

Mathematics Department Colloquium

Organizer: Olga Holtz

Thursday, 4:10–5:00pm, 60 Evans

Sep. 25 **Ronny Hadani**, University of Chicago

Group representation patterns in digital signal processing

I will explain how various fundamental structures from group representation theory appear naturally in the context of discrete harmonic analysis and can be applied to solve concrete problems from digital signal processing. I will begin the lecture by describing our solution to the problem of finding a canonical orthonormal basis of eigenfunctions of the discrete Fourier transform (DFT). Then I will explain how to generalize the construction to obtain a larger collection of functions that we call "the oscillator dictionary". Functions in the oscillator dictionary possess many interesting properties. In particular, several of these properties arise in connection with problems of current interest in areas such as communication and radar.