

CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES
COLLOQUIUM

Friday, August 31
3:00 – 4:00 PM
Maria Sanford, Room 101

DISCRETE MATH FOR FUN AND PROFIT

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Abstract: If integration and summation are analogous operations, then why does $\int_1^n \sin(x) dx$ seem easier to do than $\sum_{i=1}^n \sin(i)$? A calculus book has many tricks to do integration, but is there a theory of summation? In fact, there is, which goes by the name *finite calculus* or, sometimes, *umbral calculus*. After developing a few basic tools, we will apply them to a few problems that turn out to have practical, real-world applications. For example, the birthday problem has much to say about assigning Globally Unique IDs (GUIDs) in computer science. For instance, the idea of matching up two sets (with a bijection) has great applicability in many practical problems. Specifically, it is well known that all the subsets of a set of size n match up to binary strings of length n . However, both of these can be identified with the vertices of an n -dimensional cube. Because the latter has Hamiltonian cycles, what consequences does this have for binary strings? for subsets? If questions like this interest you, then come and join the fun. However, there is no guarantee of specific profits, and your financial results may vary.

For further information:

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<http://www.math.ccsu.edu/gotchev/colloquium/>