

Proposed Minisymposium for ILAS Cancun

Nonnegative and Eventually Nonnegative Matrices

Nonnegative matrix theory is the study of matrices whose entries are nonnegative real numbers. This is an important and beautiful area of matrix theory that has been motivated by applications and developed from the illustrious Perron-Frobenius Theorem for irreducible nonnegative matrices. The study of nonnegative and eventually nonnegative matrices is the theme of this proposed mini-symposia.

One important challenge in understanding nonnegative matrices is understanding the properties of their spectra. The inverse eigenvalue problem asks when an n -tuple of complex numbers corresponds to the eigenvalues of an $n \times n$ nonnegative irreducible matrix. This is a challenging but interesting problem, and bringing together speakers on this topic at the ILAS conference in Cancun would be valuable in furthering work in this area.

An second challenge in understanding nonnegative matrices relates to connecting the Jordan form of a reducible nonnegative matrix to the structure of the matrix. Initial results by Richman, Rothblum and Schneider linked the combinatorial structure of a nonnegative matrix to a basis for its generalized Perron eigenspace, and to the size of its largest Perron Jordan block. Further results in the area have been developed, and recent interest has turned to extending many of the properties of nonnegative matrices to eventually nonnegative matrices. The study of eventually nonnegative matrices is an area of growing interest. Having a mini-symposium on this topic would bring together people who are already interested as well as attract new interest in this area.

Organizer: Judi McDonald

Potential Speaker List:

Patricia Egleston

Tom Laffey

Raphi Lowey

Sivaram K. Narayan

Helen Smigoc

Abed Elhashash

Sherod Eubanks

DeAnne Morris

Daniel Szyld

Bit-Shun Tam

Michael Tsatomeros

Boris Zaslavsky