

# Discrete Mathematics Seminar

Illinois State University

2:00–2:50 pm, March 5@ STV 120

Speaker: Tian-Xiao He, Illinois Wesleyan University

## Expression and Computation of Generalization of Stirling Numbers and Stirling Functions

Here we present a unified approach to Stirling numbers and their generalizations as well as generalized Stirling functions by using generalized factorial functions,  $k$ -Gamma functions, and generalized divided difference. Previous well-known extensions of Stirling numbers due to Riordan, Carlitz, Howard, Charalambides-Koutras, Gould-Hopper, Hsu-Shiue, Tsylova Todorov, Ahuja-Enneking, and Stirling functions introduced by Butzer and Hauss, Butzer, Kilbas, and Trujilloet and others are included as particular cases of our generalization. Some basic properties related to our general pattern such as their recursive relations and generating functions are discussed. Three algorithms for calculating the Stirling numbers based on our generalization are also given, which include a comprehensive algorithm using the characterization of Riordan arrays.

