

BI-CO MATHEMATICS
COLLOQUIUM

Kim Ruane
Tufts University

“A Geometric Proof of Parity of Permutations”

Monday, December 3, 2018

Talk at 4:00 - H109

Tea at 3:30 - Foyer outside of H109

Abstract:

Perhaps the most important example of a finite group students learn about in a first course on group theory is the symmetric group on n objects. Take a set S that has n objects in it and consider all of the ways of shuffling those objects around - this forms a group! One of the fundamental results that is proved about this group in a beginning group theory course is that each shuffling (or permutation as they are called) can be assigned a designation as even or odd. In this talk, I will make this more precise and give a cool proof of this fact that uses graph theory. If time permits, I will also discuss how this group is related to the fact that a polynomial of degree 5 or higher cannot have a formula that is analogous to the quadratic formula. There is a geometric proof of this fact as well and I would like to give the idea behind this as well. Both of these geometric proofs were done by undergraduate research students of mine from Tufts!

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