



THE UNIVERSITY OF CHICAGO

Departments of Mathematics and Statistics
ALGEBRAIC GEOMETRY SEMINAR

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The Geometry of the Frey-Mazur Conjecture

WEDNESDAY, January 8, 2014 from 4:30–6:00 PM
312 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

A crucial step in the proof of Fermat's last theorem was Frey's insight that a nontrivial solution would yield an elliptic curve with modular p -torsion but which was itself not modular. The connection between an elliptic curve and its p -torsion is very deep: a conjecture of Frey and Mazur, stating that the p -torsion group scheme actually determines the elliptic curve up to isogeny (at least when $p > 13$), implies an asymptotic generalization of Fermat's last theorem. We study a geometric analog of this conjecture, and show that over function fields the map from isogeny classes of elliptic curves to their p -torsion group scheme is one-to-one. Our proof involves understanding curves on a certain Shimura surface, and fundamentally uses the interaction between its hyperbolic and algebraic properties. This is joint work with Jacob Tsimerman.

Organizers:

For further information on this event, please email Lek-Heng Lim at lekheng@galton.uchicago.edu or Madhav Nori at nori@math.uchicago.edu.

UCAGS Seminar URL: <http://www.stat.uchicago.edu/~lekheng/ag.html>