

## Department of Mathematics Colloquium

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# The Exotic Dynamics of Nonnormal Matrices



Prof. Mark Embree  
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March 6, 2020  
3:30 - 4:30pm  
DERR 329

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Eigenvalues often describe the "behavior" of a matrix, telling us when powers and exponentials of the matrix will converge. We teach this idea to students and use such results as the basis for stability analysis across applied mathematics. However, when the matrix is nonnormal (it does not commute with its adjoint), eigenvalues can fail to warn of important transient dynamics. We will survey this phenomenon in diverse settings from matrix iterations to ecology, then focus on the application of these ideas to analysis of simple delay differential equations (joint work with Alex Grimm).