2016 REU TOPICS

- Approximation theorems
- Matroids
- n-to-1 graphs
- Embedding
- Random walks on graphs
- Random graphs
- Chord-arc diagrams
- Medial graphs
- Geodesic integral
- Inverse problem on surfaces
- Nonlinear inverse problem
- Characteristic polynomials/paths/vector fields
- N-to1 graphs and Galois theory
- Harmonic functions on infinite graphs
- Sandpile groups
- Compute sandpile groups using $\mathbb{Q}/\mathbb{Z}$-harmonic functions
- understand number-theoretic properties/torsion in the sandpile group of the torus graph
- Asymptotic enumeration of spanning trees on "ladder graphs"
- Existence of solution for the inverse problem (Λ, G)
- Doppelgängers + Posets
- Sandpile groups
- New inverse problem
- Find G given Λ, assuming $\gamma = 1$
- Knot theory
- Sandpile Groups
- Can we "fix" every matrix by re-ordering index?
- Can we figure out which determinants are necessary to check if "it works"? or the least # to check
- Mixed problems on various types of graphs
- Partitioning circular planar graphs into $n \geq 3$ pieces—look for more patterns w/connectedness
- Random walks & Markov Chains
- Description of layerable graphs