

FRANÇOIS SOUBIRAN

Earth & Planetary Science
University of California, Berkeley
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EDUCATION

- 2009 - 2012 **Ph.D.**, *“Physics of dense plasmas: H-He mixtures in planetary interiors”*
Centre de Recherche Astrophysique de Lyon (CRAL), France,
École Normale Supérieure (ENS) de Lyon, France,
Commissariat à l'Énergie Atomique (CEA) Arpajon, France
Supervisor: Gilles Chabrier, Stéphane Mazevet, Christophe Winisdoerffer
- 2006 - 2009 **Master**, École Normale Supérieure de Lyon, France
M.Sc: Fundamental Physics, with first class honors (rank 1)
incl. Winter semester 2007 at the University of Montreal, Canada.
- 2008 **Agrégation**, Physics, highly competitive recruitment examination for French
teacher in college, rank 11
- 2005 - 2006 **Licence**, École Normale Supérieure de Lyon, France
M.Sc: Fundamental Physics, with first class honors (rank 4)

RESEARCH EXPERIENCE

- 2013 - **Postdoctoral Researcher**
University of California, Berkeley, United States
Supervisor: Burkhard Militzer
- 2012 - 2013 **Agrégé Préparateur (Assistant Lecturer)**
Centre de Recherche Astrophysique de Lyon (CRAL), France
- 2009 - 2012 **Ph.D.**, *“Physics of dense plasmas: H-He mixtures in planetary interiors”*
Centre de Recherche Astrophysique de Lyon (CRAL), France,
École Normale Supérieure (ENS) de Lyon, France,
Commissariat à l'Énergie Atomique (CEA) Arpajon, France
Supervisor: Gilles Chabrier, Stéphane Mazevet, Christophe Winisdoerffer
- 2009 **Centre de Recherche Astrophysique de Lyon (CRAL)**, France
Master project : *“Thermodynamics of dense plasmas”* (16 weeks)
Supervisor: Christophe Winisdoerffer, Gérard Massacrier
- 2007 **Observatoire Midi-Pyrénées**, Toulouse, France
Master project : *“Turbulent transport in stellar radiative zones”* (12 weeks)
Supervisor: François Lignières
- 2006 **École Normale Supérieure de Lyon**, France
Licence project : *“Degassing cascades in a shear-thinning viscoelastic fluid”* (8 weeks)
Supervisor: Valérie Vidal

TEACHING EXPERIENCE

2012 - 2013	Agrégé Préparateur (192 h/yr) (Assistant Lecturer) General undergraduate and graduate Physics École Normale Supérieure de Lyon, France
2012 - 2013	Tutorial for undergraduates (Classe Préparatoire) (~60 h/yr) Level MPSI, MP*, PC* Lycée du Parc, Lyon, France
2009 - 2012	Teaching Assistant (64 h/yr) General undergraduate and graduate Physics École Normale Supérieure de Lyon, France
2008 - 2009	Teaching Assistant (20 h) Preparation to the Agrégation examination École Normale Supérieure de Lyon, France

ACADEMIC SERVICE

Conferences	Co-convenor of two sessions of the AGU Fall Meeting 2014 Co-chair of one session of the AGU Fall Meeting 2014
Committee Member	Co-organizer of the CIPS seminar, Berkeley (2013-)
Referee	Physical Review Letters, Physical Review B, Physical Review E
Representative	PhD students representative - board of the doctoral school PHAST (2009-2012)
Memberships	AGU, SF2A

AWARDS - FELLOWSHIPS

2009	CEA doctoral fellowship for 3 year.
2005	Normalien – Acceptance as a full-time student of the ENS Lyon (France) with a 4-year scholarship.
2003	Excellence award program – Merit-based scholarship
2003	Fellowship of the Lycée Jeanne d'Arc Alumni.

REFEREED PUBLICATIONS

- 2016 ***“The properties of heavy elements in giant planet envelopes”***
F. Soubiran, B. Militzer
Astrophys. J., in press.
- 2015 ***“First-Principles Equation of State and Electronic Properties of Warm Dense Oxygen”***
K. Driver, F. Soubiran, S. Zhang, B. Militzer
J. Chem. Phys., Vol **143**, 164507, 2015.
- 2015 ***“Miscibility calculations for water and hydrogen in giant planets”***
F. Soubiran, B. Militzer
Astrophys. J., Vol **806**, 228, 2015.
- 2015 ***“Hydrogen-Water Mixtures in Giant Planet Interiors Studied with Ab Initio Simulations”***
F. Soubiran, B. Militzer
Proceedings HEDLA 2014, HEDP, **17**, 157, 2015.
- 2013 ***“Optical signature of hydrogen-helium demixing at extreme density-temperature conditions”***
F. Soubiran, S. Mazevet, C. Winisdoerffer, G. Chabrier
Phys. Rev. B, Vol **87**, 165114, 2013
- 2012 ***“Helium gap in the warm dense matter regime and experimental reflectivity measurements”***
F. Soubiran, S. Mazevet, C. Winisdoerffer, G. Chabrier
Phys. Rev. B, Vol **86**, 115102, 2012
- 2011 ***“Degassing cascades in a shear-thinning viscoelastic fluid”***
V. Vidal, F. Soubiran, T. Divoux, J.-C. Géminard
Phys. Rev. E, Vol **84**, 066302, 2011

ORAL CONTRIBUTIONS

- 2016 ***“Properties of heavy-element-enriched hydrogen-helium mixtures in giant planets”***
High Energy Density Laboratory Astrophysics Conference (HEDLA),
SLAC, Menlo Park, CA, United States, May 16 – 20, 2016
- 2016 ***“Importance of Heavy Elements in Giant Planet Interiors”***
CIPS Seminar, **Invited**,
Berkeley, CA, United States, Feb. 24, 2016
- 2016 ***“Ab initio study of fluid mixtures properties in giant planet interiors”***
LULI Seminar, **Invited**,
Palaiseau, France, Jan. 7, 2016
- 2016 ***“Ab initio study of fluid mixtures properties in giant planet interiors”***
LGLTPE Seminar, **Invited**,
Lyon, France, Jan. 4, 2016
- 2015 ***“Importance of heavy elements in giant planet interiors”***
AGU Fall Meeting,
San Francisco, CA, United States, Dec. 14 - 18, 2015
- 2015 ***“Hydrogen-water mixtures in giant planet interiors studied with ab initio simulations”***
From Super-Earths to Brown Dwarfs: who's who? (**31st IAP Colloquium**),
Paris, France, June 28 – July 3, 2015

ORAL CONTRIBUTIONS (continued)

- 2015 ***“From atoms to planets: What do astrophysicists learn from ab initio simulations”***
 UCSC Planetary lunch, **Invited**,
 Santa Cruz, CA, United States, Apr 28, 2015
- 2015 ***“From atoms to planets: What do astrophysicists learn from ab initio simulations”***
 LUTH Seminar, **Invited**,
 Meudon, France, Jan. 8, 2015
- 2014 ***“From atoms to planets: What do astrophysicists learn from ab initio simulations”***
 FOST – IPAG Seminar,
 Grenoble, France, May 23, 2014
- 2014 ***“Hydrogen-Water mixtures in giant planet interiors studied with ab initio simulations”***
 High Energy Density Laboratory Astrophysics Conference (**HEDLA**),
 Bordeaux, France, May 11 – 16, 2014
- 2013 ***“Thermodynamical and transport properties of dense H-He plasma mixtures in planetary interiors”***
 Bay Area Exoplanet Science Meeting, SETI Institute,
 Mountain View, CA, United States, Sep. 13, 2013
- 2013 ***“H-He plasma mixtures in planetary interiors”***
 CIPS Seminar, **Invited**,
 Berkeley, CA, United States, Sep. 11, 2013
- 2013 ***“Thermodynamical and transport properties of dense H-He plasma mixtures in planetary interiors”***
 Warm Dense Matter Conference (**WDM**), **Invited**,
 Saint-Malo, France, Jun. 23 – 26, 2013
- 2013 ***“The physics of H-He dense plasma mixtures in planetary interiors”***
 LUTH Seminar, **Invited**,
 Meudon, France, Apr. 11, 2013
- 2012 ***“Physics of dense plasmas: H-He mixtures in planetary interiors”***
 CEA Seminar, **Invited**,
 Arpajon, France, Nov. 26, 2012
- 2012 ***“Thermodynamical and transport properties of dense H-He mixtures”***
 High Energy Density Laboratory Astrophysics Conference (**HEDLA**)
 Tallahassee, FL, United States, Apr. 28 – May 4, 2012

POSTERS

- 2015 **KITP Conference - Physics of Exoplanets: From Earth-sized to Mini-Neptunes**
Santa Barbara, United States, Feb. 23 – 27, 2015
- 2014 **American Geophysics Union (AGU) Fall Meeting**
San Francisco, United States, Dec. 15 – 19, 2014
- 2014 **High Energy Density Laboratory Astrophysics (HEDLA),**
Bordeaux, France, May 11 – 16, 2014
- 2014 **NIF/JLF User Group Meeting,**
Livermore, CA, United States, Feb. 9 – 12, 2014
- 2013 **American Geophysics Union (AGU) Fall Meeting**
San Francisco, United States, Dec. 9 – 13, 2013
- 2011 **European Conference on Laboratory Astrophysics (ECLA),**
Paris, France, Sep. 26 – 30, 2011
- 2011 **Strongly Coupled Coulomb Systems (SCCS),**
Budapest, Hongrie, Jul. 24 – 29, 2011
- 2011 **Warm Dense Matter workshop (WDM),**
Pacific Grove, CA, United States, Jun. 5 – 8, 2011
- 2011 **3rd Japan-France Workshop and School on High Density Energy Science,**
Les Houches, France, Jan. 9 – 14, 2011