Roger Marion

PhD in Earth Sciences - Geodynamics
From Université Grenoble Alpes

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REASEARCH EXPERIENCES

2019-2023 : P.h.D in Geodynamics,in Université Grenoble Alpes at ISTerre laboratory, on a ministerial grant – **defended the 06/29/2023**

P.h.D topic: **Quantification of sediment fluxes in the Carpathian foreland basin from the collision to slab detachment.**

Project supervision: Peter van der Beek (U. of Potsdam), Arjan de Leeuw (U. of Grenoble Alpes), Laurent Husson (DR CNRS).

Thesis objectives:

- *Quantification of the exhumation:*
  - Compilation of existing LT thermochronology data.
  - Analysis and dating of samples from Ukraine with AFT, AHe and ZHe methods.
  - Inversion of database with Pecube program.
- *Quantification of sediment volumes in the Carpathian foreland basin*:
  - Understanding the spatial distribution of sediment volumes
  - Construction of isopach maps by stratigraphic age.
  - Correlation of the sediment volumes with the foreland plate structure and rheology.
- *Influence of European slab detachment:*
  - Correlation of belt exhumation and retreat and lateral tear of the slab
  - Correlation of slab lateral tear and detachment and distribution of sediments in the foreland

Collaborations:

- University of Potsdam, dating of samples using the (U/Th)/He method on apatite and zircons
- Geo3BCN, Barcelona Geology Laboratory, learning the TISC code (D. Garcia-Castellanos)
- GFZ, Potsdam, use of laboratory clusters for thermochronological database inversions.

2019: Research internship at ISTerre laboratory, Grenoble (6 months): Construction of a thermochronological database of the Carpathian belt and erosion quantification. Data inversion using the GLIDE program.

- o Compiling data and understanding the structure of the Carpathian chain
- o Data inversion using a GLIDE program
- o Skills: use of inverse modelling, data compilation, use of low-temperature thermochronology
- o Scientific fields: Tectonics, thermochronology, inverse modelling

2018 : Research internship at the ISTerre laboratory (3 months) : Stratigraphy of the Mollasse Rouge d'Esparron-la-Bâtie (Southern Alps, France)**.**

- Mapping of the sedimentary sequence of the Mollasse Rouge outcrop at the Esparron-la-Bâtie site
- Analysis of sedimentary facies and outcrop lateral variation
- Facies association and construction of an evolution of the environments of deposition
- Scientific fields: sedimentology and pedology

2017 : Research internship, Chrono-environnement Laboratory, Besançon (1 month): Opening of the Southern Ocean, integration of extensive fault data from the Antarctic margin (Dumont d'Urville).

- Scientific watch on the numerous fault data from the Southern Ocean margins
- Integration of Antarctic margin data on the Dumont d'Urville site

2016 : Internship, BRGM de Franche-Comté (1 month): "Contribution to the development of the BD-Cavité cavity database".

- Updating the database with regional speleological archives

RESARCH SKILLS:

- Low-temperature thermochronology methods (fission tracks – (U/Th)/He)
- Meta analysis of geological data: structural data, cross-sections, sedimentary logs, maps…
- Sedimentology: facies association, logs, mapping, reconstruction of environment of deposition
- Finite element model (TISC)
- Inverse modelling (Pecube program, QTqt code)
- 3D basin models + isopach maps

TEACHING EXPERIENCES

2020-2023 : Teaching of sedimentology and associated fieldwork. (~30h/year) : Introduction to sedimentary rocks (detrital and carbonate) and sedimentary systems (detrital and carbonate) for Licence 3 students in Earth Sciences. Assistance to Licence 3 students on a 2-day field trip (Vercors, Alps).

Teaching unit directors: Matthias Bernet and Arjan de Leeuw

2019 : Teaching assistant, South Dakota School of Mines and Technology, (1month): Geology and Alpine tectonics field camp in the French Alps. Sites of Dignes-les-bains and Argentière-la-Bessée.

- Teaching of field geology to American students
- Evaluation of field notes of student
- Helping during student's assignments

Director of field camp: Yann Gavillot, Dr. Nuri Uzunlar, Jérôme Nomade.

SCIENTIFIC COMMUNICATIONS

2017 : English TOEIC, 920/1000 (C1 level)

Scientific Congress :

- 2022: EGU in Vienna, pico presentation (7 min): "Construction of the Ukrainian Carpathian wedge from thermochronology and tectono-stratigraphic analysis"; M. Roger*, A. de Leeuw, P. van der Beek and Laurent Husson.
- 2021: EGU (online), pico presentation (7 min): "Diachronous exhumation of the Carpathian belt from thermochronology database inversions"; M. Roger*, A. de Leeuw, P. van der Beek and Laurent Husson.
- 2020 : Earth Sciences Meeting in Lyon (poster); M.Roger* and A. de Leeuw.

Articles:

- Marion Roger, Arjan de Leeuw, Peter van der Beek, Laurent Husson, Edward R. Sobel, Johannes Glodny, and Matthias Bernet., 2023 "Construction of the Ukrainian Carpathian wedge from low-temperature thermochronology and tectono-stratigraphic analysis", Solid Earth (Copernicus)v.14, issue 2, https://doi.org/10.5194/se-14-153-2023 .

CURRICULUM

- **2019-2023: P.h.D in Geodynamics**,in Université Grenoble Alpes at ISTerre laboratory, Grenoble

- **2017-2019: Master's degree in Earth, Planetary and Environmental Sciences - Geodynamics specialization -** Université Grenoble Alpes
- **2014-2017: Bachelor's degree in applied Geology**, Université de Bourgogne Franche-Comté – University of Besançon

FIELD COURSES :

- 2021 - DEPTH summer school: University of Milano-Bicocca, The internal zones of the Alpes, from the Monte Bianco massif to the Voltri massif. Structural, metamorphism, geodynamics of the Alps and UHT eclogitic domes.
- 2019 – Ukrainian and Romania fieldwork: PhD fieldwork on the Romanian and Ukrainian Carpathian belt and foreland basin. Sample collecting and mapping of outcrops.
- 2018 – Romanian field courses: M2 international field course with the university Grenoble Alpes and the University of Bucharest. Structural and tectonics of the Carpathian belt, development of the Carpathian foreland basin.