AMS-UMI International
Joint Meeting 2024
Palermo, July 23–26, 2024

Several Complex Variables: Theory and Applications
Special Session A28

Gian Maria Dall'Ara
Istituto Nazionale di Alta Matematica, Italy

Dusty Grundmeier
The Ohio State University, USA

Yunus Zeytuncu
University of Michigan-Dearborn, USA

This special session presents talks on several complex variables (SCV) and its applications to other areas of mathematics and beyond. Complex analysis remains a fundamental tool across various fields–from mathematics to engineering. With recent developments in SCV, new applications have emerged. One such example comes from the study of mapping problems in several complex variables; namely, does there exist a proper, holomorphic mapping from the unit ball in $\mathbb{C}^n$ to the unit ball in $\mathbb{C}^N$ where $n, N \geq 2$? The existence of such monomial mappings between balls is closely related to finding the *sparsest* solution to a certain system of linear equations. Thus, one can study compressed sensing problems in the context of several complex variables. For another application, Wiener-Hopf techniques form an important tool for studying diffraction problems in physics, and extending these techniques in several complex variables is proving to be useful for these applications. For a final example, singular integral operators have been a central object of study in harmonic analysis for many years, and they arise naturally in complex analysis through the Bergman and Szegö projection operators, and the Cauchy-Fantappie singular integral operators. The regularity properties of these operators remain of fundamental interest in the field. The properties of these canonical operators also play crucial roles in operator theory. This special session aims to bring together experts from complex analysis and adjacent fields, fostering cross-pollination of ideas, techniques, and problems.

E–mail: zeytuncu@umich.edu.