

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 - Oct. 2020

- 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 μ 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:

- 11 EUROPA CLIPPER PREPARATORY PHOTOMETRY TO CONSTRAIN SURFACE PROPERTIES under review
Dhingra R.D., Buratti B.J. & Seignovert B. Planetary Science Journal
- 10 COMPRESSION ALGORITHMS FOR BIG DATA IN PLANETARY AND EXOPLANETARY MISSIONS under review
Xie H., West R.A., Seignovert B., Jewell J., Kurth W. & Averkam T. JATIS
- 9 DISTRIBUTION AND INTENSITY OF WATER ICE SIGNATURE IN SOUTH XANADU AND TUI REGIO under review
Coutelier M., Cordier D., Seignovert B. & Rannou P. Icarus
- 8 SUN GLITTER ON TITAN'S KRACKEN MARE: EVIDENCE FOR TIDAL CURRENTS AND WIND WAVES 2020
Heslar M., Barnes J., Soderblom J., Dhingra R., Seignovert B. & Sotin C. Planetary Science Journal
- 7 TEMPERATURE AND CHEMICAL SPECIES DISTRIBUTIONS IN THE STRATOSPHERE AND MESOSPHERE OF TITAN FROM MID-NORTHERN SPRING TO EARLY SUMMER 2020
Vinatier, S., Mathé, C., Bézard, B., Vasant d'Ollone, J., Lebonnois, S., Dauphin, C., Seignovert, B., Sylvestre, M., Teanby, N.A., Achterberg, R.K., Flasar, F.M., Goriuss, N., Jennings, D.E., Mamoutkine, A. & Guandique, E. Astronomy & Astrophysics
- 6 INVESTIGATING LUNAR BOULDERS AT THE APOLLO 17 LANDING SITE USING PHOTOGRAMMETRY AND VIRTUAL REALITY 2020
Le Mouélic S., Enguehard P., Schmitt H.H., Caravaca G., Seignovert B., Mangold N., Combe J-Ph. & Civet F. Remote sensing
- 5 PHOTOMETRICALLY-CORRECTED GLOBAL INFRARED MOSAICS OF ENCELADUS: NEW IMPLICATIONS FOR ITS SPECTRAL DIVERSITY AND GEOLOGICAL ACTIVITY 2020
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., Stefko M., de Val-Borro M., Kulumani S. & Murakami S. JOSS
- 3 THE 3.4 μ 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

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

Training

Summer schools

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

Field works

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

Honors & Awards

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

Outreach

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

Leadership & Community Service

Open source projects

900+ CONTRIBUTIONS IN 2019, 650+ IN 2020.

Python modules

10 PACKAGES.

PyVIMS toolbox

FOUNDER & MAIN DEVELOPER.

Cassini VIMS Data Portal

DESIGNER & WEBMASTER: vims.univ-nantes.fr

Fireball Recovery and InterPlanetary Observation Network (FRIPON)

MEMBER & LOCAL TECHNICAL SUPPORT

Astro-Café Parisien

MEMBER

Titan Aeronomy & Climate workshop

CO-ORGANIZER & WEBMASTER: planeto.univ-reims.fr/tac

ÉNS Lyon Astro club – têteENS!air

PRESIDENT & WEBMASTER: bde.ens-lyon.fr/clubs/astro

Github

2015-2020

PyPI / Conda

2018-2020

Github / Blender

2018-2020

Nantes, France

2018-2019

Reims, France

2016-2017

Paris, France

2016-2017

Reims, France

2016

Lyon, France

2011-2014

Skills

Programming	Python, Fortran, C, Matlab, Julia, Bash, TeX
Data analysis	NAIF-SPICE, USGS-ISIS, QGIS/ArcGIS, IDL/ENVI
Web-Frontend	HTML5, CSS, JS (React/Vue/Three/D3), Sphinx, Swagger
Web-Backend	PHP (Symfony/ApiPlateform), Django/Flask, nodeJS, Golang
Database	SQLite, MySQL
Management	Git (PR/CI/CD), Docker, Composer/Yarn/NPM, Webpack/Gulp, Apache/Nginx
Photography	Lightroom, Photoshop, Inkscape, PTGui
Virtual Reality	Povray, ThreeJS, Unity, Blender
Video	DaVinci Resolve

Activities

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

Other

Citizenship	French
Birth year	1990 (30 years old)
Languages	French (native), English, Russian, German, Ancient Greek
Driving	California Class C/French B/European licence