Benoît **Seignovert**

POSTDOC SCHOLAR · ASTROPHYSICIST · DATA SCIENTIST

Jet Propulsion Laboratory, Pasadena, CA USA

🌐 benoit.seignovert.fr

Employment

Jet Propulsion Laboratory (JPL)
Pasadena, CA USA
POST-DOCTORAL RESEARCHER
Oct. 2018 - Present
- Mission: Characterization of Titan's clouds and haze structure to model transit spectra of exoplanets.

Laboratory of Planetology and Geodynamics (LPG)
Nantes, France
RESEARCH ENGINEER / POST-DOCTORAL RESEARCHER
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)
Reims, France
RESEARCH ENGINEER
Oct. - Dec. 2017
- Mission: Development of analysis tools for the Cassini-ISS instrument.
- Employer: CNRS - Délégation Centre Est

Education

University of Reims Champagne-Ardenne
Reims, France
DOCTOR OF PHILOSOPHY (ASTRONOMY & ASTROPHYSICS)
2014 – 2017
- Thesis title: Analysis of Titan's Detached Haze Layer with Cassini-ISS instrument
- Supervisors: Prof Pascal RANNOU and Dr Panayotis LAVVAS

École Normale Supérieure of Lyon
Lyon, France
MASTER DEGREE IN EARTH AND PLANETARY SCIENCE (WITH HONOURS)
2011 – 2014

Research Internships

Cassini high resolution navigation with star catalogues
JPL, Pasadena, USA
SUPERVISOR: ROBERT A. WEST
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
LAB, Bordeaux, France
SUPERVISOR: PHILIPPE PAILLOU
Jan. – Jul. 2014
- Cassini and TerraSAR-X radar image analysis
- SRTM and GDEM data processing
- Radar backscattering modeling

Cassini VIMS image processing on Titan
JPL, Pasadena, USA
SUPERVISOR: CHRISTOPHE SOTIN
May – Aug. 2013
- Hyperspectral infrared image processing
- Image navigation and mapping
- Gravitational fields analysis

Analysis on stable tungsten isotopes in iron meteorites
ÉNSL, Lyon, France
SUPERVISORS: BRETON THOMAS & QUITTÉ GHYLAINE
Jan. – Apr. 2013
- Iron meteorites sampling
- Isotopic chemistry extraction
- ICP mass spectrometry

Characterization of thermal history on primitive meteorites
IPAG, Grenoble, France
SUPERVISOR: LYDIE BONAL
Jun. – Jul. 2012
- Carbon micro-meteorites sampling
- IR and RAMAN spectroscopy
- MEB and synchrotron imaging (ESRF)

Peer review publications

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 µm 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   Possible detection of water ice in Titan's river beds   *in prep.*
Coutelier M., Cordier D., Seignovert B. & Rannou P.

10   Europa Clipper preparatory photometry to constrain surface properties   *in prep.*
Dhingra R.D., Buratti B.J. & Seignovert B.   *Planetary Science Journal*

9   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*

8   Temperature and chemical species distributions in the stratosphere and mesosphere of Titan from mid-northern spring to early summer   *under review*
Vinatier, S., Mathé, C., Bézard, B., Vatant 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   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*

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

Training

Summer schools

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

Field works

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

Honors & Awards

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

Outreach

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

Leadership & Community Service

Open source projects   *Github*
900+ CONTRIBUTIONS IN 2019, 650+ IN 2020.   *2015-2020*

Python modules   *PyPI / Conda*
10 PACKAGES.   *2018-2020*

PyVIMS toolbox   *Github / Blender*
FOUNDER & MAIN DEVELOPER.   *2018-2020*

Cassini VIMS Data Portal   *Nantes, France*
DESIGNER & WEBMASTER: vims.univ-nantes.fr   *2018-2019*

Fireball Recovery and InterPlanetary Observation Network (FRIPON)   *Reims, France*
MEMBER & LOCAL TECHNICAL SUPPORT   *2016-2017*

Astro-Café Parisien   *Paris, France*
MEMBER   *2016-2017*

Titan Aeronomy & Climate workshop   *Reims, France*
CO-ORGANIZER & WEBMASTER: planeto.univ-reims.fr/tac   *2016*

ÉNS Lyon Astro club – têteENSl'air   *Lyon, France*
PRESIDENT & WEBMASTER: bde.ens-lyon.fr/clubs/astro   *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