higgs-de Rham flows.

Abstract: Let k be an algebraic closure of the finite field F_p and G a linear algebraic group defined over k. Deligne observed the following: Let P be a principal G-bundle over a smooth projective variety X/k. If there exists some n such that $(F_X^\wedge n)^\wedge*P\cong P$, then P is finite etale trivialisable. In this talk, we want to present our recent progress in extending the method of Higgs-de Rham flows to principal G-bundles, which aims to give Deligne's result a proper generalization. This is a joint work with Hao Sun and Jianping Wang.

田一超

Title：Anticyclotomic Iwasawa Main Conjecture for Rankin—Selberg motives

Abstract: Let M be the Rankin—Selberg motive arising from a regular algebraic conjugate self-dual cuspidal automorphic representations of minimal weight on GL_n*GL_{n+1} over

a CM number field F. Consider a moderate anti-cyclotomic Z_p^d-extension F_{∞}/F such that M is good ordinary at the p-adic primes ramified in F_{∞}. In a recent joint work with Yifeng Liu and Liang Xiao, we prove that under some technical assumptions, the characteristic ideal of the Bloch—Kato Selmer group for M along F_{∞}/F contains the corresponding p-adic L-function, constructed previously by Yifeng Liu.