

MANY CHEERFUL FACTS

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You sure? Yeah, I'm *Totally Positive*

a talk by Bradley Froehle

2:10–3:00pm on Tuesday, September 9, in Evans 1015.

A matrix is totally positive (resp. totally non-negative) if the determinant of every sub-matrix is positive (resp. non-negative). Totally positive and totally non-negative matrices arise in many fields of mathematics, including cluster algebras, representation theory, theory of immanants, planar resistive networks, etc.

I will discuss, following “Total Positivity: Tests and Parametrizations” by S. Fomin and A. Zelevinsky, methods for parametrizing all totally non-negative matrices and ways to test an arbitrary matrix for total positivity.

*I am the very model of a modern Major General,
I've information vegetable, animal, and mineral,
I know the kings of England, and I quote the fights historical
From Marathon to Waterloo, in order categorical;
I'm very well acquainted, too, with matters mathematical,
I understand equations, both the simple and quadratical,
About binomial theorem I'm teeming with a lot o' news,
With many cheerful facts about the square of the hypotenuse!*

— Gilbert & Sullivan, *P ∘ P*

The website for Many Cheerful Facts is
<http://math.berkeley.edu/~mcf/>