

## Alexander McDonough (Brown)

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### Chip-Firing on Simplicial Complexes and Matroids

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Abstract for the Combinatorics Seminar 2019 Tuesday, April 30

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The critical group and its relation to spanning trees has been studied extensively in the graphical setting in the context of chip-firing. A more recent area of research has been to generalize chip-firing results to a larger class of objects. In this talk, we explore chip-firing on simplicial complexes as well as regular matroids. Through combining these topics, we produce a bijective proof for Duval-Klivans-Martin's Simplicial Matrix Tree Theorem on a particular class of simplicial complexes. This bijection provides representatives for the elements of the critical groups for these complexes that depend only on a vertex ordering. This talk does not assume any prior knowledge of chip-firing or matroids.

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