



ISU Algebra Seminar

Time: Thursday, March 30, 2023. 12:00 pm – 12:50 pm.

Zoom Room ID: 955 9760 3111

Passcode: ISU

Zoom Room Link: <https://illinoisstate.zoom.us/j/95597603111>

Speaker: George F. Seelinger, ISU

Title: Morphisms from the Variety of Rank 1 Idempotents to Projective Space

Abstract: Let F be an algebraically closed field and let $\mathcal{E} \subseteq M_n(F)$ be the set of nonzero idempotents in $M_n(F)$. Then it follows that \mathcal{E} is a smooth closed affine subvariety of $M_n(F)$ when $M_n(F)$ is viewed as an affine space of dimension n^2 . In fact, \mathcal{E} has n disjoint closed irreducible components, $\mathcal{E}_1, \dots, \mathcal{E}_n$ where \mathcal{E}_r is the variety of idempotents of rank r . In this talk I will discuss some results from a preliminary report of ongoing joint work with Wenhua Zhao (ISU) about a subclass of algebraic morphism from \mathcal{E}_1 to the projective space of dimension d (which we denote by \mathbb{P}_F^d), rank d projective modules, and Mathieu subspaces of $M_n(F)$ of codimension $d + 1$ when $n \geq 2$.

About the Speaker: George Seelinger earned his Ph.D. from The University of Texas at Austin in 1991 where he studied Geometric Invariant Theory. Geometric Invariant Theory involves actions of algebraic groups on algebraic varieties and looking at the geometric structure of the quotient of this action. From 1991 to 2002 he held a faculty position at Northern Illinois University. In 2002, he became Chair of the Mathematics Department at Illinois State University and retired as Chair in the summer of 2022. His research interests include algebraic transformation groups, representation theory, vector space partitions, and Mathieu subspaces of finite-dimensional algebras.