

Dr. Alice Le Gall

Associate Professor
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EDUCATION

- 2007** Ph.D. in Planetary Science and RADAR Remote Sensing, University of Paris VI, affiliated to LATMOS (Laboratoire Atmosphères, Milieux, Observations Spatiales), France - Advisor : V. Ciarletti & J.J. Berthelier
- 2004** M.Sc. in Astronomy and Astrophysics, University of Paris VII, France
- 2003** M.Eng. in Electrical Engineering, Major in: Radiocommunications Engineering, SUPELEC (Ecole Supérieure d'Electricité), Rennes, France

PROFESSIONAL POSITIONS

- Since Sept. 2011** Associate Professor, University of Versailles-Saint Quentin (UVSQ), France
Scientist at LATMOS, France
- 2008 - 2011** NASA Postdoctoral Research Fellow (administrated by Oak Ridge Associated Universities) at Jet Propulsion Laboratory (JPL), Advisor: Michael A. Janssen
- 2004 - 2007** Teaching Assistant, University of Paris VI, France

AWARDS & GRANTS

- 2015** DIM-ACAV "Equipements petits et moyens" (29.1k€) and CNES (Proposition Scientifique de Recherche Scientifique) (20k€) grants for the PAP (Permittivité d'Analogues Planétaires) project, PI
- 2013-2017** ANR (Agence Nationale de la Recherche) « ExoDunes », Characterization of the EXtra-terrestrial environments of Mars and Titan by the Observation and simulation of DUNE field, Co-Investigator, PI: Sébastien Rodriguez (AIM-CEA)
- 2011-2016** Chair of Excellence CNES (Centre National d'Etudes Spatiales)/UVSQ
- 2008-2011** NASA Postdoctoral Fellowship
- 2009** Gabrielle Sand, Dina, Frédéric Fortuny Prize of the French Academy of Sciences
- Fall 2006** Grant from the Universities Space Research Association (USRA), Visiting Graduate Student at the Lunar and Planetary Institute (Houston, USA)
- 2004-2007** Fellowship from the French Ministry of Research

TEACHING EXPERIENCE

- Lectured courses:** Radiative transfer (10h/years since 2011) in M.Sc. in Planetary Science (M2)
- Supervising exercices:** Physics to students in medical studies (24h/year since 2011) - Optic and Electricity (L1) (27h/year since 2014- Electromagnetism (L2) (27h/year, 2012, 2013)
- On-line courses:** Courses on Planetary Surfaces for the website SEPS (Science pour les Exoplanètes et les Systèmes Planétaires) (L3)
<https://dev-lesia.obspm.fr/webjaxe/sites/site-sesp/index.html>
- Qualification:** in sections 34 and 63 from the Conseil National des Universités (CNU), France, 2008-2012
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MENTORING EXPERIENCE

Ph.D. Co-Advisor: Ph.D. in Planetary Science: Yann Hervé (2015+), Anthony Lethuillier (DIM-ACAV grant, 2013+)

Masters Degree Co-Advisor or Advisor: M.Sc. in Planetary Sciences/Environmental Sciences/Remote Sensing: Gaëlle Veyssière (M2, 2015), Yann Hervé (M2, 2015), Gaëlle Veyssière (M1, 2014), Aurélien Stolzenbach (M2, 2012), Arnaud Amadjike (M2, 2006), Filippo Bucci (M2, 2006), Evelyne Rasamoelina (M1, 2005)

Undergraduate Co-Advisor: Etienne Vanpeene (MPSI, 2015), Saptarshi Chaudhuri (JPL Summer Intern, 2010)

NASA/ESA MISSION PARTICIPATION AND RESEARCH PROPOSALS

Science teams: Co-I on the Permittivity Probe (PP)/SESAME experience on board the Philae Lander of the ESA ROSETTA mission (since 2011, 75k€/year during 4 years from CNES), Associate Member of the Cassini RADAR Team (since 2010), Co-I on the Ground Penetrating Radar WISDOM (Water Ice and Subsurface Deposit Observations on Mars) selected for the ESA 2018 ExoMars Mission (since 2007).

Instrument proposals: Co-I on the Ground Penetrating Radar SubEx proposed for Mars 2020 Rover, PI: Valérie Ciarletti, submitted in Jan 2014, not selected - Co-I on LIME (Low Irradiance Monitor of Energy) for the ESA JUICE mission, PI: Osgür Karatekin, Oct. 2012, not selected - Co-I on the Ground Penetrating Radar EISS proposed for ESA ExoMars, PI: J.J. Berthelie, now descope.

Mission proposal: Col on EnVision (mission to Venus) M5 ESA proposal, lead of VenSAR radiometry experiment, PI: Richard Ghail - Science Team Member on the RAVEN (Radar for VENUS) Discovery proposal, PI: Buck Sharpton, not selected - Associate on the ESA White Papers for the definition of the L2 and L3 missions, "The Exploration of Titan from an Orbiter and Lake-Probe", PI: Giuseppe Mitri, May 2013 - Associate on the ESA White Paper "Joint exploration of Titan and Enceladus", PI: Gabriel Tobie and Nick Teanby, 2012 - Collaborator on the NASA Innovative Advanced Concepts "Amphibian Rover for Titan's Exploration", PI: Mathieu Choukroun, submitted in April 2012.

Mission design: NASA/JPL Team-X mission design workshop for a Ganymede Orbiter concept study, Jet Propulsion Laboratory (August 2010).

Research proposals: ANR (Agence Nationale de la Recherche) « Icy Hazy Worlds », Hydrocarbon cycles on two icy hazy worlds: Titan and Pluto, Co-Investigator, PI: Sandrine Vinatier (LESIA), submitted in 2015 - DIM-ACAV "Equipements petits et moyens" proposal for the PAP (Permittivité d'Analogues Planétaires) project, PI, selected in 2015 (29.1k€) - Scientific Research proposal at CNES for the PAP project, PI, selected in 2015 (20k€) - ANR (Agence Nationale de la Recherche) « ExoDunes », Characterization of the EXtra-terrestrial environments of Mars and Titan by the Observation and simulation of DUNE field, Co-Investigator, PI: Sébastien Rodriguez (AIM-CEA), selected in 2013 - Several NASA CDAP (Cassini Data Analysis Program), OPR (Outer Planet Research) and MFRP (Mars Fundamental Research Program) proposals as PI, Col or Collaborator.

COMMUNITY CONVENER AND REFEREE EXPERIENCE

Session organizer: European Planetary Science Conference, "Titan: Surface and Interior" Session, 2015 - "Seasonal effects in the Solar System" Session, 2014, 2013, 2012.

Session chair: Third International Planetary Dunes Workshop, "Remote Sensing and Image Analysis of Planetary Dunes" Session, June 2012 - Division for Planetary Science Conference, Titan session, 2009.

Peer Reviewer: Various papers for the Journal of Geophysical Research, Icarus, Planetary & Space Science and Earth and Planetary Science Letters, Encyclopedia of Planetary

Landforms - Springer.

Panel Reviewer: External reviewer for the NASA Outer Planets Research program, Jan. 2014, Feb. 2013.

Referee of academic positions : External examiner for a position of Associate Professor at Aix-Marseille Université, LAM (Laboratoire d'Astrophysique de Marseille) (MCF n°186), 2014

Referee of academic degrees: Examiner of the Ph.D. of Axel Lefèvre, University of Nantes, France, Nov. 2014

INVITED TALKS, SEMINARS & OUTREACH ACTIVITIES

Invited talks at international conferences: AGU Fall Meeting, San Francisco, 2 invited talks in the Sessions « Titan-Understanding Saturn's Mysterious Moon » and « Judging a Book by Its Cover: From Surface Observations to Interiors of Small Bodies, Ice Satellites, and Planets », Dec. 2015 - AGU Fall Meeting, Session Titan, San Francisco, Dec. 2010.

Invited seminars Laboratoire de Planétologie et Géologie de Nantes (LPGN), France, May 2012 - LATMOS, France, May 2011 - « Théminaire » of Observatoire de Paris-Meudon, France, Nov. 2009 - Lunar and Planetary Institute, Houston, July 2009 - Caltech Planetary Science Seminar, Pasadena, June 2009.

Press-release of first-author papers : ESA/NASA Joint press release « Cassini's radar observes Titan's tropical dune fields », Jan. 2012 - NASA press-release « Rock and Roll: Titan's Gem Tumbler », Nov. 2010.

E/PO: Participation to the partnership between LATMOS and Ecole Estienne (school of art and graphic design), 2015 - Organization of a seminar on Rosetta at IPSL (Institut Pierre et Simon Laplace) for the first anniversary of Philae landing on comet 67P/C-G, interview with TVFIL 78, Nov. 2015 - Vidéo for the UVSQ website « Questions pour un chercheur » (<http://www.uvsq.fr/questions-pour-un-chercheur-alice-le-gall>), 2015 - Contribution to the French DIM-ACAV web-site and to a scientific event in the parisian subway « L'astronomie se la raconte » (<http://www.lastronomieselaraconte.fr/>), 2014 - Participation to the CNRS event « Un instrument, un chercheur » (<http://www.insu.cnrs.fr/fr/rosetta>) for the landing of Philae/ROSETTA on comet 67P/Churyumov Gerasimenko. Involvement in the exhibition "Mars en Mars" (IPSL), 2007 - Organization in the Palais de la Découverte (a French great museum dedicated to Science) of a workshop on water, 2006 - Various Astrophysics/Planetary Science public lectures, since 2006.

ADDITIONAL INFORMATION

Training courses : Media Training, DR5, Meudon, France, Nov. 2014 - NASA Planetary Science Summer School, JLP, Pasadena, USA, July 2010 - Exobiology Summer School, Propriano, France, Sept. 2005

Organizational duties: Member of the board of the « Pole Système Solaire of IPSL », since 2015

PEER-REVIEWED PUBLICATIONS

Publications

27. Janssen, M.A., A. Le Gall, R.M. Lopes, R.D. Lorenz, M.J. Malaska, A.G. Hayes, C.D. Neish, A. Solomonidou, K.L. Mitchell, J. Radebaugh, S.J. Keihm, M. Choukroun, C. Leyrat, P.J. Encrenaz, and M. Mastrogiuseppe (2015), Titan's Surface at 2.18-cm Wavelength Imaged by the Cassini RADAR Radiometer: Results and Interpretations through the First Ten Years of Observation. *Icarus*, 2015, in press, doi: 10.1016/j.icarus.2015.09.027.

26. Bonnefoy L. E., Hayes A. G., Hayne P. O., Malaska M. J., Le Gall A., Solomonidou A.,

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- Lucas (2015), Compositional and spatial variations in Titan dune and interdune regions from Cassini VIMS and RADAR, *Icarus*, doi: 10.1016/j.icarus.2015.09.014.
25. Lorenz R. D., A. Le Gall, M.A. Janssen (2015), Detecting Volcanism on Titan and Venus with Microwave Radiometry (2015), *Icarus*
 24. Ciarletti, V., A. Le Gall, Ch. Corbel, F. Dolon, R. Ney, J.J. Berthelier (2015), Experimental validation in the West Egyptian desert of a bi-static Ground Penetrating Radar designed for deep sub-surface planetary exploration, *Planetary and Space Science* 117, 177-183.
 23. Neish C.D., J.W. Barnes, C. Sotin, S. MacKenzie, J.M. Soderblom, S. Le Mouélic, R.L. Kirk, B.W. Stiles, M.J. Malaska, A. Le Gall, R.H. Brown, K.H. Baines, B. Buratti, R.N. Clark, P.D. Nicholson (2015), Spectral properties of Titan's impact craters imply chemical weathering of its surface, *Geophysical Research Letters*, 42 (10), 3746-3754.
 22. Biancheri-Astier, M., V. Ciarletti, A. Reineix, A. Le Gall, Optimization of the antennas of the EISS radar designed to perform deep Martian sub-surface sounding (2015), *IEEE Transactions on Geoscience and Remote Sensing*, Institute of Electrical and Electronics Engineers (IEEE), 53 (8), 4627-4637.
 21. Le Gall, A., C. Leyrat, M.A Janssen, S. Keihm, L.C Wye, R. West, R.D Lorenz, F. Tosi (2014), Iapetus' near surface thermal emission modeled and constrained using Cassini RADAR Radiometer microwave observations, *Icarus* 241, 221–238.
 20. Hofgartner, J., Hayes, A., Lunine, J., Zebker, H., Stiles, B., Sotin, C., Barnes, J. W., Turtle, E., Baines, K., Brown, R., Buratti, B., Clark, R., Encrenaz, P., Kirk, R., Le Gall, A., Lopes, R., Lorenz, R., Malaska, M., Mitchell, K., Nicholson, P., Paillou, Ph., Radebaugh, J., Wall, S. and Wood, C., The discovery of transient features in a Titan sea (2014), *Nature Geoscience* 7, 493-496.
 19. Paillou, Ph., J. Radebaugh, R.D. Lorenz, A. Le Gall, T. Farr (2014), Modeling the SAR Backscatter of Linear Dunes on Earth and Titan, *Icarus* 230, 208-214 doi: 10.1016/j.icarus.2013.04.017.
 18. Zebker H., A.H. Hayes, M. Janssen, A. Le Gall, R.D. Lorenz, L.C. Wye, Surface of Ligeia Mare, Titan, from Cassini altimeter and radiometer analysis (2014), *Geophysical Research Letters*, 41 (2), 308-313, doi: 10.1002/2013GL058877.
 17. Rodriguez, S., A. Garcia, A. Lucas, T. Appéré, A. Le Gall, E. Reffet, L. Le Corre, S. Le Mouélic, T. Cornet, S. Courrech du Pont, C. Narteau, O. Bourgeois, J. Radebaugh, K. Arnold, J.W. Barnes, C. Sotin, R.H. Brown, R.D. Lorenz, E.P. Turtle, Global mapping and characterization of Titan's dune fields with Cassini: correlation between RADAR and VIMS observations (2014), *Icarus* 230, 168-179, doi: 10.1016/j.icarus.2013.11.017.
 16. Le Gall, A., M.A. Janssen, R.L. Kirk, R.D. Lorenz, Modeling microwave backscatter and thermal emission from fields of linear dunes: Application to Titan (2014), *Icarus* 230, 198-207, doi: 10.1016/j.icarus.2013.06.009.
 15. Fenton, L.K., R.K. Hayward, B.H.N. Horgan, D.M. Rubin, T.N. Titus, M.A. Bishop, D.M. Burr, M. Chojnacki, C.L. Dinwiddie, L. Kerber, A. Le Gall, T.I. Michaels, L.D.V. Neakrase, C.E. Newman, D. Tirsch, H. Yizhaq, J.R. Zimbelman (2013), Summary of the Third International Planetary Dunes Workshop: Remote Sensing and Image Analysis of Planetary Dunes, Flagstaff, Arizona, USA, June 12-15, 2012, *Aeolian Research* 8, 29-38.
 14. Lopes, R., R. Kirk, K. Mitchell, A. Le Gall, J. Barnes, A. Hayes, J. Kargel, L. Wye, J. Radebaugh, E.R. Stofan, M.A. Janssen, C. Neish, S. Wall, C. Wood, J. Lunine, M. Malaska. (2013), Cryovolcanism on Titan: New results from Cassini RADAR and VIMS, *J. Geophys. Res.:Planets*, vol. 118, 1-20, doi:10.1029/2012JE004239.
 13. Le Gall, A., A.G. Hayes, R. Ewing, M.A. Janssen, J. Radebaugh, C. Savage, P. Encrenaz and the Cassini Radar Team (2012), Latitudinal and altitudinal controls of Titan's dune field morphometry, *Icarus* 217, 231-242.
 12. Le Gall, A., M.A Janssen, L.C. Wye, A.G. Hayes, J. Radebaugh, C. Savage, H. Zebker, R.D. Lorenz, J.I. Lunine, R.L. Kirk, R.M.C. Lopes, S. Wall, P. Callahan, E.R. Stofan, T. Farr and the Cassini Radar Team (2011), SAR, radiometry, scatterometry and altimetry observations of Titan's dune fields, *Icarus* 213, 608-624.

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11. Jones, B., Vogt, M.F., M. Chaffin, M. Choukroun, N. Ehsan, L. Gibbobs, K. Lynch, K. Singer, D. Blackburn, G. DiBraccio, D. Gleeson, **A. Le Gall**, T. MacEnulty, E. Rampe, C. Schrader, L. Seward, I. Smith, C. Tsang, P. Williamson, J. Castillo, C. Budney (2011), Concept for a New Frontiers Mission to Ganymede: A Planetary Science Summer School Study, IEEE Aerospace, paper #1783.
 10. Janssen, M.A., **A. Le Gall** and L.C. Wye (2011), Anomalous radar backscatter from Titan's surface? *Icarus* 212, Issue 1, 321-328.
 9. Lorenz, R.D., E.P. Turtle, B. Stiles, **A. Le Gall**, A. Hayes, O. Aharonson, C.A. Wood, E. Stofan (2011), Hypsometry of Titan, *Icarus* 211, 699-706, doi:10.1016/j.icarus.2010.10.002
 8. Radebaugh, J., R.D. Lorenz, S.D. Wall, R.L. Kirk, C.A. Wood, J.I. Lunine, E.R. Stofan, R. M. C. Lopes, P. Valora, T.G. Farr, A.G. Hayes, B. Stiles, G. Mitri, H. Zebker, M.A. Janssen, L.C. Wye, **A. Le Gall**, K.L. Mitchell and the Cassini Radar Team (2011), Regional geomorphology and history of Titan's Xanadu province, *Icarus* 211, 672-685, doi:10.1016/j.icarus.2010.07.022.
 7. **Le Gall, A.**, M.A. Janssen, R.D. Lorenz, P. Paillou, S.D. Wall and the Cassini Radar Team (2010), Radar-bright channels on Titan, *Icarus* 207, 948-958.
 6. Wall, S., A. Hayes, C. Bristow, R. Lorenz, J. Lunine, **A. Le Gall**, M.A. Janssen, E. Stofan, L. Wye, L. Soderblom, H. Zebker, T. Farr, R. Kirk (2010), The active shoreline of Ontario Lacus, Titan: a morphological study of the lake and its surroundings, *Geophysical Research Letters*, Volume 37, L05202, doi:10.1029/2009GL041821.
 5. Lopes, R.M.C., E.R. Stofan, R. Peckyno, J. Radebaugh, K.L. Mitchell, G. Mitri, C. A. Wood, R.L. Kirk, S.D. Wall, J.I. Lunine, A. Hayes, R.D. Lorenz, T.G. Farr, L. Wye, J. Craig, R.J. Ollerenshaw, M. Janssen, **A. Le Gall**, F. Paganelli, R. West, B. Stiles, S.J. Ostro, P. Callahan, Y. Anderson, P. Valora, and the Cassini RADAR Team (2010), Distribution and interplay of geologic processes on Titan from Cassini RADAR, *Icarus* 205, 540-588, doi:10.1016/j.icarus.2009.08.010.
 4. Janssen, M.A., R.D. Lorenz, R. West, F. Paganelli, R. M. Lopes, R.L. Kirk, C. Elachi, S.D. Wall, W.T.K. Johnson, Y. Anderson, R.A. Boehmer P. Callahan, Y. Gim, G.A. Hamilton, K.D. Kelleher, L. Roth, B. Stiles, **A. Le Gall** and the Cassini Radar Team (2009), Titan's Surface at 2.2-cm Wavelength Imaged by the Cassini RADAR Radiometer: Calibration and First Results, *Icarus*, 200, 222-239, doi: 10.1016/j.icarus.2008.10.017
 3. **Le Gall, A.**, V. Ciarletti, J.J. Berthelier, A. Reineix, C. Guiffaut, R. Ney, F. Dolon, S. Bonaimé, R. Clairquin, D. Nevejans (2008), An imaging HF GPR using stationary antennas: Experimental validation over the Antarctic ice sheet, *IEEE Transactions on Geoscience and Remote Sensing*, Volume 46, Issue 12, 3975-3986, doi: 10.1109/TGRS.2008.2000718.
 2. **Le Gall, A.**, A. Reineix, V. Ciarletti, J. J Berthelier, R. Ney, F. Dolon, and C. Corbel (2006), An estimation of the electrical characteristics of planetary shallow subsurfaces with TAPIR antennas, *J. Geophys. Res.: Planets* 111, E06S06, doi: 10.1029/2005JE002595.
 1. Berthelier J.J., S. Bonaimé, V. Ciarletti, R. Clairquin, F. Dolon, **A. Le Gall**, D. Nevejans, R. Ney, A. Reineix (2005), Initial results of the NETLANDER imaging ground penetrating radar operated on the Antarctic ice shelf, *Geophysical Research Letters*, 32, L22305, 10.1029/2005GL024203

Book

Contribution in :

Encyclopedia of Planetary Landforms, ed. Hargitai, H., and A. Kereszturi, New York: Springer-Verlag New York Inc. 2014, ISBN 978-1461431350.

CONFERENCE ABSTRACTS/PRESENTATIONS

Numerous. Contact for details.