



## ISU Algebra Seminar

**Time:** Thursday, September 22, 1:00 – 1:50pm

**Zoom Room ID:** 941 2269 8654

**Passcode:** ISU

**Zoom Room Link:** <https://illinoisstate.zoom.us/j/94122698654>

**Speaker:** George F. Seelinger, Ph.D. (Illinois State University)

**Title:** Maximal Mathieu-Zhao Subspaces of Matrix Algebras

**Abstract:** Let  $F$  be an algebraically closed field and consider the algebra of  $n \times n$  matrices with entries in  $F$ , which we will denote by  $M_n(F)$ . In 2010, W. Zhao introduced the concept of a Mathieu subspace that generalizes the definition of an ideal for an associative algebra. In 2012, Zhao proved a characterization of Mathieu-Zhao subspaces in finite-dimensional associative  $F$ -algebras in terms of idempotents (i.e., matrices  $e$  in  $M_n(F)$  such that  $e^2 = e$ .) In this talk, I will discuss joint work with W. Zhao that includes some recent results we were able to prove about the Mathieu-Zhao subspaces of  $M_n(F)$  using Zhao's 2012 characterization of these subspaces in terms of idempotents.

**About the Speaker:** George Seelinger got 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.