

# The hexahedron recurrence and the Ising model

Richard Kenyon

Brown University

Thursday, October 11, 2012

007 Kemeny Hall, 4:00 pm  
(Tea 3:30 pm 300 Kemeny Hall)

## Abstract

This is joint work with Robin Pemantle. Two recurrence relations which are fundamental in combinatorics, integrable systems, and statistical mechanics are the “octahedron recurrence” also known as Hirota’s bi-linear difference equation, and “cube recurrence” or Miwa equation. We introduce a cousin of these, dubbed the “hexahedron recurrence”, show how it is related to the Ising model, and in particular show how this uncovers a cluster algebra structure in the Ising model.