

# WYKŁAD ONLINE

w ramach seminarium

## ARYTMETYCZNA GEOMETRIA ALGEBRAICZNA

(organizatorzy: Grzegorz Banaszak, Piotr Krasoń)

Środa 14 grudnia, godz. 18:00

Francesc Fité, Universitat de Barcelona

*Local-global principles for quadratic and  
polyquadratic twists of abelian varieties.*

Abstract: Let  $A$  and  $A'$  be abelian varieties defined over a number field  $k$ . In the talk I will consider the following question: Is it true that  $A$  and  $A'$  are quadratic twists of one another if and only if they are quadratic twists modulo  $p$  for almost every prime  $p$  of  $k$ ? Serre and Ramakrishnan have given a positive answer in the case of elliptic curves and a result of Rajan implies the validity of the principle when the endomorphism ring of  $A$  (and  $A'$ ) over an algebraic closure of  $\mathbb{Q}$  is just  $\mathbb{Z}$ . More in general, I will show that the answer is affirmative up to dimension 3, but that it becomes negative in dimension 4. The proof builds on Rajan's result and uses a Tate module tensor decomposition of geometrically isotypic abelian varieties obtained jointly with X. Guitart. I will also discuss a similar result concerning polyquadratic twists of abelian varieties obtained in collaboration with Antonella Perucca.