

Concurso Científicos Titulares OPIs:

Modelización de reservorios naturales -

Investigación de peligros geológicos

Fase 1/2 - Prueba 1/2: Curriculum vitae

Dr. Leonardo Mingari

February 4, 2025

Geosciences Barcelona (GEO3BCN-CSIC)



Introducción

Introduction: about me

- Postdoctoral researcher
- Institute: Geosciences
Barcelona (GEO3BCN-CSIC)
- Start date: January 2023
- Job position: Doctor FC2
- Contact:
lmingari@geo3bcn.csic.es

Online presence:

- CSIC: [Institutional website](#)
- Scopus: [56015606000](#)
- ResearchGate:
[Leonardo-Mingari](#)
- ORCID: [0000-0002-6584-4699](#)
- GitHub: [lmingari](#)
- GitLab: [lmingari](#)

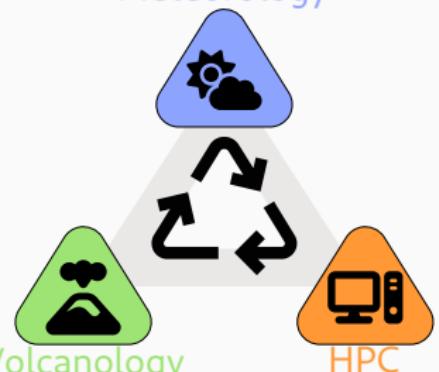


Introduction: curriculum summary

- Research with background in physics, atmospheric sciences, numerical modelling and strong programming skills
- Great potential to develop cutting-edge research in volcanology
- Participation in 10 international projects
- International collaboration: 93.8% (Scopus)
- Active participation in workshops, seminars and conferences
- 18 peer-reviewed articles and chapter books
- Most important peer-reviewed journals of his field
- h-index: 10 (Scopus), 11 (RG), 12 (Scholar)
- Contribution in peer-reviewing papers
- Involved in the thesis supervision of undergraduate, master and PhD students

Introduction: research lines

Meteorology



Volcanology

HPC

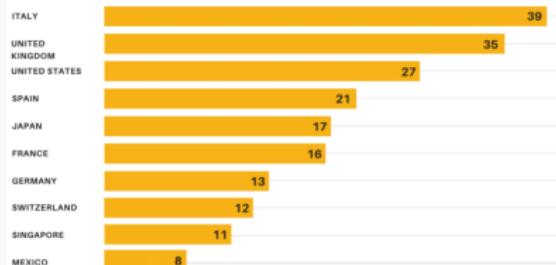
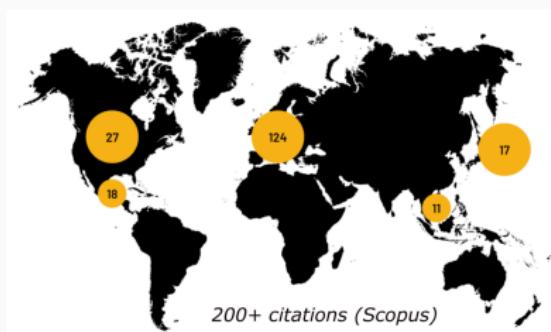
- Modeling Volcanic Processes
- Hazard and Risk Assessment
- Operational forecasting

Specific areas:

1. Computational volcanology
2. Mesoscale & Microscale meteorology
3. Atmospheric dispersion modelling
4. Numerical weather prediction modelling
5. Ensemble-based data assimilation techniques
6. High Performance Computing (HPC) applications
7. Computational fluid dynamics

Introduction: technological transfer

- One of the main developers of FALL3D
- A model for atmospheric transport of aerosols primarily focused on volcanological applications
- Track record of 200+ publications
- Ever-growing community of users worldwide
- Regular support to operational forecasting centers, such as Volcanic Ash Advisory Centres (VAAC)
- We prioritise research that addresses societal challenges and allows the transfer of technology and innovation to society



Introduction: education and research career

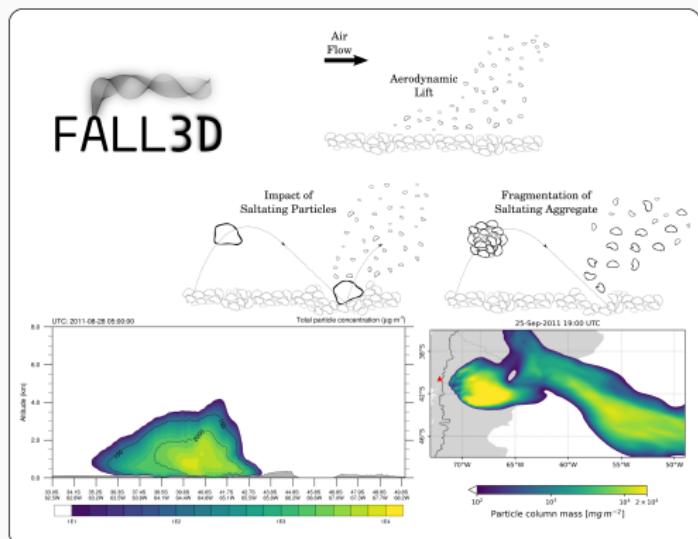
Education

- 2018: PhD in Physical Sciences
 - Department of Physics, University of Buenos Aires, Argentina
 - Sub-area: Earth & Environmental Sciences
 - Distinction: Outstanding thesis
- 2012: University Degree in Physics
 - Department of Physics, University of Buenos Aires, Argentina
 - Average university grade: 9.04/10.0

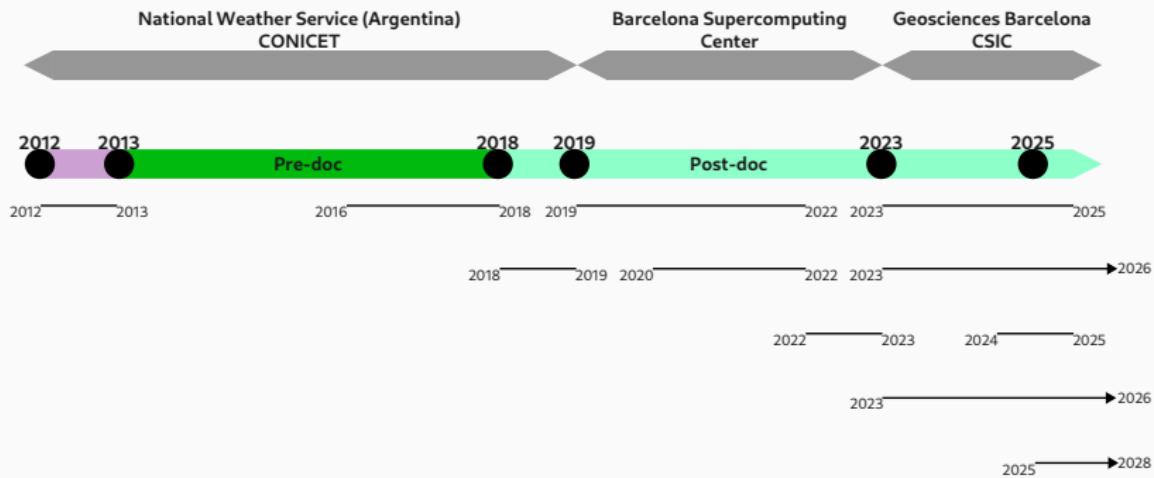
Introduction: education and research career

Tesis doctoral (2013-2018):

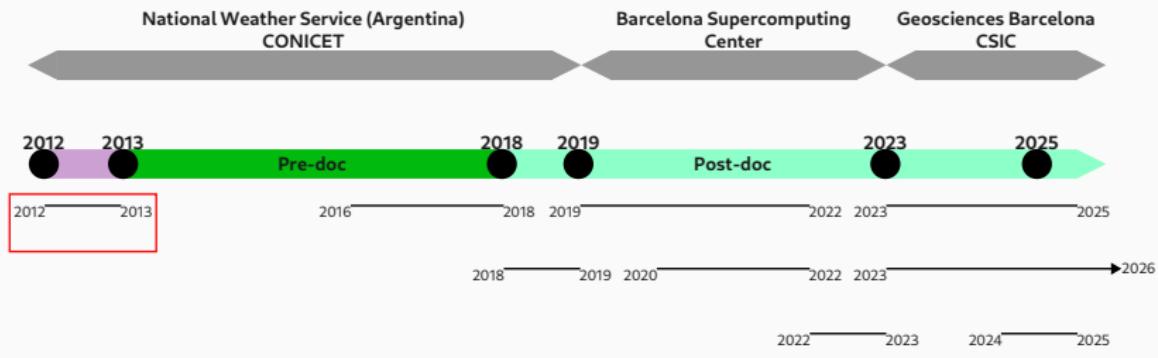
- “Resuspensión eólica de depósitos volcánicos de caída: parametrización, modelización y pronóstico operacional”
- Calificación sobresaliente.



Introduction: education and research career



Introduction: education and research career



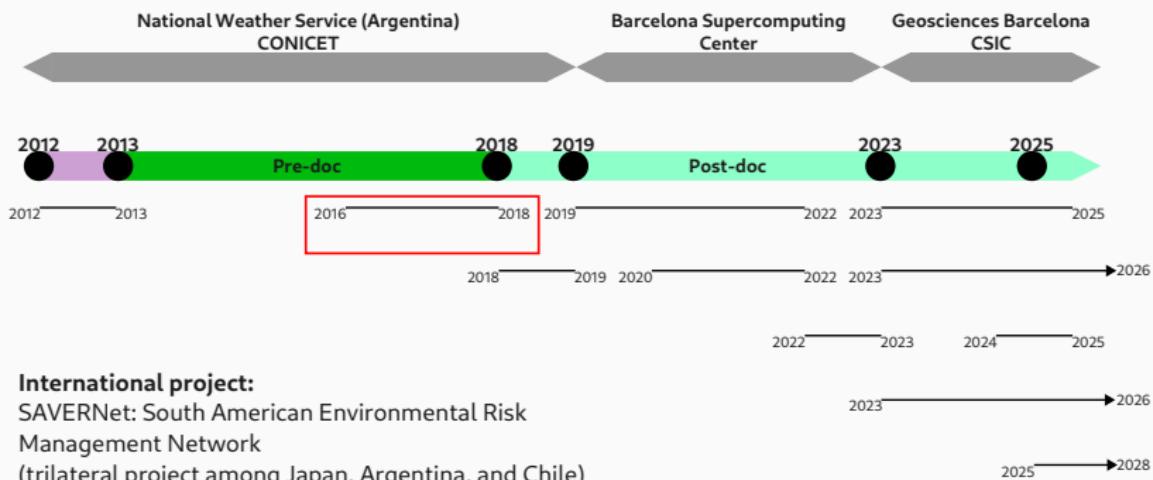
National project:

Aplicaciones de modelos numéricos de última generación, en el ámbito del Servicio Meteorológico Nacional para el pronóstico del tiempo. Estudios de vulnerabilidad del medio ambiente e impacto socioeconómico.

PI: Estela Collini

National Weather Service (Argentina)

Introduction: education and research career



International project:

SAVERNet: South American Environmental Risk

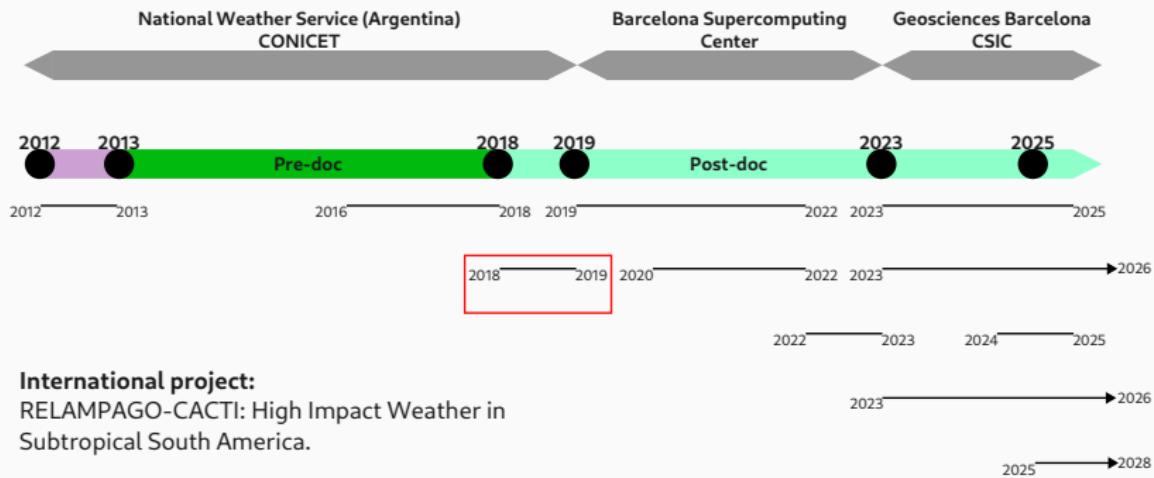
Management Network

(trilateral project among Japan, Argentina, and Chile)

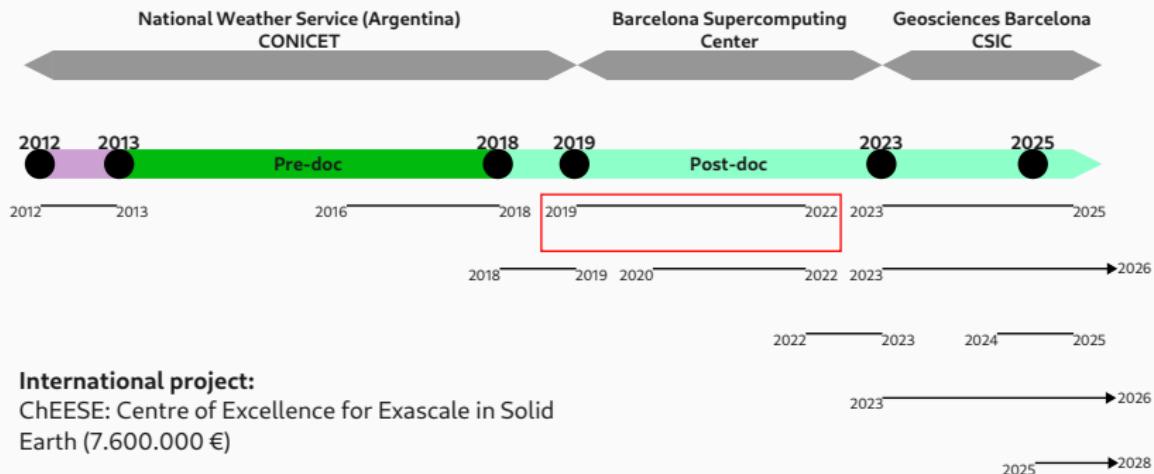
PI: Akira Mizuno

National Weather Service (Argentina)

Introduction: education and research career

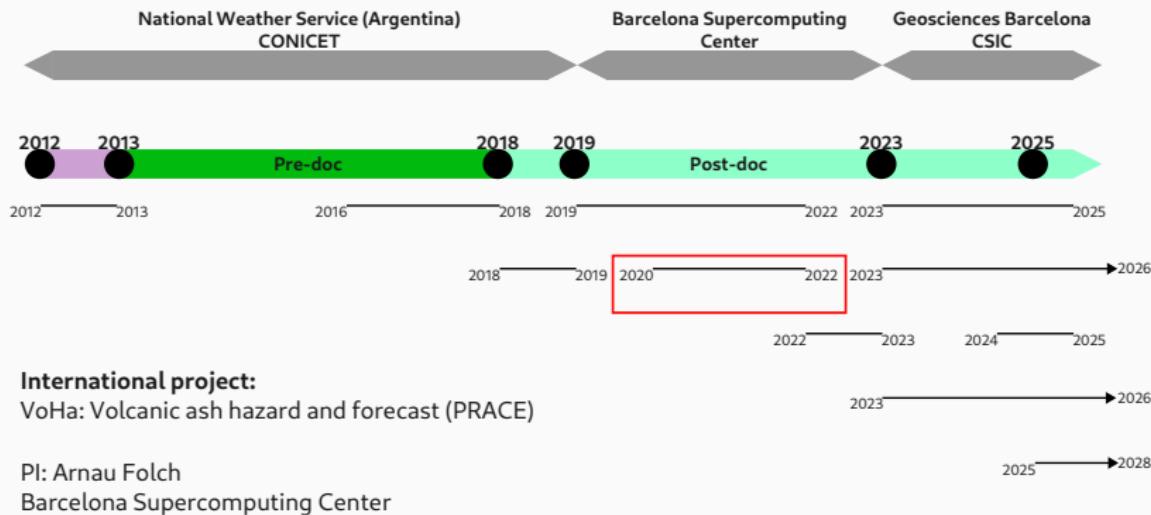


Introduction: education and research career

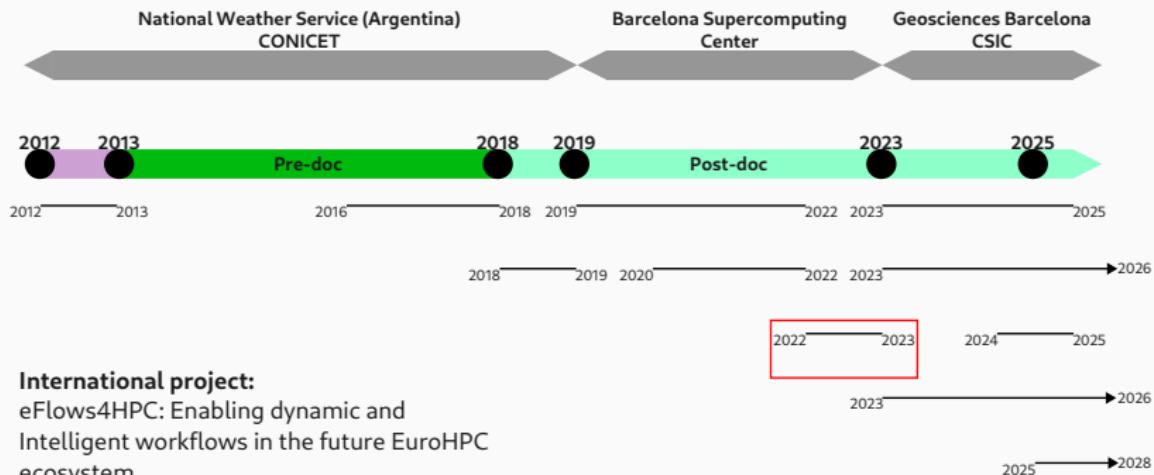


PI: Arnau Folch
Barcelona Supercomputing Center

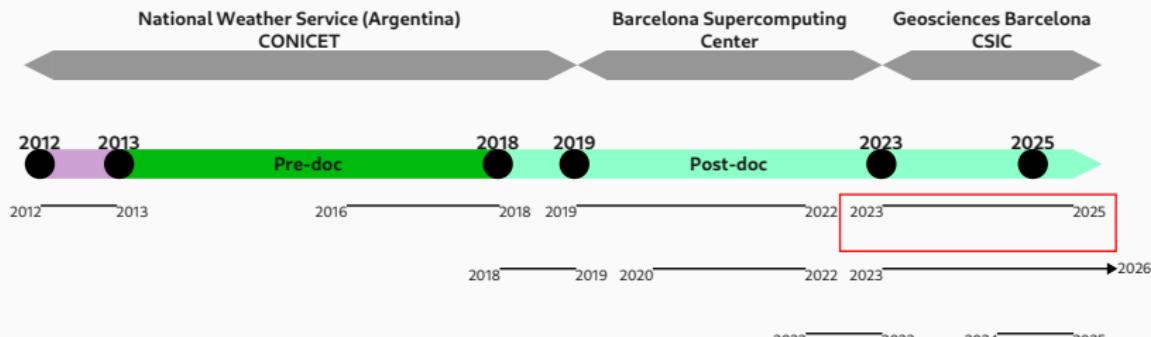
Introduction: education and research career



Introduction: education and research career



Introduction: education and research career



International project:

DT-GEO: A Digital Twin for GEophysical extremes

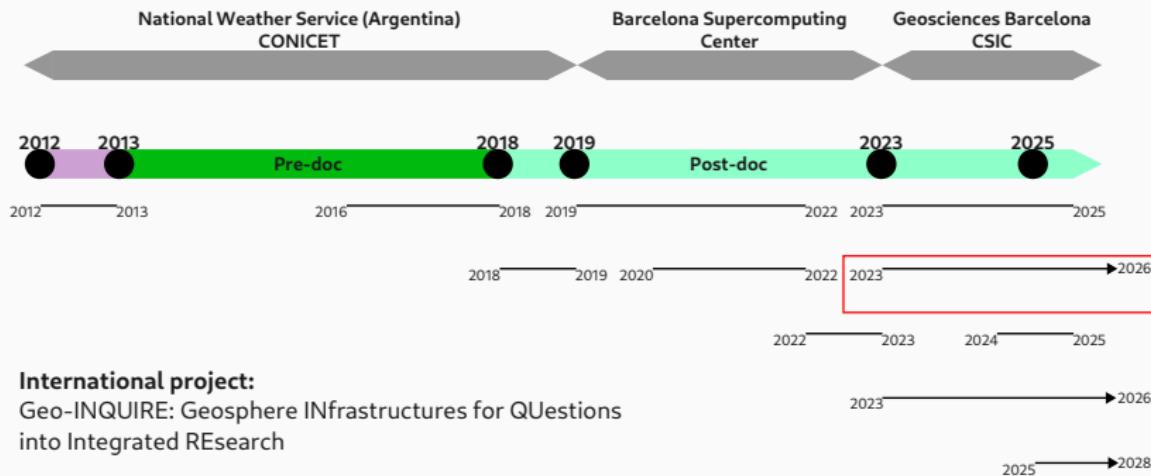
PI: Arnaud Folch

Geosciences Barcelona (GEO3BCN-CSIC)

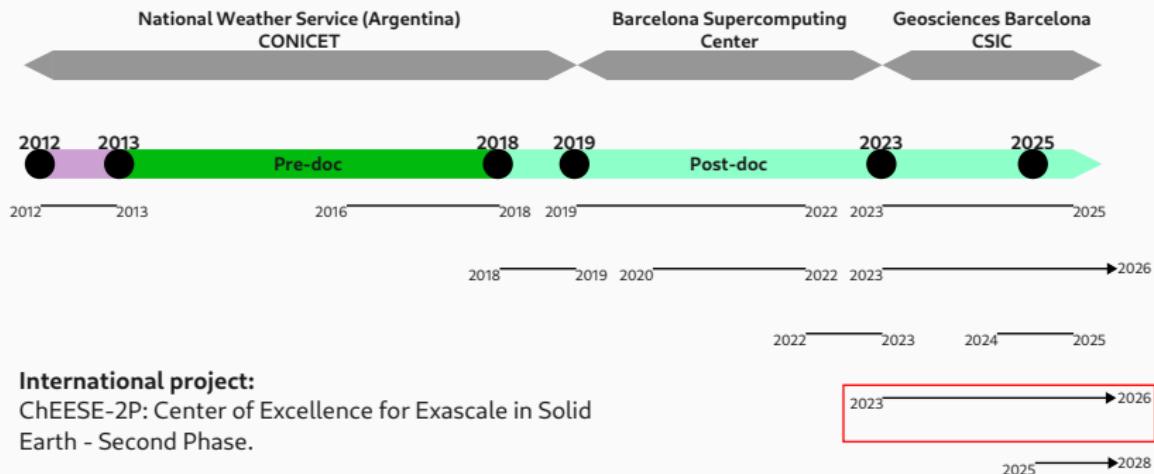
2023 → 2026

2025 → 2028

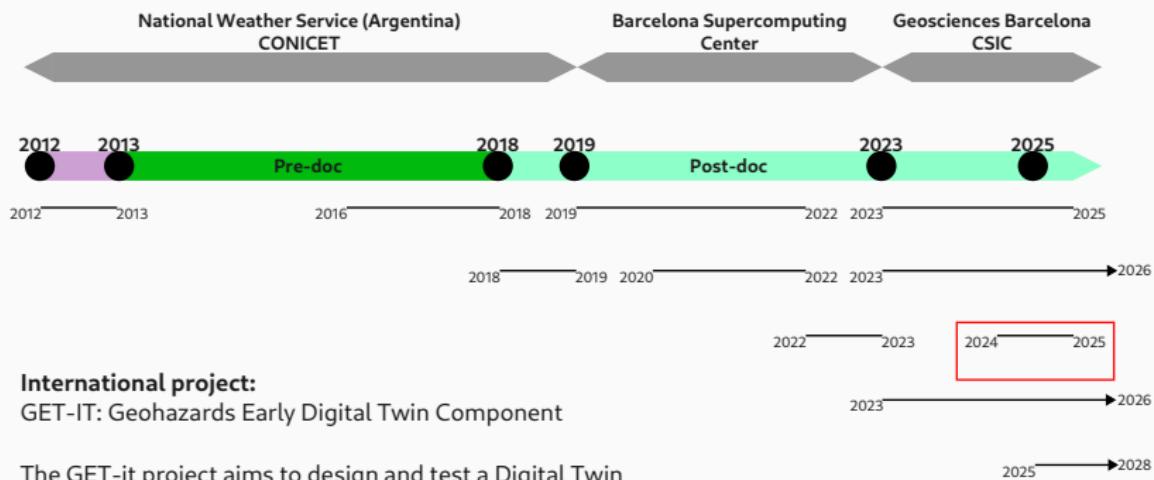
Introduction: education and research career



Introduction: education and research career



Introduction: education and research career



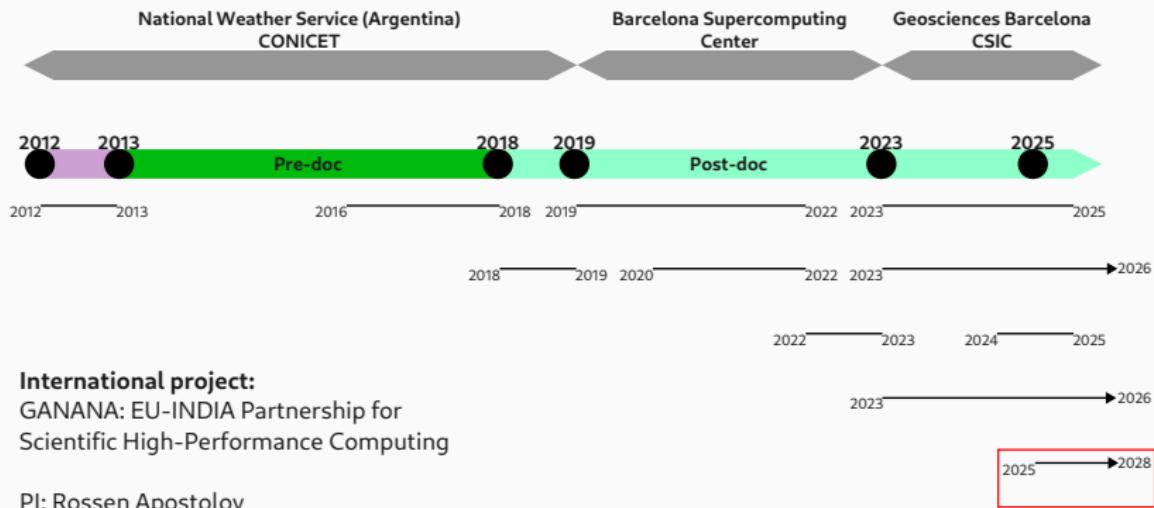
International project:

GET-IT: Geohazards Early Digital Twin Component

The GET-it project aims to design and test a Digital Twin Component (DTC) for geohazards (volcanoes, earthquakes and other natural or anthropic origin geohazards) exploiting multi-sensor EO data and AI techniques.

PI: Salvatore Stramondo
Geosciences Barcelona (GEO3BCN-CSIC)

Introduction: education and research career



International project:

GANANA: EU-INDIA Partnership for
Scientific High-Performance Computing

PI: Rossen Apostolov

Geosciences Barcelona (GEO3BCN-CSIC)

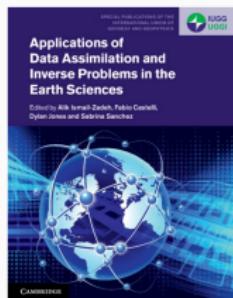
Aportaciones científico-técnicas

Peer-reviewed publications

Type	Journal	Year	Author	1st Quartile	1st Decile	Citations
Article	Commun. Earth Environ.	2024	2nd	Yes	Yes (10)	3
Article	Geosci. Model Dev.	2023	1st	Yes	Yes (9)	3
Article	Future Gener. Comput. Syst.	2023	-	Yes	Yes (31)	17
Article	Atmos. Chem. Phys.	2022	1st	Yes	Yes (6)	19
Article	Nat. Hazards Earth Syst. Sci.	2022	-	Yes	No	16
Article	Front. Earth Sci.	2022	2nd	Yes	No	17
Article	Atmos. Res.	2021	-	Yes	No	11
Article	Geosci. Model Dev.	2021	2nd	Yes	Yes (5)	35
Article	Atmosphere	2020	1st	No (Q2)	No	12
Article	Sci. Rep.	2020	3rd	Yes	Yes (10)	8
Article	Geosci. Model Dev.	2020	2nd	Yes	Yes (3)	56
Article	Front. Earth Sci.	2020	-	Yes	No	43
Conf. paper	Proc. SPIE	2018	-	No	No	0
Article	Atmos. Chem. Phys.	2017	1st	Yes	Yes (4)	25
Article	Remote Sens. Lett.	2017	2nd	Yes	No	7
Article	J. Volcanol. Geotherm. Res.	2016	3rd	Yes	No	68
Article	Nat. Hazards Earth Syst. Sci.	2014	2nd	Yes	No	58
Book ch.	N/A	2023	2nd	N/A	N/A	1

Publication summary

- 17 peer-reviewed articles
- 1 book chapter
- articles in top-10: 7
- 1st author: 4
- 1st author in Q1 (D1): 3
- 1st author in top-10: 3



Numerical simulations of wildland fire over complex terrain:
the Florida Bush episode in June 2019

Chair: Michael Ringer (University of Exeter, United Kingdom);
Co-chair: Fabio Cortellini (University of Padova, Italy);
Organizer: Alkis Vassili Zadek (University of Padova, Italy)

Reconstructing seafloor deposits via ensemble-based data assimilation techniques

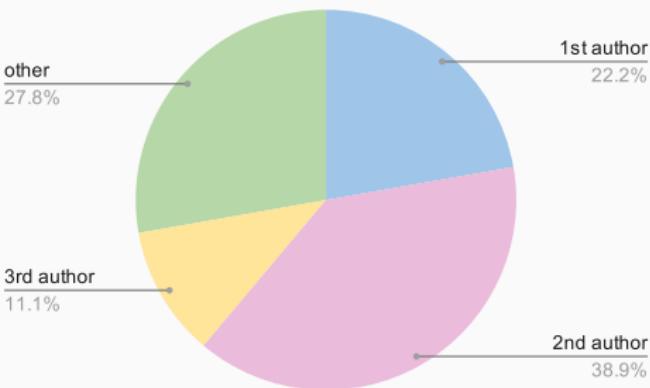
Chair: Michael Ringer (University of Exeter, United Kingdom);
Co-chair: Alkis Vassili Zadek (University of Padova, Italy);
Organizer: Fabio Cortellini (University of Padova, Italy)

Data assimilation of volcanic aerosol observations using
PALM3D-PDAF

Chair: Michael Ringer (University of Exeter, United Kingdom);
Co-chair: Alkis Vassili Zadek (University of Padova, Italy);
Organizer: Fabio Cortellini (University of Padova, Italy)

Publication summary

Author order	Publications (%)
1st	4 (22.2%)
1st+2nd	11 (61.1%)
1st+2nd+3rd	13 (72.2%)
other	5 (27.8%)



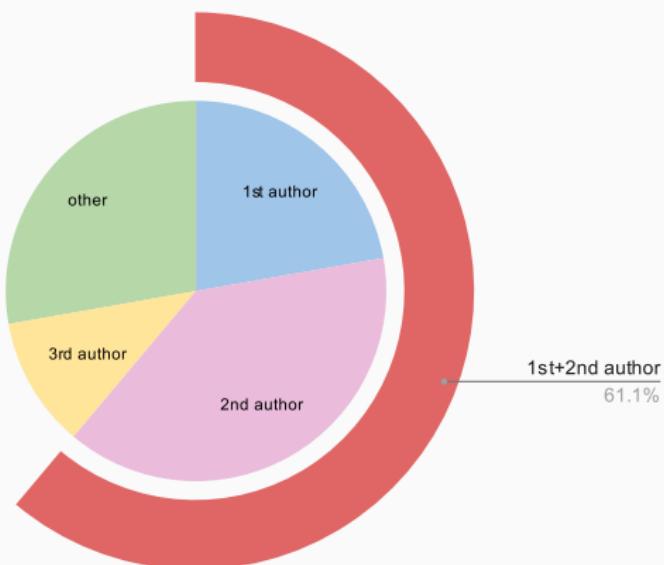
Journal	Publications (%)
Q1	15 (88.2%)
D1	9 (52.9%)
Top-10	7 (41.2%)

* Based on SJR

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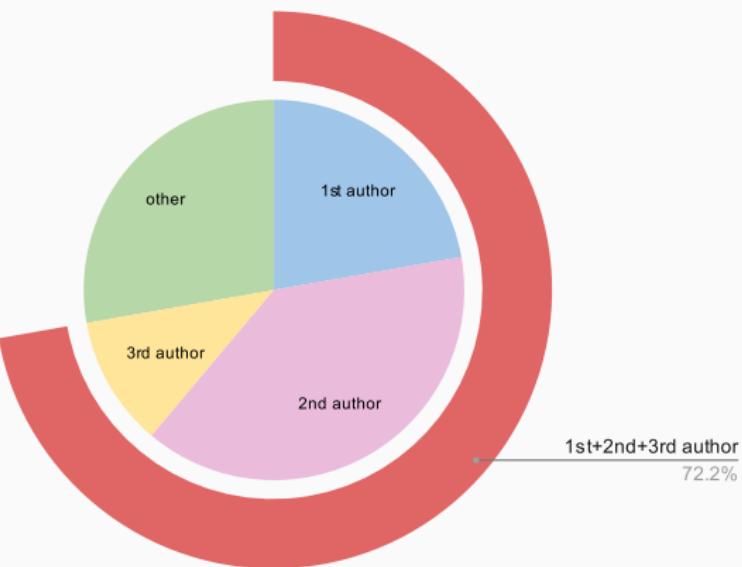


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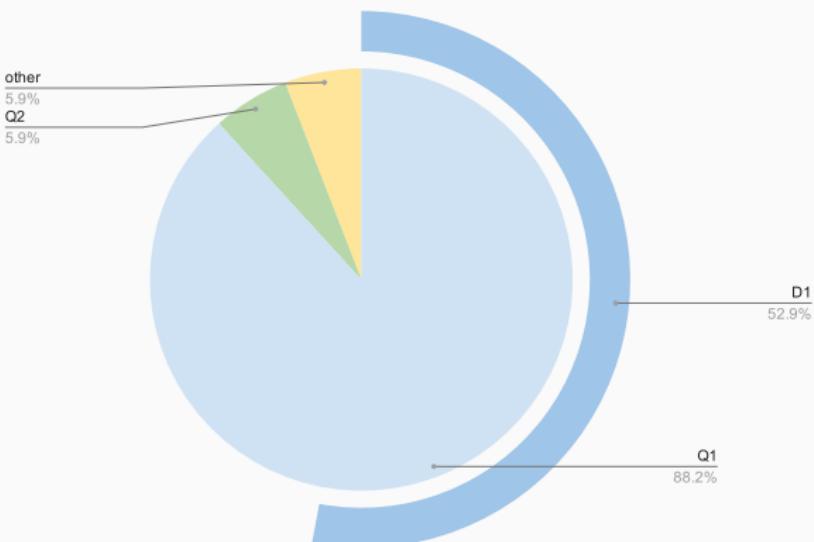
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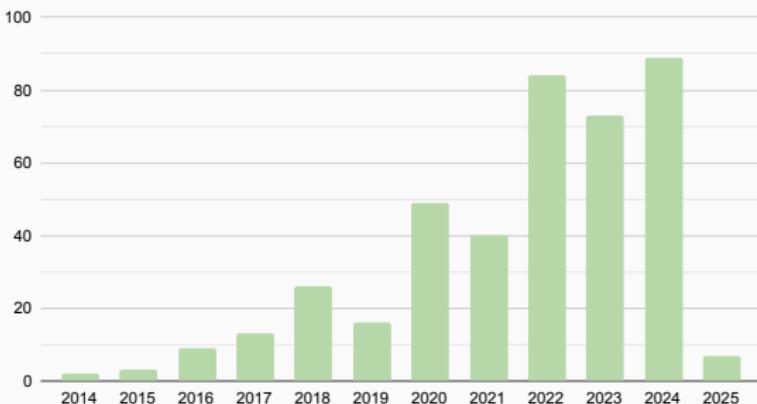
^* Based on SJR



Publication summary

	Scholar	ResearchGate	Scopus
Citations	415	409	292
h-index	12	11	10
i10-index	12		
Field-Weighted CI			1.24

Citations per year (Scholar)



Scientific/technological transfer: FALL3D

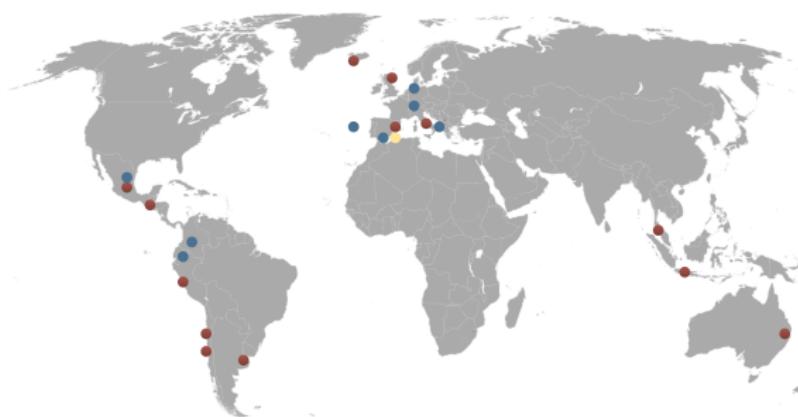
- One of the main developers of the FALL3D model
- The code is free and open source
- Track record of 200+ publications
- FALL3D: flagship codes in the European Centre of Excellence for Exascale in Solid Earth (ChEESE)
- Deployed in the most powerful European supercomputers

The screenshot shows the GitHub project page for 'FALL3D'. At the top, there's a large logo consisting of a wavy line and the text 'FALL3D' in a bold, sans-serif font.

The page has a navigation bar with links for 'Why GitHub', 'Project', and 'Explore'. The main area is titled 'FALL3D' and shows a list of files and commits. The commits are listed in a table with columns for 'Name', 'Last comment', and 'Last update'. Some commits are from 'merge master' and others are from specific contributors like 'gplato' and 'gplato-cyber'. The commits are dated from '3 months ago' to '9 months ago'. On the right side, there's a sidebar with 'Project Information' showing statistics: 6999 Commits, 2 Branches, 7 Tags, 2 Releases, and links to 'README', 'LICENSE', 'CONTRIBUTING', and 'GitHub Pages'. A note at the bottom says 'Created on February 20, 2023'.

Scientific/technological transfer: FALL3D

FALL3D: relevant code users



Public institutes (operational): ●

INGV (Italy)
CSIC (Spain)
IMO (Iceland)
BGS (UK)
SMN (Argentina)
IGP (Perú)
SERNAGEOMIN (Chile)
Dirección Meteorológica de Chile (Chile)
BMKG (Indonesia)
VAAC Buenos Aires (Argentina)
BSC (Spain)
GNS (New Zealand)
Bureau of Meteorology (Australia)
EOS (Singapore)
Cenapred (México)
INSIVUMEH (Guatemala)

Academic: ●

University of Geneva (Switzerland)
University of Bari (Italy)
University of Bremen (Germany)
University of Granada (Spain)
UNAM (México)
Univ. San Francisco de Quito (Ecuador)
Universidad de Nariño (Colombia)
University Azores (Portugal)

Private: ●

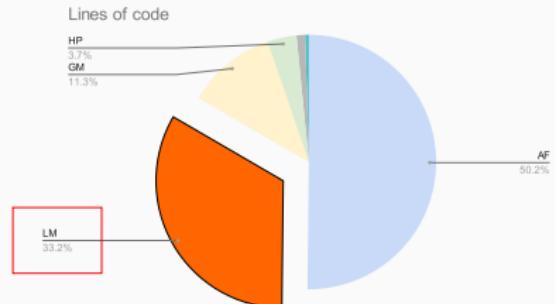
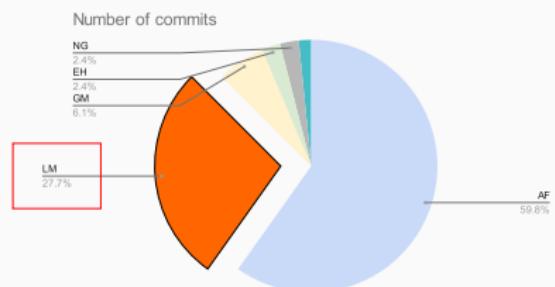
Mitiga Solutions (Spain)

Remarkable collaborations:

- Icelandic Meteorological Office
- Buenos Aires Volcanic Ash Advisory Centre (VAAC)
- Universidad Nacional Autónoma de México (UNAM)
- NVIDIA corp.

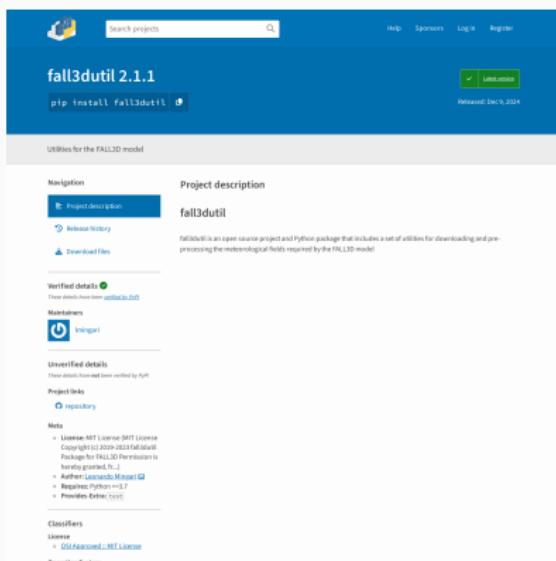
Scientific/technological transfer: FALL3D

Contributions		Total
Commits	208	752
Lines of code	24406	73488



Scientific/technological transfer: FALL3D

- **fall3dutil** Python package
- Pre-processing tool required to configure FALL3D
- Open source
- Single contributor
- 1832 lines of code
- Extensively used by FALL3D users



Otros méritos curriculares

Otros méritos curriculares: Supervising experience

PhD Thesis (ongoing) - 2020/Present:

- Student: Eliana Vázquez
- Supervisors: **Leonardo Mingari & Soledad Osores**
- Institute: University of Buenos Aires, Buenos Aires, Argentina

University degree thesis (Licenciatura) - 2024/2025:

- Student: Micaela Clara Maurizi
- Supervisors: Soledad Osores & **Leonardo Mingari**
- Institute: University of Buenos Aires, Buenos Aires, Argentina

Master TFM - 2024:

- Student: Samanta Córdova Sánchez
- Supervisors: Dario Pedrazzi & **Leonardo Mingari**
- Institute: Universitat Autònoma de Barcelona, Barcelona, Spain

Master TFM - 2024:

- Student: Joan Aymerich Nicolàs
- Supervisors: **Leonardo Mingari & Arnau Folch**
- Institute: Universitat Autònoma de Barcelona, Barcelona, Spain

Otros méritos curriculares: Community involvement

Peer review activity

- Review for journal: Atmosphere (2021)
- Review for journal: Atmospheric Chemistry and Physics (2021): Q1 journal (top-10)

Participation in scientific meetings

- co-convener in session: “Technologies for Forecasting Volcanic Hazards: Enhancing Risk Mitigation through Observations and Models”, EGU General Assembly 2025
- co-convener in session: “Forecasting volcanic hazards: new technologies and probabilistic multi-source and multi-hazard assessment combining HPC and field data”, Cities on Volcanoes 12 (Conference), Antigua, Guatemala, 2024

Otros méritos curriculares: Dissemination of research and science outreach

1. **Training course (2024): Computational volcanology**
 - Lecturer
 - Barcelona Supercomputing Center, Barcelona, Spain
2. **PATC course (2019): HPC and natural hazards**
 - Lecturer
 - Barcelona Supercomputing Center, Barcelona, Spain
3. **Master course (2017): Remote Sensing and Modelling of Volcanic Eruptions**
 - Visiting Lecturer
 - Instituto Mario Gulich, Córdoba, Argentina
4. **University courses (2009-2016): Math/Physics**
 - Teaching Assistant
 - University of Buenos Aires

Otros méritos curriculares: Dissemination of research and science outreach

Media coverage:

- During the crisis of the 2021 La Palma eruption I implemented an operational forecasting system at the Barcelona Supercomputing Center (BSC)
- Operative for three months since September 2021
- Daily predictions to the scientific committee of PEVOLCA (Plan de Emergencias Volcánicas de Canarias)
- This research received significant national and regional media coverage
- This work was featured on La Vanguardia (digital version) front page and I was interviewed by RTVE and the video was published on their website

The interview is also available on YouTube with 13K views [YouTube](#)



Otros méritos curriculares: Dissemination of research and science outreach

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MARE NOSTRUM: EL SUPERORDENADOR que ayudar a PREDECIR la evolución del ...

13 K visualizaciones hace 3 a #Volcán ... y más



RTVE Noticias 2,36 M

Suscríbete

RTVE es un servicio de difusión pública español.
[Wikipedia](#) :

Otros méritos curriculares: Dissemination of research and science outreach

<https://www.lavanguardia.com/actualidad/2022/05/16/big-vang/162103000000000000.html>

LA VANGUARDIA
Big Vang

EDICIONES | DE PORTADA | DE ESPAÑA | INTERNACIONAL | FINANZAS | INVESTIGACIÓN | TECNOLOGÍAS | VIDA MÁS ALLÁ DEL OFICIO | SUSCRIPCIONES

CONTENIDOS EN ERGENCIAS

El MareNostrum contra el volcán: cómo el superordenador limita los daños de la erupción

• La terna de decisones en La Palma incorpora un macrocálculo de la supercomputación de Vigo

• Volcán en La Palma, en directo | Nuevas temblores en la isla



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NEWS ARTICLE | Published: 25 November 2022

EU Centre of Excellence in High Performance Computing: ChEESE's urgent computing in the service of Cumbre Vieja volcanic eruption

The EU-funded ChEESE Centre of Excellence has been instrumental in predicting the behavior of volcanoes, with crucial and timely, urgent crisis management of the Cumbre Vieja eruption in La Palma, Canary Islands.

The Cumbre Vieja's eruption, which began in September 2021, has produced about 100 million cubic meters of lava flows, reaching a maximum height of 400 meters, the largest lava flow in the last 500 years, and the disruption of several villages. In response to this, the "target computing" capacities emergency use of computing resources have been activated by the Spanish Ministry of Science and Innovation and the Barcelona Supercomputing Center have been used. ChEESE scientists have been running simulations to predict the evolution and migration of the ongoing volcanic activity, using the MareNostrum 4 supercomputer installed at the Centro de Supercomputación de Madrid (CINES) in Madrid, Spain. These simulations provide information to the eruption's evolution and cover the Canary Islands at a 1 km resolution. And the results of these simulations are being used by the emergency services, composed of representatives of the Canary Islands regional government, civil protection authorities, and the Guardia Civil. The system is set to analyse and mitigate the effects of the lava flow and atmospheric emissions, keeping the people safe and also minimizing the risk

Ir a más temas | European Commission | Shaping Europe's digital future | Home | Policies | Activities | News | Library | Funding | Calendar | Consultations | All offices | Home | Press releases | 80 years of excellence in high performance computing: CHEESE's urgent computing in the service of Cumbre Vieja volcanic eruption

Related topics

Research and innovation

PORTRAÍTAS ESPAÑA: CATALUÑA

El superordenador de Barcelona que predice el volcán de La Palma: "Sería imposible sin él"

Alex Aragónés • Barcelona
16/10/2022 - 10:51h.



El superordenador ubicado en Barcelona. EUROPA PRESS

Ir a más temas | European Commission | Research and Innovation | Home | Projects | Success stories | All success stories | Supercomputers help save lives during natural disasters

Supercomputers help save lives during natural disasters

Natural disasters threaten citizens around the world with disruptions to essential services, damage to property and infrastructure, and loss of life. The EU-funded ChEESE project uses supercomputing to help to mitigate disaster scenarios. As a result, authorities in La Palma were able to make informed decisions and save lives when the Cumbre Vieja volcano erupted.



Ir a más temas | European Commission | Research and Innovation | Home | Projects | Success stories | All success stories | Supercomputers help save lives during natural disasters

Otros méritos curriculares: Other publications

FALL3D userguide

The screenshot shows the 'User Guide' page of the FALL3D documentation. The left sidebar contains a navigation menu with sections like 'User Guide', 'Reference Guide', 'Tutorials', 'Model Data', 'Case Studies', 'FAQ', 'Links', and 'Acknowledgements'. The main content area is titled 'User Guide' and features the 'FALL3D' logo. Below it is a section titled 'Introduction' which provides a brief overview of the model's purpose and capabilities. A note at the bottom states that the code is available on GitHub and Zenodo.

Reporte técnico



Proyecto SAVERNet
Productos de datos Lidar para
dispersión elástica

Nota Técnica SMN 2017-5

Leonardo Mingari^{1,2}

¹ Departamento de Física Química y Dinámica, Centro de Estudios Avanzados, Centro de Investigación en Física de la Materia

² SMN/CONICET

Junio 2017



Otros méritos curriculares: Awards, mentions and fellowships

1. **Ph.D. dissertation:** “Resuspensión eólica de depósitos volcánicos de caída: parametrización, modelización y pronóstico operacional”. Calificación sobresaliente.
2. **Fully-funded PhD scholarship (2013-2018):** Granted after a competitive selection process. Funded by CONICET (Argentinian National Scientific Research Council)
3. **Scholarship for a research stay abroad (2016):** I was awarded a scholarship for a 9-month research stay abroad (Barcelona Supercomputing Center, Barcelona, Spain)
4. **Finalist for the 2023 IAVCEI George Walker Award:** My nomination was supported by three colleagues: i. Antonio Costa (INGV), ii. Giovanni Macedonio (INGV) and iii. Soledad Osores (SMN)

Internacionalización

Internacionalización: Postdoc stays in international research centers

1. Geosciences Barcelona (Spain): 2+ years

- Main international collaborations:
 - Icelandic Meteorological Office, Iceland (Sara Barsotti et al.)
 - National Institute of Geophysics and Volcanology, Italy (Antonio Costa et al.)
 - Geosciences Centre, UNAM, Mexico (Lucia Capra)

2. Barcelona Supercomputing Center (Spain): 3+ years

- Main international collaborations:
 - ETH Zurich, Switzerland (Marta Pienkowska)
 - National Institute of Geophysics and Volcanology, Italy (Giovanni Macedonio et al.)
 - Icelandic Meteorological Office, Iceland (Manuel Titos et al.)
 - University of Oxford, United Kingdom (Andrew T. Prata)
 - University of Geneva, Switzerland (Lucia Dominguez)

Note: International centers are understood to be those located in countries other than the one in which the researcher has carried out his/her training

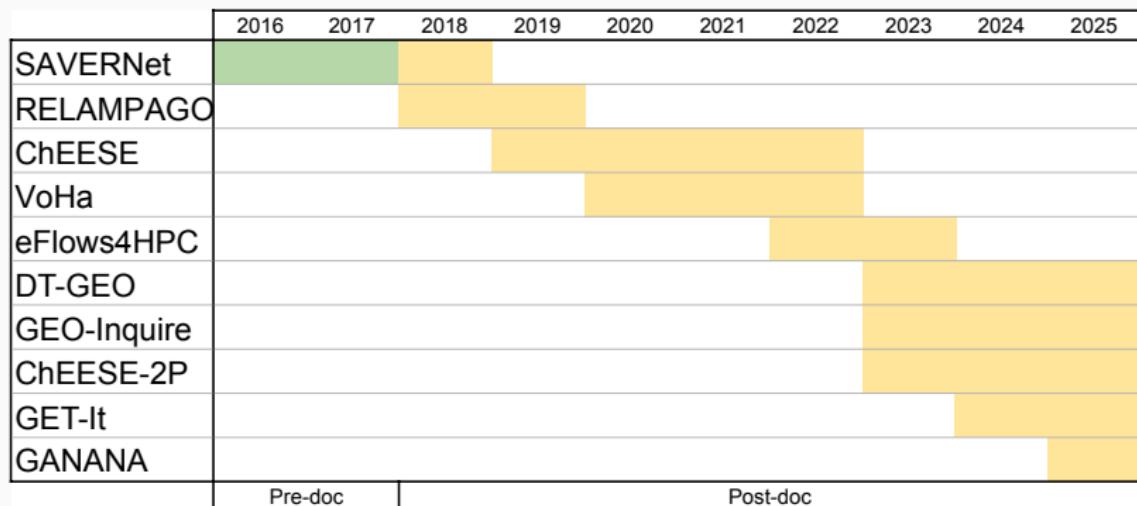
Internacionalización: International co-authors

- 93.8% International collaboration: Percent of documents co-authored with researchers in other countries/regions (Scopus)
- International collaborations with 1+ co-authorships:

Author name	Co-authored documents	Institution
Costa, A.	7	INGV, Bologna, Italy
Macedonio, G.	7	INGV, Naples, Italy
A. Prata	3	CSIRO, Australia
L. Dominguez	3	U. de Genève, Switzerland
C. Bonadonna	3	U. de Genève, Switzerland
L. Sandri	2	INGV, Bologna, Italy
F. Pardini	2	INGV, Pisa, Italy
B. Montesinos	2	INGV, Bologna, Italy
M. Titos	2	IMO, Iceland
S. Barsotti	2	IMO, Iceland

Internacionalización: Participation in international projects

- Involved in 10+ international projects since 2016:



Internacionalización: Other short research stays

Pre-doc stays

- 2017: National Institute for Environmental Studies, Tsukuba, Japan (1 month)
- 2016: Barcelona Supercomputing Center, Spain (9 months)

Post-doc stays

- 2024: Geosciences Centre, UNAM, Mexico (1 week)
- 2024: Icelandic Meteorological Office, Iceland (2 weeks)
- 2023: Icelandic Meteorological Office, Iceland (1 week)
- 2021: National Institute of Geophysics and Volcanology (INGV), Bologna, Italy (1 week)

Liderazgo

Liderazgo

- Applicant Ramón y Cajal 2024
- Applicant Concurso oposición Científicos Titulares OPIs 2024