

AWM DISTINGUISHED SPEAKER SERIES

University of Oregon



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presented by

The UO Student Chapter of the Association for Women in Mathematics

**Geometric equations for matroid varieties**

Monday, January 10, 2022

4-5pm on zoom

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Let  $x$  denote a  $k$ -dimensional subspace of  $\mathbb{C}^n$  and let  $A_x$  be a  $k \times n$  matrix whose rows are a basis for  $x$ . Although the matrix  $A_x$  is only well-defined up to a choice of basis, the subsets of columns that are linearly independent is invariant. The data of the linearly independent sets of columns is a matroid  $M_x$  on the columns of  $A_x$ . Can we find polynomial equations that cut out the set of all  $k$ -dimensional subspaces  $y$  such that  $M_y = M_x$ ? We will explore this question algebraically, showing that for some matroids that arise geometrically many non-trivial equations vanishing on  $\Gamma_x$  can be derived geometrically. This is joint work with Will Traves and Ashley Wheeler.

