

## Harmonic Analysis, the Trace Formula, and Shimura Varieties at the Fields Institute in Toronto

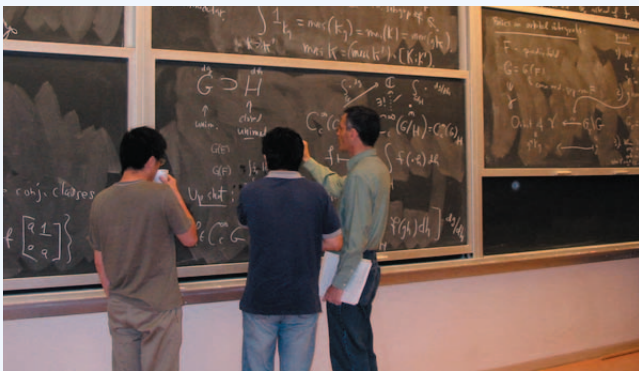
Each year the Clay Mathematics Institute seeks to bring a generation of young researchers to the frontiers of mathematical research through its summer school program.

The 2003 School was held in June at the Fields Institute in Toronto on the related subjects of Harmonic Analysis, the Trace Formula and Shimura Varieties. Aimed at graduate students and mathematicians within five years of their Ph.D.,

the school began with three weeks of foundational courses centered around the trace formula: one course on the statement and proof of the trace formula, two courses providing background material on reductive groups and harmonic analysis

on those groups, and a fourth course on Shimura varieties, which provided an illuminating application of the trace formula. The fourth week consisted of five short courses on more specialized topics related to the main themes of the school.

While there were no formal prerequisites, preference was given to applicants with some prior knowledge of



Robert Kottwitz's course on Harmonic Analysis on Reductive Groups and Lie Algebras. Courtesy of Sonia Houle

Mathematics is an international language. Students attending came from universities in Canada, the U.S., France, Austria, Israel, Italy, Germany, Holland, Hong Kong, the UK, and China. Their countries of origin were still more varied, including India, Iran, Korea, Macedonia, Peru, Romania, Pakistan, Turkey, and Vietnam.



Fields Institute Summer School participants. Courtesy of Sonia Houle

algebraic groups or number theory. The organizers reviewed and ranked the applications independently, and agreed on the final selections. The school had a very international flavor, with 104 participants from institutions in more than ten countries and of at least twenty nationalities. The response and feedback from the school was extraordinary,

and the hospitality of the Fields Institute was outstanding. In light of the school's success, CMI is now working on a book for publication in the CMI/AMS Monographs series based on the subject matter of the school. Course notes and streaming audio for all the lectures is already available through the school's web site.

One of the major benefits of the summer school is having many highly motivated people working through dialogue with many experts. The last time I was in a math course with so many people was in my first year of undergraduate work. I never had so many top mathematicians available at one spot for such a long time before. My idea of doing math is to collaborate with others as much as possible. The summer school was a rare perfect chance to do so.

— school participant

See: <http://www.fields.utoronto.ca/>