

Olivier Mousis, PhD

Personal Details:

Date of birth: 11.28.1973
Place of birth: Rennes, France
Marital status: Married, 2 daughters (9 and 5 yr old)
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Institution:

Laboratoire d'Astrophysique de Marseille (CNES-CNRS-INSU, Aix-Marseille Université)

Education:

HDR Astrophysics, Université de Franche-Comté (2006), Ph.D. Astrophysics, University of Paris 7 (2001), M.S. Astrophysics, University of Paris 7 (1998), B.S. Physics, University of Rennes (1997)

Career:

Sept. 2017 – present	Full Professor, LAM, AMU
Feb. 2015 – Aug. 2017	Senior Excellence Chair granted by AMU
Feb. 2015 – present	Co-head of the "Planetary Systems Group" at LAM (23 researchers, postdocs, and students)
Jan. 2011 – Jan 2015	Full Professor, Institut UTINAM, UFC, France
April 2014 – July 2014	Visiting Scientist at Cornell University, USA
Sept. 2009 – Aug. 2014	Junior Member of Institut Universitaire de France
Sept 2009 – May 2009	Visiting Scientist at the Univ. of Arizona, USA
Jan. 2005 – Dec. 2010	Associate Prof. (Maître de Conférences), UFC

Honors and awards:

Dec. 2015: *Installation grant* by the city of Marseille (a few researchers/year)

July 2014: *Endowed Senior Excellence Chair* attributed by Aix Marseille Université

February 2011: *Beatrice M. Tinsley Research Award*. This award is designed to recognize active scientists in the field of astronomy or astrophysics. The awardee is expected to visit the Dep. of Astronomy at Univ. of Texas, Austin, to interact with the scientists of the field

October 2009: Appointment as *Junior Member* of the Institut Universitaire de France

July 2008: "*Young Teacher-Researcher 2008*" Prize of the French Society of Astronomy and Astrophysics

2006 – now: *Scientific Excellence Award* attributed by the Univ. of Franche-Comté and Aix-Marseille Univ.

Sept. 2003: Award of a *European Space Agency International Fellow* held at Bern Univ. (Physikalisches Institute)

Sept. 2003: Award of a *NASA NPP postdoc* to be held at CalTech/Jet Prop. Lab (offer declined)

Publications and scientific production:

My research focuses on themes related to the origin of the solar system and, more generally, that of planetary systems. From thermodynamic, chemical, and hydrodynamic modeling, I try to bring constraints on the origin and the evolution of planets and small bodies by using data derived from ground-based facilities or space missions. So far, I have published 175 papers in peer-reviewed international journals and 6 chapters in peer-reviewed books, including 47 papers as first author, 37 papers as second author (including 16 papers as second author behind a PhD student). I contributed to a dozen of papers published in Nature and Science journals. I am also first author or co-author of more than 400 oral and written contributions to national and international conferences, as well as 26 IAUC, CBET, MPEC, and ATEL circulars.

Science topics investigated in the last fifteen years: Origin and evolution of the ice moons - Evolution of surface/atmosphere interfaces - Small bodies of the solar system - Formation of giant planets - Interiors of terrestrial planets and super-earths.

Scientific responsibilities in space missions in preparation, in progress, or planned

Activities as a Principal Investigator in Space Projects:

- **PI of the Hera Saturn entry probe proposal.** A white paper was submitted to ESA in May 2013 (http://hera.lam.fr/wp-content/uploads/2016/06/Hera_white_paper.pdf). The year 2014 was dedicated to the preparation of a proposal submitted to the ESA M4 call in June 2015. This proposal, co-led with David Atkinson (CalTech/JPL), included the participation of 50 researchers from Europe and USA. This proposal was resubmitted to the ESA M5 call in October 2016, where it successfully passed the ESA's technical and financial evaluation. Hera has finally been ranked within the top 5 of the 30 submitted proposals and was not selected because of the lack of spacecraft carrier on NASA's side. ESA and NASA are now working together for a joint mission toward the Ice Giants. NASA strongly supported our proposal and would like to see it involved as an ESA contribution to the flagship mission to the icy giants. **For this reason, I have been appointed by ESA to be one of the four European scientists members of its Ice Giants Science Study Team.** The Hera proposal is available at: http://hera.lam.fr/wp-content/uploads/2016/10/Hera_M5.pdf
- Recently I started a study activity of **two instruments that could be part of the instrument payload of an entry probe mission.**

Activities as a Co-Investigator in Space Projects:

- Since 2014: Co-I of **MASPEX** mass spect. (PI J.H. Waite) selected to fly on the NASA Europa Clipper mission
- Since 2014: team member of the **PEP** mass spect. (PI P. Wurz) selected to fly on the ESA JUICE mission.

- Since 2014: Co-I of the **SWI** submillimeter radar (PI P. Hartogh) selected to fly on the ESA JUICE mission.
- 2012-2013: Co-I of 3 NASA and ESA instruments teams that were competing to be part of the payload selected for JUICE mission.
- Since 2012: Co-I of the **PTOLEMY** instrument (PI Ian Wright) that was aboard the 67P/C-G PHILAE lander.
- Since 2012: Member of the **Rosetta/ROSINA** science team (PI Kathrin Altwegg).
- 2009: Co-I of the **Uranus Pathfinder** proposal (PI Chris Arridge) submitted to the ESA M3 call.
- 2009-2011: member of the **PRIME** (Primitive Material Explorer) science team (PI A. Cochran) submitted to NASA NF3 whose goal was to explore comet Wirtanen around 2022. I was the only European in the team.
- 2005-2006: co-chair with Angioletta Coradini (Institute of Space Astrophysics in Roma) of the ESA working group "Origins of the Jovian System" as part of the preparation of the space mission **LAPLACE** (now **JUICE**) to Jupiter.

Doctoral and scientific supervision:

So far, I have mentored or co-mentored 8 PhD students and fully mentored 11 students at the Master of Science level (Master 2 level in French Universities). List of mentored PhD students: **B. Brugger** (thesis defended in sept. 2018 - main adviser O. Mousis, co-mentored with M. Deleuil), **T. Ronnet** (thesis defended in oct. 2018 - main adviser O. Mousis, co-mentored with P. Vernazza), **A. Bouquet** (thesis defended in feb. 2018 - main adviser J.H. Waite, co-mentored with O. Mousis), **M. Ali-Dib** (thesis defended in sept. 2015 - main adviser O. Mousis, co-mentored with J.-M. Petit), **G. S. Pekmezci** (thesis defended in jan. 2015 - main adviser J.I. Lunine, co-mentored with O. Mousis), **A. Moudens** (thesis defended in dec. 2010 - main adviser R. Georges, co-mentored with O. Mousis), **C. Thomas** (thesis defended in dec. 2010 - main adviser S. Picaud, co-mentored with O. Mousis), **U. Marboeuf** (thesis defended in dec. 2010 - main adviser J.-M. Petit, co-mentored with O. Mousis).

Participation in 12 committees of PhD defenses and 3 committees of Habilitation (HDR) defenses:

Scientific responsibilities:

- One of the four European scientists proposed to be members of the ESA study team of the future ice giants NASA-ESA mission.
- Coordinator of a proposal submitted to AMU whose aim is to create an **institute of Astrobiology** in Marseille.
- 2016 to present: coordinator of the Planetary Sciences Pole of Aix-Marseille University.
- Since 2016: co-manager with M. Deleuil of the Planetary Systems Group at LAM (23 researchers, including 12 permanent).
- Since the beginning of 2016: member of the Scientific Council of the LAM.
- 2008-2012: co-leader with Vincent Boudon (Interdisciplinary Laboratory Carnot of Burgundy) of the Planetary Sciences Center Bourgogne Franche-Comté.

Research contracts over the last 5 years: Senior AMU Chair of Excellence: 475 keuros obtained over the 2014-2017 period; Several CNES funding for space projects /experiments in progress, including: Co-Investigator of the MASPEX instrument aboard the NASA/Europa-Clipper (20 keuros in 2017 and 2018); Co-Investigator of PTOLEMY and ROSINA instruments flying aboard ROSETTA (25 keuros/year in 2013, 2014, 2015, 2016 and 2017). Principal Investigator of Hera (15 keuros/year)

Service: Member of the CNES Solar System Working Group (2014 to present); Substitute member of the CNU, in Section 34 (Astrophysics and Astronomy) (2012-2015); Elected Member to Section 17 CNRS (2008 – 2012); Reviewer for numerous national/international projects: ANR, DIM-ACAV, NASA proposals, AERES evaluation committees, etc; Several times a year (4 to 5 times); I write expert reports on scientific publications submitted to international journals (Nature, Science, Icarus, PSS, JGR, MNRAS, SSRv, ApJ, PNAS, etc).

Editorial activities: Editor with K.E. Mandt and D. Bockelée-Morvan of issue 197 (2015) of the journal *Space Science Reviews* dedicated to the state of knowledge about comets before the arrival of the Rosetta spacecraft at 67P/Churyumov-Gerasimenko.

Organization of conferences:

- Organizer of the international workshop on in situ exploration of the ice giants to be held in Marseille on 25-27 Feb 2019. Details on: <https://icegiants2018.sciencesconf.org>
- Co-organizer (with Kathleen Mandt - SWRI) of the international workshop "Comets as Tracers Solar System Training and Evolution" from 1 to 3 April 2014. A special issue of Space Science Reviews has been published and includes a dozen journal papers from the conference. Details on: <http://icw.space.swri.edu/index.htm>
- Organizer of the "Clathrates in natural environments: thermodynamic studies and methods of analysis" workshop on 7-8 January 2010 at the Observatoire de Besançon
- Co-organizer (with Robert Georges, University of Rennes) of the "Clathrates in natural environments" workshop on March 13-14, 2008 at the Institute of Physics of Rennes

Invitations by foreign universities or organizations (* designates stays > one month): Jet Propulsion Laboratory, CalTech (2006, 2009, 2011, 2016, 2017, 2018), Cornell University (2014*), Open University (2007, 2012, 2015), Southwest Research Institute (2011, 2012*), Canadian Astronomy Data Center (2006, 2008, 2010, 2011), Department of Astrophysics at Princeton University (2011), Department of Astronomy at the University of Texas (Austin) (2011), Johns Hopkins Applied Physics Laboratory (2010, 2018), ETH Zurich (2009), Lunar and Planetary Laboratory Tucson (2007*, 2008*), International Space Science Institute, Berne (2007*), European Southern Observatory, (Santiago, Chile) (2007*).