

Chaire Aisenstadt 2008 – 2009 Aisenstadt Chair

**Craig A. Tracy (UC Davis)**



Une série de conférences / A series of conferences

## THE ASYMMETRIC SIMPLE EXCLUSION PROCESS: INTEGRABLE STRUCTURE AND LIMIT THEOREMS

MARDI 3 MARS 2009 / TUESDAY, MARCH 3, 2009  
JEUDI 5 MARS 2009 / THURSDAY, MARCH 5, 2009  
16 H / 4:00

Université de Montréal  
Pavillon André-Aisenstadt, 2920, ch. de la Tour, Salle / Room 6214

Since its introduction by FRANK SPITZER nearly forty years ago, the asymmetric simple exclusion process (ASEP) has become the "default stochastic model for transport phenomena." Some have called the ASEP the "Ising model for nonequilibrium physics." In ASEP on the integer lattice  $\mathbb{Z}$  particles move according to two rules: (1) A particle at  $x$  waits an exponential time with parameter one (independently of all the other particles), and then it chooses  $y$  with probability  $p(x,y)$ ; (2) If  $y$  is vacant at that time it moves to  $y$ , while if  $y$  is occupied it remains at  $x$  and restarts the clock. †The adjective "simple" refers to the fact that allowed jumps are one step to the right,  $p(x,x+1)=p$ , or one step to the left,  $p(x,x-1)=1-p=q$ . The asymmetric condition means  $p \neq q$  so that there is a net drift to either the right or the left.

This work is joint work with Harold Widom.

**Le café sera servi à 15h30 au Salon Maurice-L'Abbé - salle 6245 / Coffee will be served at 3:30 pm Room 6245**



## INTEGRABLE MODELS IN STATISTICAL PHYSICS AND ASSOCIATED UNIVERSALITY THEOREMS AND CONJECTURES

CETTE CONFERENCE S'ADRESSE A UN LARGE AUDITOIRE / SUITABLE FOR A  
GENERAL AUDIENCE.

LE VENDREDI 6 MARS 2009 / FRIDAY, MARCH 6, 2009  
16 H / 4:00 PM

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This lecture, designed for a general audience, will survey "exactly solvable" models in statistical physics. The three main examples will be the 2D Ising model, Random Matrix Models, and the Asymmetric Simple Exclusion Process. The underlying theme is the connection with integrable differential equations of Painlevé type.

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