

# Vanessa Lleras

## *Curriculum Vitae*

Nationality	Born October 5, 1982, in Pontarlier (25) french
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### Professional Address :

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Université Montpellier 2  
Case courrier 051  
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34095 MONTPELLIER Cedex  
FRANCE

## *Current position*

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**Associate Professor** at the University of Montpellier 2 since September 1st, 2010.

## *Education*

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- 2006-2009**    **PhD thesis in applied mathematics** at the University of Franche-Comté supervised by Patrick Hild.  
defended November 20, 2009 with *honors*.  
**Title :** Modelling, analysis and simulation of contact problems in solid mechanics and fluid mechanics.
- Committee :**
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|--------------------|---|
| Patrick Hild       | Full Professor, Franche-Comté University                |
| Bertrand Maury     | Full Professor, Paris Sud University (Orsay)            |
| Serge Nicaise      | Full Professor, University of Valenciennes              |
| Christine Bernardi | Senior CNRS Researcher, Paris 6 University              |
| Mihaï Bostan       | Associate Professor, University of Franche-Comté        |
| Marco Picasso      | Maître d'Enseignement et de Recherche, EPFL in Lausanne |
| Yves Renard        | Full professor, INSA Lyon                               |

- 2004-2006**    **Master 2 of science** in mathematics at the University of Franche-Comté, *with honors*.  
**Agrégation de mathématiques** (French competitive examination for some teacher positions).
- 2003-2004**    **Maîtrise** in mathematics at the University of Franche-Comté, *with honors*.
- 2002-2003**    **Licence** in mathematics at the University of Franche-Comté, *with honors*.
- 2000-2002**    **Classes préparatoires** in Besançon, Lycée Victor Hugo.
- 2000**            **Baccalauréat scientifique**, in Pontarlier, Lycée Xavier Marmier, *with honors*.

## *Professional background*

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- 2009-2010**    **Attachée Temporaire d'Enseignement et de Recherche (ATER)**  
at the University of Franche-Comté
- 2006-2009**    **Teaching assistant** at the University of Franche-Comté

## *Administrative and scientific duties*

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- ▶ 2011-2015 : Member of the ANR FORCE
- ▶ 2012-2016 : Member of the ANR BECASIM
- ▶ 2011- : Elected member of the council of the laboratory.
- ▶ 2008-2010 : In charge of the PhD students seminar at the university of Besançon (two-monthly).

## *Publications and communications*

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### *PUBLICATIONS*

#### **Published papers**

1. P. Hild and V. Lleras, *Residual error estimates for Coulomb friction*, SIAM J. Numer. Anal., 47 (5) (2009), pp. 3550-3583.
2. V. Lleras, *A stabilized Lagrange multiplier method for the finite element approximation of frictional contact problems in elastostatics*, Math. Model. Nat. Phenom, 4 (2009), pp. 163-182.
3. P. Hild, V. Lleras and Y. Renard, *A posteriori error analysis for Poisson's equation approximated by XFEM*, ESAIM Proceedings, 27 (2009), pp. 107-121.
4. C. Bui, V. Lleras and O. Pantz, *Dynamics of red blood cells in 2D*, ESAIM Proceedings, 28 (2009), pp. 182-194.

5. M. Bostan and V. Lleras, *Some remarks on time-dependent variational problems and their asymptotic behaviour*, *Nonlinear Anal.*, 73 (2010), pp. 1820-1833.
6. S. Amdouni, P. Hild, V. Lleras, M. Moakher and Y. Renard, *A stabilized Lagrange multiplier method for the enriched finite element approximation of contact problems of cracked elastic bodies*, *ESAIM : M2AN*, 46 (2012), pp. 813-839.

#### Accepted papers

7. P. Hild, V. Lleras and Y. Renard, *A residual error estimator for the XFEM approximation of the elasticity problem*, accepted, 2012.

#### Conferences proceedings

8. V. Lleras, P. Hild and Y. Renard, *Estimateurs d'erreur pour la méthode XFEM*, huitième colloque national du Calcul des Structures, Giens 2007, Hermès, Vol. 2, p 49-54.
9. P. Hild and V. Lleras, *A residual type error estimate for the static Coulomb friction problem with unilateral contact*, *Lectures Notes in Applied and Computational Mechanics*, proceeding du CMIS, 2011.
10. C. Bui, V. Lleras and O. Pantz, *Modélisation et simulation de la dynamique des globules rouges*, Dixième colloque national du Calcul des Structures, Giens 2011.
11. S. Amdouni, P. Hild, V. Lleras and Y. Renard, *A stabilized Lagrange multiplier method for the XFEM approximation of contact problems in elastostatics*, II European Conference on eXtended Finite Element, Cardiff 2011.

### *CONFERENCES AND SEMINARS*

#### Communications at international conferences

1. New trends in contact mechanics, Cargese, Corse, France, March 27-31, 2012.
2. US National Congress on Computational Mechanics 2011, Minneapolis, July 25-28, 2011.
3. XFEM 2011, Cardiff, June 29 -July 1, 2011.
4. Xème Colloque franco-roumain, Poitiers, France, August 26-31, 2010.
5. 5th Contact Mechanics International Symposium, Chania, Crète, April 28-30, 2009.
6. 8th World Congress on Computational Mechanics / 5th European Congress on Computational Methods in Applied Sciences and Engineering, Venise, June 30- July 4, 2008.

#### Communications at national conferences

7. Congrès CANUM, Super Besse, May 21-25, 2012
8. Dixième Colloque National en Calcul des Structures, Giens, May 9-13, 2011.
9. Journée I3M in Grammont, Montpellier, March 24, 2011.
10. Xièmes Journées des Ecoles doctorales Pasteur et Carnot, Besançon, May 6, 2010.
11. Congrès SMAI, la Colle sur Loup, May 25-29, 2009.
12. Project presentation of the CEMRACS 2008 (Modelling and simulation of complex fluids), August 2008.
13. Workshop on the Méthodes Numériques Innovantes, Application à la Mécanique, INSA Lyon, June 23-24, 2008.

14. Mini-symposium in the Congrès d'Analyse Numérique, Saint Jean de Monts, May 26-30, 2008.
15. Huitième Colloque national en Calcul des Structures, Giens, May 21-25, 2007.

### **Seminars**

15. Seminar in the university of Vigo (Spain), July 11, 2012.
16. Presentation in the workgroup Lattice Boltzmann Method, Montpellier, February 14, 2012.
17. Seminar of the LMA, Marseille, November 16, 2010.
18. Seminar of the ACSIOM team, Montpellier, October 5, 2010.
19. Seminar of the EDP and applications team, Poitiers, April 1, 2010.
20. Seminar Modélisation Mathématique, Mécanique et Numérique, Caen, March 31, 2010.
21. Seminar of the MIP team, Toulouse, March 9, 2010.
22. Presentation in the workgroup Méthodes Numériques of the LJLL, Paris, March 8, 2010.
23. Seminar Numerical Analysis of the IRMAR, Rennes, February 11, 2010.
24. Seminar of the MACS-INRIA Rocquencourt team, February 3, 2010.
25. Seminar Applied Analysis, Amiens, February 1, 2010.
26. Seminar Applied Mathematics, Nantes, January 28, 2010.
27. Presentation in the workgroup Numérique, Orsay, January 20, 2010.
28. Seminar of the Laboratoire de Spectrométrie Physique (UMR 5588), Grenoble, December 15, 2009.
29. Student Seminar in mathematics, Besançon, October 7, 2009.
30. Student Seminar, Franche-Comté university, April 8, 2009.
31. Workgroup EDP, Besançon, December 9 and December 16, 2008.
32. Seminar of the EPFL, Lausanne, November 27, 2008.
33. Seminar Numerical Analysis and Scientific Computing, Franche-Comté University, December 22, 2007.
34. Seminar of the LaMSID (UMR EDF/CNRS 2832), EDF Clamart, October 4, 2007.

### **Participation to conferences**

34. GDR CHANT : Level set, champ de phase : théorie et applications, Grenoble, November 7-9, 2011.
35. GDR : interaction fluide structure biologique, Marseille, June 23-24, 2011.
36. Congrès d'Analyse Numérique, Carcans-Maubuisson, May 31-June 4, 2010.
37. GDR Dynamique Non-linéaire Asymptotique Modélisation, Rennes, March 17-19, 2010.
38. Workshop on a posteriori estimates for adaptive mesh refinement and error control, Paris, October 13, 2008.
39. Formation "estimateurs d'erreur a posteriori pour la méthode éléments finis", Valenciennes, September 11-12, 2008.
40. Ecole des ondes : méthodes Galerkin discontinues, Rocquencourt (INRIA), November 27 -December 1, 2006.

### **Summer schools**

41. CEMRACS 2007 : Pré and post processing in scientific computing (1 week).
42. CEMRACS 2008 : Modelling and simulation of complex fluids (6 weeks).
43. CEMRACS 2009 : Mathematical modelling in medicine (2 weeks).
44. Softflow 2012, Cargese : 2 weeks.

## *Awards*

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- Prix de Thèse 2010 des Ecoles Doctorales Carnot et Louis Pasteur des universités de Bourgogne et de Franche-Comté décerné par la Société Chimique de France, la Société Française de Physique et la Société Mathématique de France.

## *Research interest*

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- Finite Element Method
- eXtended Finite Element Method
- A priori and a posteriori error estimates
- Problem with contact and friction
- Elasticity
- Mesh adaptivity
- Fictitious domain
  
- Navier Stokes equations
- Numerical simulation of dynamics of red blood cells
- Level-Set method
  
- Variational inequalities
- Study of the asymptotic behavior of solutions

## *Computer skills and languages*

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<b>System</b>	Windows, Linux, Mac.
<b>Software</b>	Latex, Maple, Scilab, Matlab.
<b>Numerical simulation</b>	CAST3M, Freefem++, Getfem++.
<b>Languages</b>	English, German.