Dr. Christian VERARD

Christian Vérard
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Born in 07 June 7th, 1974
In Annecy (74), FRANCE
Maried, 3 children

Geologist & Geophysicist

Geologist, specialized in structural geology, I combined more than 10 years of field and teaching experience, with research laboratory achievement in geophysics (terrestrial and marine seismic, geodesy, geomagnetism), geodynamics (rheology, basins dynamics, deep convection processes), and computer modelling (palinspastic model under ArcGIS).

I have led projects with integrity from their conception, through funding, creation and management of international teams, up to their realisation and publication of results. I am prepared to meet rigid deadlines, working both as part of a dynamic team and individually, with minimum supervision. I thus offer multiple skills, encompassing a large range of disciplines in geosciences, management capabilities, and abilities for teaching even for a large and diverse audience.

Contact

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Experience

- **Professor** at the University of Lausanne, UNIL, Switzerland (Dpt of Geology): 2008-2009, and MER (Maître d'Enseignement & de Recherche, Dpt of Geophysics): 2010.
  The subjects taught were general geology, tectonics & geodynamics, and physics of the globe. Lectures and practical were hold both in classroom and during field trips.
- **Geologist**: 2007-2010. Post-doc. researcher at UNIL (Dpt of Geology).
  I collaborated in the development of innovative techniques for global scale modelling of Earth past evolution. Geodynamical reconstructions are set up under ArcGIS.9.3 by thorough field and literature data collection and interpretation.
- **Geophysicist**: 2000-2006. Ph.D. and post-doc. researcher at the University of Munich, LMU, Germany (Dpt of Geophysics).
  Palaeomagnetic investigations were carried out in various countries (Australia, Lybia, Cape Verde, Island) both for a comprehensive critical-interpretation of the studied areas, and for the understanding of the Earth magnetic field itself.

Education

- 2006: Qualified to apply to the French system of professorship.
- 2000-04: Ph.D. "*cum laudae*", University of Munich, LMU, Germany (Dpt of Geophysics).
- 1998-99: DEA "Dynamique de la lithosphere" with honors, University of Grenoble, LGCA, France.
- 1997-98: Master of Sciences in geology with honors, University of Grenoble, LGCA, France.
- 1996-97: Bachelor of Sciences in geology with honors, University of Grenoble, LGCA, France.
- 1993-96: DEUG B (Earth and Life Sciences), with emphasis in geology, with honors, University of Chambéry, France.
- 1993: "Baccalauréat C" (Mathematics and Physics), Grabriel Fauré High-school in Annecy, France.

Langues

- **Languages:**
  Good communication skills with fluency in French, English and German.
- **Informatique:**
  Computer programming skills in Pascal, Fortran 77, Delphi, C++, Visual Basic Application.
  Excellent skills in GIS tools (coupled with Oracle database), Microsoft Office, Golden Softwares, etc.

Miscellaneous

- Car and motorbike driving licence holder (*i.e.* licences A and B).
- Swiss residence and working permit B valid.

Research interests

From a general point of view, I am interested in all processes related to tectonic plate movements. This encompasses all geological ensembles from continental margins to mountain ranges (in particular from the structural point of view), and also the behaviour of the Earth magnetic field from its generation to its recording in rocks. In particular, I focus my research on the following topics:

- The Cainozoic opening of the Liguro-Provencal Basin and the tectonic of the western Mediterranean Sea since the Variscan collision.
- Inversion of structures, such as the passive margin of Calabria.
- The tectonic and formation of the Australides (or Gondwanides) since the Palaeozoic.
- The palaeogeography and the apparent polar wander path of Gondwana in the Palaeozoic – a keystone for the problem of the configuration of supercontinents (Pangaea and Rodinia) and its role for the evolution of life (from the Cambrian explosion of life to the Permian mass extinction).
- The study of the Earth magnetic field during excurions and inversions, the possible variations in dipolar and non-dipolar internal magnetic field and the influence of the external magnetic field.
- The recording of palaeo-directions and palaeo-intensities in rocks: the role of the magnetic mineralogy.
- The rheology (mechanical behaviour of rocks) in the framework of plate tectonics, in particular in the case of geodynamic changes such as the creation of new structures or inversion of preexisting structures.

However, the global geodynamic models developed at the University of Lausanne give me new axes of research, and I currently focus on:

- The further development of global geodynamical reconstructions, at least as old as the Rodinia break-up.
- The implications of our models in terms of variations in accretion rates and volumes of subducted material over 600 Ma or more, on the sea-level variations, and CO2, Sr, *etc*. cycles.
- The dynamic topography, stress fields, and flexural behaviour of the lithosphere (with implications for heat flux and mantle flow).
- The development of 3D models and their implications for palaeo-topography, palaeo-geography & -environment, and palaeo-climates.
- The interactions between tectonics and climate.

Publications

- **Thesis & reports:**

VÉRARD C. (2003)- A palaeomagnetic study of Palaeozoic rocks the south Tasmanides, New South Wales, Australia. Special Report for the Volkswagen Foundation, Ludwig-Maximilians-Universität München, Germany, 45 pages.

VÉRARD C. (2004)- Palaeozoic Palaeomagnetism of South-Eastern Australia: Implications for the APW path of Gondwana. Ph.D. thesis, Ludwig-Maximilians-Universität München, Germany, 217 pages.

VÉRARD C., GLEN R. & TAIT J. (2005)- Remagnetisations and block rotation in Palaeozoic rocks from New South Wales, Australia. Geo-LMU Internal Report, Ludwig-Maximilians-Universität München, Germany, 40 pages.

- **Papers:**

VÉRARD C., HOCAHRD C. & STAMPFLI G. (2012)- Non-random distribution of Euler poles: Is plate tectonics subject to rotational effets? Terra Nova, 00, 1-10.

VÉRARD C. (2012, *in press*)- Late Cambrian palaeomagnetic pole from the Cupala Creek Formation, far-western New South Wales, Australia. Exploration Geophysics; http://dx.doi.org/10.1071/EG11052.

VÉRARD C., FLORES-REYES K. & STAMPFLI G. (2012)- Geodynamic reconstruction of the South America – Antarctica plate system. Journal of Geodynamics, **53**, 43-60; doi:10.1016/j.jog.2011.07.007.

VÉRARD C., LEONHARDT R., WINKLHOFER M. & FABIAN K. (2012)- Variations of magnetic properties in thin lava flow profiles: Implications for the recording of the Laschamp Excursion. Physics of the Earth and Planetary Interior, **200-201**, 10-27.

VÉRARD C. (2009)- Palaeomagnetic study of the Late Silurian - Early Devonian Mount Daubeny Formation from the Broken Hill area, New South Wales. Australian Journal of Earth Sciences, **56**, No.5, 1-24.

WINKLHOFER M., FABIAN K., LEONHARDT R. & VÉRARD C. (2008)- On the possibility of recovering paleo-diurnal magnetic variations in transitional lava flows: 1. Constraints form thermoremanence modelling for an experimental protocol. Physics of the Earth and Planetary Interiors, **169**, No.1-4, 108-116.

VÉRARD C , LEONHARDT R., WINKLHOFER M. & FABIAN K. (2008)- On the possibility of recovering paleo-diurnal magnetic variations in transitional lava flows: 2. An experimental case study. Physics of the Earth and Planetary Interiors, **169**, No.1-4, 117-130.

VÉRARD C. & GLEN R. (2008)- Magnetic fabrics of Palaeozoic rocks across the Lachlan Transverse Zone from eastern New South Wales. Australian Journal of Earth Sciences, **55**, No.8, 1037-1048.

VÉRARD C. & GLEN R. (2008)- Magnetic fabrics of Palaeozoic rocks from central and western New South Wales, Australia. Australian Journal of Earth Sciences, **55**, No.8, 1049-1062.

VÉRARD C., TAIT J. & GLEN R. (2005)- Palaeomagnetic study of Siluro-Devonian volcanic rocks from the Central Lachlan Orogen: Implications for the APW path of Gondwana. Journal of Geophysical Research, **110**, n°B06, 15 pages.

VÉRARD C., & STAMPFLI G. (*in prep., a*)- Geodynamic Reconstructions of the Australides – 1: Palaeozoic. Solid Earth.

VÉRARD C., & STAMPFLI G. (*in prep., b*)- Geodynamic Reconstructions of the Australides – 2: Mesozoic - Cainozoic. Solid Earth.

HOCHARD C., VÉRARD C., BAUMGARTNER P. & STAMPFLI G. (*in prep.*)- Geodynamic evolution of the Earth over the Phanerozoic: Plate tectonic activity and palaeo-climatic indicators.

VÉRARD C., HOCHARD C., BAUMGARTNER P. & STAMPFLI G. (*in prep.*)- 3D palinspastic reconstructions of the Phanerozoic *versus* sea-level and Sr-ratio variations.

- **Posters:**

VÉRARD C., TAIT J., GLEN R. & PERCIVAL I. (2001)- Palaeomagnetic study in the Tasman Fold Belt System of New South Wales, Australia. Poster, EGS Nice.

VÉRARD C., TAIT J., GLEN R. & PERCIVAL I. (2002)- Palaeomagnetic study of Ordovician rocks in the Lachlan Fold Belt, New South Wales, south-eastern Australia. Poster, EGS Nice.

VÉRARD C., TAIT J., GLEN R. & MILLS K. (2003)- A new Late Cambrian pole from the Cupala Creek Formation, far-western New South Wales, Australia. Poster, AGU-EGU Nice.

VÉRARD C. (2004)- A Palaeozoic palaeogeographic reconstruction of the Tasmanides of New South Wales, Australia. Poster, EGU Nice.

VÉRARD C., WINKLHOFER M., LEONHARDT R. & FABIAN K. (2004)- Variations in magnetic properties along a thin lava flow profile (EF1.2): implications for palaeodirection and palaeointensity determinations. Poster, AGU San Francisco.

VÉRARD C., WINKLHOFER M., LEONHARDT R. & FABIAN K. (2005)- Variations in magnetic properties along a thin lava flow profile (EF2.3): implications for palaeodirection and palaeointensity determinations. Poster, EGU Vienne.

- **Softwares:**

HOCHARD C. & VÉRARD C. (2010)- PaleoDyn Software & 3D development. Software for developing and interpreting the global reconstruction model, under VB6 for ArcGIS (Windows).

VÉRARD C. & ALEXYUTIN M. (2005)- MesAMS. Software for anisotropy of magnetic susceptibility (AMS) data acquisition from a Kappabridge KLY-2 susceptometer (15 positions), under Windows.

VÉRARD C. (2005)- MiniKappa. Software for magnetic susceptibility data acquisition during thermal demagnetisation from a Kappabridge KLY-3 susceptometer, under Windows.