

4:00 PM, TUESDAY, MARCH 27, 2007, BOYD 304

Speaker: **Prof. Tom Brown**, Department of Mathematics, Simon Fraser University, Vancouver, Canada

Title: **On colorings of the factors of a word**

A particular case of Ramsey's Theorem says that if N is the set of positive integers, and the set of all 2-element subsets of N are colored with two colors in any way whatsoever (this means that each unordered pair $\{a, b\}$ of positive integers is declared to be either Red or Blue - once the coloring is made, it is held fixed for the remainder of the discussion), then there is an infinite subset A of positive integers such that all of the 2-element subsets of A have the same color.

A surprisingly simple application of this theorem gives the following result: Let the factors of an infinite word s be colored with two colors. Then there is a set U of factors, $U = \{u_1, u_2, u_3, \dots\}$, such that (1) $s = tu_1u_2u_3 \dots$, and (2) for $1 \leq i \leq j$ all of the factors $u_iu_{i+1}u_{i+2}\dots u_j$ (including the factors $u_i, i \geq 1$) have different lengths and have the same color.

(Here, an infinite word is just a sequence of letters from some alphabet. A factor of this word is any non-empty finite block of consecutive letters in the word. For example, the word 010010 has 0, 1, 01, 10, 00, 010, 100, 001, 0100, 1001, 0010, as some of its factors.)

The talk will contain a discussion of Ramsey's theorem, Ramsey Theory, the result above, and some related results. It will be accessible to all students who have an interest in mathematics.

(Contact person: Dr. Bruce Landman, 678-839-6489)

4:45 PM, WEDNESDAY, MARCH 28, 2007, BOYD 304

Moderator: **Prof. Tom Brown**, Department of Mathematics, Simon Fraser University, Vancouver, Canada

Title: **Problem Session**

(Contact person: Dr. Bruce Landman, 678-839-6489)