Joint
APPLIED MATHEMATICS COLLOQUIUM

and

THEORY OF COMPUTATION COLLOQUIUM

FIXED POINT (RECURSION) THEOREM AND APERIODIC TILE SETS

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ABSTRACT:

A tile is a square with colored sides. The classical Berger theorem says that there exists a finite set *T* of tiles that allows only aperiodic tilings (one can place a copy of a tile from *T* in each cell of the cell paper so that all colors match, but only in an aperiodic way).

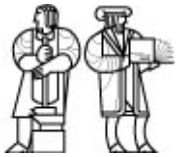
There are many proofs of this theorem; most of them use rather subtle geometric construction. We present another construction based on the Kleene fixed point (recursion) theorem. It is not economical in terms of number of tiles/colors, but rather is flexible and allows us to get aperiodic tile sets with additional properties.

Some familiarity with theory of computation (especially the recursion theorem and time-space diagrams of Turing machines) would be helpful.

MONDAY, SEPTEMBER 24, 2007
2:30 PM
Building 2, Room 105

Refreshments at 3:30 PM in Building 2, Room 349
(Applied Math Common Room)

Applied Math Colloquium: http://www-math.mit.edu/amc/fall07
Math Department: http://www-math.mit.edu



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