Erdős Colloquium

On the centenary of the birth of Paul Erdős

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Playing the Chaos Game:
Making Pictures from Strings of Symbols

Abstract. The Chaos Game algorithm relates to diverse applications, from data compression to 3D printing and analysis of DNA. Recent advances in understanding this simple algorithm, illustrated below, in very general settings will be described in elementary terms. The talk will include pictures, references to fairy tales, and an application using 3-D printing.

EXAMPLE OF CHAOS GAME ALGORITHM: Mark three non-collinear points on a sheet of paper. Label them A, B and C. Let an infinite sequence S=ABAACCBABABBBACCBAC…. contain all "words" that can be made from the "alphabet" {A,B,C}. Let S(n) be the nth member of S. Choose X(0) at random on the paper. Define and plot an infinite sequence of points in the plane (on the paper) by X(n+1)=(S(n)+X(n))/2. The result will eventually be a "picture" of the Sierpinski triangle with vertices at A, B and C. The figure illustrates the ideas.
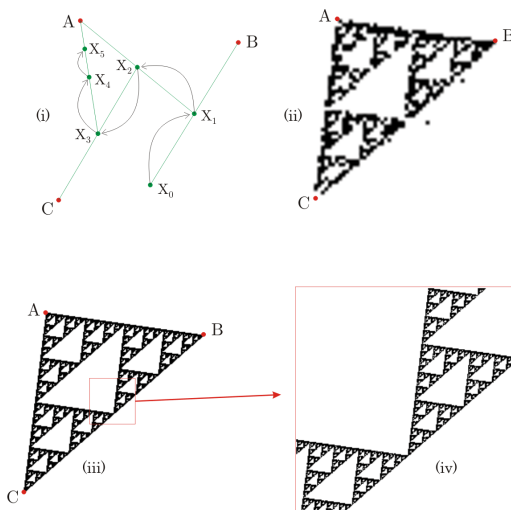
4:05-4:55 pm
March 18, 2013
LIT 109
Refreshments follow in Lit 339