

CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, October 27

3:15 – 4:15 PM

Maria Sanford, Room 101

HOW TO ENUMERATE THE POSITIVE RATIONAL NUMBERS?

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Abstract: It is a well-known fact that the set of rational numbers is enumerable, i.e., it can be put in one-to-one correspondence with the set of all positive integers, or equivalently, one can order all rational numbers in a sequence indexed by the positive integers. Of course, once you find one, you can find infinitely many such sequences.

In this talk we will show that there is a way to order the positive rational numbers in a sequence (without repetitions), called Calkin-Wilf sequence, for which there is a formula, discovered recently by Newman, how to find the $n + 1$ -st element, if you know the n -th element of that sequence. Before we define Calkin-Wilf sequence, prove some of its properties, and show how to derive that formula, we will talk about countable sets and cardinality, binary and hyper-binary representations of the integers, and Stern's diatomic series.

No previous knowledge of any of the terms mentioned above will be necessary to understand this talk; therefore, the talk should be accessible to anyone interested in mathematics.

To join us online use the following link: <https://ccsu.webex.com/meet/gotchev>

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<http://mathcolloquium.sites.ccsu.edu/>