2007 Kieval Lecture Series Talks

Featuring

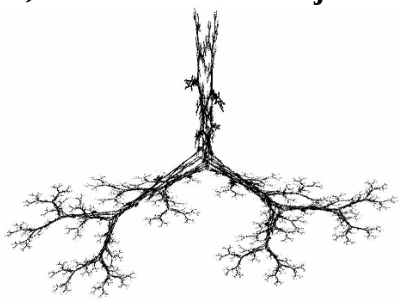
Jon McCammond

from

UC Santa Barbara

Thursday, May 3, 2007 Sigma Xi Invited Lecture, 8:00 p.m. in the Stevenson Union Rogue River Room

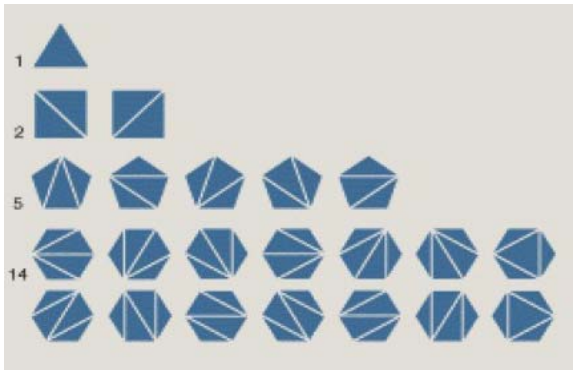
"Roots, Ratios and Ramanujan"



When things get iterated over and over, something eventually has to give. Like a two-year-old who has discovered the word "why" mathematicians are often fascinated with the results of repetition. This talk will focus on a connected set of surprises that arise through simple iteration: punching the [cos] button repeatedly on a calculator, continued fractions -- along with their connections to the golden ratio and the Fibonacci numbers, and continued square roots, with some mentions of Ramanujan, Chebyshev polynomials, and the Mandelbrot set thrown in along the way.

Friday, May 4, 2007, 10:00 a.m. in Central 105

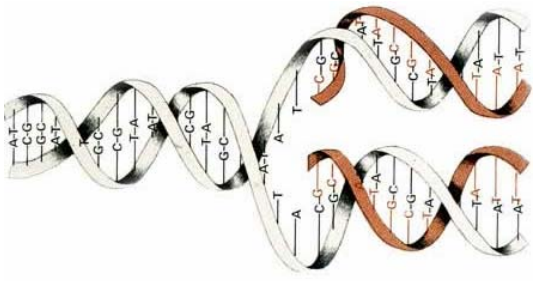
"Non-Crossing Partitions in Surprising Locations (or how to find parking when not commuting)"



Certain mathematical structures make a habit of reoccurring in the most diverse list of settings. A list of examples might include the Catalan numbers, the quaternions, and the modular group. In this talk, I will focus on a lesser known example which exhibits this intrusive type of behavior: the non- crossing partition lattice. The talk will consist of a gentle introduction to the lattice itself and three of its many guises: as a way to count the parking functions defined by combinatorialists, as a key part of the foundations of non-commutative probability, and as a building block for a contractible space acted on by the braid groups. Finally, as the talk is aimed primarily at undergraduate majors and minors, all of the areas listed above will be introduced as they arise.

Friday, May 4, 2007, 3:00 p.m. in Science 118

"Using Curvature to Average Trees."



There are many contexts in which a tree diagram is the best way to summarize a set of data (for example, when reconstructing evolutionary pathways using the data from DNA sequences), but what do you do if several equally plausible procedures produce slightly altered trees? Is there some rigorous way to "average" the trees in the sample to find the "best" tree that fits all the data. There are in fact many reasonable ways to average trees and the main one I will discuss arises from the surprising fact that "the space of all trees is non-positively curved." By the end of the talk this assertion should make sense and the corresponding averaging procedure should be clear.

Jon McCammond is a professor of mathematics at Santa Barbara, CA.