

CURRICULUM VITAE

Frédéric Caupin

Born Oct. 20th 1976 in Douai (France)

frederic.caupin@univ-lyon1.fr

<http://ilm-perso.univ-lyon1.fr/~fcaupin/>

Institut Lumière Matière

Université Claude Bernard Lyon 1 et CNRS

Bâtiment Brillouin – 6 rue Ada Byron

69622 Villeurbanne Cedex, France

Tél. +33 4 72 44 85 65 – Fax. +33 4 72 43 26 48

CURRICULUM AND DIPLOMAS

Nov. 2nd '09 **Habilitation à diriger des recherches**, Ecole Normale Supérieure :

From helium to water: capillarity and metastability in two exceptional liquids

1997 – 2001 **PhD Thesis**, University Paris 6, specialty Quantum Physics, Sébastien Balibar dir.:

Cavitation in helium 3: a Fermi liquid at negative pressure

1994 – 1998 Studies at Ecole Normale Supérieure

1996 – 1997 DEA in Quantum Physics (*summa cum laude*)

1995 – 1996 Maîtrise of Physics (*magna cum laude*)

Agrégation of Physical Sciences, specialty Physics (rank: 4th)

1994 – 1995 Licence of Physics (*magna cum laude*). Licence of Mathematics (*summa cum laude*). Maîtrise in Applied Mathematics (*with honors*)

1992 – 1994 Preparatory classes at Louis Le Grand, Paris

1991 – 1992 Terminale C at A. Châtelet high school, Douai. Baccalauréat C (*summa cum laude*)

PROFESSIONAL EXPERIENCE

Nov. 1st 2010 **Professor** at University Claude Bernard Lyon 1

April 2004 Short-term JSPS (Japan Society for the Promotion of Science) fellow

1 month stay to collaborate with T. Minoguchi,

Prof. D. Yoshioka lab, Tokyo University, Japan

Sept. 1st 2001 **Maître de Conférences** at Ecole Normale Supérieure

1st sem. 2000 Confirmed Researcher OTAN fellow. Visiting research associate,

Prof. H.J. Maris lab, Brown Univ., Providence, RI, USA

1998 – 2001 **Agrégé Préparateur** at Ecole Normale Supérieure

AWARDS AND RECOGNITION

- 1992: 1st prize, Regional Chemistry Olympiads ; 1st prize Concours Général de Physique
- 1993: Silver medal, 25th International Chemistry Olympiads
- **Junior member** of Institut Universitaire de France (oct. 10 – oct. 15)
- **Outstanding Referee** for [Rev. Sci. Instr.](#) (2011) and [American Physical Society](#) (2014)
- **Helmholtz Award 2016** from [International Association for the Properties of Water and Steam](#)

FUNDED RESEARCH PROPOSAL

March 2018 Hubert Curien Partnerships with R. Grisenti, Goethe Univ., Frankfurt,

- Dec. 2019 and J. Hruby, Czech Acad. of Science, Prague.

Jan. 2017- collaboration PICS CNRS with C. Valeriani, Univ. Complutense, Madrid

Dec. 2019 *Supercooled and stretched liquids: a combined experimental and numerical approach*

Dec. 2012- partner ANR-SEED CGS μ Lab : *Geological Micro-laboratoires on chip to study key*

Nov. 2016 *processes in multiphasic reactive transport applied to geological CO₂ storage*

(PI Y. Garrabos, ICMCB Bordeaux)

March 2010 **PI of ANR-NSF AnomWater** : *International Collaboration in Chemistry Origins of the*

- Oct. 2013 *anomalous thermodynamics and dynamics of metastable liquid water*

- Oct. 2009 **PI of ERC Starting Grant WASSR**
 – Sept. 2015 *Water anomalies in the stretched and supercooled regions*
 Nov. 2007 partner **ANR Blanc SUPERDUR**
 – Oct. 2011 *Search of the nature of supersolidity* (PI I. Mukharsky, CEA Saclay)
 Oct. 2009 partner **ANR Blanc META : Metastable phases: water, liquid helium and solid helium**
 – Sept. 2015 (PI S. Balibar, ENS)
 Dec. 2005 partner **ANR Jeune Chercheur SURCHAUF : Experimental physico-chemistry of**
 – Nov. 2008 *superheated solutions for quantitative interpretation of metastable systems in nature*
 (PI L. Mercury, Orsay)

RESPONSABILITIES

- **Teaching:** in charge and creation of new lectures, videos for teaching on the website [La physique expérimentale à Lyon 1](#)
- **Mentoring :** 9 post-doctoral associates, 9 PhD students, 33 interns (15 M2, 10 M1, 8 L3)
- **Member of 14 PhD committees** (3 abroad) **and 3 “habilitation” committee**
- **Reviewer** of >100 papers for Nature (Nature, Phys., Mat. & Comm.), APS (Phys. Rev. Lett., B, E & X), AIP (J. Chem. Phys., Phys. of Fluids, Rev. Sci. Instr), ACS (JACS, J. Phys. Chem. Lett., J. Phys. Chem. B), RSC (PCCP, Soft Matter, Langmuir, Cryst. Eng. Comm.), JLTP, EPL...
- Member (2017 –) commission documentation research, BU Lyon 1
- Member of the Scientific Committees of conferences: [9th Liquid Matter](#), Lisboa, 2014; [26th StatPhys.](#), Lyon, 2016; [10th Liquid Matter](#), Ljubljana, 2017
- Member (2011-2015) of College 6 (Structure and dynamics of liquids and glasses) of Institut Laue-Langevin, Grenoble, to select among proposals to use the neutron facility
- **Reviews** of research proposals submitted to agencies in USA (DoE, NSF), Europe (ERC, ERA Chemistry, CECAM), Poland (NSC), Switzerland (FNS), France (ANR, Rhône-Alpes)

Administrative duties :

- 2010 – Member of the consulting committee for section 28 at UCBL
 2008 – 2010 Representative of teaching and research staff at the Scientific Council of ENS
 2006 – 2010 Member of the Council of Laboratoire de Physique Statistique
 2003 – 2008 Member of the committee for section 28 at ENS
 1999 – 2002 Representative of teaching and research staff
 at the Administrative and Scientific Councils of ENS
 1997 – 2001 Representative of PhD students at the ENS Physics Department Council
 1997 – 1998 Representative of scientific students
 at the Administrative and Scientific Councils of ENS

RESEARCH DISSEMINATION

77 publications : 1 book chapter, 49 peer-reviewed papers, 27 peer-reviewed conference proceedings. **>1000 citing articles** (excl. self-cites)

International conferences: 23 invited talks, 11 talks, 13 posters. 25 seminars incl. 10 abroad

Co-organizer of [Water 2014](#), Ecole de Physique des Houches; mini-colloquium at [Condensed Matter in Paris](#), 2014; [WaterX](#), Nice, 2016 ; session of [20th symposium on thermophysical properties](#), Boulder, 2018

Broad audience conferences at Espace des Sciences de Paris, ESPCI, sept. 2003 : *Bulles : son et lumière* and the Physics Olympiads, UCBL, déc. 2011 : *L'eau dans tous ses états*

21 disseminations in medias : Le Monde, France Culture, La Recherche, Science et Vie, Sciences et Avenir, Physics World...

SIGNIFICANT PUBLICATIONS

- S. Sasaki, R. Ishiguro, F. Caupin, H.J. Maris, and S. Balibar. Superfluidity of grain boundaries and supersolid behavior. *Science*, 2006, **313**, 1098-2000.
- F. Caupin and E. Herbert. Cavitation in water: a review. *C. R. Phys.*, 2006, **7**, 1000-1017.
- M. El Mekki Azouzi, C. Ramboz, J.-F. Lenain, and F. Caupin. A coherent picture of water at extreme negative pressure. *Nature Physics*, 2013, **9**, 38-41.
- G. Pallares, M. El Mekki Azouzi, M.A. González, J.L. Aragoes, J.L.F. Abascal, C. Valeriani, and F. Caupin. Anomalies of water at negative pressure. *Proc. Natl. Acad. Sci. USA*, 2014, **111**, 7936-7941.
- A. Dehaoui, B. Issenmann, and F. Caupin. Viscosity of deeply supercooled water and its coupling to molecular diffusion. *Proc. Natl. Acad. Sci. USA*, 2015, **112**, 12020-12025.
- N. Bruot and F. Caupin. Curvature dependence of the liquid-vapor surface tension beyond the Tolman approximation. *Phys. Rev. Lett.*, 2016, **116**, 056102.
- P. Gallo, K. Amann-Winkel, C.A. Angell, M.A. Anisimov, F. Caupin, C. Chakravarty, E. Lascaris, T. Loerting, A.Z. Panagiotopoulos, J. Russo, J.A. Sellberg, H.E. Stanley, H. Tanaka, C. Vega, L.M. Xu, L.G.M. Pettersson. Water: A Tale of Two Liquids. *Chem. Rev.* 2016, **116**, 7463-7500.
- L.P. Singh, B. Issenmann, and F. Caupin. Pressure dependence of viscosity in supercooled water and a unified approach for thermodynamic and dynamic anomalies of water. *Proc. Natl. Acad. Sci. USA*, 2017, **114**, 4312-4317.
- V. Holten, C. Qiu, E. Guillermin, M. Wilke, J. Ricka, M. Frenz, and F. Caupin. Compressibility anomalies in stretched water and their interplay with density anomalies. *J. Phys. Chem. Lett.*, 2017, **8**, 5519-5522.
- C. Goy, M.A.C. Potenza, S. Dederá, M. Tomut, E. Guillermin, A. Kalinin, K.-O. Voss, A. Schottelius, N. Petridis, A. Prosvetov, G. Tejada, J.M. Fernández, C. Trautmann, F. Caupin, U. Glasmacher, R.E. Grisenti. Shrinking of rapidly evaporating water microdroplets reveals their extreme supercooling. *Phys. Rev. Lett.*, 2018, **120**, 015501.