UNIVERSITY AT ALBANY
State University of New York

College of Arts and Sciences
Department of Mathematics and Statistics

Analysis and Data Science Seminar

Victor Bailey
University of Oklahoma

Dynamical Frames and Hyperinvariant Subspaces

Tuesday, October 7, 2025
3:00 P.M. in Catskill 130

Abstract. The theory of dynamical frames arose from practical problems in dynamical sampling where the initial state of a vector needs to be recovered from the space-time samples of future states of the vector. This leads to the investigation of structured frames obtained from the orbits of evolution operators. One of the basic problems in dynamical frame theory is to determine the semigroup representations, which we will call central frame representations, whose frame generators are unique (up to equivalence). In this talk, we will address the general uniqueness problem by presenting a characterization of central frame representations for any semigroup in terms of the cohyperinvariant subspaces of the left regular representation of the semigroup. This result is not only consistent with the known result of Han and Larson in 2000 for group representation frames, but also proves that the frame vectors for any system of the form $\{A_1^{n_1} \cdots A_k^{n_k} : n_j \geq 0\}$, where $A_1, ..., A_k \in B(H)$ commute, are equivalent. This is joint work with Deguang Han, Keri Kornelson, David Larson, and Rui Liu.