

Benoît Seignovert

ASTROPHYSICIST · RESEARCH ENGINEER · DATA SCIENTIST

Laboratory of Planetology and Geodynamics (LPG), Nantes, FR

✉ benoit.seignovert.fr

Employment

Laboratory of Planetology and Geodynamics (LPG)

CNRS RESEARCH ENGINEER

Nantes, France

Nov. 2020 - Present

- Development of **coverage analysis** tool for ESA-JUICE mission (under ESA-EXPRO contract).

Jet Propulsion Laboratory (NASA/JPL-Caltech)

POST-DOCTORAL RESEARCHER

Pasadena, CA USA

Oct. 2018 - Oct. 2020

- Mapping of Titan's specular reflexions during the Cassini mission.
- Analysis of lossy compression on hyperspectral datasets for outer-planets exploration.
- Characterization of Titan's clouds and haze structure

Laboratory of Planetology and Geodynamics (LPG)

RESEARCH ENGINEER / POST-DOCTORAL RESEARCHER

Nantes, France

Jan. - Sept. 2018

- Development of the **Cassini VIMS Data Portal**, a web interface for the calibrated Cassini-VIMS dataset.

Group of Molecular and Atmospheric Spectroscopy (GMSA)

RESEARCH ENGINEER

Reims, France

Oct. - Dec. 2017

- Development of analysis tools for the Cassini-ISS instrument.

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: Pr. Pascal RANNOU and Dr. Panayotis LAVAS

École Normale Supérieure of Lyon

BACHELOR AND 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

First-author publications:

- 2 HAZE SEASONAL VARIATIONS OF TITAN'S UPPER ATMOSPHERE DURING THE CASSINI MISSION 2021
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:

- 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:

- 13 TITAN'S GLOBAL RADIANT ENERGY BUDGET DURING THE CASSINI EPOCH (2004-2017) 2021
Creedy, E.C., Li L., Jiang X., West R.A., Fry P.M., Nixon C.A., Kenyon M.E., Seignovert B. GRL
- 12 EUROPA CLIPPER PREPARATORY PHOTOMETRY TO CONSTRAIN SURFACE PROPERTIES 2021
Dhingra R.D., Buratti B.J. & Seignovert B. Planetary Science Journal
- 11 TITAN: EARTH-LIKE ON THE OUTSIDE, OCEAN WORLD ON THE INSIDE 2021
MacKenzie S. and 32 colleagues Planetary Science Journal
- 10 COMPRESSION ALGORITHMS FOR BIG DATA IN PLANETARY AND EXOPLANETARY MISSIONS 2021
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 2021
Coutelier M., Cordier D., Seignovert B. & Rannou P. Icarus
- 8 SUN GLITTER ON TITAN'S KRAKEN 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., Steffo 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

2022	European Planetary Science Congress (EPSC)	Grenada
	Planetary Science Informatics and Data Analytics Conference (PSIDA)	Madrid
	53rd Lunar and Planetary Science Conference (LPSC)	Virtual Conference
2021	5th Planetary Data Workshop (PDW)	Virtual Conference
2020	American Geophysical Union (AGU)	Virtual Conference
	European Planetary Science Congress (EPSC)	Virtual Conference
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
2011	Initiation to geology field work / Geology Mapping , 2 weeks	Le Mas/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

2020	Enceladus in Infrared Enceladus in the Infrared - PIA 24023	<i>Astronomical Picture Of the Day</i> <i>NASA JPL Photo Journal</i>
2018	Titan comme vous ne l'avez jamais vu Seeing Titan Seeing Titan with Infrared Eyes - PIA 21923	<i>Ciel & Espace</i> <i>Astronomical Picture Of the Day</i> <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

ESA/JUICE moon-coverage tool MAIN DEVELOPER. Pole Surface Planétaires ADMIN & MEMBER. PyVIMS toolbox FOUNDER & MAIN DEVELOPER. Python modules 12 PACKAGES. 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 – têteENSI'air PRESIDENT & WEBMASTER: bde.ens-lyon.fr/clubs/astro	<i>Moon-coverage / ESA DataLabs</i> 2020-2022 <i>Github</i> 2021-2022 <i>Github / Binder</i> 2018-2022 <i>PyPI</i> 2018-2022 <i>Nantes, France</i> 2018-2022 <i>Reims, France</i> 2016-2017 <i>Paris, France</i> 2016-2017 <i>Reims, France</i> 2016 <i>Lyon, France</i> 2011-2014
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Skills

Programming	Python, Fortran, C, Matlab, Julia, Bash, T _E X
Data analysis	NAIF-SPICE, USGS-ISIS, QGIS/ArcGIS, IDL/ENVI
Web-Frontend	HTML5, CSS3, JS (React/Vue/Three/D3), Sphinx, Swagger, Webpack/Gulp
Web-Backend	PHP (Symfony/ApiPlatform), Python (FastAPI/Flask/Django), Apache/Nginx
Database	SQLite, MySQL, PostgreSQL
Management	Git (Agile, CI/CD), Docker, Poetry/Setuptools, Composer/Yarn
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 (32 years old)
Languages	French (native), English, Russian, German, Ancient Greek
Driving	California Class C/French B/European licence