

## CONTACT INFORMATION

Laboratoire Analyse, Géométrie &  
Applications

Teams *Modélisation et Calcul Scientifique (MCS)*  
*Mathématiques pour la Biologie et les Images (MBI)*

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France

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## CITIZENSHIP

French

## BIRTH

June 13, 1973 in Toulouse (France)

## RESEARCH INTERESTS

fluid mechanics, roughness, asymptotic analysis, elliptic or parabolic systems, finite  
elements methods, blood flow in stented arteries  
cell motility, lamellopodium,  
discrete kinetic approximations, finite differences, high-order entropic schemes

## EDUCATION

**Université Bordeaux I**, France

- PhD in Applied Mathematics,  
at **Institut de Mathématiques de Bordeaux**, **December 11, 2001**
    - Thesis Topic: Discrete kinetic approximation for initial boundary conservation laws
    - Advisor:
      - **Professor Bernard Hanouzet**
      - **MdC Denise Aregba**
    - Area of Study: Conservation Laws
    - Stay of 18 month at **IAC CNR Rome Italy**,
      - Advisor: Dir. Research. **Roberto Natalini (CNR Italy)**
  - Master Degree, **Institut de Mathématiques de Bordeaux**, **June 1997**
    - specialization in applied mathematics
- rank: 3<sup>rd</sup> among 34 candidates

## ACADEMIC EXPERIENCE

**Centre National de la Recherche Scientifique (CNRS)**, France

Position: *1st class CNRS full researcher*

Section 44: Modeling of biological systems, bioinformatics

**June 2005 to present**

- At **Laboratoire Jean Kuntzmann**, UMR 5524, Grenoble (France)  
**June 2005 to August 2008**
- On secondment in **Wolfgang Pauli Institute**, UMI 2842, Vienna (Austria)  
**September 2008 to present**

*Post-doctoral studies*

**March 2002 to June 2005**

- **LJK MAD/EDP**  
**September 2004 to June 2005**

- Topic: Modelling and simulation of the Heart Contraction
    - Development of a 3D code for [non-linear elasticity in great deformation](#)
    - Homogenized constitutive equations for the heart ventricles
  - Collaboration with
    - Prof. Annie [Raoult](#) (MAP5, Paris)
    - Prof. Denis [Caillerie](#) (L3SR, Grenoble)
  - [EPFL CMCS](#)
- September 2002 to September 2004**
- Collaboration with
    - Prof. Alfio [Quarteroni](#)
    - C.R. Miguel Angel [Fernandez](#)
  - Topic: Geometric multi-scale modelling of the cardio-vascular circulation

*Teaching Assistant*

**October 2001 to September 2002** EPFL, Lausanne, Numerical analysis

**Sept. 2006 to June 2007** Grenoble University, Elliptic PDE's

**Sept. 2007 to June 2008** Grenoble University, Rough boundaries in fluid mechanics

- Attaché temporaire de la recherche (ATER) University Bordeaux I
- Sept. 2000 to June 2001**

## PHD SUPERVISION

- **October 2013 to november 2016** Irene BALELLI  
dissertation title : "Mathematical foundations of antibody affinity maturation"

## INDUSTRIAL CONTRACTS & GRANTS

- Contract with [Cardiatis](#) a company designing and commercializing artero-vascular prostheses.
  - since March 2006
  - total amount of the contract: 25 000 €
- Grant of the [Institut des Systèmes Complexes](#) that federates various research fields around complex systems.
  - since October 2007
  - total amount of the grant: 2 000 €

## PUBLICATIONS

- V. Milisic  
Discrete Kinetic Approximation of Initial Value Problems For Conservation Laws  
PhD Thesis (105 pages) written in french
- V. Milisic  
Stability and convergence of discrete kinetic approximations to an initial-boundary value problem for conservation laws Proc. Amer. Math. Soc. 131 (2003), no. 6, 1727–1737 [ps](#)
- D. Aregba-Driollet and V. Milisic  
Kinetic approximation of a boundary value problem for conservation laws Numerische Mathematik 2004, vol. 97, no4, pp. 595-633 [pdf](#)

- F. Guarguaglini, V. Milisic and A. Terracina  
A discrete kinetic approximation for a strongly degenerate parabolic problems with boundary conditions J. Differential Equations 202 (2004), no. 2, 183–207. [ps](#)
- M. Fernandez, V. Milisic and A. Quarteroni  
Analysis of a geometrical multiscale blood flow model based on the coupling of ODE's and hyperbolic PDE's SIAM Multiscale Model. Simul. 4 (2005), no. 1, 215–236 (electronic) [ps](#)
- V. Milisic and A. Quarteroni  
Analysis of lumped parameter models for blood flow simulations and their relation with 1D models M2AN Math. Model. Numer. Anal. 38 (2004), no. 4, 613–632 [pdf](#)
- D. Bresch and V. Milisic,  
High order multi-scale wall-laws, part I : the periodic case  
accepted for publication in Quat. Appl. Math. [pdf](#)
- D. Bresch and V. Milisic,  
Towards implicit multi-scale wall laws  
C. R. Math. Acad. Sci. Paris 346 (2008), no. 15-16, [pdf](#)
- P.S. Jouk and A. Mourad and V. Milisic and G. Michalowicz and A. Raoult and D. Caillerie and Y. Usson  
Analysis of the fibre architecture of the heart by quantitative polarized light microscopy: Accuracy, limitations and contribution to the study of the fibre architecture of the ventricles during fetal and neonatal life.  
European Journal of Cardio-Thoracic Surgery, vol: 31(2007), pp: 916-922pdf
- D. Caillerie and V. Milisic and A. Mourad and A. Raoult  
Modelling and simulation of fibrous biological tissues via discrete homogenization methods  
PAMM Volume 7, Issue 1, Date: December 2007, Pages: 1121601-1121602 [pdf](#)
- E. Bonnetier and D. Bresch and V. Milisic,  
*A priori* convergence estimates for a rough Poisson-Dirichlet problem with natural vertical boundary conditions  
Accepted for publication in Advances in Mathematical Fluid Mechanics (2008) [pdf](#)
- V. Milisic,  
Very weak estimates for a rough Poisson-Dirichlet problem with natural vertical boundary conditions  
Methods and Applications of Analysis Vol. 16 No. 2, 2009 [pdf](#)
- V. Milisic, A. Rambaud, K. Gostaf Pichon  
Asymptotic analysis of blood flow in stented arteries: time dependency and direct simulations. CEMRACS 2009: Mathematical modelling in medicine, 70–89, ESAIM Proc., 30, EDP Sci., Les Ulis, 2010.
- V. Milisic and D. Oelz  
On the asymptotic regime of a model for friction mediated by transient elastic linkages. accepted for publication in Journal de Mathematiques Pures et Appliquées (9) 96, No. 5, 484-501 (2011)

- V. Milišić, Vuk; D. Oelz,  
On a structured model for load-dependent reaction kinetics of transient elastic linkages mediating nonlinear friction. *SIAM J. Math. Anal.* 47 (2015), no. 3, 2104–2121.
- V. Milišić, U. Razafison,  
Weighted Lp-theory for Poisson, biharmonic and Stokes problems on periodic unbounded strips of  $\mathbb{R}^n$ . *Ann. Univ. Ferrara Sez. VII Sci. Mat.* 62 (2016), no. 1, 117–142.
- V. Milišić, D. Oelz,  
Tear-off versus global existence for a structured model of adhesion mediated by transient elastic linkages. *Commun. Math. Sci.* 14 (2016), no. 5, 1353–1372.
- V. Milišić, G. Wainrib,  
Mathematical modeling of lymphocytes selection in the germinal center. *J. Math. Biol.* 74 (2017), no. 4, 933–979.
- V. Milišić, D. Oelz,  
Space dependent adhesion forces mediated by transient elastic linkages: New convergence and global existence results. *J. Differential Equations* 265 (2018), no. 12.
- V. Milišić,  
Initial layer analysis for a linkage density in cell adhesion mechanisms. *CIMPA School on Mathematical Models in Biology and Medicine*, 108–122, *ESAIM Proc. Surveys*, 62, EDP Sci., Les Ulis, 2018.
- I. Balelli, V. Milišić, G. Wainrib,  
Random walks on binary strings applied to the somatic hypermutation of B-cells. *Math. Biosci.* 300 (2018), 168–186. 92D15
- I. Balelli, V. Milišić, G. Wainrib,  
Multi-type Galton-Watson processes with affinity-dependent selection applied to antibody affinity maturation. *Bulletin of Mathematical Biology*, 2018, DOI 10.1007/s11538-018-00548

#### PREPRINTS ON ARXIV

- Irene Balelli, Vuk Milisic, Gilles Wainrib  
Branching Random Walks on Binary Strings for Evolutionary Processes [link](#)
- V. Milišić  
From delayed minimization to the harmonic map heat equation, 35 pages, [link](#)

#### TECHNICAL SKILLS Software experience in finite elements methods

Extensive use of **FREFEM++**, **FENICS**, **Modulef**, **maxima**, **octave**.  
experience: linear algebra, domain decomposition, parallel computing, mesh generation, numerical treatment of corner singularities, nonlinear numerical methods, visualization