The SUMO Speaker Series for Undergraduates

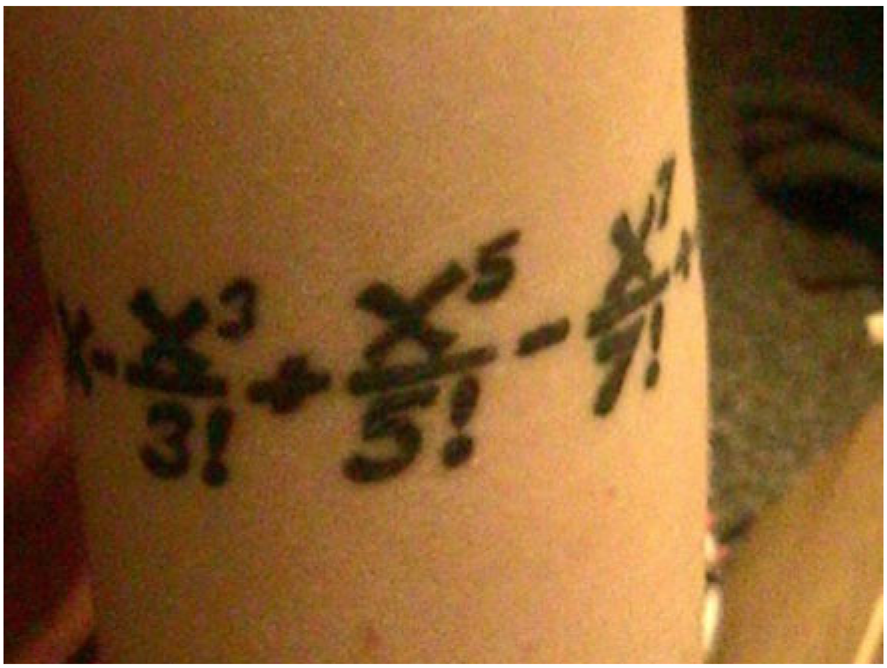
Wednesday, April 18th

4:15-5:05, room 380C

(Food Provided)

Can one sum any Taylor series?

Professor Andras Vasy



ABSTRACT:

Any infinitely differentiable functions on the real line has a Taylor series at each point x_0, $\sum_{n=0}^{\infty} \frac{f^{(n)}(x_0)}{n!}(x-x_0)^n$, which need not converge anywhere except at x_0. Those functions which have a convergent Taylor series, converging to the function, near each point x_0 are called real analytic; this puts a strong condition on the growth of the Taylor coefficients $f^{(n)}(x_0)$ as $n \to \infty$. But one can ask whether any series $\sum_{n=0}^{\infty} \frac{a_n}{n!}(x-x_0)^n$ is the Taylor series of some infinitely differentiable function, i.e. whether for a fixed x_0, $f^{(n)}(x_0)$ can be specified arbitrarily for each n (without growth restrictions). I'll explain Borel's lemma that this is indeed the case, and discuss other aspects of Taylor series as well.

sumo.stanford.edu/speakers