BI-CO MATHEMATICS COLLOQUIUM

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"*Approximating roots: from Newton to the ghost conjecture*"

Monday, September 24, 2018

Talk at 4:00 – H109
Tea at 3:30 – Foyer outside of H109

Abstract: In this talk I want to discuss an old method, due completely to Newton, for studying roots of polynomials by means of a combinatorial polygon in the (x,y)-plane. The method's first application was to find explicit power series expansions for equations defining implicit curves. In modern number theory, we use Newton's idea to approximate the roots of integer polynomials and you'll see that such approximations are based only on the *coefficients* of the polynomial — a bizarre, yet powerful, feature. In the second half of the talk, we will focus exclusively on turning this idea on its head in order to make elementary and precise predictions for coefficients of modular forms. That work, which we call the ghost conjecture, is joint with Robert Pollack. If time allows, I'll outline a few completely accessible combinatorial problems the ghost conjecture raises.

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