

Speaker: **Andrei Jorza**
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Wednesday, September 26, 2012
4:00 pm
117 Hayes Healy Hall

Title: Interpolation, arithmetic and Birch and Swinnerton-Dyer style conjectures

Abstract:

The values of the Riemann ζ function at negative integers are rational numbers computable in terms of the Bernoulli numbers, and the ζ function can be thought of as a meromorphic interpolation of the Bernoulli numbers. It is not a very strong interpolation since the negative integers are not dense in \mathbb{C} , but they are dense in the ring of p -adic integers. An arithmetic property of the Bernoulli numbers allows one to interpolate them into an *analytic* function ζ_p defined not over \mathbb{C} but over the p -adic integers; such analytic functions exist in more general contexts.

The underlying principle of the Birch and Swinnerton-Dyer conjecture (one of the Clay problems) is that the first term in the Taylor expansion of an L -function (which is a generalization of the Riemann ζ -function) contains rich information about arithmetic. We will discuss the Bernoulli numbers, the Riemann ζ -function, the function ζ_p , and analogs of the above mentioned principle for p -adic L -functions, which are analogs of ζ_p . This field of research has become extremely active in the last decade.