Preparatory Lecture Series

A preparatory lecture series by Chris Wuthrich (Nottingham) and Xin Wan (Princeton) will take place the week (23 July - 27 July) before the Iwasawa 2012 conference. The lectures will be introductory and are mainly intended for research students who are either working or interested in working in Iwasawa theory.

In the morning (10:00-12:00) of Tuesday, Wednesday, Thursday and Friday, a room (Diskussions-Raum, opposite to the office of Mrs. B. Schmoetten-Jonas, room no. 229, 1st. floor of the Math. Institute, where the registration for the preparatory course will take place) will be available for the participants to meet and discuss mathematics. From 11:00 to 12:00 the two lecturers will be also present and available to discuss questions regarding the material of the lectures.

All lectures will take place in HS 2 of the Institute of Mathematics.

Lectures by Chris Wuthrich

The lectures by Chris Wuthrich will start with an introduction to the classical (cyclotomic) Iwasawa theory, followed by the extension of Iwasawa theory to elliptic curves. Then applications of the theory to the arithmetic of elliptic curves (or even Galois representations) will be discussed, as for example proving an Euler characteristic formula.

A tentative programme of the lectures is the following:

- Lecture 1 (**Monday 23.07, 14:15-15:45, HS 2**): Introduction and Cyclotomic Iwasawa Theory: Class group growth, Stickelberger elements, p-adic zeta functions.
- Lecture 2 (**Monday 23.07, 16:15- 17:45, HS 2**): Examples of Selmer group growth, Mazur-Stickelberger elements, Statement of the main conjecure of GL2.
- Lecture 3: (**Thursday 26.07, 14:15-15:45, HS 2**): Control theorem, p-adic heights and Euler-characteristic formula.
- Lecture 4: (**Friday 27.07, 14:15-15:45, HS 2**): Overview of further results: Kato, Heegner points, supersingular case,...

Lectures by Xin Wan

The lectures by Xin Wan will mainly aim to provide the needed background for understanding the fundamental work of Skinner and Urban in proving the missing divisibility (after Kato's work) of the Main Conjecture for elliptic curves. The lectures will, among other, offer an introduction to some basic notions of Hida's theory (p-adic modular forms), the theory of Klingen-Eisenstein series for unitary groups as well as a presentation of the doubling method of Garrett-Shimura/Piatestski-Shapiro-Rallis, a method which plays a central role in the work

of Skinner and Urban.

A tentative programme of the lectures is the following:

- Lecture 1 (**Tuesday 24.07, 14:15-15:45, HS 2**): Main conjectures and main results
  - Recall Iwasawa's main conjecture (for cyclotomic extension),
  - State the conjecture and Iwasawa-Greenberg main conjecture for GL(2),
  - State the main results,
  - If time allows: comments on proof, especially Ribet's converse to Herbrand.
- Lecture 2 (**Tuesday 24.07, 16:15-17:45, HS 2**): Hermitian modular forms,
  - Discuss Hermitian modular forms,
  - Hida theory,
  - (Klingen-)Eisenstein ideal,
  - Galois argument.
- Lecture 3 (**Thursday 26.07, 16:15-17:45, HS 2**): Constructing Klingen-Eisenstein series,
  - Pull-back formula of Garrett-Shimura/Piatestski-Shapiro-Rallis,
  - constant terms of Klingen-Eisenstein series,
  - p-adic interpolations.
- Lecture 4 (**Friday 27.07, 16:15-17:45, HS 2**): The Eisenstein ideal,
  - Fourier-Jacobi coefficients of Siegel-Eisenstein series,
  - Fourier coefficients of Klingen-Eisenstein series,
  - coprimality with the p-adic L-function.

Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 am					
8:30 am					
9:00 am	Registration 9:00-13:00				
9:30 am					
10:00 am		Discussion-Questions in Diskussions-Raum	Discussion-Questions in Diskussions-Raum	Discussion-Questions in Diskussions-Raum	Discussion-Questions in Diskussions-Raum
10:30 am					
11:00 am					
11:30 am					
12:00 am					
12:30 am					
1:00 pm					
1:30 pm					
2:00 pm					
2:30 pm	C. Wuthrich	X. Wan		C. Wuthrich	C. Wuthrich
3:00 pm					
3:30 pm					
4:00 pm	Break 15:45-16:15	Break 15:45-16:15		Break 15:45-16:15	Break 15:45-16:15
4:30 pm	C. Wuthrich	X. Wan		X. Wan	X. Wan
5:00 pm					
5:30 pm					
6:00 pm					
6:30 pm					
7:00 pm			Social Event 21:00 Ziegler		
7:30 pm					
8:00 pm					