

Pierre LAMBERT (Service BEAMS)

Curriculum vitae

Work experience (mm/yyyy)

Permanent positions

Since 10/2009: **CNRS Senior Research Fellow** (in French: chargé de recherché 1ère classe)
Since 10/2007: **Assistant Professor**, Université libre de Bruxelles (ULB)

Other work experience

August 2013: Invited Professor at **Aalto University** (Helsinki, Finland), Prof. Q. Zhou
09/2010-05/2011: Invited researcher in **U. Tokyo**, Institute of Industrial Science, Prof. H. Fujita and CNRS laboratory for integrated micromechatronic systems (**LIMMS**)
10/2009-08/2010: CNRS researcher in **FEMTO-ST** institute, Besançon, France
During 2009: 4 research periods as invited researcher in FEMTO-ST, collaboration on Hydromel European project with Prof. N. Chaillet and Prof. Ph. Lutz
04/2008-10/2008: Invited professor at **EPFL**, Lausanne, Switzerland, Prof. J. Jacot
01/2006-06/2006: Postdoc at **U. Pierre et Marie Curie**, Paris, France, Prof. S. Régnier
02/2005-11/2005: Postdoc at EPFL, Prof. J. Jacot
08/2000-01/2005: Research assistant, **ULB**, Prof. A. Delchambre, PhD preparation
09/1999-06/2000: Physics teacher, Brussels, Belgium + teaching assistant in mechanics, ULB
05/1999-08/1999: Engineer in Aricie company, Lyon, France (logistics consultant)
09/1998-04/1999: Engineer in Trasys-France company, Paris, France (SAP consultant)

Education (dd/mm/yyyy)

07/09/2010: « Habilitation à diriger des recherches », “Surface tension effects in microrobotics”, Université de Franche-Comté, Besançon, France
Jury: Prof. K.F. Bohringer (U. Washington, USA), Prof. B. Le Pioufle (ENS Cachan, France), Prof. Ph. Lutz (U. Franche-Comté, France), Prof. D. Reynaerts (Kath.U. Leuven, Belgium), Prof. N. Chaillet (U. Franche-Comté, France), Prof. D. Collard (U. Tokyo, Japan), Prof. A. Delchambre (U. Libre de Bruxelles), Prof. J. Jacot (EPFL, Switzerland), Prof. S. Régnier (U. Pierre et Marie Curie, France)
2000 – 2004 : Engineering school (Université libre de Bruxelles ULB), **PhD Dec. 10th 2004**
« A Contribution to Microassembly: a Study of Capillary Forces as a gripping Principle » (Final note > 18/20),
2002 – 2003 : MD in engineering sciences, Université libre de Bruxelles,
1999 – 2000 : Sciences Faculty (ULB), Pedagogical degree for physics teaching, June 2000
1993 – 1998 : MD in electromechanical engineering, ULB (Final note > 16/20),

Invitations in International Conferences and International Advanced Schools

- Invitation in Robotics Science and Systems (2006) – Workshop in the conference
- Invitation in International Conference on Robotics and Automation (2011) – Workshop in the conference
- Invited speaker at the Summer School in Microrobotics, Besançon, July 2010
- Invitation by the Dutch Acoustic Society NAG (November 2011) – Topical session on acoustics frontiers

Prizes and awards

- My paper on capillary forces in assembly was awarded a best paper award in Assembly Automation (2005)
- I was selected for the second stage of the ERC starting grant in 2007;
- My paper on acoustic levitation was highlighted in Physics Today (September 2011)

Research activities

Scientific activities

My expertise includes microtechnologies and mechanical design, scaling laws and downscaling, modelling, design of experiments and experimental skills, especially forces and capillary forces measurements down to the nanonewton.

I'm reviewer for many journals (transactions on mechatronics, tribology transactions, journal of micromechanics and microengineering, IEEE Transactions on Robotics, Journal of Fluids Eng., Micro Nano Letters, Langmuir, Microfluidics and Nanofluidics, Nanotechnology, Journal of Adhesion Science and Technology, J. Phys. Condensed Matter, JCIS, powder technology). Until this year, I've been a member of the editorial board of T-ASE (transactions on automation science and engineering) and the International Journal of Advanced Robotic Systems.

I've been expert for many research agencies in Belgium, France, Finland, Netherlands. I've been a member of the program committee and chairman of conferences in the field of Assembly and Manufacturing (IEEE ISAM, International Precision Assembly Seminar, 3M-Nano).

PhD supervision

1. Alexandre CHAU, FRIA grant, Theoretical and experimental study of capillary condensation and its possible application in micro-assembly, 11/12/2007 – Current position : medical engineering spin-off (Endo tools therapeutic)
2. Vincent VANDAELE, FRIA grant, Contactless handling for micro-assembly : acoustic levitation, 21/02/2008 – Current position : engineer at Siemens
3. Marion SAUSSE-LHERNOULD, ARC project, Theoretical and experimental study of electrostatic forces applied to micromanipulation : influence of surface topography, 28/11/08 (co-direction ULB/U. Pierre et Marie Curie). Current position : postdoc at ULB
4. Jean-Baptiste VALSAMIS, FRIA Grant, Liquid bridge dynamics, 31/05/10. Current postdoc at ULB
5. Cyrille LENDERS, Assistant, Fluid/Solid interaction in micromechanics: Use of Surface Tension in Immersed Microsystems, 02/09/2010, co-supervision with Prof Nicolas CHAILLET and Michaël GAUTHIER (FEMTO-ST). Current position : engineer in RD at ABB
6. Aline DE GREEF, FNRS grant, Flexible fluidic actuators, 15/09/2010. Current position : engineer for Brussels public transportation (STIB)
7. Sophie GERNAY, FRIA grant, Bio-inspired capillary adhesion, from 01/10/2012, co-supervision with Prof. Tristan Gilet (ULg)
8. Jean-Charles LARRIEU, ARC project, Design of an active packaging embedding a biosensor towards lung cancer detection, from 15/01/2013
9. Nicolas CAUCHE, Assistant, Conception et modélisation de robots flexibles, Co-supervision Prof. Alain Delchambre, from 01/10/2011
10. Ronald TERRAZAS MALLEA, IAP PhD grant, Interfacial Self-Assembly, co-supervision with Dr Michaël Gauthier (FEMTO-ST), from 01/11/2013

International collaborations (underlined names are co-authors, including those involved in my book to be released in Summer 2013)

1. EPFL, Lausanne (CH), Prof. Jacques Jacot, Dr Massimo Mastrangeli
2. FEMTO-ST, Besançon (F), Dr M. Gauthier, Prof. N. Chaillet, Prof. Ph. Lutz, Prof. N. Andreff
3. Université Pierre et Marie Curie, Paris (F), Prof. Stéphane Régnier
4. CNRS CEMES, Dr Thierry Ondarçuhu
5. University of Tokyo (JAP), Prof. Hiroyuki Fujita, Dr. Astushi Takei
6. Ritsumeikan Institute Kyoto (JAP), Prof. Satoshi Konichi

7. University of Padova (I), Dr Fabio Gabrieli
8. University of Pisa (I), Prof. Marco Santochi, Dr Gualtiero Fantoni
9. University of California (USA), Prof. Michel Maharbiz
10. University of Oldenburg, Dr Thomas Wich
11. TU Delft (NL), Prof Marcel Tichem, Dr Marcello Porta
12. KU Leuven (B), Prof. Dominiek Reynaerts, Dr Michaël Devolder
13. University of Okayama (JAP), Prof. Takefumi Kanda (bilateral exchange of PhD students)

Participation to research contracts

1. Assembly Net, 2000-2004, in collaboration with academic and industrial leaders in the field of micro-assembly (European Thematic Network) – **research only**
2. Machines miniaturization (4M), 2000-2004, in collaboration with the UC Louvain and the U Liège (Funded by the Région wallonne) – **research only**
3. Micromanipulators miniaturization through nanomaterials modeling and characterization, 2004-2009, among ULB (Action de Recherche Concertée ARC funding) – **research & management**
4. Tools and models for microassembly (MOMIE), 2006-2008, in collaboration with University Paris VI (Pierre et Marie Curie) (joint funding CNRS-FNRS) – **research & management**
5. Contribution à la plate-forme wallonne pour l'administration de médicaments (Neofor), 2007-2010 (Funded by the Région wallonne, Biowin project) – **research & management**
6. Micro Nozzle Arrays (MuNA), 2009-2010, RégionWallonne, First Post Doc – **r. & management**
7. Micro-assembly, 2009, joint funding CNRS-CGRI, Tournesol Project – **research & management**
8. Participation to the European Hydromel project on hybrid assembly, 2009 – **research only**
9. ARC project "PREDICTION": Protein detection for in vivo diagnosis using catheteric optical fibre biosensors - **Management (2012-2017)**
10. Micromanipulation and microfluidics : multiscale applications of surface tension (Belgian IAP), **Research and management (coordinator, 2012-2017)**
11. FNRS PDR research project on capillary forces in granular media – **Copromotor (2014-2018)**
12. FNRS GEQ – Acquisition of the Nanoscribe submicron resolution 3D printer – **Promotor (2014)**

Organization of scientific events

1. International workshop on hybrid assembly, ULB, March 12th 2009
2. Workshop on Grand Challenges on Microrobotics and Microassembly, in the conference Robotics : Science and Systems, Zurich, 25-27 June 2008, ETHZ
3. Special session " Microassembly " (in collaboration with Prof. M. Tichem, (TU Delft), IEEE International Symposium on Assembly Manufacturing (ISAM'07), Ann Arbor, Michigan, 22-25 July 2007
4. Special session " Microassembly " (in collaboration with Prof. M. Tichem, TU Delft), IEEE International Symposium on Assembly and Task Planning (ISATP'05), Montréal, 19-21 July 2005
5. Workshop on micro-assembly: scaling laws, similitude and dimensional analysis (with Sandra Koelemeijer),EPFL, June 15th 2005
6. Seminar on micro-assembly with TU Delft, ULB, June 3rd 2004
7. IAP MicroMAST yearly meetings (January 2013, September 2013, September 2014)

Publications summary

I have authored 1 patent, 32 papers in international journals, more than 30 publications in proceedings of international collaborations, one monography and many chapters in 4 additional books, 1 patent WO2011042562 .

Bibliometric indicators

h-index (scopus) = 12

h-index (google scholar) = 17

citations (scopus) = 383

citations (google scholar) = 911

10 Significant publications

1. **Pierre Lambert** and Alain Delchambre, Parameters ruling capillary forces at the submillimetric scale, *Langmuir*, **25**, pp 9537-9543, 2005
2. Vincent Vandaele, **P. Lambert** et Alain Delchambre, Non-contact handling in microassembly : acoustical levitation, *Precision Engineering* **29**, pp 491–505, 2005
3. **Pierre Lambert**, Frank Seigneur, Sandra Koelemeijer and Jacques Jacot, A case study of surface tension gripping: the watch bearing, *Journal of Micromechanics and Microengineering*, **16**:7, pp. 1267-1276, 2006
4. **P. Lambert (Author)**, Capillary Forces in Microassembly : Modeling, Simulation, Experiments, and Case Study, Springer, Série Microtechnology and MEMS, ~250 pages, ISBN: 978-0-387-71088-4, Septembre 2007
5. **Pierre Lambert**, Alexandre Chau, Alain Delchambre and Stéphane Régnier. Comparison between Two Capillary Forces Models, *Langmuir*, **24** (7) pp 3157-3163 (2008)
6. De Greef, **Lambert**, Delchambre, Towards flexible medical instruments: Review of flexible fluidic actuators, *Precision Engineering*, **33**, pp 311-321, 2009
7. Cyrille Lenders, Michaël Gauthier, Rémi Cojan and **Pierre Lambert**, Three-DOF Microrobotic Platform Based on Capillary Actuation, *IEEE Transactions on Robotics*, DOI: 10.1109/TRO.2012.2199009, 2012
8. Daunay, **Lambert**, Renaudot, Fujita, Effects of the Substrate Wettability in Liquid Dielectrophoresis (LDEP) Based Droplets Generation: an Experimental Study, *Lab on a Chip*, **12**, 361-368 2012
9. **P. Lambert (Editor)**, Surface Tension Effects in Microsystems : Engineering below the capillary length, Microtechnology and MEMS series, 429 pages, Springer, ISBN: 978-3-642-37551-4, July 2013
10. A. Buttafuoco, C. Lenders, R. Clavel, **P. Lambert**, M. Kinnaert, Design, manufacturing and implementation of a novel 2-axis force sensor for haptic applications, *Sensors and Actuators A* **209**, pp 107-114, 2014

Full list available at <http://difusion.ulb.ac.be/>