



# QUENTIN BRISSAUD - PHD

## PROFILE

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 ADDRESS Oslo, Norway  
 LANGUAGES French (native) English (fluent)  
 CITIZENSHIP French

## EDUCATION

**Research Master** 2013 - 2014  
**PAUL SABATIER UNIVERSITY, TOULOUSE, FRANCE**

Nonlinear dispersive and elliptic equations.

**Master degree in Engineering** 2010 - 2014  
**INSA TOULOUSE, TOULOUSE, FRANCE**

Optimization, CFD, Structural mechanics, Image processing,  
 Data Assimilation and Wave theory.

**phD degree** 2014 - 2017  
**SSPA TEAM, ISAE, TOULOUSE, FRANCE**

Numerical modeling of atmospheric waves due to  
 Earth/Ocean/Atmosphere couplings and applications.

**Interests** 1) *Mechanical couplings between a planet and its atmos. are a major source of signal that can provide insights of a planet internal and atmos. structure. Understanding the underlying processes that drive the transmission of energy at the surface (basins, topo.) and the propagation in the atmos. (winds, attenuation, nonlinearities) is crucial to explain and make use of seismic and atmos. observations.* 2) *Ground-motion predictions in sedimentary basins are essential to prevent earthquake disasters. However, the impact of the basin geometry on the site response is poorly constrained. Using analytical and machine-learning models show a great trade-off between cost and accuracy.*

## AWARDS - FELLOWSHIPS

**2017** Caltech Seismolab fellowship

**2017** Geophysical Journal International (GJI), Student Author Awards. Awards designed to recognize the best papers submitted to GJI by young scientists in the field.

## RESEARCH EXPERIENCE

### Post-doc

**CALTECH, PASADENA, USA**  
 Adviser: Victor TSAI

Near-surface seismic modeling and study of the Earth-atmosphere couplings

## TEACHING EXPERIENCE

2017 - 2018 **phD student supervision on wave theory**

2015 - 2017 **1st Year Math Bachelor - Analysis**

2017 **1st Year Info Bachelor - Numerical modeling**

2016 - 2017 **Tutoring Master interns (Space Engineer.)**

## SELECTED PUBLICATIONS

### 2021 Publication - GRL

Q. Brissaud et al, The first detection of an earthquake from a balloon using its acoustic signature, *GRL*

- Co-investigator on R&TD NASA funded project
- Exhaustive investigation of seismo-acoustic balloon-based records from the 2019 Ridgecrest sequence

### 2021 Publication - Earth, Planets and Space - *submitted*

Q. Brissaud et al, Using machine learning to predict surface-wave basin amplification, *GRL*

- Random forests trained over synthetics provides an accurate nonlinear regression model for surface-wave amplification in basins

### 2020 Publication - BSSA

Q. Brissaud et al, EXTENSION OF THE BASIN RAYLEIGH-WAVE AMPLIFICATION THEORY TO INCLUDE BASIN-EDGE EFFECTS, *BSSA*

- 1D theory to predict surface-wave amplification in sedimentary basins is a good approximation for low velocity contrasts ( $< 2.5$ )
- 1D theory + transmission coef. provide a good estimate of amplification in realistic basin structures

### 2019 Remote-sensing seismology co-Investigator

Q. Brissaud et al, VENUS REMOTE-SENSING SEISMOLOGY, *NASA ISC report*

- Sensitivity analysis of quake-induced signals on source properties and atmospheric specifications on Venus
- Quakes with magnitudes  $> 5$  might be observed 300km from the epicenter
- Adaptation of a full-waveform modeling tool to Venus atmospheric and magnetic specifications

### 2018 Publication - GRL

L. Martire, Q. Brissaud et al., NUMERICAL SIMULATION OF THE ATMOS. SIGNATURE OF ARTIFICIAL AND NATURAL SEISMIC EVENTS, *GRL*

- Very shallow subsurface structures determine the directivity and amplitude of seismically-induced infrasounds
- High impedance contrasts allow infrasound observations from airborne instruments

### 2017 Publication - GJI

Q. Brissaud et al., HYBRID GALERKIN NUMERICAL MODELING OF ELASTODYNAMICS AND COMPRESSIBLE NAVIER-STOKES COUPLINGS: APPLICATIONS TO SEISMO-GRAVITO ACOUSTIC WAVES, *GJI*

- Earth-atmosphere coupling with topography of non-linear acoustic-gravity waves and elastic seismic waves.

### 2016 Publication - Space Science Review

R. Garcia, Q. Brissaud et al., FINITE-DIFFERENCE MODELING OF WAVE PROPAGATION IN MARS ATMOSPHERE: APPLICATION TO INFRASOUNDS EMITTED BY METEOR IMPACTS, *Space Science Review*

- Implementation of complex vibrational absorption processes
- At night, a near-surface waveguide enables long distance propagation of acoustic signals in flat regions.

### 2016 Publication - GJI

Q. Brissaud et al., FINITE-DIFFERENCE NUMERICAL MODELLING OF GRAVITO-ACOUSTIC WAVE PROPAGATION IN A WINDY AND ATTENUATING ATMOSPHERE, *GJI*

- 3D gravito-acoustic wave propagation in a windy, attenuating atmos.
- Study of acoustic and gravity waves from ground forcing and atmospheric explosions.