

ACADEMICIAN

STÉPHAN FAUVE



CURRICULUM VITAE

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Education:

- Maîtrise de physique, Université de Paris 11 : 1978
- Thèse de troisième cycle, Université de Paris 6 : 1982
- Thèse de doctorat d'état, Université de Paris 6 : 1984

Employment history:

- Teaching and research assistant, ENS-Paris : 1981-87
- Professor of physics, ENS-Lyon : 1987-97
- Professor of physics, ENS-Paris : 1997 – present

Awards, Memberships :

- IBM prize (Physics) (1993)
- Professor at Institut Universitaire de France : 1992-97
- Lewis Fry Richardson Medal of the European Geosciences Union (2009)
- G. K. Batchelor Lecturer 2004, University of Cambridge

- President of the Board of Statistical and Nonlinear Physics Division of the European Physical Society : 2009 – present

- Editorial board « Europhysics Letters » : 2005 – present

- Editorial board « Physica D » : 1994 – 2003

- Editorial board « Nonlinearity » : 1997 – 2003

Research interests :

- Instabilities and nonlinear phenomena, pattern formation, chaos,
- Stochastic resonance, effect of noise on instabilities,
- Granular flows.
- Fluid dynamics, hydrodynamic turbulence,
- Acoustics, sound-turbulence interaction,
- Wave turbulence,
- Magnetohydrodynamics, dynamo

Selected publications

Chaos

- A. Libchaber, C. Laroche and S. Fauve, "Period doubling cascade in mercury, a quantitative measurement", J. Physique Lettres 43, 211 (1982).

Stochastic resonance

- S. Fauve and F. Heslot, "Stochastic resonance in a bistable system", Physics Letters 97A, 5 (1983).

Pattern forming instabilities

- P. Coullet and S. Fauve, "Propagative phase dynamics for systems with Galilean invariance", Phys. Rev. Letters 55, 2857 (1985).
- P. Coullet, S. Fauve and E. Tirapegui, "Large scale instability of nonlinear standing waves", J. Physique Lettres 46, 787 (1985).
- O. Thual and S. Fauve, "Localized structures generated by subcritical instabilities", J. Physique 49, 1829 (1988).
- W. S. Edwards and S. Fauve, "Patterns and quasi-patterns in the Faraday experiment", J. Fluid Mech. 278, 123-148 (1994).

Granular flows

- S. Fauve, S. Douady and C. Laroche, "Collective behaviours of granular masses under vertical vibrations", J. Physique C3 50, 187-191 (1989).
- S. Douady, S. Fauve and C. Laroche, "Subharmonic instabilities and defects in a granular layer under vertical vibrations", Europhysics Letters 8, 621 (1989).

- C. Coste, E. Falcon and S. Fauve, "Solitary waves in a chain of beads in Hertzian contact", Phys. Rev. E 56, 6104-6116 (1997).

Acoustics

- C. Coste, C. Laroche and S. Fauve, "Acoustic resonances in a liquid with vapor bubbles : effect of liquid-vapor transition on sound velocity and attenuation", Phys. Rev. Letters 69, 765-768 (1992).
- N. Mujica, R. Wunenburger and S. Fauve, "Scattering of sound by sound in the vicinity of the liquid-vapor critical point", Phys. Rev. Lett. 90, 234301 (2003).

Turbulence

- S. Fauve, C. Laroche and B. Castaing, "Pressure fluctuations in swirling turbulent flows", J. Physique II 3, 271-278 (1993).
- B. Derroncourt, J. F. Pinton and S. Fauve, "Experimental study of vorticity filaments in a turbulent swirling flow", Physica D 117, 181-190 (1998).
- R. Labbé, J. F. Pinton and S. Fauve, "Power fluctuations in turbulent swirling flows", J. Physique II 6, 1099-1110 (1996).

Fluctuations in out of equilibrium dissipative systems

- S. Aumaître and S. Fauve, "Statistical properties of the fluctuations of the heat transfer in turbulent convection", Europhys. Letters 62, 822-828 (2003).
- S. Aumaître, S. Fauve, S. McNamara and P. Poggi, "Power injected in dissipative systems and the fluctuation theorem", Eur. Phys. J. B 19, 449-460 (2001).
- S. Aumaître, J. Farago, S. Fauve and S. McNamara, "Energy and power fluctuations in vibrated granular gases", Eur. Phys. J. B, 42, 255-261 (2004).
- S. Aumaître, A. Alastuey and S. Fauve, "A quasi-elastic limit for vibrated granular gases", Eur. Phys. J. B, 54, 263-266 (2006).

Fluid dynamos

- F. Pétrélis and S. Fauve, "Saturation of the magnetic field above the dynamo threshold", Eur. Phys. J. B 22, 273-276 (2001).
- R. Monchaux, M. Berhanu, M. Bourgoin, M. Moulin, Ph. Odier, J.-F. Pinton, R. Volk, S. Fauve, N. Mordant, F. Pétrélis, A. Chiffaudel, F. Daviaud, B. Dubrulle, C. Gasquet, L. Marié, "Generation of magnetic field by dynamo action in a turbulent flow of liquid sodium", Phys. Rev. Lett. 98, 044502 (2007).
- M. Berhanu, R. Monchaux, S. Fauve, N. Mordant, F. Pétrélis, A. Chiffaudel, F. Daviaud, B. Dubrulle, L. Marié, F. Ravelet, M. Bourgoin, Ph. Odier, J.-F. Pinton, R. Volk, "Magnetic field reversals in an experimental turbulent dynamo", Europhys. Lett. 77, 59001 (2007).

Wave turbulence

- E. Falcon, S. Fauve and C. Laroche, "Observation of intermittency in wave turbulence", Phys. Rev. Lett. 98, 154501 (2007).
- E. Falcon, S. Aumaître, C. Falcon, C. Laroche and S. Fauve, "Fluctuations of energy flux in wave turbulence", Phys. Rev. Lett. 100, 064503 (2008).