

Schedule Summer School Randomness in Physics & Mathematics

(week 1 = 08. - 13. August 2016 & week 2 = 15. - 20. August 2016)

week 1	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9:15	welcome					
9:30-10:30	Hairer	Schlein	Zirnbauer	Keating	Hairer	Schlein
coffee						
11-12	Zirnbauer	Keating	Keating	Hairer	Schlein	Zirnbauer
lunch						
14-15	Keating	Hairer	talks*	Schlein	Zirnbauer	excursion
15-16:30	exercises	exercises	coffee &	exercises	exercises	-”-
coffee			talks*			
17-18	solutions	solutions		solutions	solutions	-”-
19 diner	reception & music					-”-

week 2	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9:30-10:30	Krishnapur	Forrester	Conrey	Spencer	Spencer	Conrey
coffee						
11-12	Spencer	Krishnapur	Forrester	Conrey	Krishnapur	Forrester
lunch						
14-15	Conrey	Spencer	poster*	Krishnapur	Forrester	departure
15-16:30	exercises	exercises	talks*	exercises	exercises	
coffee						
17-18	solutions	solutions	talks*	solutions	solutions	
19 diner	reception					

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Lecture titles week 1:

- Martin Hairer: Renormalisation of SPDEs
- Jon Keating: RMT and Number Theory: some recent themes
- Benjamin Schlein: Effective equations from many-body quantum mechanics
- Martin Zirnbauer: Non-linear sigma models for (super-) spin chains

Lecture titles week 2:

- J. Brian Conrey: Random Matrix Theory and statistics of L-functions
- Peter J. Forrester: Random matrices: invariant measures, eigenvalue PDFS, integrals and characteristic polynomials
- Manjunath Krishnapur: Zeros of random polynomials and analytic functions
- Thomas Spencer: Duality, Statistical Mechanics and Random matrices

¹* see separate Wednesday afternoon's programme

Literature for the lectures:

- J. Brian Conrey: see .pdf notes
- Peter J. Forrester: see .pdf notes
- Martin Hairer:
- Jon Keating: Chapter 24 in “The Oxford Handbook of Random Matrix Theory”, Eds.: Akemann, Baik, Di Francesco, Oxford University Press, Oxford (2011), see .pdf notes
- Manjunath Krishnapur:

In the last few years there have been many interesting developments in the old area of random polynomials. Some of the topics that we shall cover are: Stationary zero sets of random analytic functions, Abnormal fluctuations and asymptotic normality, Hole/gap probabilities for zeros, Limiting distributions of zeros of random polynomials, the relationship between zeros and critical points, the distribution of zeros of the sum of two random polynomials. We shall give an introduction to some of these at a level that should be accessible to graduate students with basic knowledge in probability and analysis. Some of the basics are covered in the book (from 2009)

http://math.iisc.ernet.in/~manju/GAF_book.pdf but our aim will be to talk about more recent developments.

- Benjamin Schlein:
- Thomas Spencer: see .pdf notes
- Martin Zirnbauer: see .pdf notes and
Franz Wegner “Supermathematics and its Applications in Statistical Physics”, Lecture Notes in Physics, vol. 920, Springer-Verlag Berlin, Heidelberg (2016)

Wednesday Afternoon’s Programme

Wednesday 10.8.		Wednesday 17.8.	
14:00 – 14:20	Tristan Benoist	14:00 – 14:30	poster session
14:20 – 14:40	H. Adrian Ortega Rosales	14:30 – 14:50	Mareike Lager
14:40 – 14:50	break	14:50 – 15:10	Martin Lohmann
14:50 – 15:10	Dmitry Zaporozhets	15:10 – 15:20	break
15:10 – 15:30	Fabio Deelan Cunden	15:20 – 15:40	Theodoros Assiotis
15:30 – 16:00	coffee	15:40 – 16:00	Petri Tuisku
16:00 – 16:20	Aurélien Grabsch	16:00 – 16:30	coffee
16:20 – 16:40	Christopher Joyner	16:30 – 16:50	Nanda Kishore Reddy
16:40 – 17:00	Offer Kopelevitch	16:50 – 17:10	Alexey Naumov
		17:10 – 17:30	Jesper R. Ipsen

Poster Titles:

- Giusi Alfano: “Error Exponent approximations in multi-antenna channels via Selberg Integrals”
- Fabio Deelan Cunden: “Large deviations of radial statistics in the 2D-OCP”
- Sushma Kumari: “Convergence of Eigenvalues of Inverse Wishart Matrices”

Talk Titles:

- Theodoros Assiotis: “Interlacing Diffusions”
- Tristan Benoist: “Quantum trajectories and non iid random products of matrices”
- Fabio Deelan Cunden: “Time delay matrix for chaotic cavities: new results and a conjecture”
- Aurélien Grabsch: “Truncated linear statistics over the largest eigenvalues”
- Jesper R. Ipsen: “Geometric Dyson Brownian motion and May-Wigner stability”
- Christopher Joyner: “Random Walk approach to Linear Statistics in Bernoulli Ensembles”
- Nanda Kishore Reddy: “Hole probabilities for finite and infinite Ginibre ensembles”
- Offer Kopelevitch: “Convergent $1/N$ expansion of the GUE”
- Mareike Lager: “Density of States for Random Band Matrices in $d=2$ via the supersymmetric approach”
- Martin Lohmann: “Density of states of Gaussian random band matrices”
- Alexey Naumov: “On the Local Semicircular Law for Wigner Ensembles”
- Hugo Adrian Ortega Rosales: “Transport in small correlated disordered networks”
- Petri Tuisku: “The Energy Density in the Toric Ising Model”
- Dmitry Zaporozhets: “On distribution of algebraic numbers”