Matthieu SANCHEZ

Currently a PhD student at CRPG, I investigate volatile cycling in subduction zones, with a focus on the H_2O storage capacity of arc lower crust, combining petrology and geochemistry through in situ SIMS analyses of natural samples

Contact

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Driving licence (for cars)

Skills

- LG-SIMS (IMS 1280)
- EPMA
- Raman spectroscopy
- LA-ICPMS
- SEM
- FTIR
- Samples preparation
- Matlab
- Geochemical and petrological modeling

Research profiles

CRPG

https://crpg.univ-lorraine.fr/membres/matthieu-sanchez/

Research experiences

2024 - 2027 : PhD student

Centre de Recherches Pétrographiques et Géochimiques (CRPG), Université de Lorraine, CNRS, Nancy (France)

"Constraining volatile storage in the lower crust of arcs"

Supervised by Véronique LE ROUX and Laurette PIANI

- Quantify the volatile storage capacity and distribution of the Jurassic Talkeetna arc section in Alaska through in situ SIMS measurements of minerals across multiple lithologies
- Identify deep fluid sources as well as igneous and metamorphic processes that could affect volatile abundance in deep arc crust and sub-lithospheric mantle
- Produce new global models of volatile budgets and fluxes by integrating the contribution of arc lower crustal reservoirs
- Improve analytical capabilities at the CRPG for both H and D/H (δD) measurements through the development of new analytical protocols and a more exhaustive suite of reference materials

2024 : Master's degree internship (5 months)

Laboratoire Magmas et Volcans (LMV), Université Clermont-Auvergne, Clermont-Ferrand (FRANCE)

"Primitive, oxidized and metalliferous magmas of the forearc zone of New-Ireland (Papua New-Guinea)".

Supervised by Antoine BENARD and Bertrand MOINE

- Petrological and geochemical study of melt inclusions in primitive undersaturated rocks (ankaramites) of the forearc zone to constrain the behaviour and evolution of sulfur.
- Characterize major, trace and volatile compositions of minerals and melt inclusions to determine the nature of the source and fusion conditions.
- Assess the links between magma evolution and metal transport

2023 : Master's degree internship (2 months)

Laboratoire Magmas et Volcans (LMV), Université Clermont-Auvergne, Clermont-Ferrand (FRANCE)

"Dehydration of melt inclusions in magmatic arcs : consequences on their silica content". Supervised by Muriel LAUBIER

- Study of melt inclusions and olivine hosted minerals (Fo>80) from different subduction zones to determine the influence of H_2O on the silica content.
- Estimate the initial water contents of primitive arcs magmas

Education

Master's degree "Magmas et Volcans" at LMV
2022-2024
Université Clermont Auvergne

Bachelor's degree in Earth Science (with high honors)
2019-2022
Université de La Réunion

References

- **Véronique LE ROUX**
  PhD supervisor
  07.80.75.58.42
  Veronique.le-roux@univ-lorraine.fr

- **Laurette PIANI**
  PhD co-supervisor
  06.17.13.07.91
  Laurette.piani@univ-lorraine.fr

- **Antoine BENARD**
  M2 Internship supervisor
  07.89.53.46.82
  Antoine.benard@uca.fr

- **Muriel LAUBIER**
  M1 Internship supervisor
  06.08.10.46.49
  Muriel.laubier@uca.fr

Languages

- **French** (mother tongue)
- **English** (C1)

2021-2022 : Internship (18 weeks)

Stratagem 974, Université de La Réunion (974), France

"Application of geophysical methods in geology, environnemental and civil engineering". Supervised by Emilie ROULLEAU

- Self-Potential (SP) at the Piton de La Fournaise and Electrical Resistivity Tomography (ERT)
- Gas (He) sampling to determine the heating source

Teaching experiences

2026 : Teaching assistant in geochemistry (ENSG)

- Delivered tutorials classes of geochemistry of the mantle and geochronology to 4th-year students at ENSG (Ecole Nationale Supérieure de Géologie)

2025 : Teaching assistant in igneous petrology (UL)

- Leading practical classes in optical microscopy and petrographic interpretation for 2nd year undergraduate students at Université de Lorraine (UL)

2025 : Teaching assistant for a fieldwork (UL)

- Supervised field excursion around the Eiffel volcano (Germany) to study volcanic deposits and processes to 2nd year undergraduate students

Conferences / workshops attended

2026 : European Geosciences Union (EGU, Vienna)

- Presented a poster entitled "The lower crust as a volatile reservoir: new constraints from the Talkeetna arc (Alaska)" in the session "Global cycle of volatiles"
- **Award winner of the OSPP (Outstanding Student and PhD Presentation)**

2026 : E-Volatiles workshop (Orléans, France)

- Network with the aim of coordinating the French community about planetary volatiles
- Talks, posters and discussions about volatiles, their reservoirs, the fluxes and their origins on Earth and the Solar System

2025 : Gordon Research Conference (GRC, Massachusetts)

- "Interior of the Earth" about Volatiles, Melt and Viscosity: Consequences for Mantle Evolution and Climate System Interaction
- Presentation of a poster with my first analytical results

2025 : SwissSIMS workshop (Lausanne, Switzerland)

- Training workshop on SIMS technique and their applications in geosciences, organized around lectures and practical classes with examples given by invited speakers

Field experiences

2023 : Active volcanoes in Italy (1 week)

- Magmatic and volcanic processes / eruptive styles and associated deposits / risks and hazards / hydrothermal systems
- Vesuvius / Stromboli / Vulcano / Campi Flegrei / Lipari

2023 : The oceanic lithosphere in French Alps (1 week)

- Study of different lithologies (magmatic and metamorphic) to understand the evolution and the establishment of an oceanic lithosphere
- Chenaillet / Mont Viso / Chamrousse / Lanzo / Queyras

2022 : Mapping in Massif Central, France (1 week)

- Mapping of volcanic and sedimentary deposits, creation of a geological map

2022 : Mapping at Reunion Island

- Collaborative mapping during free time in the last year of my Bachelor's degree
- Produced of a geological map of the western part of the Reunion Island

2022 : Mapping at "Les Makes", Reunion Island (1 week)

- Introduction to the study of volcanic deposits at La Réunion

2021-2022 : Volcanic processes at Reunion Island

- Study the main characteristics of Piton des Neiges and Piton de la Fournaise (mapping, study of volcanic deposits and geophysics) over several days

Science outreach

2026 : Poster at Université de Lorraine

- Presentation of my research with a talk and poster to specialists and non-specialists in my university

2026 : Intervention in high school

- Leading classes about discriminations and bias in research and society to high school students

2025 : Intervention in a hospital

- Spending days with children in a hospital to show some rocks / meteorites, experiments and talk about geosciences

2025 : Intervention in a primary school

- Delivered classes about the origin of water on Earth, the different reservoirs and the importance of water for the Earth

Publications

2026 : First-author manuscript in preparation

- The lower crust of arcs as a new reservoir of volatiles