Math 291Y - *p*-adic analytic groups

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Fall 2023

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Class Hours: Mon/Fri 9:00-10:15AM
Office Hours: Thu 11AM in the Common Room

Web: **https://canvas.harvard.edu/courses/90574**
Class Place: : Science Ctr 116

Course Description

An important class of profinite groups often occuring in number theory is known as *p*-adic analytic groups. Despite their strange profinite topology, so different from the structure of a real manifold, these groups behave in many ways like the *p*-adic analogue of Lie groups. They are ubiquitous and central objects in many parts of number theory, representation theory and homotopy theory.

This course will be an introduction to p-adic analytic groups, with an emphasis on how their group-theoretic properties are reflected in their cohomology ring. One example guiding our journey through this beautiful subject will be the Morava stabilizer group, whose cohomology forms the building blocks of the moduli stack of formal groups and, by extension, of the stable homotopy groups of spheres.

Textbooks

No promises are made about following any single textbook, but the following books cover some of the same material which will appear in class:

- Peter Schneider, *p-adic Lie groups*

- Peter Symonds, Thomas Weigel, *Cohomology of p-adic Analytic Groups*

- J. D. Dixon, M. P. F. Du Sautoy, A. Mann, D. Segal, *Analytic pro-p Groups*

Prerequisites

This is a graduate-level course. It should be accessible to anyone with the knowledge equivalent to completing the introductory graduate course in number theory.

For more on the difference between undergraduate- and graduate-level course, and to help you decide whether this course is appropriate for you, see here. If you're unsure, do not hesitate to reach out to me.

Assessment

Your grade for the course will be determined by a final in the form of discussion with the instructor on the topics of the course. This is an advanced topics course and your grade will depend on the effort put into understanding the subject (as evidenced by the discussion) and not on its mastery.

Contacting me

Feel free to email me anytime, or pop to the Office Hours. If you would like to discuss something outside of these, just message me with a suggested time.