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David Plaxco* (davidplaxco@clayton.edu), University Center 428, 2000 Clayton State Blvd, Morrow, GA 30260. *Cubes Underscore Art: Exploring How Algebraic Structures Support Aesthetic Patterns on $n \times n \times n$ Rubik's Cube-type Puzzles.*

The Cubes Underscore Art project is an exploration of the possibilities of and techniques for producing patterns on Rubik's cube-like twisty puzzles, as well as larger ($n \times n \times n$) versions of the puzzle. In the 1970s and 80s, Ernő Rubik's magic cube became one of the most ubiquitous toys in the world. Recently, it has regained its popularity, even leading to the development of "speed cubing" as a competitive sport. However, the Rubik's cube has also led to puzzling mathematical questions, such as the quest for determining god's number - the diameter of the group of the cube's positions. The Rubik's cube has proven a ready example of a group for algebraists teaching introductory group theory. One branch of exploration of the cube's properties is the production of states of the puzzle that do not result in each side being a single color ("solved"), but instead produce aesthetic patterns on the cube. This talk will include an introduction to the project, a discussion of group theoretic concepts that can be used to generate patterns on cubes, and a presentation of a variety of the designs already generated through the project, including actual cubes, a photo gallery, and slow-motion and stop-motion videos. (Received September 16, 2018)