# SOUTHERN CALIFORNIA NUMBER THEORY DAY, NOVEMBER 4, 2012

ABSTRACTS

Noam Elkies, *Remarks on isogenies over* $\mathbf{Q}(\sqrt{5})$ *and other number fields.*

On the occasion of the creation of a table of modular elliptic curves over $\mathbf{Q}(\sqrt{5})$, we review the "Remarks on isogenies" that accompanied the "Antwerp" tables (LNM 476), and outline some of the new phenomena and open questions that arise in attempting to give a similar overview of isogenies defined over $\mathbf{Q}(\sqrt{5})$ or other number fields. In particular, we account for some new isogeny degrees and graphs not seen over $\mathbf{Q}$, and explain why the problem of proving completeness of the list over $\mathbf{Q}(\sqrt{5})$ is difficult but not hopeless.

Jeff Stopple, *Repulsive behavior in an exceptional family.*

The existence of a Landau-Siegel zero leads to the Deuring-Heilbronn phenomenon, here appearing in the 1-level density in a family of quadratic twists of a fixed genus character $L$-function. We obtain explicit lower order terms describing the vertical distribution of the zeros, and realize the influence of the Landau-Siegel zero as a resonance phenomenon.

Ramdorai Sujatha, *Structure of Selmer groups of Lambda-adic deformations over p-adic Lie extensions.*

Otmar Venjakob, *On $\epsilon$-isomorphisms for crystalline representations.*

As $\epsilon$-constants show up in (local or global) functional equations, they also crucial role regarding the behaviour of the (Equivariant) Tamgama Number Conjecture when going over from a motive $M$ to its (Kummer) dual $M^*(1)$. The existence of $\epsilon$-isomorphism—in the language of Fukaya & Kato— or the Local Tamagawa Number Conjecture—in the teminology of Burns & Flach (generalizing Fontaine & Perrin-Riou)—just imply the compatibility of the global conjecture for $M$ and $M^*(1)$ taking into account their functional equation and Poitou-Tate/Artin-Verdier duality, respectively. In the talk we shall report on recent improvements and results in this direction, which is partly joint work with David Loeffler and Sarah Zerbes.