

Curriculum Vitae and publications

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Position: Researcher in the CNRS (French National Scientific Research Center), CR 1

Laboratory: Laboratoire J.A. Dieudonné, Parc Valrose, 06108 Nice Cedex 02, France

Career:

1997-2001: student of the « Ecole Normale Supérieure » of Cachan (ENS Cachan), BSc and MSc in mathematics

2000: « Agrégation » of Mathematics (national competitive exam for the recruitment of high school teachers)

2000-2004:

- PhD thesis in the CMLA at the ENS Cachan, directed by B. Sapoval and L. Desvillettes, « Hydrodynamic in the lungs, interplay between flows and geometries » defended on July 5th 2004.
- Teachings at the ENS Cachan (tutorials for Master students, training for the “agrégation” of mathematics)

2004-2005:

- Post-doc CNRS in the laboratory J.L. Lions in University Paris VI.
- Teachings at the ENS Cachan (tutorials for Master students, training for the “agrégation” of mathematics).

2005-2010:

- CNRS Researcher in laboratory MSC in University Paris VII.
- Teaching at the ENS Cachan

2005-2006: tutorials for Master students, training for the “agrégation” of mathematics

2006-2010: course for Master students (M2), training for the “agrégation” of mathematics

Sept. 2010-....: CNRS Researcher in laboratory LJAD in University Nice Sophia-Antipolis.

Other professional experiences and responsibilities:

- member of the selection comity for a position of “Maître de Conférence” in Paris V in 2009.
- member of the scientific committee of the GDR 2760 since summer 2008.
- supervision of a M2 student (2007), subject “*Towards a modelling of the vascular network*” and a M1 student “*Numerical modelling of the sedimentation and of the centrifugation of a red blood cell*”(2008, co-supervisor J. Salomon).
- since September 2008, co-direction of the PhD student B. Moreau (MSC, Paris 7) with P. Dantan (MSC, Paris 7).
- since September 2008, participation of the supervision of the PhD student P. Bokov (MSC, Paris 7), defence predicted on October 2009).
- from June 2007 to October 2008, participation to the supervision of the PhD student Y. Privat (IECN Nancy) and member of his PhD thesis jury (defended on 2008, the 21st of October).
- Introduction of mathematics to children of an elementary school (under the framework of the “science feast”, organised by the CNRS)
- Realisation of posters on “what are mathematics?” for the science museum “Palais de la découverte” in Paris, in collaboration with C. Baranger, L. Baudouin and V. Roussier.

Awards:

Sept. 2004: Award from the French College of Pneumologist Professors (“Collège des Professeurs de Pneumologie”).

Nov. 2005: Award of the price “La Recherche 2005”, mention of the Research Ministry. Price received in common with M. Felici, M. Filoche, B. Sapoval and E.R Weibel.

Publications:

16- *Electrokinetic Motion of a Deformable Particle: Dielectrophoretic Effect*, Y. Ai, B. Mauroy, A. Sharma and S. Qian, submitted.

15- *Laminar inertial flow in branching structures: numerical simulations and experimental predictions. Applications to the airway resistance*, P. Bokov, B. Mauroy, B. Mahut, C. Delclaux and P. Flaud, submitted.

14- *Towards the modelling of mucus draining from human lung: role of the geometry of the airway tree*, B. Mauroy, C. Fausser, D. Pelca, J. Merckx and P. Flaud, submitted.

13- *Don't fall off the adaptation cliff: when do asymmetrical fitness costs select for suboptimal traits?*, E. Vercken, M. Wellenreuther, E. I. Svensson and B. Mauroy, submitted.

12- *Role of hematocrit on heart work in pulmonary capillaries*, B. Mauroy, submitted.

11- *Shape Minimization of the dissipated energy in dyadic trees*, X. Dubois De La Sablonnière, B. Mauroy and Y. Privat, Discrete Contin. Dyn. Syst. (B), 2010.

10- *Lumen areas and homothety factor influence airway resistance in COPD*, P. Bokov, B. Mauroy, M.P. Revel, P.A. Brun, C. Peiffer, C. Lebozec-Daniel, M.M. Nay, B. Mahut and C. Delclaux, Respir. Physiol. Neurobiol, 2010.

9- *Influence of variability on the optimal shape of a dichotomous airway tree branching asymmetrically*, B. Mauroy, P. Bokov, Phys. Biol. 7 (2010) 016007.

8- *Following red blood cells in a pulmonary capillary*, B. Mauroy, ESAIM Proc, 23, 48-65, 2008.

7- *Optimal Poiseuille flow in a finite elastic dyadic tree*, B. Mauroy, N. Meunier, ESAIM M2AN, 42, 507-534, 2008.

6- *Géométrie pulmonaire*, B. Mauroy, La Recherche , 382, 96-97, January 2005 and La Recherche, 48-51, December 2007.

5- *3D Hydrodynamics in the upper human bronchial tree: interplay between geometry and flow distribution*, B. Mauroy. Fractals in Biology and Medicine, vol IV, Birkhauser, 2005.

4- *Hydrodynamique dans le poumon, relations entre flux et géométries*, B. Mauroy, Thèse de doctorat, ENS Cachan , 5 Juillet 2004.

3- *Reply to J.P. Butler and A. Tsuda.*, B. Mauroy, M. Filoche, J. S. Andrade Jr., and B. Sapoval, Physical Review Letters, 93, 049802 1-1, 22 July 2004.

2- *An optimal bronchial tree may be dangerous*, B. Mauroy, M. Filoche, E. R. Weibel, and B. Sapoval. Nature, 427, 633-636, 12 February 2004.

1- *Interplay between geometry and flow distribution in an airway tree*, B. Mauroy, M. Filoche, J. S. Andrade Jr., and B. Sapoval, Physical Review Letters, 90, 148101 1-4, 11 April 2003.

Conferences:

15- Participation (oral) to the “Journées de la Matière Condensée”, Troyes, August 2010, *Etude numérique 2D d'un modèle de globule rouge dans un canal.*

14- Invitation to the congress CANUM 2010, Carcans-Maubuisson, June 2010, *Rôle de la variabilité sur la forme optimale d'un arbre asymétrique, application aux poumons.*

13- Participation (oral) to the European Society for Evolutionary Biology, Turin (Italy), August 2009, *Don't fall off the adaptation cliff! When asymmetrical fitness costs select for suboptimal traits.*

12- Invitation in “US France Young Engineering Scientists symposium 2007”, Washington (USA), October 2007, *Modelling of red blood cells in a pulmonary capillary.*

11- Invitation to the congress SMAI 2007, Praz-sur-Arly, June 2007, *Contribution de la simulation directe l'étude de la suspension sanguine* (with P. Dantan).

10- Invitation to the workshop Modelling of the Respiratory System, Biomechanical, Computational and Mathematical Aspects, IHP, Paris, December 2007, *Towards a modeling of the red blood cell.*

9- Invitation to the congress “Challenges actuels en mécanique des fluides : modélisation et analyse”, CIRM, Marseilles, France, October 2006, *Study of oxygen pathway in the lung.*

8- Invitation to the Workshop “Fluide et Structure”, Mulhouse, France, November 2005, *Lung modelling, theoretical and numerical insights.*

7- Participation (oral) to the congress SMAI 2005, Evian, France, May 2005, *Sensibility of dichotomical trees, application to the lungs.*

6- Invitation to the congress CEA-GAMNI on Numerical fluid mechanics, Institut Henri Poincaré, Paris, January 2005, *Hydrodynamics in the lungs, relations between flows and geometries.*

5- Invitation to the conference “Practical Applications of Fractals”, Trieste, Italy, November 2004, *The danger of an optimal bronchial tree as a consequence of fractal modelling of the lung.*

4- Invitation to the congress “Modélisations physico-numérique pour les fluides, les particules et le rayonnement - Confrontation modèles physiques et modèles numériques”, Cargèse, France, October 2004, *Hydrodynamics in the lungs, relations between flows and geometries.*

3- Invitation to the Fourth International Symposium, Fractals in Biology and Medicine, Ascona, Swiss, March 2004, *3D Hydrodynamics in the upper human bronchial tree: interplay between geometry and flow distribution.*

2- Participation (oral) to the European Respiratory Society, Vienne, October 2003, *Asymmetry of inspiratory and expiratory fluid dynamics in a branched model of the lung.*

1- Participation (poster) to the European Respiratory Society, Stockholm, September 2002, *Interplay between geometry and flow in an airway tree.*