Many Cheerful Facts

Organizers: Yael Degany & Jason Ferguson

Friday, 2:10pm–3:00pm, 891 Evans

July 9 **Jason Ferguson**, UC Berkeley

Pointwise Convergence of Fourier Series

Abstract: A standard result on the pointwise convergence of Fourier series often given in analysis and differential equations courses is the following:

Let f be a piecewise continuous function on a closed interval $[a, b]$ that is differentiable at $x_0 \in (a, b)$. Then the Fourier series of f at x_0 converges to $f(x_0)$.

However, many standard proofs of this result are either messy or non-intuitive. In my talk I will present a very simple proof of this result by Paul Chernoff, one that gives a stronger conclusion with much weaker hypotheses. Time permitting, I will review other results concerning pointwise convergence of Fourier series.

I will assume some experience with basic real analysis–e.g., limits, convergence of series, and integrability. Although I will review all relevant definitions from Fourier analysis in my talk, some prior experience with Fourier series will be helpful.