

Scuola Normale Superiore  
Piazza dei Cavalieri, 7  
Pisa

Lunedì 15 ottobre 2012  
Aula Mancini  
Palazzo della Carovana  
ore 16,00

# Colloquio De Giorgi

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*Congruent numbers and Heegner points*

Abstract

A positive integer  $n$  is congruent if it is the area of a right-angled triangle all of whose sides have rational length. A special case of BSD asserts that every positive integer which is congruent to 5, 6 or 7 mod 8 should be congruent, but the proof in general is a problem of the level of the Riemann Hypothesis. The lecture will explain a proof of the following recent result: Theorem (Ye Tian) For any given integer  $k > 0$ , there are infinitely many square-free congruent numbers  $n$  in each class of 5, 6, 7 mod 8 with exactly  $k$  prime divisors. The case  $k=1$  was proven by Heegner, and the case  $k=2$  by Monsky, but nothing was known before for  $k > 2$ . The proof of for general case is by induction on  $k$  and uses a generalized Gross--Zagier formula.

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