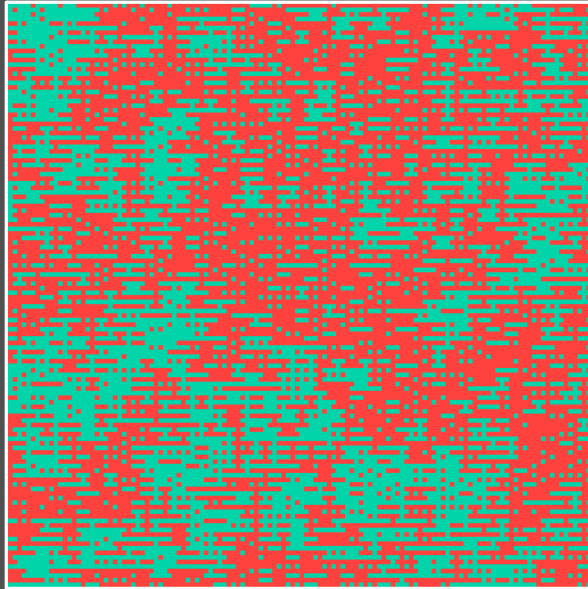


UCCS Department of Mathematics
Math Colloquium Series

DR. THOMAS BOTHNER
UNIVERSITY OF MICHIGAN



DATE:

NOVEMBER 3, 2016

TIME:

12:30PM-1:30PM
(REFRESHMENTS AT 12:15PM)

LOCATION:

OSBORNE CENTER
ROOM# A327

Painlevé Functions in Statistical Physics

Abstract: The so-called Painlevé functions form a family of special functions that was discovered around 1900 as solution to a classification problem posed by E. Picard. During the first half of the twentieth century many important mathematical properties of Painlevé functions were derived, however a direct application to problems in mathematical physics was still outstanding. This changed dramatically in the mid 1970's and early 1990's through appearances of Painlevé functions in the 2D-Ising model and random matrix theory. Nowadays it is a common belief that Painlevé functions in fact play the same dominant role in nonlinear problems that the classical special functions (Airy, Bessel, Hypergeometric,...) play in linear problems.

In this survey talk we will highlight key mathematical properties of the transcendents and discuss several exciting applications of Painlevé functions in statistical physics. The talk is intended for a broad math audience, including graduate students, and does not require any prerequisites. Parts of the lecture will mention results obtained by the speaker in collaboration with M. Bertola, R. Buckingham, P. Deift, A. Its and I. Krasovsky.