

1023-51-1118

Dmitri Tymoczko* (dmitri@princeton.edu), 310 Woolworth Center, Princeton, NJ 08540.

Orbifolds and musical scales.

I have recently argued that musical chords can be represented as points on an orbifold. In my talk I will use this geometrical perspective to investigate musical scales, showing how to construct generalized diatonic, harmonic minor, and melodic minor scales. Convergent fractions and the Stern-Brocot tree (known to music theorists in connection with "well-formed" or "MOS" scales) enter naturally into this construction. The diatonic three-note chords constitute one such generalization of the major and minor scales: thus, for any familiar scale we can find an analogous three-note diatonic chord. Finally, I will show that these "generalized scale families" constitute one of three important classes of lattices inhabiting the space of musical chords. These lattices again have a natural characterization in terms of well-formed scales and convergent fractions. Only one lattice-type has previously been known to music theorists. (Received September 25, 2006)