Sébastien VALADE

Institution: UNAM (National Autonomous University of Mexico), Institute of Geophysics, Dept of Volcanology

Position: Full Professor ("Investigador Titular A")

Date/Place of birth: 31/10/1985, France Contact: valade@igeofisica.unam.mx Personal page: https://svalade.github.io/

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Education

2008

2012 Ph.D. in Earth Sciences, specialty volcanology/geophysics

Institution: Université Clermont-Auvergne (Laboratoire Magmas et Volcans, LMV), France Thesis: Source mechanisms and dynamics of volcanic pyroclastic emissions: a perspective from

Doppler radar (VOLDORAD) and other geophysical data (online access)

2008 <u>Masters of Science M.Sc.</u>, speciality "Magmas and Volcanoes" (INVOGE)

Institution: Université Clermont-Auvergne (Laboratoire Magmas et Volcans, LMV), France Thesis: Doppler radar study of Popocatépetl (Mexico) ash plumes: first insights into the long-term

monitoring of explosive volcanoes with the VOLDORAD

Engineer Degree (master level) in Geosciences

Institution: Institut Polytechnique UniLaSalle (UniLasalle), France

2006 <u>Bachelor of Science</u> in Geology

Institution: Institut Géologique Albert-Lapparent (IGAL, now UniLasalle), France

Thesis: Petro-stratigraphic and tectonic study of the northern flank of the Valle del Bove, Etna

(Sicily, Italy)

Professional Appointments

since 2023/08 <u>Full Professor</u> (Investigador Titular A)

Institution: Universidad Nacional Autónoma de México (UNAM), Institute of Geophysics, Dept.

of Volcanology, Mexico

2020/03 - <u>Associate Professor</u> (Investigador Asociado C)

2023/08 Institution: Universidad Nacional Autónoma de México (UNAM), Institute of Geophysics, Dept.

3.5 years of Volcanology, Mexico

2019 PostDoc.

6 months Institution: GeoForschungsZentrum (GFZ) Potsdam, Volcano Hazards Team, Germany

Project: "MOUNTS-AI: Artificial Intelligence in support of Volcano Monitoring"

Grant: Geo.X seed-funding (Research Network for Geosciences in Berlin and Potsdam)

2017-2019 **PostDoc.**

2 years Institution: Technische Universität Berlin (TU-Berlin), Dept. of Computer Vision and Remote

Sensing (CV) & GeoForschungsZentrum (GFZ) Potsdam, Volcano Hazards, Germany Project: "MOUNTS: Monitoring Unrest from Space" (www.mounts-project.com)

Grant: Geo.X (Research Network for Geosciences in Berlin and Potsdam)

2013-2017 **PostDoc.**

4 years Institution: Università di Firenze UNIFI (Laboratorio di Geofisica Sperimentale, LGS), Italy

 $\textbf{Project:} \ \textit{Geophysical monitoring of Stromboli/Etna for Italian Civil Defense; responsible for a stromboli of the project of the proje$

installation/management of monitoring cameras (IR/VIS) at Etna

2012-2013 **PostDoc.**

1 year Institution: Université Blaise Pascal UBP (now UCA), Lab. Magmas et Volcans LMV, France

Project: Study of volcanic ash plumes through infrared thermal imagery

2008-2011 **Ph.D.**

3 years Institution: Université Blaise Pascal UBP (now UCA), Lab. Magmas et Volcans LMV, France

Project: "Pyroclastic emission dynamics and source mechanisms with multi-parametric geophysical

data"

Research projects

Financed research projects (as Principal Investigator PI)

2024-2027 OMEGA: Observatorio Mundial de Erupciones Guiado por Inteligencia Artificial

3 years Grant: UNAM DGAPA PAPIIT-IN114625 (link)

2024-2026 Infrasonic Early Warning System for explosive eruptions applied to Popocatépetl

1.5 years Grant: SECTEI (Secretaría de Educación, Ciencia, Tecnología e Innovación de la Cd. de México)

Funding: 2,425,075 MXN (~110 k€)

2021-2023 Linking space and ground-based observations for better understanding and

2 years prediction of eruptive crises

Grant: UNAM DGAPA PAPIIT-IA102221 (link)

2019 MOUNTS-AI: artificial intelligence for volcano monitoring

6 months Grant: Geo.X Seed Funding (Research Network for Geosciences in Berlin and Potsdam)

2017-2019 MOUNTS: Monitoring Unrest from Space (www.mounts-project.com)

2 years Grant: Geo.X (Research Network for Geosciences in Berlin and Potsdam)

Success rate: 5.3% (in 2017: 322 applications received, 17 applicants funded)

2012 MODAPLUME: Model and Data for Plumes

2 weeks Grant: MEMOVOLC european grant for young researchers

Collaboration in research projects

since 2024 GDACS (Global Disaster Alert and Coordination System)

ongoing (GDACS is a cooperation framework between the United Nations and the European Commission)

Title: Pilot project for the implementation of a Global Volcano Hazard Assessment in GDACS Role: provider of real-time global volcano monitoring parameters through the MOUNTS API

since 2024 VIGIA 2 (Visual and Infrared Ground-based Imagery Analyser)

ongoing Title: "VIGIA 2.0 permanent installation on Popocatépetl (Mexico)"

Role: co-PI

PI: S. Valade (UNAM) & Y. Moussalam (Columbia University, USA)

2023-2026 Classification and formation processes of lava lakes

ongoing Grant: UNAM DGAPA PAPIIT-IN112923

Role: co-PI, in charge of infrasonic array deployment and analysis

PI: R. Campion (UNAM, Mexico)

since 2021 Virunga Volcanoes Supersite (GEO-GSNL Permanent Supersites)

ongoing Title: "Virunga Volcanoes Supersite" (biennial reports: 2020-2021, 2022-2023)

Role: scientific collaborator in the support of volcano monitoring in D.R. Congo using MOUNTS

PI: C. Balagizi (GVO, R.D. Congo)

since 2020 Volcano hazards in Guatemala

ongoing Title: International Collaboration Agreement between UNAM and INSIVUMEH (National Insti-

tute of Seismology, Volcanology, Meteorology and Hydrology of Guatemala)

Role: scientific collaborator in the support of volcano monitoring in Guatemala using MOUNTS

PI: Dr. J.L. Macías Vázquez, Dr. L. Capra Pedol

since 2020 Volcanotectonic hazards in Mexico

ongoing Title: International Collaboration Agreement between UNAM and the IRD (Institut de Recherche

pour le Développement, France) Role: scientific collaborator

PI: Dr. D. Legrand (UNAM), Dr. V. Pinel (ISTerre)

2013-2017 Università di Firenze UNIFI - Dept. of Italian Civil Protection DPC

4 years

Title: "Development of knowledge and methods useful for the assessment of hazard scenarios related to explosive volcano dynamics through a multiparametric monitoring network"

Role: responsible for installation/management of monitoring cameras (IR/VIS) at Etna

PI: M. Ripepe (UNIFI, Italia)

Research projects under review

2025-05 **TEMPO** (study of atmospheric contamination using TEMPO satellite)

(under review) Call: SECIHTI - Ciencia Básica y de Frontera 2025 (cross-border research projects)

Title: Estudio de la contaminación atmosférica con datos del satélite TEMPO

Role: scientific collaborator PI: W. Stremme (UNAM)

Participants: UNAM (Mexico), CIATEJ (Mexico)

2025-04 PRISM (PREcursory seismic IndicatorS of eruptive activity using volcano Monitoring)

(under review) Call: DFG - WEAVE (cross-border research projects)

Title: PRISM - PREcursory seismic IndicatorS of eruptive activity using volcano Monitoring data

Role: scientific collaborator

PIs: M. Reiss (Uni. Mainz) & C. Caudron (ULB)

Participants: ULB (Belgium), Uni. Mainz (Germany), UNAM (Mexico), UNITO (Italy), EOS

(Singapore), Carnegie (USA)

2025-03 VIVOMAC (VIvre au milieu des VOlcans au Mexique et en Amérique Centrale)

(under review) Call: IRD - JEAI 2025 ("Jeunes Equipes Associées à l'IRD")

Title: VIVOMAC - VIvre au milieu des VOlcans au Mexique et en Amérique Centrale: Risques

et patrimoine naturel

Role: scientific collaborator

PI: Dr. Guilbaud (UNAM, Mexico)

Participants: UNAM (México), INETER/UNAN (Nicaragua), LMV (Francia), IRD (Francia)

Teaching activities

Lectures

Regular lectures

2025 Co-creator and co-responsible for the new lecture "Methods of investigation of

(upcoming) volcanic activity"

Institution: UNAM

Level: master in Earth Sciences (Posgrado en Ciencias de la Tierra PcTierra)

Hours per semester: 64

2025 Participation in lecture "Volcanology"

(upcoming) Institution: UNAM

Level: master in Earth Sciences (Posgrado en Ciencias de la Tierra PcTierra)

Course taught: Volcano Infrasounds

Hours per semester: 2

2024 Creator and responsible for the new lecture "Digital Image Processing for Remote

Sensing (DIP4RS)"(link)

Institution: UNAM - ENCIT (Escuela Nacional de Ciencias de la Tierra) Level: bachelor in Applied Geography (Licenciatura en Geografía Aplicada)

Hours per semester: 64

2021, 2024 Creator and responsible for the new lecture "Computer Vision for Geosciences

(CV4GS): from classical methods to modern approaches using Deep Learn-

ing" (link)

Institution: UNAM

Level: master in Earth Sciences (Posgrado en Ciencias de la Tierra PcTierra)

Hours per semester: 64

Occasional lectures

2025 Hands-on training on the MOUNTS monitoring system provided to the National Civil

Protection (Chiapas, Mexico)

Course taught: MOUNTS training: theory and hands-on experience

Date/place: 14 May 2025, online

Hours: 2

2025 Participacion in the National Civil Protection School (Chiapas University Campus)

lecture: "Foro internacional de vulcanología 2025"

Course taught: Volcano Monitoring using satellites

Date/place: 24 February 2025, Ocozocoautla de Espinosa (Chiapas, Mexico), link

Hours: 1

2019 Participation in the International School of Volcanology: "Working on an active

volcano: learning the tools of modern volcanology (field measurements, instruments, data

acquisition and processing)"

Course taught: Satellite ground deformation

Date/place: 15-22 June 2019, Stromboli (Italy), link

Hours: 1

2017 Participation in the **International Training Course**: "Seismology, seismic data analysis,

hazard assessment, and risk mitigation" (organized annually by the GFZ, part of the UNESCO

program)

Course taught: InSAR processing with SNAP

Date/place: 4-29 Sept. 2017, Potsdam (Germany), link

Hours: 3

2013 Participation in the course Volcanic systems and hazards (postgraduate level, responsible

Prof. A. Harris, master "Magmas et Volcans", Université Blaise Pascal, Clermont-Ferrand, France)

Course taught: Explosive Eruption Plume Dynamics Date/place: 2013/02/26, Clermont-Ferrand (France)

Hours: 3

2010 Participation in the "Science of the Earth and Universe" university program (undergraduate

level, 2nd year, Université Blaise Pascal, Clermont-Ferrand, France) Course taught: Introduction to geological maps and sections Date/place: 2010/04/06, Clermont-Ferrand (France)

Hours: 6

2009 Participation in the "Science of the Earth and Universe" university program (undergraduate

 $level,\ 1^{st}\ year,\ Universit\'e\ Blaise\ Pascal,\ Clermont\text{-}Ferrand,\ France)$

Course taught: Methodology of academic research work Date/place: Sept.-Oct. 2009, Clermont-Ferrand (France)

Hours: 15

Tutor in geological mapping excursion with students in engineering school in geology (In-

stitut Polytechnique LaSalle)

Date/place: 19 May - 02 June 2007, Massif Central (France)

Hours: >140

Student supervision

Theses supervision

Theses concluded:

2022 Master - Balazs Markus

(concluded) Thesis: "Automatic segmentation of volcanic SO₂ clouds in satellite images"

Degree: Master

Institution: Technische Universität Berlin (Germany)

Supervisors: S. Valade, M. Wollhaf

Publication: Markus B., Valade S. et al. 2023 [3]

2013 Master - Anthony Lamur

(concluded) Thesis: "Eruption dynamics of Fuego volcano (Guatemala): a comparative study of seismic, acous-

tic and thermal signals"

Degree: Master

Institution: Université Blaise Pascal (France)

Supervisors: G. Waite, B. Van Wyk de Vries, S. Valade

Theses in progress:

since 2025 Master - Daniel Pérez Hernández

(ongoing) Thesis: "Analysis of volcanic activity using Google Earth Engine and AI"

Degree: Master

Institution: UNAM (Mexico), master degree in Earth Sciences

Supervisor: S. Valade

Estimated graduation date: August 2027

since 2024 Bachelor - Dulce M. Ruiz Velasco

(ongoing) Tesis: Afectaciones a la vegetación por actividad del volcán Mombacho

Degree: Bachelor

Entidad: UNAM - ENCIT (Escuela Nacional de Ciencias de la Tierra

Supervisor: S. Valade

Estimated graduation date: August 2025

since 2023 Master - Santiago Piñón Juarez

(ongoing) Thesis: "Eruption source parameters retrieval at Popocatépetl volcano combining infrasound and

satellite observations" Degree: Master

Institution: UNAM (Mexico), master degree in Earth Sciences

Supervisor: S. Valade

Estimated graduation date: August 2025
Publication: Piñon Juarez et al. 2024 [2]
Publication: Piñon Juarez et al. (in prep)

Travel Grant: awarded to student for 1 month at UNIFI (Florence) + INGV (Rome)

$Thesis\ candidates:$

(2026-2030)? PhD - Santiago Piñón Juarez

(candidate) Thesis: "Estimación de parámetros eruptivos en el volcán Popocatépetl mediante un sistema de

monitoreo multiparamétrico (VIGIA)."

Degree: PhD

Institution: UNAM (Mexico), PhD degree in Earth Sciences

Supervisor: S. Valade (UNAM)

(2026-2030)? PhD - Evelyn Ramos Facio

(candidate) Thesis: "Detección y anticipación de erupciones volcánicas mediante métodos estadísticos aplicados

a series temporales multivariadas satelitales."

Degree: PhD

Institution: UNAM (Mexico), PhD degree in Earth Sciences

Supervisor: S. Valade (UNAM) & F. de Jesús Corona-Villavicencio (INEGI)

PostDoc supervision

2024-2026 Postdoc - Francisco Massimetti

(ongoing) Project: Exploring long-term space-based thermal and gas emissions at open vent volcanoes: erup-

tive patterns and magma budgets Institution: UNAM (México) Supervisor: S. Valade (UNAM)

Publication: Massimetti et al. (in prep)

Student supervision and capacity building

2025 - Javier Cortés Rosas

(ongoing) Project: "Sistema de monitoreo de la actividad explosiva volcánica del Popocatépetl"

Degree: technician Entidad: UNAM (Mexico) Supervisor: S. Valade

2024 Casandra Muñoz Gomez

Project: "Evolution of the crater lake of El Chichón volcano from satellite imagery"

Degree: undergraduate research project

Institution: Escuela Nacional de Ciencias de la Tierra (ENCiT)

Supervisor: S. Valade

2023 Sergio Iván García Gómez

Project: "Estimation of lava effusion rates at Bagana volcano from SAR Sentinel-1 images"

Degree: undergraduate research project (6 months)

Institution: UNAM (Mexico), Postgraduate degree in Earth Sciences

Supervisor: S. Valade

2021 Raúl de la Rosa

Project: "Detection and characterization of volcanic ash plumes using satellite imagery and Deep

Learning"

Degree: postgraduate research project (3 months) Institution: Faculty of Engineering, UNAM

Supervisor: S. Valade

Scholarship obtained for student: "ExxonMobil Research Grant 2021-2022"

2021 Supervision of 1 Project with 4 postgraduate students, in the framework of the course *Hot Topics in Computer Vision (HTCV): "Scientific Process in Computer Vision: From Ideas to Publications"*

Project: "Automatic Analysis of Volcano Monitoring Footage" (students: D. Hoffmann, M. Sprin-

genberg & K. Schwarz)

Degree: postgraduate research project (4 months)
Institution: Technische Universität Berlin (Germany)

Supervisor: S. Valade

2018-2019 Supervision of 4 Projects with 6 postgraduate students, in the framework of the course Hot Topics in Computer Vision (HTCV): "Scientific Process in Computer Vision: From Ideas to Publications"

Projects:

1. "Despeckling Synthetic-Aperture Radar images using a Deep Residual Convolutional Neural Network (CNN)" (students: T. Davis & V. Jain)

Published scientific article [14]

2. "Detection of Surface Deformation due to Volcanic Activity" (student: H. Jain)

3. "Abnormal Change Detection in Volcano SAR-Images using Artificial Neural Networks" (students: D. Luibrand & E. Gruener)

4. "Case Study for volcano Digital Elevation Model (DEM) estimation base on Single Synthetic Aperture Radar (SAR) Image" (student: S. Shani)

Degree: postgraduate research project (4 months)
Institution: Technische Universität Berlin (Germany)

Supervisors: S. Valade, A. Ley

Academic duties

Member of theses defense juries

2025/08 Maricela Ortiz
Degree: Bachelor

Institution: Facultad de Ingeniería, UNAM

2022/10 Francesco Massimetti

Degree: PhD (Earth Sciences)

Institution: Università di Torino, Italia

2022/10 Mendo Pérez Gerardo Manuel

Degree: PhD (Earth Sciences)

Institution: Facultad de Ciencias, Instituto de Geofísca, UNAM

2022/07 Karina Bernal Manzanilla

Degree: Master (Postgraduate in Earth Sciences)

Institution: Facultad de Ciencias, Instituto de Geofísca, UNAM

2022/04 Susana Alejandra Layana Guerrero

Degree: PhD in Science, speciality Geology

Institution: Universidad Católica del Norte (Chile)

2021/01 Lorenzo Innocenti

Degree: PhD (Earth Sciences)

Institution: Università di Firenze, Italia

Member of supervision and candidacy committees

since 2025 Oscar Bravo Pérez

(ongoing) Member of the Supervision Committee of Master student

Institution: Postgraduate in Earth Sciences, UNAM

2025/06 Mariana Sandoval Garcia

Member of the Candidacy Committee for Ph.D. candidate

Institution: Postgraduate in Earth Sciences, UNAM

2024/11 Luis Alberto Morales González

Member of the Doctoral Admissions Committee (PCTierra semestre 2025-2)

Entidad: Posgrado en Ciencias de la Tierra, UNAM

since 2023 Ali Zare

(ongoing) Member of the Supervision Committee of Ph.D student

Institution: Postgraduate in Earth Sciences, UNAM

2020/02 Fernández Torres Enrique Antonio

Member of the Candidacy Committee for Ph.D. candidate

Institution: Facultad de Ciencias, Instituto de Geofísca, UNAM

2021-2022 López Landa Víctor Rodolfo

Member of the Supervision Committee of master student

Institution: Facultad de Ciencias, Instituto de Geofísca, UNAM

Contribution to the development of university educational program

2024 Initiator of a collaborative program between UNAM (Posgrado en Ciencias de la Tierra

PcTierra & Escuela Nacional de Ciencias de la Tierra ENCiT) and Lasalle Beauvais (France) for the exhange of students; formal collaboration agreements under development

2021 Participation in the creation and design of the new Field of Knowledge "Computational

Geoscience", now included in the new Postgraduate Program in Earth Sciences (UNAM)

Professional experience & achievements

Research interests

My research interests focus on the study of volcanic eruptive processes, using (1) multiparametric geophysical & remote sensing monitoring, (2) numerical modelling, and (3) volcanic hazard assessment.

1. integrated monitoring

I use both ground-based (infrared/optical imagery, infrasound, seismic, Doppler radar) and space-borne (SAR, infrared, UV) remote sensing techniques to study eruptive processes.

In particular, I am the founder and developper of the volcano monitoring platform MOUNTS (www.mounts-project.com, [19]), which exploits multi-sensor satellite data (Sentinel-1, Sentinel-2, Sentinel-5P) and artificial intelligence (Deep Learning) to recover key parameters informing on the volcanic activity of >80 active volcanoes worldwide in near-real-time. Recently, a ground-based module was added to the platform, which handles real-time processing of infrasonic arrays to inform on volcanic explosive activity (currently implemented at Popocatépetl volcano, in collaboration with UNIFI-LGS). This unique integration between different sensors allows for a comprehensive understanding of the volcanic process, useful to both the research and operational communities. The platform is used daily by several volcano monitoring agencies, and delivers automatic email alerts on key volcanic parameters (i.e., ground deformation, thermal anomalies, gas emissions). The collected datasets feed my research on the study of various eruptive styles worldwide.

Alongside, I regularly participate to scientific geophysical data acquisition campaigns in various volcanoes worldwide.

2. numerical modelling

I develop forward numerical models to reproduce source processes and synthetic geophysical signals, and use inverse modelling to constrain input parameters and subsequent source parameters.

In particular, I modelled the ballistic projections produced by strombolian explosions, and simulated the synthetic radar signal measured with a Doppler radar [36], in order to explain the internal dynamics of these pyroclastic emissions.

3. hazard assessment

I develop algorithms dedicated to volcanic harzard assessment through multi-parameter monitoring of active volcanoes.

In particular, from 2013 to 2017 I participated in the geophysical surveillance of the volcanoes Etna and Stromboli, as part of a contract between the University of Firenze and the Italian Civil Protection. This involved the design and installation of instrumentation, automation of algorithms for real-time data transmission, acquisition, processing, definition of automatic alert thresholds, web publication of results and communication with decision-making authorities during eruptive crises. I contributed from 2013 to 2017 to the drafting of the daily volcanic activity reports of Stromboli and Etna volcanoes, as well as to the scientific consulting for authorities during eruptive crisis. Since 2020 I am member of Extraordinary Meetings and Working Groups of the Scientific Advisory Committees of the Mexican National Civil Protection and National Center for Disaster Prevention (CENAPRED), on the volcanic activity of the Popocatepetl volcano, and the seismic activity of the Michoacan-Guanajuato volcanic field.

Research stays at foreign research centers

2025 GDACS, Ispra (Italia), Marzia Santini (leader of the European Crisis Management Laboratory)

2+3 days Project: "Pilot project for the implementation of a Global Volcano Hazard Assessment in GDACS

(Global Disaster Alert and Coordination System - UN & European Commission framework)"

Grant: GDACS

Dates: 9-10 January 2025, 18-20 June 2025

2024 Università di Firenze, Firenze (Italy), G. Lacanna

2 months Project: "Explosive activity at Popocatépetl studied from infrasonic array"

Grant: Academic exchange grant (UNAM)

2022 Università di Torino, Torino (Italy), D. Coppola

1 month Project: "Combined processing of data from MOUNTS & MIROVA volcano monitoring platforms"

Grant: Academic exchange grant (UNAM)

2021 Università di Torino (Italy, D. Coppola) & Università di Firenze (Italy, M. Ripepe)

1 month Project: "Processing of ground-based infrasonic data and satellite data (MOUNTS & MIROVA

platforms) at Sabancaya volcano"

Grant: Academic exchange grant (UNAM)

2008 Universidad de Chile, Santiago (Chile), D. Legrand

2 weeks Project: "Installation of seismic stations at Villarrica and Llaima volcanoes"

Grant: ECOS-CONICYT (D. Legrand, J. Clavero Ribes, B. Van Wyk de Vries)

2008 Universidad de Costa Rica, San José (Costa Rica), M. Mora

3 months Project: "Development of a MATLAB software for the analysis of seismic and Doppler radar

data"

Grant: Project VOLUME (M. Mora)

2006 Massey University, Palmerston North (New Zealand), J. Lecointre

4 months Project: "Analogue modeling of clay-rich debris flows"

Grant: EGIDE scholarhip (French Ministry of Foreign Affairs)

Scientific campaigns for geophysical & geological data acquisition

| 2025 (5 days) | El Chichón (México) – gas and bathymetry measurements from lake and fumarolic system |
|----------------|--|
| 2022 (2 1) | Villamica (Chila) installation of infraganic appear |

2023 (2 weeks) Villarrica (Chile) – installation of infrasonic array

2023 (1 week) **Popocatépetl** (México) – installation of permanent infrasonic array

2022 (3 days) Colima (México) – assistance in in-situ gas sampling inside the crater

2021 (1 week) Pacaya (Guatemala) – assistance in UV camera, drone, and multigas recordings

2020 (5 días) **Popocatépetl** (México) – assitance in multigas recordings

2018 (4 weeks) Bezymianny, Karymsky (Rusia) – drone, time-lapse, seismic & tilt

2017 - 2013 Etna, Stromboli (Italy) – maintenance of large geophysical monitoring network

[27][28][24][22][15]

2016 (2 weeks) Nyiragongo, Nyamulagira (RDC) – infrasonic array and infrared camera [23]

2015 (2 weeks) Piton de la Fournaise (Isla de la Reunión) – infrasonic array and infrared camera

 $\textbf{2014} \hspace{0.1cm} \textbf{(4 weeks)} \hspace{0.5cm} \textbf{Stromboli} \hspace{0.1cm} \textbf{(Italy)} - \text{scientific consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científico durante al consultant during 2014 effusive crisisases or científ$

la crisis efusiva de 2014 [27]

2013 (2 weeks) Sakurajima (Japón) – infrared and UV cameras

2012 (3 weeks) Lastarria, Lascar (Chile) – infrared and UV cameras [17][30]

2012 (2 weeks) Stromboli (Italy) – multidisciplinary geophysical experiment (radar, IR, UV, VIS) [32]

2009 (2 weeks) Arenal (Costa Rica) – Doppler Radar [36]

2009 (1 week) Etna (Italy) – permanent installation of Doppler Radar (voldorad 2B) [26]

2009 (2 weeks) Villarica, Llaima (Chile) – broadband seismometers

2007 (2 weeks) Sancy (France) – supervisor of geological mapping field trip (undergrad students)

2005 (4 weeks) Etna (Italy) – petro-stratigraphic study of the north flank of Valle del Bove

2004 (4 weeks) Etna (Italy) – flank eruption study (September 2004), field mapping & 3D quarry map

Member of collegial bodies

| 2025/06 | member of the Selection | Committee for a permanen | t research position at Instituto de |
|---------|--------------------------------|--------------------------|-------------------------------------|
| | | | |

Geociencias, (UNAM, Campus Juriquilla)

2023/11 member of the Selection Committee for a permanent research position at IGEF

(UNAM, Dept. of Volcanology)

since 2023/10 member of the Scientific Counsil of the Geophysical Institute (UNAM), representative

of the Department of Volcanology

| since 2023 | member of the ECOs network of Volcanology, organized by the Secretary of Education, | |
|---|--|--|
| | Science, Technology and Innovation (SECTEI) | |
| since 2020 | member (permanent invited member) of the Scientific Advisory Committees of the Mex- | |
| ican National Civil Protection and National Center for Disaster Pre | | |
| | (CENAPRED), on the volcanic activity of the Popocatépetl volcano, and the seismic | |
| | activity of the Michoacan-Guanajuato volcanic field | |
| 2013 - 2017 | member of recurring meetings with the Italian National Civil Protection as staff of | |
| | the Centro di Competenza UNIFI-LGS, responsible for monitoring the volcanic activity | |
| | of the Stromboli and Etna volcanoes | |
| 2010 - 2011 | member of the scientific counsil of the observatory OPGC | |
| 2009 - 2010 | member of the administrative counsil of the observatory OPGC | |
| | | |

Services to the scientific community

Editorial activities

| since $2024/03$ | Editorial Board member of journal Nature - Communications Earth & Environment |
|-----------------|---|
| 2023-11 | Guest Editor for the journal Geofísica Internacional |

Convenor activities

| 2023/02/23 | co-convenor of session Precursors, monitoring and crisis management - C1. Seismology, | | | | |
|------------|---|--|--|--|--|
| | Remote Sensing, GPS in the conference "80th anniversary of the Paricutin volcano" | | | | |
| 2021/04/26 | co-convenor of the EGU 2021 session "Long-term observation of volcanic degassing: | | | | |
| | methods, findings and challenges" | | | | |

Reviewer activities (articles, books, projects)

| 2025/04 | reviewer de proyecto European Research Council (ERC) - Starting Grants (€1.5 million) | | | | |
|--------------|---|--|--|--|--|
| since 2012 | reviewer of scientific publications (Geology, GRL, Scientific Reports, Nature Communications) | | | | |
| | $cations\ Earth\ \mathcal{E}\ Environment)$ and book chapters $(Springer\text{-}IAVCEI)$ | | | | |

Awards & Academic distinctions

| 2024 | Academic Excellence Award in the INFOTEC IA 1000 Learning Journey | | | |
|------------|--|--|--|--|
| 2024 | Exchange grant for AI training in China: awarded after ranking among the top 100 scores | | | |
| | nationwide in HCIA-AI Certification Exam (phase 2 of "AI 1000 Talent Development Program") | | | |
| 2021, 2024 | Teaching recognition: Excellent rating classification in CV4GS 2021-1/2024-1 & DIP4RS 2024-2 | | | |
| | (Student Evaluation, supervised by UNAM Educational Evaluation Office) | | | |
| 2023, 2024 | Nomination by the Institute of Geophysics (UNAM) for the National University Distinction | | | |
| | Award for Young Academics (RDUNJA 2023, 2024) | | | |
| 2023 | Italian "Abilitazione Scientifica Nazionale" in sectors 04A04-Geophysics (GEO10) & 04A01- | | | |
| | Volcanology (GEO8), granting access to Associate Professor positions in Italian universities | | | |
| 2020, 2024 | Mexican "National Researcher Distinction" SNII I: Investigador Nacional Nivel I (SECIHTI) | | | |
| 2020 | <u>Publication distinction</u> : Valade et al. 2019 [19] amongst the " <u>highly cited papers</u> " of <i>Remote</i> | | | |
| | Sensing (statistics from the Editor conclusion article on the Special Issue "Remote Sensing of | | | |
| | Volcanic Processes and Risk": link) | | | |
| 2018 | <u>Hackathon</u> : 1^{st} place in Geo.X hackathon (link) | | | |
| 2012 | Publication distinction: Valade et al. 2011 [36] in the "Research Spotlight" of AGU journals | | | |
| 2007 | Scholarship (French Ministry of Education): 1-year scholarship awarded on the basis of aca- | | | |
| | demic merit for Master's studies | | | |
| 2006 | Scholarship (French Ministry of Foreign Affairs): 4-months scholarship awarded on the basis | | | |
| | of academic merit for a research training in New Zealand | | | |

| daily | web | Open-access website of the volcano monitoring system MOUNTS: |
|----------------|----------------------------------|---|
| | | - ~6.4k visitors in 2024, regular users in >20 countries |
| | | - ~ 15 institutions responsible for volcanic monitoring use the data for official com- |
| | | munications. List of collaborations with institutions having official responsibilities |
| | | in volcano monitoring: MOUNTS end-users |
| | | (e.g. GDACS, USGS-VDAP, IG-EPN Ecuador 2019+2020, INSIVUMEH Guatemala 2019, CE- |
| | | NAPRED México 2020, INGEMMET Perú 2020, OVDAS Chile todos los informes desde 2022-12 |
| | | p.ej.2023, etc.). |
| | | - social networks (Twitter @MountsSystem) and specialized blogs (e.g., Earth of |
| | | Fire) |
| 2025-05 | video | Documentary "A 30 años de la reactivación del Popocatépetl" |
| 2025-01-23 | school | Aventuras Volcanicas en la prepa (link) - "Inteligencia Artificial: Aplicaciones en |
| 2020-01-20 | SCHOOL | la Vulcanología"' |
| 2024-08-24 | multi- | Press Agency Xinhu - "Conoce la plataforma mexicana que monitorea en tiempo |
| 2024-00-24 | media | real los volcanes más activos del mundo" |
| 2024 07 08 | | |
| 2024-07-08 | $rac{	ext{press}}{	ext{video}}$ | Reforma - "¿Es posible anticiparse a un volcán?" |
| 2024-04-04 | video | Canal 22 - The cultural news of Mexico with Laura Barrera and Rafael Garcia Vil- |
| 0004.04.04 | 14. | legas: "Entrevista a un vulcanólogo, plataforma MOUNTS" (video minuto 05:30) |
| 2024-04-04 | multi- | <u>UNAM Gaceta</u> Número 5,463 (portada): "Monitorea la UNAM 83 volcanes en |
| | media | tiempo real crea la plataforma "MOUNTS" con alcance global" (video, web, pdf, |
| 2021.02.01 | | tweet) |
| 2024-03-31 | press | Boletín UNAM-DGCS-227 (Dirección General de Comunicación Social): "Moni- |
| | | torean con MOUNTS de la UNAM actividad volcánica en el orbe" (Tweet) |
| 2024-03-31 | press | <u>López-Dóriga Digital</u> : "Plataforma MOUNTS de la UNAM monitorea actividad |
| | | volcánica en el mundo" |
| 2024-01-31 | \mathbf{press} | NASA Earth Observatory image & story of the day: "Another Puff of Ash from |
| | | Popocatépetl" |
| 2023-11-15 | \mathbf{press} | Entrevista MILENIO "¿Bomba de tiempo? Los posibles escenarios para Islandia |
| | | ante una "inminente" erupción volcánica" |
| 2023-09-25 | \mathbf{press} | Entrevista en <u>UNAM-Ciencia</u> "Cómo se forman y destruyen los domos del volcán |
| | | Popocatépetl", Ciencia UNAM |
| 2023-09-01 | school | Talk in secondary school (Atlixco, Mexico): "Comprendiendo los Sismos y Volcanes: |
| | | Naturaleza y Razones para No Temer" |
| 2023-06-12 | press | Interview for the UNAM-science web portal about the article Valade et al. 2023. |
| | | Nature Communications [4] |
| 2023-06-01 | \mathbf{video} | Interview in TV-UNAM: "Popocatépetl, el volcán más emblemático de México" |
| 2023 - 05 - 24 | \mathbf{video} | Interview IGEF: "Cómo es un sistema de monitoreo del volcán Popocatépetl con |
| | | imágenes de satélite?" |
| 2022-04-17 | press | Interview in NEXOS: "Centinelas de volcanes: del espacio a la Tierra" |
| 2020-09-10 | \mathbf{video} | Interview in the CIGIDEN Conversation Cycle: "Nuevas herramientas para la |
| | | volcanología" |
| 2019 | press | Interviews and publications about the article Valade et al. (2019) [19], selection: |
| | | National Geographic, Prevention Web, Science Daily, Il Fatto Quotidiano, Eureka |
| | | Alert, Golem, Künstlicher Intelligenz, GFZ, TU-Berlin, UN-Spider |
| 2018-12-12 | \mathbf{video} | Documentary TV Arte: "Les arpenteurs de la Terre" |
| 2018-08-01 | press | University press GFZ: "Geo-Data-Science Projects & Geo.X network" |
| 2018-06-09 | public | Science Night: "Lange Nacht der Wissenschaften 2018 (Berlín)" |
| 2017 | book | Children's book: collection "Was Ist Was - Erstes Lesen", volume "Volcanoes" |
| 2016-04-30 | image | Photo of the day UN (United Nations) MONUSCO: "Volcanologist Sébastien |
| | 8 | Valade films the Nyamulagira volcano crater" |
| 2016-04-29 | video | Documentary (France 2): "Volcanoes of the world: Stromboli" |
| 2016-04-27 | video | Documentary Nyiragongo 2016 Expedition <u>UN-MONUSCO</u> |
| 2010 OT 21 | 11400 | Dodding Tylingongo 2010 Exponition Olymorropoo |

2011-11-28 image GRL journal cover image (Volume 38, Issue 22), 28 Nov. 2011

image Book cover image: "Doppler radar observations" (2012), ed: J. Bech, J.L. Chau,

InTech, 470p, doi: 10.5772/2036

2006-08-24 press University press Massey New: "Testing behaviour of clay-laden lahar", Massey

News, Issue 20, Nov. 2006

Contribution to open-science

Codes - MOUNTS: Monitoring Unrest from Space

- PlumeAscentTracker: Interactive Matlab software for analysis of plumes in image data

- pyvolc: Toolbox for processing and modeling volcanic processes

Lectures - CV4GS: Computer Vision for GeoSciences: from traditional to Deep Learning methods

- DIP4RS: Digital Image Processing for Remote Sensing

- Physics-of-Volcanoes: Measurement & modeling of physical processes operating at volcanoes

Websites - MOUNTS: Satellite-based global volcano monitoring system

Certifications & Specialized Trainings

| 2024 | Certification, Advanced Level "HCIA Artificial Intelligence", Hangzhou (China), 11-25 Mayo 2024 |
|------|---|
| 2024 | Certification, Basic Level "HCIA Artificial Intelligence" (link), online course/exam |
| 2021 | Course "Cloud computing", Reunión Anual 2021 de la Unión Geofísica Mexicana (RAUGM), |
| | Guadalajara (México), 5 Nov 2021 |
| 2018 | 2nd GEOX Autumn School, "Young Academy School", Berlin (Germany), 15-18 Oct 2018 |

2017 1st GEOX Autumn School, "Young Academy School", Berlin (Germany), 09-13 Oct 2017
2012 1st MEMOVOLC Summer School "Volcanic ash: from magma to aviation impact", Nicolosi

(Italy), 25-29 June 2012

Skills

Scientific Integrated geophysical monitoring, satellite remote sensing, numerical modelling, study of

eruptive processes, quantification of volcanic hazard, deep learning

Computer Programming (Python, Matlab, Shell), software engineering with distributed version

control (Git), fullstack web developer (HTML, JS, jQuery), Linux server management, database management (SQL Data Base, Wave Servers Earthworm / SeisCompP), vector graphics editor (Inkscape), tools dedicated to remote sensing (SNAP, GEE Google Earth

Engine), LATEX

Language French (native), English (fluent), Italian (fluent), Spanish (advanced), German (basic)

Technical Know-how to operate real-time multiparametric monitoring network: design and instal-

lation of instrumentation, data transmission/acquisition/processing/archiving and web

publishing, communication with authorities

Publications

Bibliometrics (updated 2025/06/05)

| | H-index | N.publications | N.citations |
|----------------------------------|---------|----------------|-------------|
| Scopus profile: | 17 | 39 | 988 |
| Google Scholar profile: | 20 | - | 1329 |
| Research Gate profile: | 19 | - | 1191 |
| ORCID 0000-0002-6687-7302 | | | |

Publications (peer-reviewed)

2025

[1] Bernal-Manzanilla, K., Calò, M., Martínez-Jaramillo, D., Valade, S., "Automated seismo-volcanic event detection applied to popocatépet using machine learning," *Journal of Volcanology and Geothermal Research*, vol. 458, p. 108 261, Feb. 2025. DOI: 10.1016/j.jvolgeores.2024.108261.

2024

[2] Piñón Juárez*, S., Ramírez-Serrato, N. L., Valade, S., "Detection of Volcanic Ash Using Goes-16 Satellite Imagery: Case Study of Popocatépetl Volcano, Mexico," Revista de Gestão Social e Ambiental, vol. 18, no. 10, e08863–e08863, Oct. 2, 2024. DOI: 10.24857/rgsa.v18n10-140.

2023

- [3] Markus*, B., Valade, S., Wöllhaf, M., Hellwich, O., "Automatic retrieval of volcanic SO₂ emission source from TROPOMI products," Frontiers in Earth Science, vol. 10, 2023. DOI: 10.3389/feart. 2022.1064171.
- [4] Valade, S., Coppola, D., Campion, R., Ley, A., Boulesteix, T., Taquet, N., Legrand, D., Laiolo, M., Walter, T. R., De la Cruz-Reyna, S., "Lava dome cycles reveal rise and fall of magma column at Popocatépetl volcano," *Nature Communications*, vol. 14, no. 1, p. 3254, Jun. 2023. DOI: 10.1038/s41467-023-38386-9.

2022

- [5] Boudoire, G., Calabrese, S., Colacicco, A., Sordini, P., Habakaramo Macumu, P., Rafflin, V., Valade, S., Mweze, T., Kazadi Mwepu, J.-C., Safari Habari, F., Amani Kahamire, T., Mumbere Mutima, Y., Ngaruye, J.-C., Tuyishime, A., Tumaini Sadiki, A., Mavonga Tuluka, G., Mapendano Yalire, M., Kets, E.-D., Grassa, F., D'Alessandro, W., Caliro, S., Rufino, F., Tedesco, D., "Scientific response to the 2021 eruption of Nyiragongo based on the implementation of a participatory monitoring system," Scientific Reports, vol. 12, no. 1, p. 7488, May 2022. DOI: 10.1038/s41598-022-11149-0.
- [6] Boulesteix, T., Legrand, D., Taquet, N., Coppola, D., Laiolo, M., Valade, S., Massimetti, F., Caballero-Jiménez, G., Campion, R., "Modulation of Popocatépetl's activity by regional and worldwide earth-quakes," *Bulletin of Volcanology*, vol. 84, no. 8, p. 80, Aug. 2022. DOI: 10.1007/s00445-022-01584-2.
- [7] Coppola, D., Valade, S., Masias, P., Laiolo, M., Massimetti, F., Campus, A., Aguilar, R., Anccasi, R., Apaza, F., Ccallata, B., Cigolini, C., Cruz, L. F., Finizola, A., Gonzales, K., Macedo, O., Miranda, R., Ortega, M., Paxi, R., Taipe, E., Valdivia, D., "Shallow magma convection evidenced by excess degassing and thermal radiation during the dome-forming Sabancaya eruption (2012–2020)," Bulletin of Volcanology, vol. 84, no. 2, 2022. DOI: 10.1007/s00445-022-01523-1.

^{*} articles written by students under the supervision of Sébastien Valade

- [8] Gouhier, M., Pinel, V., Belart, J. M. C., De Michele, M., Proy, C., Tinel, C., Berthier, E., Guéhenneux, Y., Gudmundsson, M. T., Óskarsson, B. V., Gremion, S., Raucoules, D., <u>Valade, S.</u>, Massimetti, F., Oddsson, B., "CNES-ESA satellite contribution to the operational monitoring of volcanic activity: The 2021 Icelandic eruption of Mt. Fagradalsfjall," *Journal of Applied Volcanology*, vol. 11, no. 1, p. 10, Aug. 2022. DOI: 10.1186/s13617-022-00120-3.
- [9] Hidalgo, S., Vasconez, F. J., Battaglia, J., Bernard, B., Espín, P., <u>Valade</u>, <u>S.</u>, Naranjo, M.-F., Campion, R., Salgado, J., Córdova, M., Almeida, M., Hernández, S., Pino, G., Gaunt, E., Bell, A., Mothes, P., Ruiz, M., "Sangay volcano (Ecuador): The opening of two new vents, a drumbeat seismic sequence and a new lava flow in late 2021," *Volcanica*, vol. 5, no. 2, pp. 295–311, Oct. 2022. DOI: 10.30909/vol.05.02.295311.
- [10] Vasconez, F. J., Hidalgo, S., Battaglia, J., Hernandez, S., Bernard, B., Coppola, D., Valade, S., Ramón, P., Arellano, S., Liorzou, C., Almeida, M., Ortíz, M., Córdova, J., Vásconez Müller, A., "Linking ground-based data and satellite monitoring to understand the last two decades of eruptive activity at Sangay volcano, Ecuador," *Bulletin of Volcanology*, vol. 84, no. 5, p. 49, Apr. 2022. DOI: 10.1007/s00445-022-01560-w.

2021

- [11] Burgi, P.-Y., Valade, S., Coppola, D., Boudoire, G., Mavonga, G., Rufino, F., Tedesco, D., "Unconventional filling dynamics of a pit crater," *Earth and Planetary Science Letters*, vol. 576, p. 117230, 2021. DOI: 10.1016/j.epsl.2021.117230.
- [12] Ripepe, M., Donne, D. D., Legrand, D., Valade, S., Lacanna, G., "Magma pressure discharge induces very long period seismicity," *Scientific Reports*, vol. 11, no. 1, 2021. DOI: 10.1038/s41598-021-99513-4.
- [13] Sugimura, S., Nishimura, T., Lacanna, G., Legrand, D., Valade, S., Ripepe, M., "Seismic source migration during strombolian eruptions inferred by very-near-field broadband seismic network," *Journal of Geophysical Research: Solid Earth*, vol. 126, no. 12, e2021JB022623, 2021. DOI: 10.1029/2021JB022623.

2020

- [14] Davis, T., Jain, V., Ley, A., D'Hondt, O., <u>Valade, S.</u>, Hellwich, O., "Reference-free despeckling of Synthetic-Aperture Radar images using a Deep Convolutional Network," pp. 3908–3911, 2020. DOI: 10.1109/IGARSS39084.2020.9323293.
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- [16] Massimetti, F., Coppola, D., Laiolo, M., <u>Valade</u>, <u>S</u>, Cigolini, C., Ripepe, M., "Volcanic hot-spot detection using SENTINEL-2: A comparison with MODIS-MIROVA thermal data series," *Remote Sensing*, vol. 12, no. 5, 2020. DOI: 10.3390/rs12050820.
- [17] Sainlot, N., Vlastélic, I., Moune, S., Rose-Koga, E., Schiavi, F., Valade, S., Aguilera, F., "Uptake of gaseous thallium, tellurium, vanadium and molybdenum into anhydrous alum, Lascar volcano fumaroles, Chile," *Geochimica et Cosmochimica Acta*, vol. 275, pp. 64–82, 2020. DOI: 10.1016/j.gca. 2020.02.009.

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2018

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- [22] Ripepe, M., Marchetti, E., Delle Donne, D., Genco, R., Innocenti, L., Lacanna, G., <u>S. Valade</u>, "Infrasonic Early Warning System for Explosive Eruptions," *Journal of Geophysical Research: Solid Earth*, vol. 123, no. 11, pp. 9570–9585, 2018. DOI: 10.1029/2018JB015561.
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2017

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2016

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2015

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2014

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2013

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2012

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2011

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Publications in preparation & under review

- 1. Polcari, M. et al., "2023 activity of Nyamulagira volcano monitored by SAR interferometric coherence" (under review, sent on 10/02/2025 to Science of Remote Sensing)
- 2. Campion, R., Zare A., Valade, S. et al., "Gas measurements reveal fractional degassing and water interaction during a flank eruption of Pacaya Volcano (Guatemala)" (in prep., 95% completed for Bull. Volc.)
- 3. Munguiko Munyamahoro, O., et al., "Transition from irregular to sustained lava lakes activity in continental rifting" (in prep., 90% completed for *Geophys. Res. Lett.*)
- 4. Piñon-Juarez*, S., Valade, S. et al., "Eruption source parameters retrieval combining satellite and infrasound observations at Popocatépetl", (in prep., 80% completed for J. Geophys. Res.)
- 5. Massimetti*, F., **Valade**, **S.** et al., "Recent activity of Popocatépetl volcano: from lava dome to lava pool", (<u>in prep., 75% completed</u> for the *Special Issue "Active Volcanoes of Mexico" in J. S. Am. Earth Sci.*)
- 6. Campion, R., Jacome, P., **Valade, S.** et al., "Long-term gas measurements and satellite imagery give insight into recent activity changes at El Chichón Volcano", (in prep., 50% completed for the Special Issue "Active Volcanoes of Mexico" in J. S. Am. Earth Sci.)

- 7. Hidalgo, S. et al. (en prep.), "Cotopaxi (Ecuador) eruptive sequence: observations and implications" (in prep., 40% completed for Bull. Volc.)
- 8. Valade, S. et al. (en prep.), "First operational infrasonic monitoring system of Popocatépetl: implications for eruption forecasting" (in prep., 10% completed)

Theses

- [1] <u>S. Valade</u>, "Source mechanisms and dynamics of volcanic pyroclastic emissions: A perspective from Doppler radar (VOLDORAD) and other geophysical data," Ph.D. thesis, University Blaise Pascal, Laboratoire Magmas et Volcans (France), 2012, 277 pp.
- [2] <u>S. Valade</u>, "Etude des panaches de cendres du Popocatépetl (mexique) par radar Doppler: Premiers enseignements sur la surveillance à long terme de volcans explosifs avec le VOLDORAD," M.Sc. thesis, University Blaise Pascal, Laboratoire Magmas et Volcans (France), 2008, 48 pp.
- [3] <u>S. Valade</u>, "Etude pétro-stratigraphique et tectonique du flanc nord de la Valle del Bove, Etna (Sicile, Italie)," B.Sc. thesis, Institut Géologique Albert-Lapparent IGAL (France), 2006, 115 pp.

Reports

- [1] ERCC, "Ethiopia seismic and volcanic activity European Civil Protection And Humanitarian Aid Operations Emergency Response Coordination Centre (ERCC) DG ECHO Daily Map | 27/01/2025," 2025, https://erccportal.jrc.ec.europa.eu/ECHO-Products/Maps#/maps/5166.
- [2] Jácome Paz, M. P., Campion, R., Valade, S., Massimetti, F., Zare, A., "Reporte técnico campaña geoquímica del volcán Chichón (México) febrero 2025," 2025, Addressed to: Protección Civil del Estado de Chiapas.
- [3] Balagizi, C., Mavonga, G., Albert, K., Arsène, S., Honoré, C., King, I., Jonathan, K., Sandra, N., Bonheur, N., Niche, M., Marcellin, K., Mathieu, Y., Bo, G., Adriano, N., Gaetana, G., Annalisa, C., Cristina, P., Sven, B., Mario, M., Eugenio, P., Mauro, C., Valade, S., Diego, C., Cristiano, T., Lisa, B., Elisa, T., "Virunga volcanoes supersite biennial report: 2022-2023," 2024. DOI: 10.5281/zenodo. 13825720.
- [4] UNICACH-UNAM, "Reporte interinstitucional UNICACH-UNAM-CENAPRED: Actividad del volcán El Chichón (méxico)," 2024, https://monitoreo.unicach.mx/index.php.
- [5] Balagizi, C., Mavonga, G., Kyambikwa, A., Sadiki, A., Ciraba, H., Iragi, K., Kavuke, J., Nzamu, S., Ngangu, B., Mashagiro, N., Kasereka, M., Safari, F., Rusimbuka, M. B., Habiyakare, T., Niyitegeka, T., Galle, B., Poland, M., Liotta, M., Aoki, Y., Nobile, A., Ganci, G., Cappello, A., Proietti, C., Kolzenburg, S., Borgstrom, S., Mattia, M., Privitera, E., Coltelli, M., Valade, S., Coppola, D., Kelly, P., Griswold, J. P., Tolomei, C., Beccaro, L., Trasatti, E., "Virunga volcanoes supersite biennial report: 2020-2021," 2022. DOI: 10.5281/zenodo.6338730.
- [6] Tedesco, D., "Report for MONUSCO (Mission de l'Organisation des Nations Unies pour la stabilisation en République démocratique du Congo): activity of Virunga Volcanoes Nyamulagira and Nyiragongo," 2022.
- [7] Mora, M., Lesage, P., Donnadieu, F., <u>S. Valade</u>, A., Soto, G., Taylor, W., Alvarado, G., "Joint seismic, acoustic and Doppler radar observations at Arenal volcano, Costa Rica: Preliminary results," The VOLUME Project VOLcanoes: Understanding subsurface mass moveMEnt, 2009, In: Bean C. et al. 2009, VOLUME Project, EU PF6 (No. 018471). ISBN 978-1-905254-39-2, Dublin, https://uca.hal.science/hal-03909396/document.

- [1] <u>Valade</u>, S., Jácome Paz, M. P., Campion, R., *El chichón (mexique)*, https://www.lave-volcans.com/lave_gp/index.php?action=000, *Revue de L'Association Volcanologique Européenne*, June 2025, num. 218, 2025.
- [2] Valade, S., Formación y destrucción de domos en el popocatépetl, https://geogaceta.geofisica. unam.mx/index.php/2023/10/30/octubre-2023/, GeoGaceta, year 1, num. 0, 2023.

Invited talks (selection)

- 1. seminar UNAM (Universidad Nacional Autónoma de México), 24/04/2024, Mecanismos de construcción y destrucción de domos de lava en el volcán Popocatépetl (enlace)
- 2. webinar University of Leeds (DEEPVOLC, UK), 20/03/2024, Volcano monitoring assisted by Deep Learning: experience from the satellite monitoring system MOUNTS
- 3. webinar GDACS (GDACS Global Disaster Alert and Coordination System, EU), $\underline{29/02/2024}$, MOUNTS Monitoring Unrest from Space
- 4. keynote Lamont-Doherty Earth Observatory (Columbia University, USA), "Workshop Novel Instrumentation to Anticipate Volcanic Eruptions", 01-02/02/2021, Satellite monitoring assisted by Deep Learning: a tool to help anticipate eruptions? (link)
- 5. webinar IGP (Instituto Geofísico del Perú), International Conf. "Erupciones Volcánica: Estrategias para la prevención y mitigación del riesgo volcánico" (link), 04-06/11/2020, Detección y vigilancia de domos de lava desde el espacio mediante el sistema MOUNTS
- 6. webinar UNAM (Universidad Nacional Autónoma de México), 22/09/2020, Detección de procesos eruptivos a escala mundial mediante observaciones satelitales multiparamétricas y inteligencia artificial
- 7. webinar CIGIDEN (Centro Nacional de Investigación para la Gestión Integrada de Desastres Naturales, Chile), 10/09/2020, interview on Gestión del riesgo de desastre y nuevas herramientas para la vulcanología (link), parte del "Ciclo de Conversaciones CIGIDEN: Re-pensando la Gestión del Riesgo de Desastre y la Resiliencia"
- 8. webinar IG-EPN (Instituto Geofísico de la Escuela Politécnica Nacional, Ecuador), SGC (Colombia), IGP/INGEMMET (Perú), 04/09/2020, Detección y alerta automática de emisiones de SO2 mediante el sensor TROPOMI satélite Sentinel-5P: Estado actual y evolución futura del sistema de vigilancia MOUNTS (Monitoring Unrest From Space) (link)
- 9. webinar INSIVUMEH (Instituto Nacional de Sismología Vulcanologia Meteorologia e Hidrología, Guatemala) INETER (Instituto Nicaragüense de Estudios Territoriales), 16/06/2020, Monitoreo volcánico por satélites con el sistema MOUNTS
- 10. webinar SGC (Servicio Geológico Colombiano) IGP (Instituto Geofísico del Perú) INGEM-MET (Instituto Geológico Minero y Metalúrgico, Perú), 12/06/2020, Discusión sobre las Funcionalidades y Potencialidades del Sistema de Información Web del Project MOUNTS (link, link)
- 11. seminar LMV (Laboratoire Magmas et Volcans, France), 03/12/2019, Surveillance multiparamétrique des volcans à l'aide des satellites Sentinel et de l'intelligence artificielle ()
- 12. seminar GFZ (GeoForschungsZentrum, Germany), 15/06/2018, "Seismo-geodesy and volcano-geodesy seminar", Global volcano geodesy with the Sentinels

Conferences (selection)

- 1. talk <u>Valade S.</u> (2024) "El volcán desde el espacio", Simposio 30 años de la reactivación del Popocatépetl Estado del conocimiento sobre el volcán que se llevó, UNAM-CENAPRED, 3 Dec. 2024, (enlace)
- 2. talk <u>Valade S.</u> et al. (2024) Lava dome cycles at Popocatépetl: insights into shallow magma dynamics from multiparametric satellite datasets, Cities on Volcanoes 12, La Antigua Guatemala (Guatemala), 11-17 Feb. 2024
- 3. talk <u>Valade S.</u> (2021) Volcanic hazard monitoring from space using MOUNTS, 90° Congresso della Società Geologica Italiana (SGI), Trieste, 14-16 Sept. 2021
- 4. talk D'Hondt O., <u>Valade S.</u>, Hellwich O. (2019) Nonlocal filtering of polarimetric SAR images applied to change detection for volcano monitoring, ESA POLINSAR, Frascati, 28-Jan 1-Feb 2019
- 5. talk <u>Valade S.</u>, et al. (2018) MOUNTS: a Sentinel-powered volcano monitoring system, Cities on Volcanoes 10, Naples (Italy), 6 Sept. 2018

- 6. talk Ripepe R., Marchetti E., Delle Donne D., Genco R., Innocenti L., Lacanna G., <u>Valade S.</u> Infrasonic Early-Warning for Explosive Eruption as operational tool for volcanic risk management, Cities on Volcanoes 10, Naples (Italy), 3 Sept. 2018
- 7. poster Sugimura S., Ripepe M., Lacanna G., Legrand D., <u>Valade S.</u>, Nishimura T. (2018) Analysis of seismo-acoustic signals associated to volcanic eruptions at Stromboli volcano, Cities on Volcanoes 10, Naples (Italy), 7 Sept. 2018
- 8. poster Genco R., <u>Valade S.</u>, Villeneuve N., Peltier A., Ferrazzini V., Di Muro A., Ripepe M. (2016) Infrasound of basaltic effusive activity at Piton de la Fournaise Volcano, EGU General Assembly 2016, Vienna (Austria), 12-17 Apr. 2016
- 9. talk <u>Valade S.</u>, et al. (2015) Internal dynamics and eruptive behaviour of Stromboli volcano: insights from the 2014 eruption, EGU General Assembly 2015, Vienna (Austria), Apr. 2015
- 10. poster <u>Valade S.</u>, Ripepe M., Ulivieri G., Marchetti E., Evolution of eruption dynamics during ash-rich lava fountaining episodes revealed by infrasonic monitoring, Cities on Volcanoes 8, Yogyakarta (Indonesia), 9-13 Sept. 2014
- 11. talk <u>Valade S.</u>, Cerminara, M. (2013) Reconstruction of Volcanic Plume Properties Through Integration of Infrared Imagery and Analytical One-dimensional Models, IAVCEI General Assembly 2013, Kagoshima (Japan), 20–24 Jul. 2013
- 12. poster <u>Valade S.</u>, Harris, A., Sawyer, G., Donnadieu, F., Labazuy, P., Kelfoun, K., Bombrun, M., Barra, V., Hervier, C., Ripepe, M., Delle Donne, D., Lacanna, G., Burton, M., Chevalier, L., Stachowicz, T. (2013) Full bandwidth remote sensing for total parameterization of volcanic plumes. IAVCEI General Assembly 2013, Kagoshima (Japan), 20–24 Jul. 2013
- 13. poster <u>Valade S.</u>, Harris, A. (2013) Ground-based imaging of volcanic plumes for mass flux, 2nd IUGG-WMO workshop on Ash dispersal forecast and civil aviation, World Meteorological Organization, Geneva, Switzerland, 18-20 Nov. 2013
- 14. talk Harris, A., <u>Valade S.</u>, et al. (2012) Full bandwidth remote sensing for total geophysical parameterization of volcanic emissions at Stromboli, CNFGG conference (French National Comity of Geodesy and Geophysics), Clermont-Ferrand, 10-12 Oct. 2012
- 15. poster <u>Valade S.</u>, Donnadieu, F., Augier, A., Gouhier, M. (2011) Discriminating ash plume and ballistics using ground-based Doppler radar: constraints on eruptive parameters from inverse modeling. London Geological Society, William Smith Meeting "Remote sensing of volcanoes & volcanic processes: integrating observation & modeling", 4-5 Oct. 2011
- 16. talk Valade S., Donnadieu, F., Lesage, P., Mora Fernandez, M. Harris, A. J., Alvarado, G. E., (2010) Linking conduit and surface activity at Arenal volcano using broadband seismometers and Doppler radar: do we need a new conduit model?, AGU Fall Meeting, San Francisco, 13-17 Dec. 2010
- 17. poster Valade S., Donnadieu, F., Lesage, P., Fernandez, M. M., Harris, A. J., Alvarado, G. E. (2010) From conduit to surface dynamics at Arenal (Costa Rica): insights from Doppler radar and broadband seismic data, Workshop of the European Seismological Commission (ESC, "Earthquakes and Volcanoes"), Annual Workshop, Besse (France), 26-30 Oct. 2009
- 18. talk <u>Valade S.</u>, Donnadieu F., Lesage P., Mora M., Hervier C. (2009) Cross-correlations of Doppler radar and seismic records: insights into the explosive source mechanisms at Arenal volcano, Costa Rica, Workshop of the IAVCEI Commission on Explosive Volcanism, Clermont-Ferrand (France), 26-29 Oct. 2009
- 19. talk <u>Valade S.</u>, Schmid, A., Donnadieu, F., Mora, M., Lesage, P. (2008) Multi Method Approach for the Remote Monitoring of Arenal Volcano (Costa Rica), European Seismological Commission (ESC, "Earthquakes and Volcanoes") Annual Workshop, Managua (Nicaragua), 21-27 Sept. 2008
- 20. poster <u>Valade S.</u>, Donnadieu, F., Valdes Gonzales, C., Guevara Ortiz, E. (2008) Ground-based Doppler radar monitoring of ash plumes at Popocatépetl volcano, IAVCEI General Assembly 2008, Reykjavik (Island), 18-23 Aug. 2008