

CURRICULUM VITAE

Events :

Birth : 19 Octobre 1965, Paris XIVe
Baccalauréat : C (science), Juin 1983
École Normale Supérieure (concours math), Juin 1985
Magistère Inter Universitaire de Paris (licence, maîtrise de physique,
D.E.A de mécanique quantique), Juin 1987
Thèse de Doctorat de l'Université de Paris 6, spécialité physique,
18 Octobre 1989

C.N.R.S. (Science Physique et Mathématique - 02) :

C.R.2, Septembre 1989
C.R.1, Septembre 1993
D.R.2, Septembre 2003
D.R.1, Novembre 2011
D.R.E., Octobre 2024

Médaille de Bronze du C.N.R.S., Juin 1993
Prix Édouard Branly, Décembre 1998
Médaille d'Argent du C.N.R.S., Juin 2005

Places :

1980-1983, Lycée Racine, Paris VIIIe
1983-1985, Lycée Condorcet, Paris IXe
1985-1987, École Normale Supérieure, rue d'Ulm, Paris Ve
1987-1990, Laboratoire de Physique de l'École Normale Supérieure de Lyon,
Lyon VIIe
1991-2006, Laboratoire de Physique Statistique de l'École Normale Supérieure, Paris Ve
2001-2005, Dune field of Tarfaya (Morocco)
2007- ... Laboratoire Matière et Systèmes Complexes de l'Université Paris-Diderot, Paris 13e
2012-2015 Department of Computer Science, Bogor Agricultural University (*IPB*), Bogor, Indonésie
2012-2018 Laboratoire de Biologie Marine, Point-à-Pitre, Guadeloupe

Work :

1987-1989, Thesis: "surface instabilities under parametric excitation",
Faraday instability in vertically vibrated thin layer of fluids and granular media, other
instabilities (convection, period doubling) in vibrated granular beds, experiments and
modelling by amplitude equation normal form.
1990, Dynamics and instability of grains in a horizontal rotating drum,
experiments modelled by *stick-slip instability* of the surface flowing layer.
Same experiments and instability for a fluid layer (spatio-temporal intermittency).
1991-1996, Fully developed *turbulence*, vorticity and low-pressure filaments: their observation in
fully developed 3D turbulent flow in a particular geometry, study of their characteristics and
dynamics, model experiments on a single strong vortex to study the interaction of vorticity
and strain.
Phyllotaxis: modelling of the appearance of the leaves to reproduce the
botanical arrangement and explain the appearance of the Fibonacci series as well

- as the selection between the whorled and the spiral modes. Simulation of real specimens, study of abnormal transitions.
- 1997-2000, Grain *avalanches* on a rough inclined plane, study of the dynamics of grains in the hysteresis between the dynamical and static angle. Modelling and experiments of granular surface flows
- 2001-2004 *Venation*: studies of the net formed by the veins of plant leaves, characterisation of the structure, of the angles between the veins.
- 2001-2005 Field studies of the *dune* field of Tarfaya (Morocco). Description and measurement of the motion of the barchans, destabilising effect of the winter storms. Reproduction of miniature dunes under water. Studies (in the field Morocco, Chile, China, Oman- and in the lab) of the *song of the dunes*.
- 2005-2010 Study of avalanche fronts in a channel, explanation of the fronts' constant velocity. Reproduction of other types of dunes underwater (transverse, longitudinal and star dunes). Singing avalanches *in the lab* and characterisation of different singing sands.
- 2005-... Study of the *folds* of leaves in the buds, in relation with the final *leaf shape*. Study of the *unfolding* motion of the leaves, together with the *straightening* of stems, and more generally of the "morphogenetic" motions of growing plants.
- 2007-2011 Study of 3D morphogenesis in reactive chemical systems, and bio-mineralization in diatomea, and growth of lungs.
- 2008-... Characterization of net patterns forming loops, with models allowing from a local information at each node to reconstruct a global hierarchy. Characterisation of street patterns and models of urban growth. Network transition in Ferns leaf veins patterns and dynamics of clay cracks.
- 2011-2015 Study of random Chemical networks to obtain the minimal conditions to reproduce growing cells.
- 2012-2020 Study of the network of *Gorgonia ventalina* (sea fan), and their mechanics and movement under the swell.

Transmission

- Stages de Physique Expérimentales, Licence-Maîtrise de physique de Paris VII (1995-1996)
- Cours d'École Doctorale d'Été (11*1h30, 250 étudiants), Beijing, Chine (2004)
- Cours d'École Doctorale d'Été (2*1h30), Homloebeck, Danemark (2004)
- Intervention Science Académie (2006-2007)
- Retraite-Initiation aux projets interdisciplinaires, Foljuif M2 AIV, (2003-2007)
- Interdisciplinary project school, Medils, Split, Croatia (2006-2007)
- Animation-Projet pour 2 classes de collège de Zep de Normandie (l'Odyssée Jaune, 2009).
- Retraite-Initiation aux projets et thèses interdisciplinaires M2 AIV & ED FdV, Dourdan (2008), Frejus (2009-2010), Sèvres (2011-2016) & M2 EdTech depuis 2014, Chales (2017-2019), CRI-Charles V (2020-2023)
- Cours sur les systèmes dynamiques appliqué au vivant, (30h CM, 2eme semestre), DEA CPM, IPB, SBPC, Paris VII-XI (2001-...)*
- Cours du M2 AIV - LiSc de l'ED FdV - FIRE du CRI : CARA, BibSyn, ZIZO (40h TD), Paris V-VII - Université de Paris (2002-...)*
- Cours sur la modélisation des systèmes dynamiques, (36h CM, 1er semestre), ED FdV, Paris V-VII (2007-2014)
- Cours sur le vivant dans « Naruto », (36h CM, 1er semestre), ED FdV, Paris V-VII (2009-2018)
- Cours Université Ouverte « Math-Plantes » (18h CM), Paris Diderot (2018-2019)
- Cours d'École de Physique (2*1h30), Geilo, Norway (2019) & (2023), Sandomierz, Poland, (2022).