CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, October 3
3:00 – 4:00 PM
Maria Sanford, Room 101

PROPERTIES OF RATIONAL BASE REPRESENTATIONS OF POSITIVE INTEGERS

FREDERIC LATOUR

CENTRAL CONNECTICUT STATE UNIVERSITY

Abstract: Every positive integer has a unique representation in every integer base $b > 1$. It turns out that this result remains true in every rational base $b > 1$. We investigate properties of rational base representations of positive integers. For instance, in integer base b, the number of digits in the representation of n is one plus the floor of the base-b logarithm of n. This formula does not work in non-integer bases; we will show how to modify the formula to make it valid in every rational base. We will also study the properties of the initial digit strings and final digit strings of a rational base representation of an integer, and whether the sum of the digits in a representation of n tells us anything about divisors of n. This is joint work with Zoe Cramer, who is currently a graduate student at the University of Connecticut.