References

1. H. Airault, P. Malliavin, Quasi-invariance of Brownian measures on the group of circle homeomorphisms and infinite-dimensional Riemannian geometry, *J. Funct. Anal.* **241**(1) (2006) 99–142.
2. S. Albeverio, A. B. Cruzeiro, Global flows with invariant (Gibbs) measures for Euler and Navier-Stokes two-dimensional fluids, *Comm. Math. Phys.* **129** (1990), no. 3, 431–444.
3. S. Albeverio, B. Ferrario, Uniqueness of solutions of the stochastic Navier-Stokes equation with invariant measure given by the enstrophy, *Ann. Probab.* **32** (2004), no. 2, 1632–1649.
4. S. Albeverio, B. Ferrario, *Some methods of infinite dimensional analysis in hydrodynamics: an introduction.* SPDE in hydrodynamic: recent progress and prospects, 1–50, Lecture Notes in Math., 1942, Springer, Berlin, 2008.
5. S. Albeverio, O. Rozanova, Suppression of unbounded gradients in an SDE associated with the Burgers equation, *Proc. Amer. Math. Soc.* **138** (2010), no. 1, 241–251.
6. A. Alabert, I. Gyöngy, On stochastic reaction-diffusion equations with singular force term, *Bernoulli* 7 (2001), no. 1, 145–164.
7. H. Allouba, Uniqueness in law for the Allen-Cahn SPDE via change of measure, *C. R. Acad. Sci. Paris* Sér. I Math. **330** (2000), no. 5, 371–376,
8. L. Ambrosio, Transport equation and Cauchy problem for *BV* vector fields, *Invent. Math.* **158**, 227–260 (2004).
9. L. Ambrosio, G. Crippa, Existence, uniqueness, stability and differentiability properties of the flow associated to weakly differentiable vector fields, in Transport Equations and Multi-D Hyperbolic Conservation Laws, Lecture Notes of the Unione Matematica Italiana **5**, Springer Verlag, 2008.
10. L. Ambrosio, G. Savaré, L. Zambotti, Existence and stability for Fokker-Planck equations with log-concave reference measure, *Probab. Theory Related Fields* **145** (2009), no. 3–4, 517–564.
11. L. Arnold, Stabilization by noise revisited, *Z. Angew. Math. Mech.* **70** (1990), no. 7, 235–246.
12. L. Arnold, H. Crauel, V. Wihstutz, Stabilization of linear systems by noise, *SIAM J. Control Optim.* **21** (1983), no. 3, 451–461.
13. S. Attanasio, L'equazione del trasporto deterministica e stocastica, tesi di Laurea in Matematica, Università di Pisa (2010).
14. S. Attanasio, F. Flandoli, Zero-noise solutions of linear transport equations without uniqueness: an example, C. R. Acad. Sci. Paris, Ser. I 347 (2009) 753–756.
15. S. Attanasio, F. Flandoli, Renormalized solutions for stochastic transport equations and the regularization by bilinear multiplicative noise, arXiv:1007.4102.
16. R. Bafico, P. Baldi, Small random perturbations of Peano phenomena, *Stochastics* **6** (1981/82), no. 3–4, 279–292.

F. Flandoli, *Random Perturbation of PDEs and Fluid Dynamic Models,*
Lecture Notes in Mathematics 2015, DOI: 10.1007/978-3-642-18231-0,

17. R. Bafico, P. Baldi, Small random perturbations of first order ordinary equations with Peano phenomenon, *Rend. Sem. Mat.* Univ. Politec. Torino 1982, 23–37.
18. V. Bally, I. Gyöngy, É. Pardoux, White noise driven parabolic SPDEs with measurable drift, *J. Funct. Anal.* **120** (1994), no. 2, 484–510.
19. D. Barbato, M. Barsanti, H. Bessaih, F. Flandoli, Some rigorous results on a stochastic GOY model, *J. Stat. Phys.* **125** (2006), no. 3, 677–716.
20. D. Barbato, F. Flandoli, F. Morandin, Energy dissipation and self-similar solutions for an unforced inviscid dyadic model, *Trans. Amer. Math. Soc.* **363** (2011), 1925–1946.
21. D. Barbato, F. Flandoli, F. Morandin, Uniqueness for a stochastic inviscid dyadic model, *Proc. Amer. Math. Soc.* **138** (2010), no. 7, 2607–2617.
22. D. Barbato, F. Flandoli, F. Morandin, A theorem of uniqueness for an inviscid dyadic model, C. R. Acad. Sci. Paris, Ser. I, **348** (2010), no. 9–10, 525–528.
23. D. Barbato, F. Flandoli, F. Morandin, Anomalous dissipation in a stochastic inviscid dyadic model, arXiv:1007.1004, to appear on Ann. Appl. Probab.
24. D. Barbato, F. Morandin, M. Romito, Smooth solutions for the dyadic model, arXiv:1007.3401.
25. V. Barbu, G. Da Prato, A. Debussche, Essential m-dissipativity of Kolmogorov operators corresponding to periodic 2D Navier-Stokes equations, *Atti Accad. Naz. Lincei Cl. Sci. Fis. Mat. Natur. Rend. Lincei* (9) *Mat. Appl.* **15** (2004), no. 1, 29–38.
26. V. Barbu, G. Da Prato, A. Debussche, The transition semigroup of stochastic Navier–Stokes equations in 2-D, *Infin. Dimens. Anal. Quantum Probab. Relat. Top.* **7** (2004), n.2, 163–181.
27. V. Barbu, G. Da Prato, M. Röckner, Existence of strong solutions for stochastic porous media equation under general monotonicity conditions, *Ann. Probab.* **37** (2009), no. 2, 428–452.
28. V. Barbu, G. Da Prato, L. Tubaro, Kolmogorov equation associated to the stochastic reflection problem on a smooth convex set of a Hilbert space, *Ann. Probab.* **37** (2009), n. 4, 1427–1458.
29. M. Barton-Smith, A. Debussche, L. Di Menza, Numerical study of two-dimensional stochastic NLS equations, *Numer. Meth. Partial Diff. Eqs.* **21** (2005), no. 4, 810–842.
30. R. F. Bass, Z.-Q. Chen, Brownian motion with singular drift, *Ann. Probab.* **31** (2003), no. 2, 791–817.
31. A. Bensoussan, *Filtrage Optimal des Systems Lineaires*, Dunot, Paris 1971.
32. H. Bessaih, M. Gubinelli, F. Russo, The evolution of a random vortex filament, *Ann. Probab.* **33** (2005), no. 5, 1825–1855.
33. H. Bessaih, A. Millet, Large deviation principle and inviscid shell models, *Electron. J. Probab.* **14** (2009), no. 89, 2551–2579.
34. D. Blömker, *Amplitude equations for stochastic partial differential equations.* World Scientific Publishing Co. Pte. Ltd., Hackensack, NJ, 2007.
35. D. Blömker, F. Flandoli, M. Romito, Markovianity and ergodicity for a surface growth PDE, *Ann. Probab.* 37 (2009), no. 1, 275–313.
36. V. I. Bogachev, G. Da Prato, M. Röckner, Fokker-Planck equations and maximal dissipativity for Kolmogorov operators with time dependent singular drifts in Hilbert spaces, *J. Funct. Anal.* **256** (2009), no. 4, 1269–1298.
37. V. I. Bogachev, G. Da Prato, M. Röckner, Existence and uniqueness of solutions for Fokker-Planck equations in Hilbert spaces, *J. Evol. Equ.* **10** (2010), 487–509.
38. V. I. Bogachev, G. Da Prato, M. Röckner, Uniqueness for solutions for Fokker-Planck equations on infinite dimensional spaces, *Comm. Partial Diff. Equ.* **36** (2011), n.6, 925–939.
39. Z. Brzeźniak, B. Ferrario, 2D Navier-Stokes equation in Besov spaces of negative order, *Nonlinear Anal.* **70** (2009), no. 11, 3902–3916.
40. Z. Brzeźniak, M. Neklyudov, Duality, vector advection and the Navier-Stokes equations, *Dyn. Partial Differ. Equ.* **6** (2009), no. 1, 53–93.
41. Z. Brzezniak, S. Peszat, Stochastic two dimensional Euler equations, *Ann. Probab.* **29** (2001), no. 4, 1796–1832.

42. K. Burdzy, C. Mueller, E. A. Perkins, Non-uniqueness for non-negative solutions of parabolic stochastic partial differential equations, arXiv1008.2126v2.
43. L. Caffarelli, R. Kohn, L. Nirenberg, Partial regularity of suitable weak solutions of the Navier-Stokes equations, *Comm. Pure Appl. Math.* **35** (1982), no. 6, 771–831.
44. A. Celani, S. Rubenthaler, D. Vincenzi, Dispersion and collapse in stochastic velocity fields on a cylinder, *J. Stat. Phys.* **138** (2010), no. 4–5, 579–597
45. S. Cerrai, Kolmogorov equations in Hilbert spaces with nonsmooth coefficients, *Commun. Appl. Anal.* **2** (1998), no. 2, 271–297.
46. S. Cerrai, *Second order PDE's in finite and infinite dimension. A probabilistic approach.* Lecture Notes in Mathematics, 1762. Springer-Verlag, Berlin, 2001.
47. S. Cerrai, M. Freidlin, Averaging principle for a class of stochastic reaction-diffusion equations, *Probab. Theory Related Fields* **144** (2009), no. 1–2, 137–177.
48. D. Chae, On the incompressible Euler equations and the blow-up problem. Asymptotic analysis and singularities–hyperbolic and dispersive PDEs and fluid mechanics, 1–30, Adv. Stud. Pure Math., 47-1, Math. Soc. Japan, Tokyo, 2007.
49. A. S. Cherny, H.-J. Engelbert, *Singular Stochastic Differential Equations*, Springer, Berlin 2005.
50. P.-L. Chow, *Stochastic partial differential equations*, Chapman & Hall/CRC Applied Mathematics and Nonlinear Science 2007.
51. A. Cheskidov, Blow-up in finite time for the dyadic model of the Navier-Stokes equations, *Trans. Amer. Math. Soc.* **360** (2008), no. 10, 5101–5120.
52. A. Cheskidov, S. Friedlander, N. Pavlovic, Inviscid dyadic model of turbulence: the fixed point and Onsager's conjecture, *J. Math. Phys.* **48** (2007), no. 6, 065503, 16 pp.
53. A. Cheskidov, S. Friedlander, N. Pavlovic, An inviscid dyadic model of turbulence: the global attractor, arXiv:math.AP/0610815
54. M. Cranston, M. Scheutzow, D. Steinsaltz, Linear bounds for stochastic dispersion, *Ann. Probab.* **28** (2000), no. 4, 1852–1869
55. H. Crauel, *Random Probability Measures on Polish Spaces*, Stochastic Monographs, Vol. 11, Taylor & Francis, London 2002.
56. A.-B. Cruzeiro, F. Flandoli, P. Malliavin, Brownian motion on volume preserving diffeomorphisms group and existence of global solutions of 2D stochastic Euler equation, *J. Funct. Anal.* **242** (2007), no. 1, 304–326.
57. R. C. Dalang, J. B. Walsh, The sharp Markov property of the Brownian sheet and related processes, *Acta Math.* **168** (1992), no. 3–4, 153–218.
58. R. C. Dalang, C. Mueller, L. Zambotti, Hitting properties of parabolic s.p.d.e.'s with reflection, *Ann. Probab.* **34** (2006), no. 4, 1423–1450.
59. G. Da Prato, *Kolmogorov equations for stochastic PDEs.* Advanced Courses in Mathematics. CRM Barcelona. Birkhäuser Verlag, Basel, 2004.
60. G. Da Prato, A. Debussche, Two-dimensional Navier-Stokes equations driven by a space-time white noise, *J. Funct. Anal.* **196** (2002), no. 1, 180–210.
61. G. Da Prato, A. Debussche, Ergodicity for the 3D stochastic Navier-Stokes equations, *J. Math. Pures Appl.* (9) 82 (2003), no. 8, 877–947.
62. G. Da Prato, A. Debussche, m-Dissipativity of Kolmogorov operators corresponding to Burgers equations with space-time white noise, *Potential Anal.* **26** (2007), 31–55.
63. G. Da Prato, A. Debussche, On the martingale problem associated to the 2D and 3D stochastic Navier-Stokes equations, *Atti Accad. Naz. Lincei Cl. Sci. Fis. Mat. Natur. Rend. Lincei* (9) *Mat. Appl.* **19** (2008), no. 3, 247–264.
64. G. Da Prato, F. Flandoli, Pathwise uniqueness for a class of SDE in Hilbert spaces and applications, *J. Funct. Anal.* 259 (2010), no. 1, 243–267.
65. G. Da Prato, J. Zabczyk, *Stochastic Equations in Infinite Dimensions*, Cambridge Univ. Press, Cambridge 1992.
66. G. Da Prato, J. Zabczyk, *Ergodicity for infinite-dimensional systems* London Mathematical Society Lecture Note Series, 229, Cambridge University Press, Cambridge, 1996.

67. G. Da Prato, J. Zabczyk, *Second order partial differential equations in Hilbert spaces*, London Mathematical Society Lecture Note Series, 293, Cambridge University Press, Cambridge, 2002.
68. A. M. Davie, Uniqueness of solutions of stochastic differential equations, Int. Math. Res. Not. 24, Article ID rnm 124, 26 p. (2007)
69. A. de Bouard, A. Debussche, On the effect of the noise on the solutions of supercritical Schrödinger equation, *Probab. Theory Related Fields* **123** (2002), 76–96.
70. A. de Bouard, A. Debussche, Finite time blow-up in the additive supercritical stochastic nonlinear Schrödinger equation: the real noise case, Contemporary Math. 301 (2002), 183–194.
71. A. de Bouard, A. Debussche, Explosion en temps fini pour l'equation de Schrödinger non linéaire stochastique surcritique, Séminaire Equations aux Dérivées Partielles 2002–2003, Ecole Polytech. Palaiseau 2003.
72. A. de Bouard, A. Debussche, Blow-up for the stochastic nonlinear Schrödinger equation with multiplicative noise, *The Annals of Probab.* **33** (2005), no. 3, 1078–1110.
73. A. de Bouard, A. Debussche, The nonlinear Schrodinger equation with white noise dispersion, *J. Funct. Anal.* **259** (2010), 1300–1321.
74. A. Debussche, L. Di Menza, Numerical simulation of focusing stochastic nonlinear Schrödinger equations, *Physica D* **162** (2002), 131–154.
75. A. Debussche, L. Di Menza, Numerical resolution of stochastic focusing NLS equations, Appl. Math. Letters 15 (2002), no. 6, 661–669.
76. A. Debussche, C. Odasso, Markov solutions for the 3D stochastic Navier-Stokes equations with state dependent noise, *J. Evol. Equ.* **6** (2006), no. 2, 305–324.
77. A. Debussche, Y. Tsutsumi, 1D quintic nonlinear Schrödinger equation with white noise dispersion, preprint 2010.
78. C. De Lellis, L. Székelyhidi, The Euler equations as a differential inclusion, arXiv:math/0702079.
79. C. De Lellis, L. Székelyhidi, On admissibility criteria for weak solutions of the Euler equations, *Arch. Ration. Mech. Anal.* **195** (2010), no. 1, 225–260.
80. J.-M. Delort, Existence de nappes de tourbillon en dimension deux (French), *J. Amer. Math. Soc.* **4** (1991), no. 3, 553–586.
81. R. J. DiPerna, P. L. Lions, Ordinary differential equations, transport theory and Sobolev spaces, *Invent. Math.* **98**, 511–547 (1989).
82. N. Dirr, S. Luckhaus, M. Novaga, A stochastic selection principle in case of fattening for curvature flow, *Calc. Var. Partial Diff. Eq.* **13** (2001), no. 4, 405–425.
83. D. Dolgopyat, V. Kaloshin, L. Koralov, Sample path properties of the stochastic flows, *Ann. Probab.* **32** (2004), no. 1A, 1–27.
84. W. E, E. Vanden Eijnden, Generalized flows, intrinsic stochasticity, and turbulent transport, *Proc. Natl. Acad. Sci. USA* **97** (2000) 8200–8205.
85. J.-P. Eckmann, D. Ruelle, Ergodic theory of chaos and strange attractors, *Rev. Modern Phys.* **57** (1985), no. 3, part 1, 617–656.
86. J. Eggers, M. A. Fontelos, The role of self-similarity in singularities of partial differential equations, *Nonlinearity* **22** (2009), no. 1, R1–R44.
87. H. J. Engelbert, W. Schmidt, On the behaviour of certain functionals of the Wiener process and applications to stochastic differential equations, Stochastic differential systems (Visegrád, 1980), pp. 47–55, Lecture Notes in Control and Information Sci., 36, Springer, Berlin-New York, 1981.
88. E. Fedrizzi, Uniqueness and flow theorems for solutions of SDEs with low regularity of the drift, tesi di Laurea in Matematica, Università di Pisa (2009).
89. E. Fedrizzi, F. Flandoli, Pathwise uniqueness and continuous dependence for SDEs with nonregular drift, arXiv:1004.3485, to appear on Stochastics.
90. E. Fedrizzi, F. Flandoli, Hölder flow and differentiability for SDEs with nonregular drift, to appear on Stoch. Anal. Appl.
91. C. L. Fefferman, Existence and smoothness of the Navier-Stokes equations, the millennium prize problems, Clay Math. Inst., Cambridge 2006, 57–67.

92. B. Ferrario, Absolute continuity of laws for semilinear stochastic equations with additive noise, *Commun. Stoch. Anal.* **2** (2008), no. 2, 209–227.
93. B. Ferrario, A note on a result of Liptser-Shiryaev, arXiv:1005.0237v1.
94. A. Figalli, Existence and uniqueness of martingale solutions for SDEs with rough or degenerate coefficients, *J. Funct. Anal.* **254** (2008), no. 1, 109–153.
95. F. Flandoli, *An introduction to 3D stochastic fluid dynamics.* SPDE in hydrodynamic: recent progress and prospects, 51–150, Lecture Notes in Math., 1942, Springer, Berlin, 2008.
96. F. Flandoli, Remarks on uniqueness and strong solutions to deterministic and stochastic differential equations, *Metrika* **69** (2009), n. 2, 101–123.
97. F. Flandoli, Regularizing properties of Brownian paths and a result of Davie, *Stochastics and Dynamics* **11** (2011), no. 2–3, 1–9.
98. F. Flandoli, D. Gatarek, Martingale and stationary solutions for stochastic Navier-Stokes equations, *Probab. Theory Related Fields* **102** (1995), no. 3, 367–391.
99. F. Flandoli, F. Gozzi, Kolmogorov equation associated to a stochastic Navier-Stokes equation, *J. Funct. Anal.* **160** (1998), no. 1, 312–336.
100. F. Flandoli, M. Gubinelli, E. Priola, Well posedness of the transport equation by stochastic perturbation, *Invent. Math.* **180** (2010), 1–53.
101. F. Flandoli, M. Gubinelli, E. Priola, Does noise improve well-posedness of fluid dynamic equations?, Proceedings Levico 2008, Quaderni di Matematica n. 25.
102. F. Flandoli, M. Gubinelli, E. Priola, Full well-posedness of point vortex dynamics corresponding to stochastic 2D Euler equations, arXiv:1004.1407, accepted on Stoch. Proc. Appl.
103. F. Flandoli, M. Gubinelli, F. Russo, On the regularity of stochastic currents, fractional Brownian motion and applications to a turbulence model, *Ann. Inst. Henri Poincaré Probab. Stat.* **45** (2009), no. 2, 545–576.
104. F. Flandoli, B. Maslowski, Ergodicity of the 2-D Navier-Stokes equation under random perturbations, *Comm. Math. Phys.* **172** (1995), no. 1, 119–141.
105. F. Flandoli, M. Romito, Partial regularity for the stochastic Navier-Stokes equations, *Trans. Amer. Math. Soc.* **354** (2002), no. 6, 2207–2241
106. F. Flandoli, M. Romito, Regularity of transition semigroups associated to a 3D stochastic Navier-Stokes equation, in: Stochastic differential equations: theory and applications, 263–280, Interdiscip. Math. Sci., 2, World Sci. Publ., Hackensack, NJ, 2007.
107. F. Flandoli, M. Romito, Markov selections for the 3D stochastic Navier-Stokes equations, *Probab. Theory Related Fields* 140 (2008), no. 3–4, 407–458.
108. F. Flandoli, F. Russo, Generalized calculus and SDEs with non regular drift, *Stoch. Stoch. Rep.* **72** (2002), no. 1–2, 11–54.
109. S. Friedlander, N. Pavlovic, Blowup in a three-dimensional vector model for the Euler equations, *Comm. Pure Appl. Math.* **57** (2004), no. 6, 705–725.
110. M. I. Friedlin, A. D. Wentzell, *Random perturbations of dynamical systems.* Second edition. Grundlehren der Mathematischen Wissenschaften 260. Springer-Verlag, New York, 1998.
111. U. Frisch, *Turbulence*, Cambridge University Press, Cambridge (1995).
112. M. Fuhrman, G. Tessitore, Infinite horizon backward stochastic differential equations and elliptic equations in Hilbert spaces, *Ann. Probab.* **32** (2004), no. 1B, 607–660.
113. M. Fuhrman, G. Tessitore, Generalized directional gradients, backward stochastic differential equations and mild solutions of semilinear parabolic equations, *Appl. Math. Optim.* **51** (2005), no. 3, 279–332.
114. G. Gallavotti, *Foundations of Fluid Dynamics*, Texts and Monographs in Physics, Springer-Verlag, Berlin, 2002.
115. D. Gatarek, B. Goldys, On uniqueness in law of solutions to stochastic evolution equations in Hilbert spaces, *Stochastic Anal. Appl.* **12** (1994), no. 2, 193–203.
116. B. Goldys, B. Maslowski, Lower estimates of transition densities and bounds on exponential ergodicity for stochastic PDE's, *Ann. Probab.* 34 (2006), no. 4, 1451–1496.

117. B. Goldys, M. Röckner, X. Zhang, Martingale solutions and Markov selections for stochastic partial differential equations, *Stochastic Process. Appl.* **119** (2009), no. 5, 1725–1764.
118. F. Gozzi, S. S. Sritharan, A. Swiech, Viscosity solutions of dynamic-programming equations for the optimal control of the two-dimensional Navier-Stokes equations, *Arch. Ration. Mech. Anal.* **163** (2002), no. 4, 295–327.
119. F. Gozzi, S. S. Sritharan, A. Swiech, Bellman equations associated to the optimal feedback control of stochastic Navier-Stokes equations, *Comm. Pure Appl. Math.* **58** (2005), no. 5, 671–700.
120. M. Gradinaru, S. Herrmann, B. Roynette, A singular large deviations phenomenon, *Ann. Inst. H. Poincaré Probab. Statist.* **37** (2001), no. 5, 555–580.
121. I. Gyöngy, Existence and uniqueness results for semilinear stochastic partial differential equations, *Stochastic Process. Appl.* 73 (1998), no. 2, 271–299.
122. I. Gyöngy, T. Martínez, On stochastic differential equations with locally unbounded drift, *Czechoslovak Math. J.* 51(126) (2001), no. 4, 763–783.
123. I. Gyöngy, D. Nualart, On the stochastic Burgers' equation in the real line, *Ann. Probab.* 27 (1999), no. 2, 782–802.
124. I. Gyöngy, É. Pardoux, On the regularization effect of space-time white noise on quasi-linear parabolic partial differential equations, *Probab. Theory Related Fields* 97 (1993), no. 1–2, 211–229.
125. M. Hairer, *An Introduction to Stochastic PDEs*, arXiv:0907.4178v1.
126. M. Hairer, J. C. Mattingly, Ergodicity of the 2D Navier-Stokes equations with degenerate stochastic forcing, *Ann. of Math.* (2) **164** (2006), no. 3, 993–1032.
127. M. Hairer, J. C. Mattingly, Spectral gaps in Wasserstein distances and the 2D stochastic Navier-Stokes equations, *Ann. Probab.* **36** (2008), no. 6, 2050–2091.
128. H. Holden, B. Øksendal, J. Ubøe, T. Zhang, *Stochastic partial differential equations. A modeling, white noise functional approach.* Second edition. Universitext. Springer, New York, 2010.
129. I. Karatzas, S. E. Shreve, *Brownian motion and stochastic calculus*, Second edition. Graduate Texts in Mathematics, 113. Springer-Verlag, New York, 1991.
130. N. H. Katz, N. Pavlovic, Finite time blow-up for a dyadic model of the Euler equations, *Trans. Amer. Math. Soc.* **357** (2005), no. 2, 695–708.
131. R. Z. Khas'minskii, On positive solutions of the equation $Au+Vu=0$, *Theor. Probab. Appl.* **4** (1959), 309–318.
132. A. Kiselev, A. Zlatoš, On discrete models of the Euler equation, *IMRN* **38** (2005), no. 38, 2315–2339.
133. A. N. Kolmogorov, The local structure of turbulence in incompressible viscous fluids at very large Reynolds numbers, *Dokl. Akad. Nauk. SSSR* **30** (1941), 301–305.
134. P. Kotelenez, *Stochastic Ordinary and Stochastic Partial Differential Equations: Transition from Microscopic to Macroscopic Equations,* Stochastic modelling and applied probability 58, Springer, 2008.
135. S. M. Kozlov, Some questions on stochastic equations with partial derivatives, *Trudy Sem. Petrovsk.* **4** (1978), 147–172.
136. N. V. Krylov, *Lectures on elliptic and parabolic equations in Hölder spaces*, Graduate Studies in Mathematics, 12. American Mathematical Society, Providence, RI, 1996.
137. N. V. Krylov, The heat equation in $L_q((0,T),L_p)-$spaces with weights, *SIAM J. on Math. Anal.* **32**, 1117–1141 (2001).
138. N. V. Krylov, M. Röckner, Strong solutions of stochastic equations with singular time dependent drift, *Probab. Theory Related Fields* **131** (2005), 154–196.
139. N. V. Krylov, B. L. Rozovskii, *Stochastic evolution equations*, (Russian) Current problems in mathematics, Vol. 14, pp. 71147, 256, Akad. Nauk SSSR, Vsesoyuz. Inst. Nauchn. i Tekhn. Informatsii, Moscow, 1979.
140. S. B. Kuksin, *Randomly forced nonlinear PDEs and statistical hydrodynamics in 2 space dimensions.* Zurich Lectures in Advanced Mathematics. European Mathematical Society (EMS), Zürich, 2006.

141. S. B. Kuksin, A. L. Piatnitski, Khasminskii-Whitham averaging for randomly perturbed KdV equation, *J. Math. Pures Appl.* (9) **89** (2008), no. 4, 400–428.
142. S. B. Kuksin, A. Shirikyan, *Mathematics of 2D Statistical Hydrodynamics*. See http://www.u-cergy.fr/shirikyan/
143. H. Kunita, *Stochastic differential equations and stochastic flows of diffeomorphisms*, Ecole d'été de probabilités de Saint-Flour, XII–1982, 143–303, Lecture Notes in Math. **1097**, Springer, Berlin, 1984.
144. H. Kunita, First order stochastic partial differential equations. In: Stochastic Analysis, Katata/Kyoto, 1982. North-Holland Math. Library, vol. 32, pp. 249–269. North-Holland, Amsterdam (1984).
145. H. Kunita, *Stochastic Flows and Stochastic Differential Equations*, Cambridge Studies in Advanced Mathematics, vol. 24. Cambridge Univ. Press, Cambridge (1990).
146. P. D. Lax, *Hyperbolic Systems of Conservation Laws and the Mathematical Theory of Shock Waves*, Society for Industrial and Applied Mathematics, Philadelphia, Pa., 1973.
147. C. Le Bris, P.-L. Lions, Existence and uniqueness of solutions to Fokker-Planck type equations with irregular coefficients, *Comm. Partial Differential Equations* **33** (2008), no. 7–9, 1272–1317.
148. Y. Le Jan, O. Raimond, Integration of Brownian vector fields, *Ann. Probab.* **30** (2002), no. 2, 826–873.
149. S. V. Lototskii, B. L. Rozovskii, The passive scalar equation in a turbulent incompressible Gaussian velocity field. (Russian) *Uspekhi Mat. Nauk* **59** (2004), no. 2(356), 105–120; translation in Russian *Math. Surveys* **59** (2004), no. 2, 297–312.
150. P. L. Lions, *Mathematical Topics in Fluid Mechanics*, *Vol. 1, Incompressible Models*, Oxford University Press, New York, 1996.
151. R. S. Liptser, A. N. Shiryaev, *Statistics of random processes.* "Nauka", Moscow 1974 in Russian; English translation: Springer–Verlag, Berlin 1977.
152. A. J. Majda, A. L. Bertozzi, *Vorticity and incompressible flow*, Cambridge Texts in Applied Mathematics, 27, Cambridge University Press, Cambridge, 2002.
153. P. Malliavin, *Stochastic analysis*, Springer-Verlag, Berlin, 1997.
154. L. Manca, Fokker-Planck equation for Kolmogorov operators with unbounded coefficients, *Stoch. Anal. Appl.* 27 (2009), no. 4, 747–769.
155. C. Marchioro, M. Pulvirenti, *Mathematical Theory of Incompressible Nonviscous Fluids*, Applied Mathematical Sciences, 96. Springer-Verlag, New York, 1994.
156. M. Mariani, Large Deviations Principles for Stochastic Scalar Conservation Laws, *Prob. Th. and Rel. Fields* **147** (2010), no. 3–4, 607–648.
157. J. C. Mattingly, E. Pardoux, Malliavin calculus for the stochastic 2D Navier-Stokes equation, *Comm. Pure Appl. Math.* **59** (2006), no. 12, 1742–1790.
158. J. C. Mattingly, T. Suidan, E. Vanden-Eijnden, Simple systems with anomalous dissipation and energy cascade, *Comm. Math. Phys.* **276** (2007), no. 1, 189–220.
159. O. Menoukeu-Pamen, T. Meyer-Brandis, F. Proske, A Gel'fand Triple Approach to the small noise problem for discontinuous ODE's, preprint.
160. M. Métivier, *Stochastic partial differential equations in infinite-dimensional spaces.* Scuola Normale Superiore di Pisa. Quaderni. Pisa, 1988.
161. R. Mikulevicius, B. L. Rozovskii, Global L^2-solutions of stochastic Navier-Stokes equations, *The Annals of Probab.* 33 (2005), no. 1, 137–176.
162. A. Millet, M. Sanz-Solé, A simple proof of the support theorem for diffusion processes, *Séminaire de Probabilité XXVIII*, LNM 1583, 36–48, Springer, Berlin 1994.
163. A. Millet, M. Sanz-Solé, A stochastic wave equation in two space dimension: smoothness of the law, *Ann. Probab.* **27** (1999), no. 2, 803–844.
164. C. Mueller, Some tools and results for parabolic stochastic partial differential equations. A minicourse on stochastic partial differential equations, 111–144, Lecture Notes in Math., 1962, Springer, Berlin, 2009.
165. L. Mytnik, Weak uniqueness for the heat equation with noise, *Ann. Probab.* **26** (1998), no. 3, 968–984.

166. L. Mytnik, E. Perkins, A. Sturm, On pathwise uniqueness for stochastic heat equations with non-Lipschitz coefficients, *Ann. Probab.* **34** (2006), no. 5, 1910–1959.
167. C. Mueller, R. Tribe, Hitting properties of a random string, *Electron. J. Probab.* **7** (2002), no. 10, 29 pp. (electronic).
168. C. Mueller, R. Tribe, A singular parabolic Anderson model, *Electron. J. Probab.* **9** (2004), no. 5, 98–144.
169. D. Nualart, *The Malliavin Calculus and Related Topics*, Springer, 1995.
170. C. Odasso, Exponential mixing for the 3D stochastic Navier-Stokes equations, *Comm. Math. Phys.* **270** (2007), no. 1, 109–139.
171. E. Pardoux, *Equations aux Dérivées Partielles Stochastiques non Linéaires Monotones. Etude de Solutions Fortes de Type Itô*, PhD Thesis, Université Paris Sud, 1975.
172. F. Poupaud, Diagonal defect measures, adhesion dynamics and Euler equation, *Methods Appl. Anal.* **9** (2002), no. 4, 533–561.
173. M. Pratelli, Le support exact du temps local d'une martingale continue, Sém. Prob. XIII, Lecture Notes in Math. 721, pp 126–131, Springer, Berlin 1979.
174. E. Priola, Pathwise uniqueness for singular SDEs driven by stable processes, arXiv:1005.4237.
175. E. Priola, L. Zambotti, New optimal regularity results for infinite-dimensional elliptic equations, *Boll. Unione Mat. Ital.* Sez. B Artic. Ric. Mat. (8) **3** (2000), no. 2, 411–429.
176. C. Prévôt, M. Röckner, *A concise course on stochastic partial differential equations*, Lecture Notes in Mathematics, 1905, Springer, Berlin, 2007.
177. D. Revuz, M. Yor, *Continuous Martingales and Brownian Motion*, Springer-Verlag, Berlin, 1994.
178. M. Röckner, Z. Sobol, Kolmogorov equations in infinite dimensions: well-posedness and regularity of solutions, with applications to stochastic generalized Burgers equations, *Ann. Probab.* **34** (2006), no. 2, 663–727.
179. M. Röckner, Z. Sobol, A new approach to Kolmogorov equations in infinite dimensions and applications to the stochastic 2D Navier-Stokes equation, *C. R. Math. Acad. Sci. Paris* **345** (2007), no. 5, 289–292.
180. M. Romito, Analysis of equilibrium states of Markov solutions to the 3D Navier-Stokes equations driven by additive noise, *J. Stat. Phys.* **131** (2008), no. 3, 415–444.
181. B. L. Rozovskii, *Stochastic evolution systems. Linear theory and applications to nonlinear filtering*, Translated from the Russian, Mathematics and its Applications (Soviet Series), 35, Kluwer Academic Publishers Group, Dordrecht, 1990.
182. F. Russo, P. Vallois, Elements of stochastic calculus via regularization. Séminaire de Probabilités XL, 147–185, Lecture Notes in Math., 1899, Springer, Berlin, 2007.
183. V. Scheffer, The Navier-Stokes equations on a bounded domain, *Comm. Math. Phys.* **73** (1980), no. 1, 1–42.
184. V. Scheffer, An inviscid flow with compact support in space-time, *J. Geom. Anal.* 3, 4 (1993), 343–401.
185. A. Shirikyan, Contrôlabilité exacte en projections pour les équations de Navier-Stokes tridimensionnelles, *Ann. Inst. H. Poincaré Anal. Non Linéaire* **24** (2007), no. 4, 521–537.
186. B. Schmalfuss, Qualitative properties for the stochastic Navier-Stokes equation, *Nonlinear Anal.* **28** (9) (1997), 1545–1563.
187. A. Shnirelman, On the nonuniqueness of weak solution of the Euler equation, *Comm. Pure Appl. Math.* 50, 12 (1997), 1261–1286.
188. A. Shnirelman, Weak solutions with decreasing energy of incompressible Euler equations, *Comm. Math. Phys.* 210, 3 (2000), 541–603.
189. P. E. Souganidis, N. K. Yip, Uniqueness of motion by mean curvature perturbed by stochastic noise, *Ann. Inst. H. Poincaré Anal. Non Linéaire* **21** (2004), no. 1, 1–23.
190. W. Stannat, A new a priori estimate for the Kolmogorov operator of a 2D-stochastic Navier-Stokes equation, *Infin. Dimens. Anal. Quantum Probab. Relat. Top.* **10** (2007), no. 4, 483–497.

191. D. W. Stroock, S.R.S. Varadhan, *Multidimensional Diffusion Processes*, Springer-Verlag 1979.
192. T. Tao, J. Wright, L^p improving bounds for averages along curves, *J. Amer. Math. Soc.* **16** (2003), no. 3, 605–638.
193. Y. A. Veretennikov, On strong solution and explicit formulas for solutions of stochastic integral equations, *Math. USSR Sb.* **39**, 387–403 (1981).
194. M. I. Visik, A. V. Fursikov, *Mathematical problems of statistical hydromechanics*, Akademische Verlagsgesellschaft Geest & Portig K.-G., Leipzig, 1986.
195. F. Waleffe, On some dyadic models of the Euler equations, *Proc. Amer. Math. Soc.* **134** (2006), 2913–2922.
196. J. B. Walsh, *An introduction to stochastic partial differential equations.* École d'été de probabilités de Saint-Flour, XIV–1984, 265–439, Lecture Notes in Math., 1180, Springer, Berlin, 1986.
197. H. Weber, Sharp interface limit for invariant measures of a stochastic Allen-Cahn equation, *Comm. Pure Appl. Math.* **63** (2010), no. 8, 1071–1109.
198. L. Zambotti, An analytic approach to existence and uniqueness for martingale problems in infinite dimensions, *Probab. Theory Related Fields* **118** (2000), no. 2, 147–168.
199. X. Zhang, Homeomorphic flows for multi-dimensional SDEs with non-Lipschitz coefficients, *Stochastic Process. Appl.* **115** (2005) 435–448.
200. X. Zhang, Strong solutions of SDES with singular drift and Sobolev diffusion coefficients, *Stochastic Process. Appl.* **115** (2005), 1805–1818.
201. A. K. Zvonkin, A transformation of the phase space of a diffusion process that will remove the drift, (Russian) Mat. Sb. (N.S.) **93(135)**, 129–149 (1974).

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Programme of the School

Main lectures

Franco Flandoli	Random perturbations of PDEs and fluid dynamic models
Giambattista Giacomin	Disorder and critical phenomena through basic probability models
Takashi Kumagai	Random walks on disordered media and their scaling limits

Short lectures

Sergio Almada Monter	Scaling limit for the diffusion exit problem
Marek Arendarczyk	Asymptotics of supremum distribution of a Gaussian process over a random time interval
David Barbato	Girsanov transform of SPDEs with multiplicative noise
David Belius	Cover levels and random interlacements
Pierre Bertin	Linear stochastic evolutions
Omar Boukhadra	Return probabilities of random walks among random conductances
Charles-Edouard Brehier	Averaging for some SPDEs: strong and weak order
Elisabetta Candellero	Phase transitions for random walks, asymptotics on free products of groups
Latifa Debbi	Numerical approximation of the solutions of fractional stochastic Burgers equations
François Delarue	Density estimates for a random noise propagating through a chain of differential equations
François Ezanno	Markov models of crystal growth
Ennio Fedrizzi	Uniqueness and flow theorems for solutions of SDEs with low regularity of the drift
Robert Fitzner	Lace expansion for dummies
Elena Issoglio	On the solution of a stochastic PDE with fractal noise

Shuai Jing	Semilinear backward doubly stochastic differential equations and SPDEs driven by fractional Brownian motion with Hurst parameter in $(0, 1/2)$
Kazumasa Kuwada	Duality results on gradient estimates and Wasserstein controls
Mateusz Kwaśnicki	On exit distribution of Markov processes
Clément Laurent	Large deviations for self-intersection local times of stable random walks
José Alfredo López-Mimbela	Finite-time blowup and existence of global positive solutions of a semi-linear SPDE
Eric Luçon	Quenched and averaged convergence and fluctuations of the empirical measure in the Kuramoto model
Camille Male	Random matrix theory and free probability
Francesco Morandin	Anomalous dissipation in a birth and death process and in two stochastic dyadic models
Jean-Christophe Mourrat	Subdiffusive scaling limit for the random walk among random traps
Misha Neklyudov	Ergodicity for infinite particle systems with locally conserved quantities
Eyal Neumann	Sample path properties of Volterra processes
Harald Oberhauser	Towards a theory of rough viscosity solutions
Katarzyna Pietruska-Pałuba	Function spaces arising in connection with stochastic processes on metric spaces
Marco Romito	Non-uniqueness and uncertainty: untold stories about the Navier-Stokes equation
Mykhaylo Shkolnikov	On competing particle systems and their applications
Julien Sohier	Scaling limits of a stripe wetting model
Ekaterina Todorova Kolkovska	The expected Gerber-Shiu penalty function for a perturbed classical risk process
Dario Vincenzi	Dispersion and collapse in turbulent transport
Hendrik Weber	Tightness for a stochastic Allen-Cahn equation

Lihu Xu	Harnack and log-Harnack inequalities of SPDEs
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