

Dr. Colin BOUSIGE

colin.bousige@univ-lyon1.fr

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

Institut Lumière Matière

Université Claude Bernard Lyon 1
Domaine Scientifique de La Doua
Bâtiment Brillouin, 10 rue Ada Byron
69622 Villeurbanne CEDEX, France

Education

- Institut Laue Langevin (ILL)**, Grenoble, France
Laboratoire de Physique des Solides (LPS), Orsay, France
- 2012 PhD, Physics, “*Structure and dynamics of model 1D systems: carbon nano-peapods*”.
Supervised by Pascale Launois (LPS) and Stéphane Rols (ILL).
Examination panel composed of Mathieu Kociak, Pierre Levitz, Marc Monthieux, Alfonso San Miguel (main examiner), Bertrand Toudic (main examiner) and presided by Jean-Louis Sauvajol.
- Université Joseph Fourier (UJF)**, Grenoble, France
- 2009 MSc, Physics of Condensed Matter and Radiations.
“*Low frequency dynamics of a rotor-stator molecular crystal: Fullerene-Cubane $C_{60}\cdot C_8H_8$* ”.
Master’s thesis performed at the ILL (Grenoble) and supervised by Stéphane Rols.
- 2008 **École Normale Supérieure de Lyon (ENSL)**, Lyon, France (status of “normalien”)
BSc (equivalent), Physics
- 2006 **Lycée Joffre**, Montpellier, France
Undergraduate studies (“*Classes Préparatoires*”), Physics and Chemistry (PCSI-PC*)

Professional Experience

- June 2015 – present **Institut Lumière Matière (ILM)**, Lyon, France
Post-Doctoral Fellow, (*Nano*)*Materials and Energy Group*
Supervised by Alfonso San Miguel.
- April 2013 to May 2015 **Massachusetts Institute of Technology (MIT)**, Cambridge, Massachusetts
Post-Doctoral Fellow, *Department of Civil and Environmental Engineering*
Supervised by Benoît Coasne and Roland Pellenq.
- Sept. 2009 to Nov. 2012 **Institut Laue Langevin (ILL)**, Grenoble, France
Graduate Student, *Time Of Flight - High Resolution Group* (TOF-HR)
Supervised by Stéphane Rols.
- Sept. 2009 to Nov. 2012 **Laboratoire de Physique des Solides (LPS)**, Orsay, France
Graduate Student, *X-ray Diffraction Group* (RIX)
Supervised by Pascale Launois.
- 2011 & 2012 **Polytech’Orsay**, Orsay, France
Teaching Assistant, supervision of group research projects.
- 2011 & 2012 **Institut Laue Langevin (ILL)**, Grenoble, France
Teaching Assistant, practicals for neutrons time-of-flight instruments at school HERCULES.
- March to June 2010 **National Institute of Advanced Industrial Science and Technology**, Tsukuba, Japan
Graduate Student, three months formation with Hiromichi Kataura, synthesis of carbon peapods.
- March to Aug. 2009 **Institut Laue Langevin (ILL)**, Grenoble, France
Master 2 Student, *Time Of Flight - High Resolution Group* (TOF-HR)
Supervised by Stéphane Rols.
- Feb. to Sept. 2008 **Lawrence Berkeley National Laboratory**, Berkeley, California
Master 1 Student, *Beamline 12.3.2, Advanced Light Source* (ALS)
Supervised by Martin Kuntz and Nobumichi Tamura.
- March to July 2007 **Université Claude Bernard**, Lyon, France
Undergraduate Student, *Laboratoire de Physique de la Matière Condensée et Nanostructures*
Supervised by Alphonso San Miguel.

Fellowships And Awards

- 2015 – 2016 Post-Doctoral fellowship of the Programme d’Avenir Lyon-Saint-Etienne (PALSE).
2015 **Prize** of the Francophone Group on Carbon Studies (GFEC).
2013 **Thesis Prize** of the French Neutron Society (SFN).
2013 – 2015 Massachusetts Institute of Technology post-doctoral fellowship.
2012 Institut Laue-Langevin directors’ award for best student presentation.
2010 ILL Vision 2020 conference – Best poster prize.
2009 – 2012 Institut Laue-Langevin graduate fellowship.
2006 – 2010 École Normale Supérieure de Lyon, status of “normalien” (4 years state fellowship earned on the basis of a national competitive examination).

Peer-Reviewed Publications

- [9] “*Realistic molecular model of kerogen’s nanostructure.*”
C. Bousige, C. Ghimbeu, C. Vix, A. Pomerantz, A. Suleimenova, G. Vaughan, G. Garbarino, M. Feyngenson, C. Wildgruber, F.-J. Ulm, R. Pellenq & B. Coasne
[Nature Materials](#) **15**, 576–582 (2016)
- [8] “*Optimized molecular reconstruction procedure combining Hybrid Reverse Monte Carlo and Molecular Dynamics.*”
C. Bousige, A. Boțan, F.-J. Ulm, R. Pellenq & B. Coasne
[Journal of Chemical Physics](#) **142**, 114112 (2015)
- [7] “*In situ X-ray diffraction observation of two-step fullerene coalescence in carbon peapods.*”
C. Bousige, S. Rols, E. Paineau, S. Rouzière, C. Mocuta, H. Kataura & P. Launois
[European Physical Letters](#) **103**, 66002 (2013)
- [6] “*From a one-dimensional crystal to a one-dimensional liquid: a comprehensive study of a textbook system, C₆₀ peapods.*”
C. Bousige, S. Rols, J. Ollivier, H. Schober, P. Fouquet, G.G. Simeoni, V. Agafonov, V. Davydov, H. Kataura & P. Launois
[Physical Review B](#) **87**, 195338 (2013)
- [5] “*Unravelling low lying phonons and vibrations of carbon nanostructures: the contribution of inelastic and quasielastic neutron scattering.*”
S. Rols, **C. Bousige**, J. Cambedouzou, P. Launois, J.-L. Sauvajol, H. Schober, V. Agafonov, V. Davydov & J. Ollivier
[European Physical Journal: Special Topic](#) **213**, 77–102 (2012)
- [4] “*Progressive melting in confined one-dimensional C₆₀ chains.*”
C. Bousige, S. Rols, E. Paineau, S. Rouzière, C. Mocuta, B. Verberck, J.P. Wright, H. Kataura & P. Launois
[Physical Review B](#) **86**, 045446 (2012)
- [3] “*Translational dynamics of one-dimensional fullerene chains encapsulated inside single-walled carbon nanotubes.*”
C. Bousige, S. Rols, H. Kataura & P. Launois
[Fullerenes, Nanotubes and Carbon Nanostructures](#) **20**, Issue 04-07, 395–400 (2012)
- [2] “*Determining the energy-dependent x-ray flux variation of a synchrotron beamline using Laue diffraction patterns.*”
C. Dejoie, M. Kunz, N. Tamura, **C. Bousige**, K. Chen, S. Teat, C. Beavers & C. Baerlocher
[Journal of Applied Crystallography](#) **44**, 177–183 (2011)
- [1] “*Lattice dynamics of a rotor-stator molecular crystal: Fullerene-cubane C₆₀·C₈H₈.*”
C. Bousige, S. Rols, J. Cambedouzou, B. Verberck, S. Pekker, É. Kováts, G. Durkó, I. Jalsovsky, É. Pellegrini & P. Launois
[Physical Review B](#) **82**, 195413 (2010) (*Editor’s suggestion*)

Invited Talks And Seminars

Invited Talks:

- Neutrons and Carbon Workshop**, ILL, Grenoble, France Janvier 2016
Structure and dynamics of model carbon systems... and other less model systems: simulations and experiments.
JDN21, French Neutron Society Annual Meeting, Seignosse, France June 2013
Structure and dynamics of a model one dimensional system: carbon nano-peapods.

Seminars:

- IMN Jean Rouxel**, Nantes, France June 2016
IPANEMA, Saclay, France June 2016
Institut Lumière Matière, Lyon, France November 2014
Laboratoire de Physique de la Matière Condensée et Nanostructures, Lyon, France July 2012
Institut Laue Langevin, Grenoble, France January 2012

Contributed Talks at Conferences

- [15] **SFEC 2016**, Francophone Society on Carbon Studies, Carqueiranne, France June 2016
Exploring the limits of strain transfer in supported graphene
[14] **GDRi Graphene & Nanotubes 2015**, Aussois, France (poster) November 2015
Graphene interaction with substrates under high pressure.
[13] **EMI 2015**, Engineering Mechanics Institute Conference, Stanford University, California June 2015
Realistic molecular model of the nanostructure of mature and immature kerogens in organic-rich shales (presented by B. Coasne).
[12] **GFEC 2015**, French Group on Carbon Studies, Les Karellis, France May 2015
Realistic molecular model of the nanostructure of mature and immature kerogens in organic-rich shales.
[10–11] **Matériaux 2014**, Montpellier, France Nov. 2014
Building realistic models of kerogen using Hybrid Reverse Monte Carlo simulations.
Studying the mechanical properties of kerogen using molecular modeling.
[9] **MMM 2014**, Multiscale Materials Modeling, Berkeley, California Oct. 2014
Building realistic models of kerogen using Hybrid Reverse Monte Carlo simulations.
[8] **Carbon 2014**, The World Conference on Carbon, Jeju Island, Korea June 2014
Building realistic models of kerogen using Hybrid Reverse Monte Carlo simulations.
[7] **GFEC 2013**, French Group on Carbon Studies, Voreppe, France May 2013
Low temperature orientational ordering in carbon nanopeapods: an inelastic neutron scattering study.
[6] **JDN20**, French Neutron Society Annual Meeting, Seignosse, France May 2012
One dimensional physics and carbon nano-peapods: from the textbook to the real world.
[5] **ECNS 2011**, European Conference on Neutron Scattering, Prague, Czech Republic July 2011
Translational dynamics of one-dimensional C_{60} chains inside carbon nanotubes.
[4] **ACN 2011**, Advanced Carbon Nanostructures, Saint Petersburg, Russia July 2011
Translational dynamics of one-dimensional C_{60} chains inside carbon nanotubes.
[3] **IWEPNM 2011**, International Winterschool on Electronic Properties of Novel Materials, Kirchberg, Austria (Poster) Feb. 2011
Translational dynamics of 1D fullerenes chains encapsulated inside single-walled carbon nanotubes.
[2] **ILL Vision 2020**, Grenoble, France (Poster) Sept. 2010
Dynamics of carbon-based molecular crystals using Time Of Flight spectrometers.
[1] **X-rays and Matter (RX 2009)**, Orsay, France Dec. 2009
Coalescence of fullerenes-inserted single walled nanotubes into double-walled nanotubes: an x-ray study.

Computer Skills

Programming and Data Analysis: C, C++, R, bash, IDL, MAPLE, LAMP (IDL-based neutron data treatment software), Materials Studio, LAMMPS and nMoldyn (molecular dynamics simulations)
Scientific Editing: L^AT_EX, R, ORIGINPRO, QTIPLOT

Interpersonal Skills

Languages: French (mother tongue), English (proficient), German (scholar)
Social activities: Elected representative of the PhD students at the ILL (2011-2012) – Elected member of the École Normale Supérieure student office (2007-2008) – Responsible for the rock climbing club at the École

Normale Supérieure (2007-2008).

Interests: Rock climbing and mountain sports in general, racket sports, swimming, sailing and other water related sports, backpack world travelling, science fiction literature, cooking and Lindy Hop.