Total Positivity
Positivité totale
(Org: **Shaun Fallat** (Regina) and/et **Michael Gekhtman** (Notre Dame))

ALVARO BARRERAS, Universidad de Zaragoza
Signed bidiagonal decompositions

Matrices with a bidiagonal decomposition satisfying some sign restrictions are analyzed. They include all nonsingular totally positive matrices, their matrices opposite in sign and their inverses, as well as tridiagonal nonsingular H-matrices. Properties of these matrices are presented and the bidiagonal factorization can be used to perform coputations with high relative accuracy.

SHAUN FALLAT, University of Regina
Rank Deficiency and Shadows in Totally Nonnegative Matrices

An $m \times n$ matrix is called totally nonnegative (TN) if all of its minors are nonnegative. It is a simple consequence of this definition to deduce that if $A = [a_{ij}]$ is TN with no zero rows or columns, and if $a_{kl} = 0$, then A will contain a block of zeros determined by the (k, l) position. In this talk, I will present a generalization of this phenomenon to larger sized rank deficient blocks, discuss some related results on row and column inclusion for TN matrices, and connections to the distribution of zero minors in a TN matrix.

STEPHANE LAUNOIS, University of Kent (United Kingdom)
Deleting derivations algorithm and TNN matrices

In this talk, I will present the deleting derivations algorithm, which was first developed in the context of quantum algebras, and explain the significance of this algorithm for the study of TNN matrices.

MAHMOUD MANJEGANI, Isfahan University of Technology and University of Regina
Hadamard Powers of Totally Positive Matrices

Let $A = (a_{ij})$ be a totally positive $n \times n$ matrix. Is the $A^{(\alpha)}$ totally positive? In this talk we try to show that under some conditions on α the Hadamard power $A^{(\alpha)}$ is totally positive.

(Joint work with Shaun M. Fallat)

SHAHLA NASSERASR, University of Regina
TP_k completion of partial matrices with one unspecified entry

An $m \times n$ matrix is called TP_k if every minor of size at most k is positive. The TP_k completion problem for patterns of specified entries is considered. For a given pattern with one unspecified entry, the minimal set of conditions characterizing TP_k completability is given. These conditions are finitely many polynomial inequalities in the specified entries of the pattern. This is joint work with C. Johnson and V. Akin.