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Random matrices and permutations, matrix integrals and integrable systems. (English)

Zbl 0995.15019

Séminaire Bourbaki. Volume 1999/2000. Exposés 865-879. Paris: Société Mathématique de France, Astérisque 276, 411-433, Exp. No. 879 (2002).

This lecture gives a survey of recent interactions between the theory of random matrices, random permutations, and integrable models. Two sets of integrals form the basis of the lecture. It contains the following chapters: (a) Largest increasing sequences in random permutations; (b) The spectrum of random matrices; (c) Infinite Hermitian matrix ensembles; (d) Large random matrices and permutations: a direct connection via enumerative geometry; (e) Integrals, moment matrices and integrable systems.

For the entire collection see [Zbl 0981.00011].

Reviewer: Václav Burjan (Praha)

MSC:

15B52	Random matrices (algebraic aspects)
37K10	Completely integrable infinite-dimensional Hamiltonian and Lagrangian systems, integration methods, integrability tests, integrable hierarchies (KdV, KP, Toda, etc.)
82B31	Stochastic methods applied to problems in equilibrium statistical mechanics
05A05	Permutations, words, matrices
14H70	Relationships between algebraic curves and integrable systems
37K60	Lattice dynamics; integrable lattice equations
37N20	Dynamical systems in other branches of physics (quantum mechanics, general relativity, laser physics)
60C05	Combinatorial probability
82B44	Disordered systems (random Ising models, random Schrödinger operators, etc.) in equilibrium statistical mechanics

Keywords:

random matrices; random permutations; integrable systems; Painlevé equations; infinite Hermitian matrix ensembles; spectrum; enumerative geometry; moment matrices

Full Text: Numdam EuDML