

The Geometry of Music

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Abstract

In my talk, I will describe five properties that help make music sound tonal – or “good,” to most listeners. I will then show that combining these properties is mathematically non-trivial, with the consequence that space of possible tonal musics is severely constrained. This leads me to construct higher-dimensional geometrical representations of musical structure, in which it is clear how the various properties can be combined. Finally, I will show that Western music combines these five properties at two different temporal levels: the immediate level of the chord, and the long-term level of the scale. The resulting music is hierarchically self-similar, exploiting the same basic procedures on two different time scales. In fact, one and the same twisted cubic lattice describes the musical relationships among common chords and scales.

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