Many Cheerful Facts

Organizer: Alvin Kerber

Wednesday March 14, 3-4 PM, 891 Evans

Speaker: Anna Lieb, UC Berkeley

Title: *Pseudospectra and the hidden life of linear dynamical systems*

Once upon a time there was a linear dynamical system of the form $y' = Ay$. A mathematician waved a magic wand, found the eigenvalues of A, knew all there was to know about y, and everyone lived happily ever after. This is a familiar story, but in some cases, it may be a fairy tale. In applications where the eigenvalues alone are not the end of the story, looking at *pseudospectra* of a linear operator can reveal deep and surprising information about how a dynamical system will evolve in time. I will introduce the basic definitions and properties of pseudospectra, and their relevance to dynamical systems in biology and fluid mechanics. Along the way, we will encounter Toeplitz matrices, symbol curves, and maybe even a wolverine!

I am the very model of a modern Major-General,
I've information vegetable, animal, and mineral,
I know the kings of England, and I quote the flights historical
From Marathon to Waterloo, in order categorical;
I'm very well acquainted, too, with matters mathematical,
I understand equations, both the simple and quadratical,
About binomial theorem I'm teeming with a lot o' news,
With many cheerful facts about the square of the hypotenuse.
I'm very good at integral and differential calculus;
I know the scientifc names of beings animalculous:
In short, in matters vegetable, animal, and mineral,
I am the very model of a modern Major-General.