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*Towards a unified theory of equiangular tight frames.*

Several applications in signal processing require lines through the origin of a finite-dimensional Hilbert space with the property that the smallest interior angle is as large as possible. Line packings that achieve equality in the Welch bound are known as equiangular tight frames (ETFs). This talk will discuss a general theory of ETFs that draws on ideas from algebraic combinatorics and representation theory to simultaneously explain all real ETFs as well as all complex ETFs with sufficient symmetry. While the theory suggests a program to classify all ETFs with doubly transitive symmetries, it is currently insufficient to solve Zauner's conjecture on the existence of ETFs with Heisenberg symmetry. This is joint work with Joseph W. Iverson (Maryland) and John Jasper (South Dakota State). (Received January 29, 2018)