

# Benoît Seignovert

POSTDOC SCHOLAR · ASTROPHYSICIST · DATA SCIENTIST

Jet Propulsion Laboratory, Pasadena, CA USA

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## Employment

### Jet Propulsion Laboratory (JPL)

POST-DOCTORAL RESEARCHER

Pasadena, CA USA

Oct. 2018 - Present

- Mission: Characterization of Titan's clouds and haze structure to model transit spectra of exoplanets.

### Laboratory of Planetology and Geodynamics (LPG)

RESEARCH ENGINEER / POST-DOCTORAL RESEARCHER

Nantes, France

Jan. - Sept. 2018

- Mission: Design of the [Cassini VIMS Data Portal](#), a web interface to get the calibrated Cassini-VIMS data.
- Employer: CNRS - Délégation Bretagne et Pays de Loire

### Group of Molecular and Atmospheric Spectroscopy (GMSA)

RESEARCH ENGINEER

Reims, France

Oct. - Dec. 2017

- Mission: Development of analysis tools for the Cassini-ISS instrument.
- Employer: CNRS - Délégation Centre Est

## Education

### University of Reims Champagne-Ardenne

DOCTOR OF PHILOSOPHY (ASTRONOMY & ASTROPHYSICS)

Reims, France

2014 - 2017

- Thesis title: Analysis of Titan's Detached Haze Layer with Cassini-ISS instrument
- Supervisors: Prof Pascal RANNOU and Dr Panayotis LAVAS

### École Normale Supérieure de Lyon

MASTER DEGREE IN EARTH AND PLANETARY SCIENCE (WITH HONOURS)

Lyon, France

2011 - 2014

## Research Internships

### Cassini high resolution navigation with star catalogues

SUPERVISOR: ROBERT A. WEST

JPL, Pasadena, USA

Mar. - Apr. 2017

- Full calibration and deconvolution of ISS data
- Star navigation with the Tycho & GAIA catalogues

### Modeling radar response of Linear Dunes and Mega-Yardangs on Earth and Titan

SUPERVISOR: PHILIPPE PAILLOU

LAB, Bordeaux, France

Jan. - Jul. 2014

- Cassini and TerraSAR-X radar image analysis
- SRTM and GDEM data processing
- Radar backscattering modeling

### Cassini VIMS image processing on Titan

SUPERVISOR: CHRISTOPHE SOTIN

JPL, Pasadena, USA

May - Aug. 2013

- Hyperspectral infrared image processing
- Image navigation and mapping
- Gravitational fields analysis

### Analysis on stable tungsten isotopes in iron meteorites

SUPERVISORS: BRETON THOMAS & QUITTÉ GHYLAINE

ÉNSL, Lyon, France

Jan. - Apr. 2013

- Iron meteorites sampling
- Isotopic chemistry extraction
- ICP mass spectrometry

### Characterization of thermal history on primitive meteorites

SUPERVISOR: LYDIE BONAL

IPAG, Grenoble, France

Jun. - Jul. 2012

- Carbon micro-meteorites sampling
- IR and RAMAN spectroscopy
- MEB and synchrotron imaging (ESRF)

## First-author publications:

- 3 MAPPING VIMS SPECULAR REFLECTIONS ON TITAN'S SURFACE DURING THE CASSINI MISSION in prep  
*Seignovert B., Sotin C., Seignovert B., Lawrence K.J. & Heslar M.*
- 2 HAZE SEASONAL VARIATIONS OF TITAN'S UPPER ATMOSPHERE DURING THE CASSINI MISSION under review  
*Seignovert B., Rannou P., West R.A. & Vinatier S.* Astrophysical Journal
- 1 AEROSOLS OPTICAL PROPERTIES IN TITAN'S DETACHED HAZE LAYER BEFORE THE EQUINOX 2017  
*Seignovert B., Rannou P., Lavvas P., Cours T. & West R.A.* Icarus

## Second-author publications:

- 4 LANDSCAPE FORMATION ON TITAN: A 3D KARST LANDSCAPE EVOLUTION MODEL in prep.  
*Cornet T., Seignovert B., Fleurant C., Cordier D., Bourgeois O., Le Mouélic S., Rodriguez S. & Lucas A.*
- 3 TITAN'S DETACHED HAZE SEASONAL CYCLE 2018  
*West, R.A., Seignovert B., Rannou P., Dumont Ph., Turtle, P., Perry J., Roy M. & Ovanessian A.* Nature Astronomy
- 2 TRANSPARENCY OF 2  $\mu$ M WINDOW OF TITAN'S ATMOSPHERE 2017  
*Rannou P., Seignovert B., Le Mouélic S., Maltagliati L. & Sotin C.* Planetary and Space Science
- 1 RADAR SCATTERING OF LINEAR DUNES AND MEGA-YARDANGS: APPLICATION TO TITAN 2016  
*Paillou Ph., Seignovert B., Radebaugh J. & Wall S.* Icarus

## N-author publications:

- 9 COMPRESSION ALGORITHMS FOR BIG DATA IN PLANETARY AND EXOPLANETARY MISSIONS in prep.  
*Xie H., West R.A., Jewell J., Seignovert B. & Kurth W.*
- 8 TEMPERATURE AND CHEMICAL SPECIES DISTRIBUTIONS IN THE STRATOSPHERE AND MESOSPHERE OF TITAN FROM MID-NORTHERN SPRING TO EARLY SUMMER submitted  
*Vinatier, S., Mathé, C., Bézard, B., Vatan d'Ollone, J., Lebonnois, S., Dauphin, C., Seignovert, B., Sylvestre, M., Teanby, N.A., Achterberg, R.K., Flasar, F.M., Gorius, N., Jennings, D.E., Mamoutkine, A. & Guandique, E.* Astronomy & Astrophysics
- 7 INVESTIGATING LUNAR BOULDERS AT THE APOLLO 17 LANDING SITE USING PHOTOGRAMMETRY AND VIRTUAL REALITY submitted  
*Le Mouélic S., Enguehard P., Schmitt H.H., Caravaca G., Seignovert B., Mangold N., Combe J-Ph. & Civet F.* Remote sensing
- 6 SUN GLITTER ON TITAN'S KRAKEN MARE: EVIDENCE FOR TIDAL CURRENTS AND WIND WAVES under review  
*Heslar M., Barnes J., Soderblom J., Dhingra R., Seignovert B. & Sotin C.* Planetary Science Journal
- 5 PHOTOMETRICALLY-CORRECTED GLOBAL INFRARED MOSAICS OF ENCELADUS: NEW IMPLICATIONS FOR ITS SPECTRAL DIVERSITY AND GEOLOGICAL ACTIVITY under review  
*Robidel R., Le Mouélic S., Tobie G., Massé M., Seignovert B., Sotin C.* Icarus
- 4 SPICEYPY: A PYTHONIC WRAPPER FOR THE SPICE TOOLKIT 2020  
*Annex A.M., Pearson B., Seignovert B., Carcich B.T., Eichhorn H., Mapel J.A., Freiherr von Forstner J.L., McAuliffe J., del Rio J.D., Berry K.L., Aye K.M., Steffo M., de Val-Borro M., Kulumani S. & Murakami S.* JOSS
- 3 THE 3.4  $\mu$ M ABSORPTION OF THE TITAN'S STRATOSPHERE: CONTRIBUTION OF ETHANE, PROPANE, BUTANE AND COMPLEX HYDROGENATED ORGANICS 2020  
*Cours T., Cordier D., Seignovert B., Maltagliati L. & Biennier L.* Icarus
- 2 THE CASSINI VIMS ARCHIVE OF TITAN: FROM BROWSE PRODUCTS TO GLOBAL INFRARED COLOR MAPS 2019  
*Le Mouélic S., Cornet T., Rodriguez S., Sotin C., Seignovert B., Barnes J.W., Brown R.H., Baines K.H., Buratti B.J., Clark R.N., Nicholson Ph.D., Lasue J. & Soderblom J.* Icarus
- 1 MAPPING POLAR ATMOSPHERIC FEATURES ON TITAN WITH VIMS: FROM THE DISSIPATION OF THE NORTHERN CLOUD TO THE ONSET OF A SOUTHERN POLAR VORTEX 2018  
*Le Mouélic S., Rodriguez S., Robidel R., Rousseau B., Seignovert B., Sotin C., Barnes J.W., Brown R.H., Baines K.H., Buratti B.J., Clark R.N., Nicholson Ph.D., Rannou P. & Cornet T.* Icarus

## Seminars & Conference Talks

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2020	<b>Titan Through Time</b> , <i>cancelled</i>	Boulder, USA
	<b>51th Lunar and Planetary Science Conference (LPSC)</b> , <i>cancelled</i>	The Woodlands, USA
2019	<b>American Geophysical Union (AGU)</b>	San Francisco, USA
	<b>Titan Surface Meeting - Titan after Cassini Huygens</b>	Madrid, Spain
	<b>European Planetary Science Congress (EPSC)</b>	Geneva, Switzerland
	<b>50th Lunar and Planetary Science Conference (LPSC)</b>	The Woodlands, USA
	<b>NASA Astrobiology Institute workshop (NAI)</b>	Pasadena, USA
2018	<b>European Planetary Science Congress (EPSC)</b>	Berlin, Germany
	<b>Committee on Space Research (COSPAR)</b>	Pasadena, USA
	<b>European Geosciences Union (EGU)</b>	Vienna, Austria
2017	<b>European Planetary Science Congress (EPSC)</b>	Riga, Latvia
	<b>European Geosciences Union (EGU)</b>	Vienna, Austria
	<b>48th Lunar and Planetary Science Conference (LPSC)</b>	Houston, USA
2016	<b>Division for Planetary Science (DPS)</b>	Pasadena, USA
	<b>Titan Surface Meeting (TSW)</b>	Paris, France
	<b>Titan Aeronomy and Climate workshop (TAC)</b>	Reims, France
2015	<b>European Planetary Science Congress (EPSC)</b>	Nantes, France
2014	<b>Reunion des Sciences de la Terre (RST)</b>	Pau, France
	<b>Workshop on the Habitability of Icy Worlds</b>	Pasadena, USA
2013	<b>American Geophysical Union (AGU)</b>	San Francisco, USA
	<b>European Geological Union (EGU)</b>	Vienna, France
2012	<b>Annual Meteoritical Society Meeting (MetSoc)</b>	Cairns, Australia

## Training

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### Summer schools

Jun. 2015	<b>Spec-Atmos</b> , CNRS	Fréjus, France
Jul. 2014	<b>Space missions for geophysics of the terrestrial planets</b> , ESA/FFG/CNES	Alpbach, Austria

### Field works

Oct. 2012	<b>Stratigraphy analysis of sedimentary basin</b>	Blieux, France
Oct. 2012	<b>Geomorphology in ophiolitic context</b>	Mt Chenaillet, France
May 2012	<b>Sedimentology, Metamorphism and Volcanism</b>	Tournon & Puy de Sancy, France
Apr. 2012	<b>Marine Seismology</b>	Nice, France
Oct. 2011	<b>Geology Mapping</b>	Le Mas, France
Sep. 2011	<b>Initiation to geology field work</b>	Cucugnan, France

## Honors & Awards

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2018 – 2020	<b>Postdoctoral Scholarship</b> , Jet Propulsion Laboratory	Pasadena, CA, USA
2014 – 2017	<b>Doctor of Philosophy Scholarship</b> , French Ministry of Research	Reims, France
2014	<b>ESA summer school Alpbach grant</b> , CNES	Alpbach, Austria
2013	<b>EXPLORA travel grant for international interns</b> , Rhône-Alpes region	Pasadena, USA

## Outreach

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2018	<b>Titan comme vous ne l'avez jamais vu</b>	Ciel & Espace
2018	<b>Seeing Titan</b>	Astronomical Picture Of the Day
2018	<b>Seeing Titan with Infrared Eyes - PIA 21923</b>	NASA JPL Photo Journal
2015	<b>Airburst over Chelyabinsk and small impactors</b>	GSMa Journal Club
2014	<b>La chute de la météorite de Tcheliabinsk (Russie) du 15 février 2013, un an après</b>	Planet Terre

## Leadership & Community Service

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### PyVIMS toolbox

FOUNDER & MAIN DEVELOPER: [github.com/seignovert/pyvims](https://github.com/seignovert/pyvims)

*PyPI / Github*

2018-2019

### Cassini VIMS Data Portal

DESIGNER & WEBMASTER: [vims.univ-nantes.fr](https://vims.univ-nantes.fr)

*Nantes, France*

2018-2019

### Fireball Recovery and InterPlanetary Observation Network (FRIPON)

MEMBER & LOCAL TECHNICAL SUPPORT

*Reims, France*

2016-2017

### Astro-Café Parisien

MEMBER

*Paris, France*

2016-2017

### Titan Aeronomy & Climate workshop

CO-ORGANIZER & WEBMASTER: [planeto.univ-reims.fr/tac](https://planeto.univ-reims.fr/tac)

*Reims, France*

2016

### ÉNS Lyon Astro club – têteENSI'air

PRESIDENT & WEBMASTER: [bde.ens-lyon.fr/clubs/astro](https://bde.ens-lyon.fr/clubs/astro)

*Lyon, France*

2011-2014

## Skills

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<b>Programming</b>	Python, Fortran, C, Matlab, IDL, Julia, Bash, TeX
<b>Data analysis</b>	PDS, NAIF, ISIS, ENVI, ArcGIS, Maple, Mathematica, Abinit, Yorick
<b>WebDev</b>	PHP (Symfony), HTML5, CSS, (coffee/node)JS, Yarn/NPM, Gulp, Golang
<b>Database</b>	SQLite, MySQL
<b>Management</b>	Git (CI/CD), Docker, Apache/Nginx
<b>Photography</b>	Lightroom, Photoshop, Inkscape, PTGui
<b>Virtual Reality</b>	Povray, Unity, Blender
<b>Video</b>	DaVinci Resolve

## Activities

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<b>Astronomy</b>	Nightscape to deep field observation and survey
<b>Photography</b>	Digital / B&W film capture and processing: <a href="https://photos.seignovert.fr">photos.seignovert.fr</a>
<b>Sports</b>	Walking/Hiking/Trekking, Skiing, Climbing, Mountain biking
<b>Music</b>	Flutist, Oboist, Rock band bassist

## Other

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<b>Citizenship</b>	French
<b>Birth year</b>	1990 (29 years old)
<b>Languages</b>	French (native), English (fluent, CLES B2), Russian, German, Ancient Greek
<b>Driving</b>	California Class C/French B/European licence