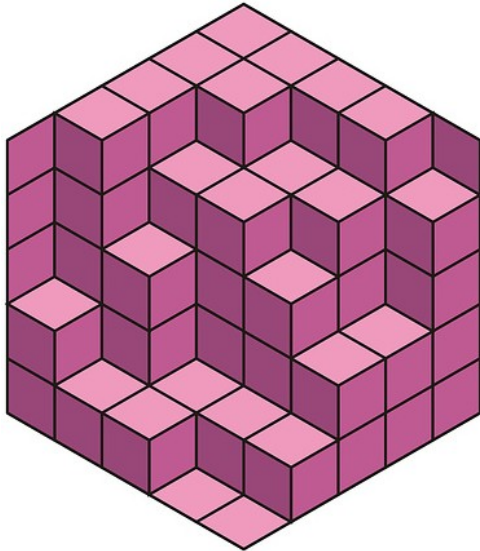


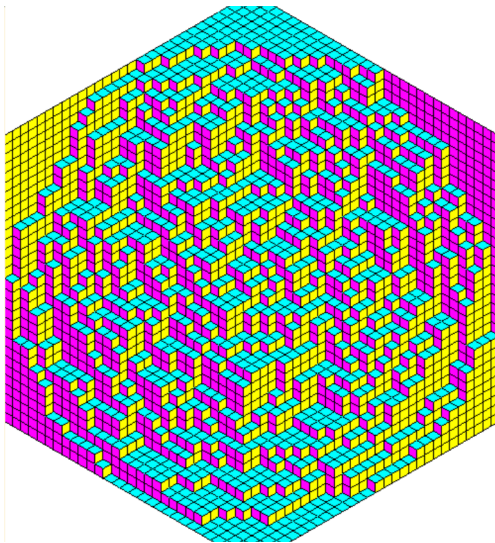
Surfaces aléatoires, pavages, tableaux de Young, courbes arctiques

Philippe Marchal

Pavage par des losanges



Courbe arctique



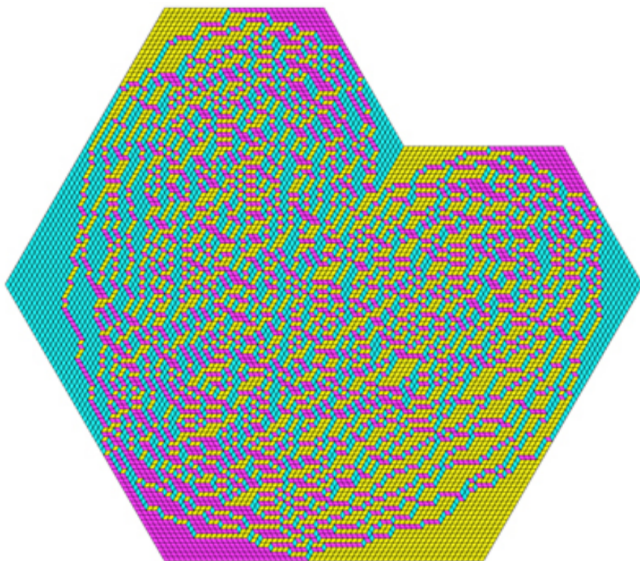
Courbe arctique



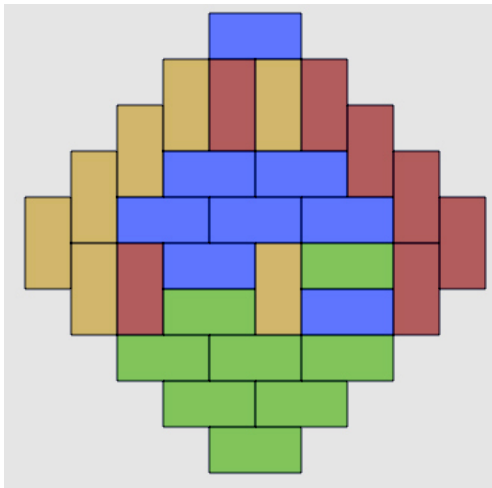
Kenyon, Okounkov, Sheffield



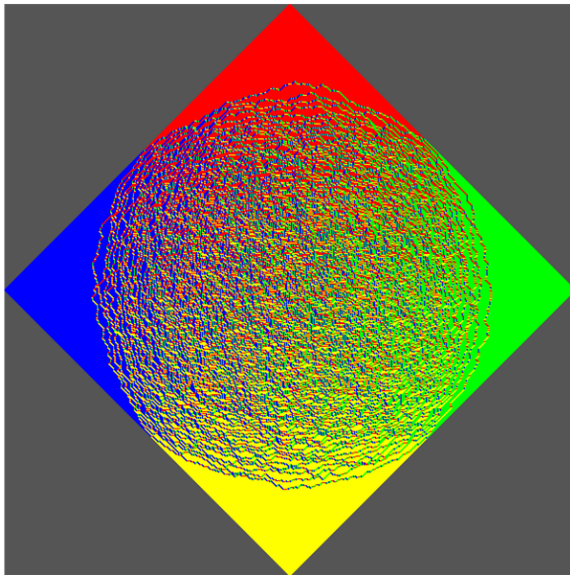
Autres domaines



Pavages par dominos



Le diamant aztèque



Elkies, Kuperberg, Larsen, Propp



Diagramme de Young

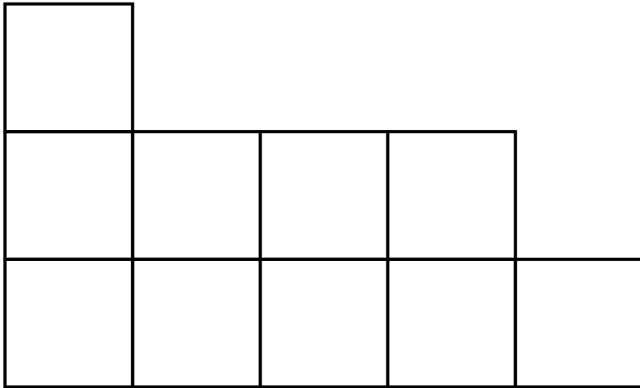
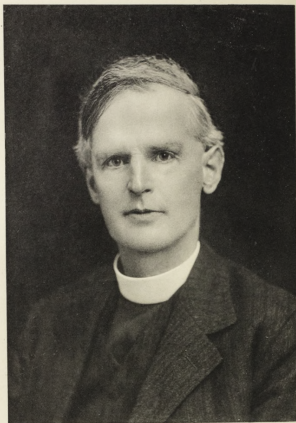


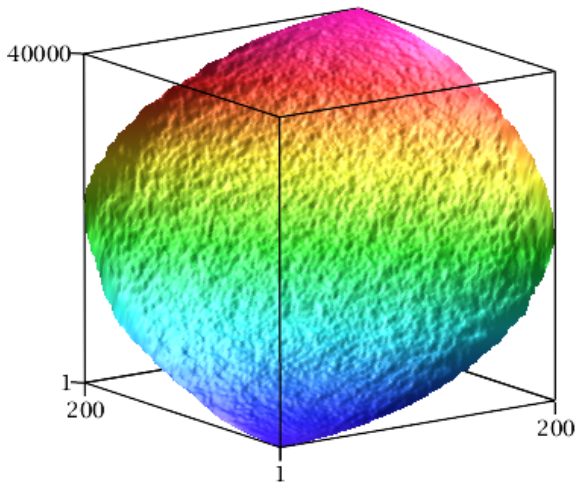
Tableau de Young

4				
3	5	8	9	
1	2	6	7	10

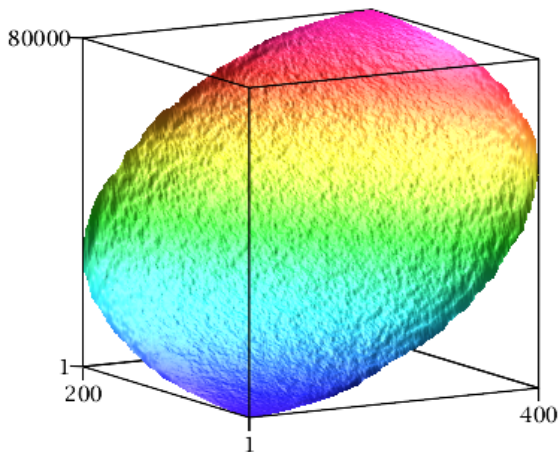


Alfred Young

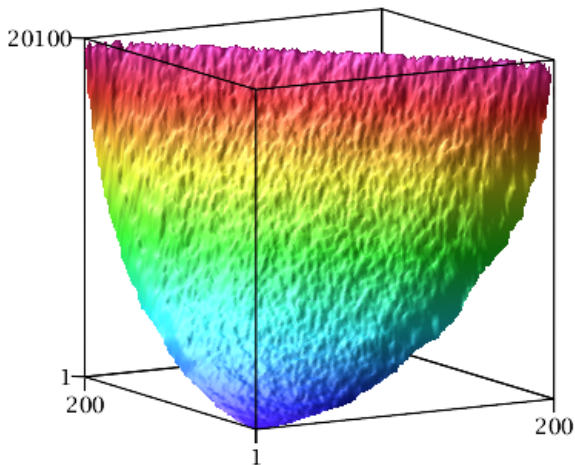
Surfaces et tableaux de Young



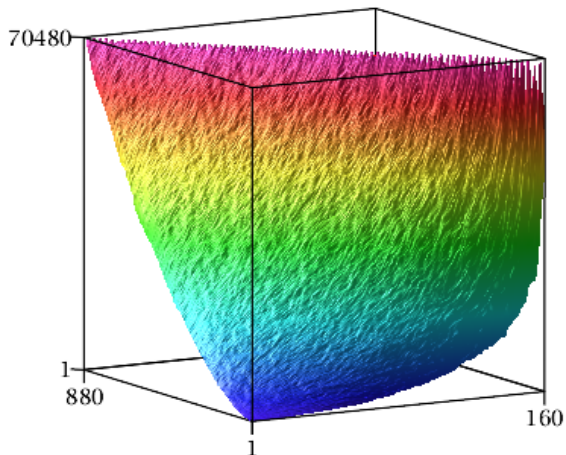
Surfaces et tableaux de Young



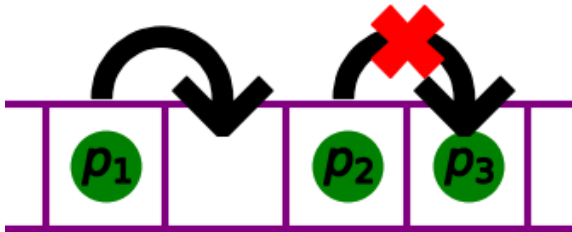
Surfaces et tableaux de Young



Surfaces et tableaux de Young



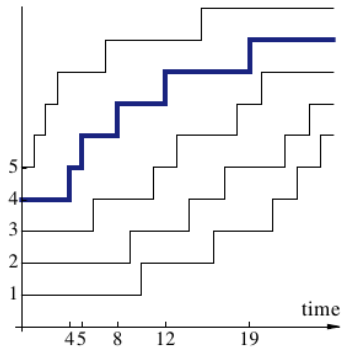
Un système de particules : le TASEP



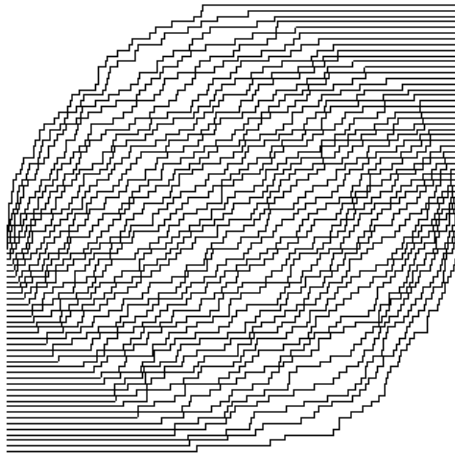
Tableaux de Young et TASEP

10	16	21	23	25
9	14	17	22	24
6	11	13	18	20
4	5	8	12	19
1	2	3	7	15

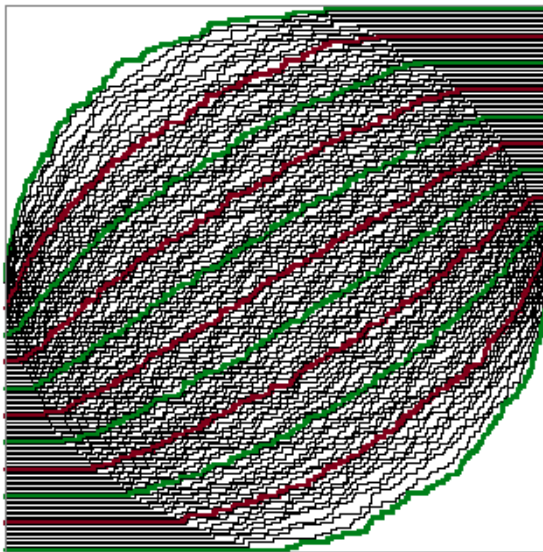
↔



TASEP et courbe arctique

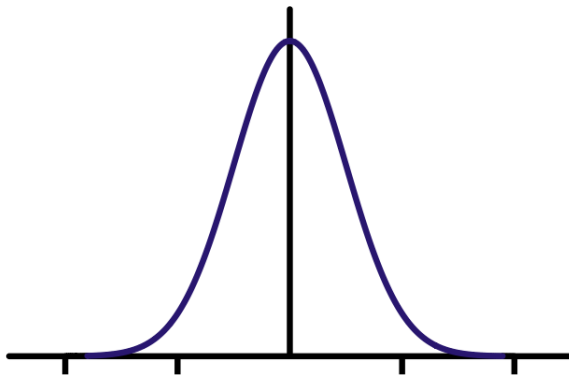


TASEP et courbe arctique





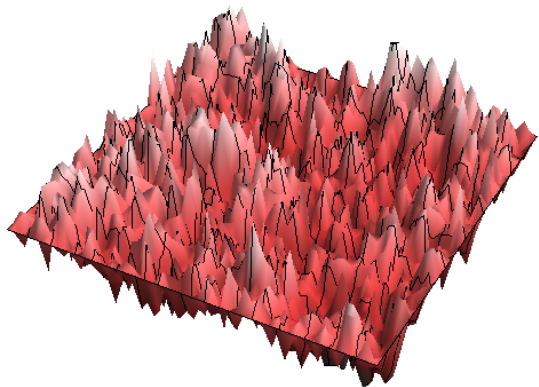
Réels aléatoires : la loi gaussienne



Gauss

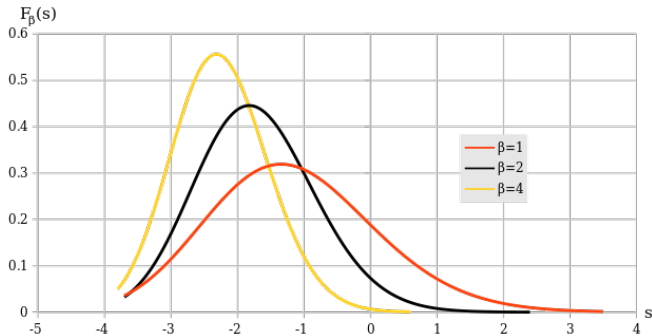


Une “fonction” aléatoire $\mathbb{R}^2 \rightarrow \mathbb{R}$: le champ libre gaussien





Réels aléatoires : la loi de Tracy-Widom



q

Tracy-Widom et Airy

The **cumulative distribution function** of the Tracy-Widom distribution can be given as the **Fredholm determinant**

$$F_2(s) = \det(I - A_s)$$

of the operator A_s on square integrable functions on the half line (s, ∞) with **kernel** given in terms of **Airy functions** Ai by

$$\frac{\text{Ai}(x)\text{Ai}'(y) - \text{Ai}'(x)\text{Ai}(y)}{x - y}.$$

It can also be given as an integral

$$F_2(s) = \exp\left(-\int_s^\infty (x - s)q^2(x) dx\right)$$

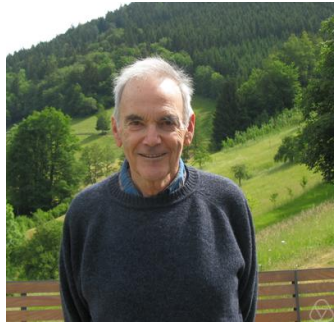
in terms of a solution of a **Painlevé equation** of type II

$$q''(s) = sq(s) + 2q(s)^3$$

where q , called the Hastings-McLeod solution, satisfies the boundary condition

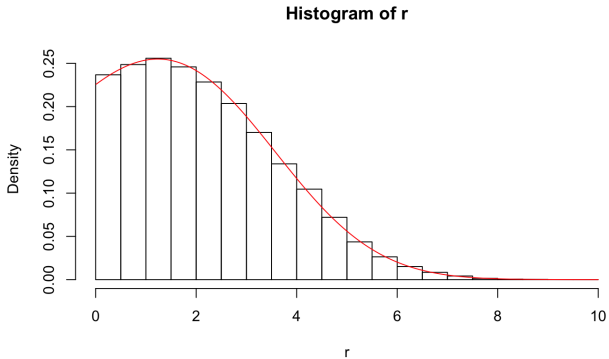
$$q(s) \sim \text{Ai}(s), s \rightarrow \infty.$$

Tracy, Widom



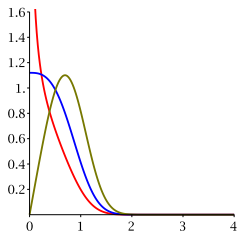
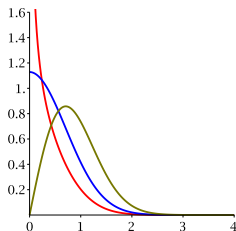
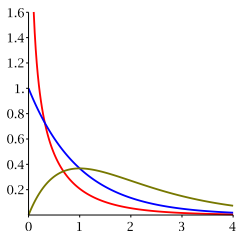


Réels aléatoires : les lois de Mittag-Leffler





Réels aléatoires : les produits de loi Gamma généralisées

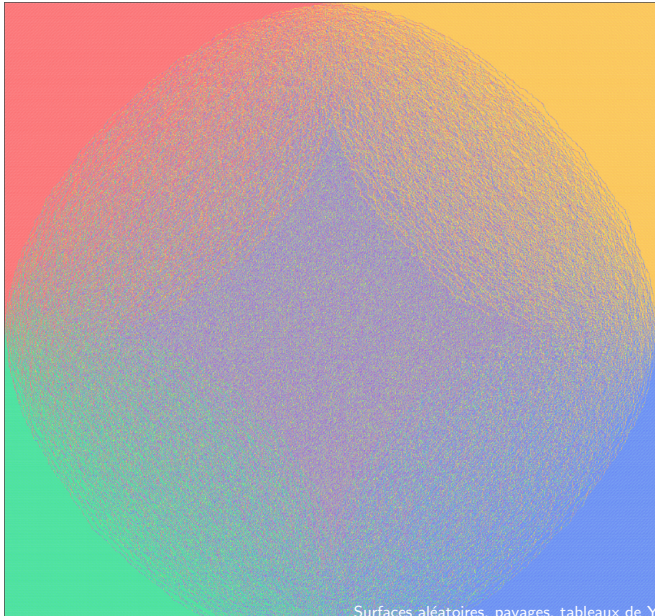


Banderier, M., Wallner





Phase gazeuse dans d'autres modèles



Surfaces aléatoires, pavages, tableaux de Y

Beffara, Chhita, Johansson



