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Julian Hook* (juhook@indiana.edu), Jacobs School of Music, Indiana University, Bloomington, IN 47405. *Introduction to Musical Spaces and Transformations*. Preliminary report.

A musical score is a graph whose vertical axis represents pitch and whose horizontal axis represents time. In light of the apparent simplicity of the pitch and time domains, the recognition since the time of Pythagoras that mathematical principles underlie many musical phenomena, and the extensive body of speculative and theoretical writings about music, it is perhaps surprising that our understanding of the mathematical structure of the spaces in which musical phenomena operate remains fragmentary. Aspects of melody (scales), harmony (chords), voice leading (motion from chord to chord), and rhythm may be studied in the context of these spaces. These investigations engage several branches of classical and contemporary mathematics, including group theory, combinatorics, and topology; these mathematical approaches, in turn, have given rise to several new and active subfields within the discipline of music theory.

This talk, which opens the Special Session on Mathematical Techniques in Musical Analysis, is designed to introduce mathematicians to a sampling of these musical applications, and to some of the concepts to be explored in the remainder of the session. (Received August 21, 2006)