Graduate Seminar on Probability Theory: Mixing times for Markov processes

Mondays 10.15-11.45,   Andreas Eberle

Date	*Name*	*Topic*	*References*
		A. Basics and examples	
3.4	Andreas Eberle	A1. Examples	Royer; Pavliotis, ….
	Andreas Eberle	A2. Symmetric operators & Spectral Theorem	Reed, Simon; Royer
17.4.	Andreas Eberle	A3. Dirichlet forms	Ma, Röckner; Lecture notes Markov Processes Ch. 4.5
		B. Functional inequalities, entropy	
24.4		B1. Log Sobolev Inequalities, Brascamp-Lieb	Royer, Gross: LSI and contractivity prop. of semigroups, BGL
8.5.		B2. Bakry-Emery, Holley-Stroock etc.	Royer, BGL, Bakry: L'hypercontractivité en théorie des semigroupes
		B3. Gradient flow of the entropy	Otto, Villani: The geometry of dissipative evolution equations
15.5.		B4. Isoperimetric inequalities	Chewi Ch. 2.5
22.5.		B5. Space-time Poincaré inequalities	Albritton, Armstrong, Mourrat, Novack: Variational methods for KFP
		C. Spin systems	
5.6.		C1. Polchinski equation	Bauerschmidt, Bodineau, Degallier
		C2. LSI for near-critical Ising models	Bauerschmidt, Degallier
12.6.		C3. Localization schemes	Chen, Eldan
		C4. Application to Ising and SK model	Chen, Eldan; Eldan,Koehler, Zeitouni
19.6.		C5. Couplings, spectral independence, entropy	Blanca, Caputo, Chen, Parisi, Stefankovic
		D. Sampling	
26.6.		D1. Random walk Metropolis	Andrieu, Lee, Power, Wang
3.7.		D2. Langevin algorithms	Chewi Ch. 4, 7.5, 7.6
		D3. Hamiltonian Monte Carlo	Bou-Rabee, Sanz-Serna; Bou-Rabee, Eberle, Zimmer
10.7.		D4. Randomized HMC and BPS	Lu, Wang
		D5. Event chain Monte Carlo	Krauth

General References:
- Royer: An initiation to logarithmic Sobolev inequalities
- Bakry, Gentil, Ledoux: Analysis and geometry of Markov diffusion semigroups
- Chewi: Log-concave sampling