

BI-CO MATHEMATICS COLLOQUIUM

Mark Dominus

"Topology of data types"

Monday, January 27, 2014

Talk at 4:00 – H109

Tea at 3:30 – KINSC Math Lounge, H208

Abstract:

There is a surprising correspondence between computability theory and classical topology. Computability is continuity, open sets are recursively enumerable, spaces are Hausdorff if they admit a definable \neq operation, and a set over which one can universally quantify is compact. The natural numbers, being non-compact, can't be exhaustively searched: given a predicate p you can't guarantee to find a number n for which $p(n)$ is true—there might not be one, and so your search might continue forever. But the naturals can be embedded in a compact set that *can* be exhaustively searched. Since this larger type can be modeled on the computer, I will present a simple computer program which, given any predicate p , either locates an n for which $p(n)$ is true, or correctly asserts that no such n exists.

HAVERFORD COLLEGE