

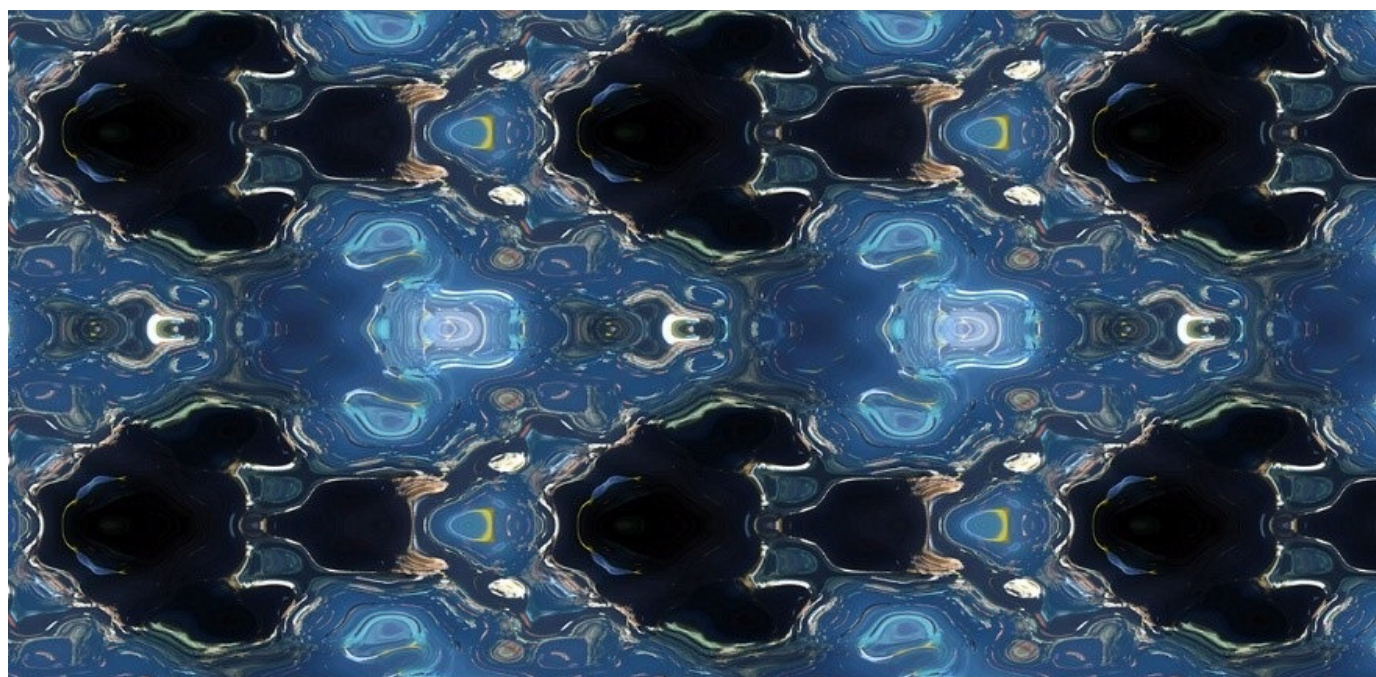
**DEPARTMENT OF  
MATHEMATICS**



73rd  
**KIEVAL  
LECTURE**

*APRIL 25, 2019 - 7:30 - FH118*

**Frank A. Farris, Santa Clara University**



**Seeing Symmetry: The Artful  
Mathematics of Wallpaper Patterns**

For some reason, humans like to see symmetry. For instance, your mind can look at the pattern shown and know how it could repeat to fill the whole plane. In this talk, I'll focus on helping you see the symmetries in decorative patterns, from rosettes and friezes to wallpaper patterns. I'll describe the path that led me to create these patterns, using mathematics and photographs. The kernel of the idea is as simple as a sine wave, but the story touches on such far-flung topics as group theory and partial differential equations. Building from scratch, I'll take you through my technique of turning photographs into mathematical art.