



The Math/Stats Colloquium  
Department of Mathematics and Statistics  
San José State University



## Emily Clader

San Francisco State University

### *Why Twelve Tones?*

*The Mathematics of Musical Tuning*

WED OCT 19, 2022, VIA ZOOM

**Abstract:** If you've played a musical instrument, you may know that Western music is based on a scale with twelve notes: C, C#, D, D#, and so on. But why divide the scale into twelve steps, rather than some other number? We will begin with a single (imaginary) guitar string and ask a series of questions that lead, via the mathematics of continued fractions, to an answer to this question. Along the way, we'll discover a purely mathematical theorem.

*Background:* No knowledge of music will be assumed, and no particular mathematical prerequisites besides a willingness to manipulate fractions and logarithms.

**About the speaker:** Emily Clader received her PhD in Mathematics from the University of Michigan, and she is currently an Associate Professor at San Francisco State University. Her research is in the field of algebraic geometry, but she also enjoys thinking about music both as a mathematician and as a singer.

COLLOQUIUM BROADCAST VIA ZOOM, 3:00PM PACIFIC

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For our full schedule, see: <http://www.timhsu.net/colloq/>