

Yanick RICARD

Date: october/2023

Present position: DR1 CNRS Senior Scientist.

Place and date of birth: january 14, 1958, Brignoles, France.

Family status: Married, two children.

Personal address: Le Garon, 69630, Chaponost. (04 78 45 52 95)

Professionnal address: Laboratoire de Géologie, Batiment Géode, 2 rue Raphael Dubois,
69622 Villeurbanne Cedex France.

Tel.: 04 72 44 84 13 (univ) Tel.: 04 72 44 86 82 (ENSL)

e-mail: Ricard@ens-lyon.fr

<http://perso.ens-lyon.fr/yanick.ricard>

EDUCATION

- 80-86: Thèse d'État (PhD+Habilitation), 1986, University Paris XI
 - Dissertation: "Internal Dynamic of the Earth and Gravimetric Observations"
 - PhD advisor: Professor Claude Froidevaux.
- 81: Agregation of Physics.
- 80: DEA of Geophysics from Paris VI, VII and XI.
- 79: M.S. of Physics, Paris VI.
- 78-82: École Normale Supérieure de Saint Cloud.

PROFESSIONAL APPOINTMENT

- 04-05: Sabbatical at University of Yale (US)
- 01-present: First Class Senior Scientist CNRS/ENS-Lyon
- 94-01: Second Class Senior Scientist CNRS/ENS-Lyon
- 89-90: Sabbatical at University of Bologna (Italy)
- 87-94: Junior Scientist CNRS/ENS-Paris
- 86: Junior Scientist CNRS/Paris XI
- 82-86: Scholarship of the CNES (French Space Agency).

AWARDS

- 14: AGU Fellowship
- 12: Augustus Love medal of the EGU
- 00: Silver Medal of the CNRS
- 94: Medal Doistau-Blutet of the Académie des Sciences.

TEACHING

A CNRS position does not include teaching in its duties. However I always taught about 40 h/year to undergraduates (L3 and M1) and 20 h/year to graduates (M2). My lectures have evolved with my scientific interests but I covered subjects like

- Mathematics for geologists
- Continuum mechanics
- Inverse theories
- Geodynamics (the topics of “Geodynamics” by Turcotte and Schubert)
- Seismology and tomography
- Fluid dynamics
- Introduction to core dynamics
- Mixing and stirring
- High pressure physics and mantle mineralogy
- Natural Hazards

PHD STUDENTS

- 12-: C-E. Boukaré^{116–122} (Dynamics of the deep mantle)
07-11: S. Durand^{91–95–101–105–114–118–124–127–133–135} (Seismic attenuation)
06-10: A. Rozel⁹⁰ (Grainsize evolution)
05-09: J. Monteux^{80–86} (Planetary impacts)
03-08: W Landhuyt⁸² (Plate generation) codirection Pr David Bercovici
02-07: O. Sramek^{76–84–87–92–94} (Two phase melting and compaction)
01-05: E. Mattern^{70–72–77} (Thermodynamic models of mantle mineralogy) codirection with Jan Matas.
98-01: L. Husson^{68–71} (Thermal regimes of mountain belts)
98-01: N. Coltice^{50–55–63–66–78–80–83} (Convection and geochemistry) codirection with Pr Ph Gillet.
97-00: C. Lemery⁵³ (Rayleigh-Bénard convection).
96-99: S. Ferrachat^{44–55–60} (Mixing in the mantle).
95-99: J. Matas^{38–52–54–56–70–72–77} (Mantle mineralogy).
95-98: Carlo Giunchi⁴⁷ (Subduction and collision), codirection with Pr Roberto Sabadini.
92-96: Y. Le Stunff^{27–32–42} (Dynamic topography and topographies of phase changes).
91-94: V. Corrieu^{30–31–54} (Geoid modeling).
89-92: Giorgio Spada^{17–20–22–23–25–28–29–39–41} (Earth Rotation), with Pr Roberto Sabadini (Bologna).
86-89: C. Vigny^{11–12–14–19} (Geoid and plate tectonics).

SERVICES

Administrative responsibilities

- Acting president ENS de Lyon july 2022-mars 2023
Provost ENS de Lyon janvier 2022 -mars 2023
Provost ENS de Lyon 2014-2021

12-17: Member of the Science Board of the University of Lyon 1
 11-present: Vice-Chairman of the LGLTPE (70 permanents+60 students and visitors)
 09-present: Member of the "PN Planetology" commission
 07-present: Member of the INSU - CCST
 08-12: Member of the CNRS National Committee, section 18
 06-09: Member of the "Relief" commission
 04-07: Vice-director of UFR (Sciences de la Terre, Univ-Lyon1)
 00-04: Chairman of the laboratory of Earth Sciences at ENS-Lyon (35 permanents+35 students and visitors)
 03-06: President of the CNES commission "Earth-Atmosphere-Oceans"
 96-00: Vice Chairman of the laboratory of Earth Sciences at ENS-Lyon (35 permanents+35 students and visitors)

Scientific responsibilities

09-15: Editor Earth Planet. Sci. Lett.
 06-present: PI of the ANR grants Ether, (Earth formation and core-mantle segregation), CMBmelt, (dynamics of the deep mantle with G Fiquet), Seisglob and JigSaw (Tomography of the Earth with E Debayle)
 99-09: Editor Geophys. J. Int.
 08: Organiser of a summer school, Les Houches "Structure and Dynamic of the Deep Earth".
 03: Member of the organising committee of the international workshop, Czech Republic, "Mantle convection and Lithospheric Dynamics"
 01: Organiser of the international workshop, Aussois, "Mantle convection and Lithospheric Dynamics"
 00: Member of the organising committee of the international workshopsummer school, Cargese, "Mixing in Geophysical Flows"
 94: Organiser of a summer school, Les Houches "Internal Dynamic of the Earth".

REVIEWED PUBLICATIONS

- ¹Paquin, C., C. Froidevaux, J. Bloyet, **Y. Ricard**, and C. Angelidis, Tectonic stresses on the mainland of Greece: in situ measurements by overcoring, *Tectonophysics*, 86, 17-26, 1982.
²**Ricard, Y.**, C. Froidevaux, and J. F. Hermance, Model heat flow and magnetotellurics for the San Andreas and oceanic transform faults, *Annales Geophysicae*, 1, 47-52, 1983.
³**Ricard, Y.**, L. Fleitout, and C. Froidevaux, Geoid heights and lithospheric stresses for a dynamic Earth, *Annales Geophysicae*, 2, 267-286, 1984.
⁴**Ricard, Y.**, and C. Froidevaux, Stretching instabilities and lithospheric boudinage, *J. Geophys. Res.*, 91, 8314-8324, 1986.
⁵**Ricard, Y.**, Thèse d'Etat, "Dynamique interne de la Terre et observations gravimétriques", Orsay, 1986.
⁶Froidevaux, C. and **Y. Ricard**, Tectonic evolution of high plateaus, *Tectonophysics*, 134, 227-238, 1987.

- ⁷**Ricard, Y.**, C. Froidevaux and R. Simpson, Spectral analysis of topography and gravity in the Basin and Range Province, *Tectonophysics*, 133, 175-187, 1987.
- ⁸**Ricard, Y.**, C. Froidevaux and L. Fleitout, Global plate motion and the geoid: A physical model, *Geophys. J.*, 93, 477-484, 1988.
- ⁹**Ricard, Y.**, and R. J. Blakely, A method to minimize edge effects in two-dimensional discrete Fourier transforms, *Geophysics*, 53, 1113-1117, 1988.
- ¹⁰Bloyet, J., N. Beghoul, **Y. Ricard**, and C. Froidevaux, In situ test of a borehole extensometer, *Rocks Mech. and Rocks Engineering*, 22, 289-297, 1989.
- ¹¹**Ricard, Y.**, C. Vigny, and C. Froidevaux, Mantle heterogeneities, geoid and plate motion: a Monte Carlo inversion, *J. Geophys. Res.*, 94, 13,739-13,754, 1989.
- ¹²**Ricard, Y.**, and C. Vigny, Mantle dynamics with induced plate tectonics, *J. Geophys. Res.*, 94, 17,543-17,559, 1989.
- ¹³**Ricard, Y.**, and R. Sabadini, Rotational instabilities of the Earth induced by mantle density anomalies, *Geophys. Res. Lett.*, 17, 627-630, 1990.
- ¹⁴Vigny, C., **Y. Ricard**, and C. Froidevaux, The driving mechanism of plate tectonics, *Tectonophysics*, 187, 345-360, 1991.
- ¹⁵**Ricard, Y.** and Bai Wuming, Inferring the mantle viscosity and its three dimensional structure from geoid, topography and plate velocities, *Geophys. J.*, 105, 561-571, 1991.
- ¹⁶**Ricard, Y.** and C. Froidevaux, Seismic imaging, plate velocities and geoid, the direct and inverse problem, "Glacial isostasy, Sea-level and Mantle rheology", Sabadini and Lambeck eds, Kluwer Academic Publishers, 553-569, 1991.
- ¹⁷Sabadini, R., G. Spada and **Y. Ricard**, Perturbations in the earth's rotation induced by internal density anomalies: implications for sea level changes, "Glacial isostasy, Sea-level and Mantle rheology", Sabadini and Lambeck eds, Kluwer Academic Publishers, 589-605, 1991.
- ¹⁸**Ricard, Y.**, C. Doglioni and R. Sabadini, Differential rotation between lithosphere and mantle: a consequence of lateral viscosity variations, *J. Geophys. Res.*, 96, 8407-8415, 1991.
- ¹⁹Bai Wuming, C. Vigny, **Y. Ricard**, and C. Froidevaux, On the origin of deviatoric stresses in the lithosphere, *J. Geophys. Res.*, 97, 11,729-11,737, 1992.
- ²⁰Spada, G., R. Sabadini, D. A. Yuen and **Y. Ricard**, Effects on post-glacial rebound from the hard rheology in the transition zone, *Geophys. J. Int.*, 109, 683-700, 1992.
- ²¹Čadek O. and **Y. Ricard**, Toroidal/poloidal partitioning and global lithospheric rotation during Cenozoic time, *Earth Planet. Sci. Lett.*, 109, 621-632, 1992.
- ²²**Ricard, Y.**, R. Sabadini, and G. Spada, Isostatic deformations and Polar Wander induced by redistribution of mass within the Earth, *J. Geophys. Res.*, 97, 14223-14236, 1992.
- ²³Spada, G., **Y. Ricard** and R. Sabadini, True polar wander for a dynamic Earth, *Nature*, 360, 452-454, 1992.
- ²⁴Čadek O., **Y. Ricard**, Z. Martinec, and C. Matyska, Comparison between Newtonian and non-Newtonian flow driven by internal loads, *Geophys. J. Int.* 112, 103-114, 1993.
- ²⁵**Ricard Y.**, G. Spada and R. Sabadini, Polar wandering of a dynamic Earth, *Geophys. J. Int.*, 113, 284-298, 1993.
- ²⁶Lithgow-Berteloni, C., M. A. Richards, **Y. Ricard** and R. J. O'Connell, Toroidal-poloidal partitioning of Cenozoic and Mesozoic plate motions, *Geophys. Res. Lett.*, 20, 375-378, 1993.
- ²⁷**Ricard Y.**, M. A. Richards, C. Lithgow-Berteloni and Y. Le Stunff, A Geodynamic Model of Mantle Mass Heterogeneities, *J. Geophys. Res.*, 98, 21895-21909, 1993.

- ²⁸Spada, G., R. Sabadini, **Y. Ricard**, On a particular solution of the non-linear Liouville equations, *Geophys. J. Int.*, 114, 339-404, 1993.
- ²⁹**Y. Ricard**, R. Sabadini, and G. Spada, Comments on "Polar motion excited by a convecting viscous mantle" by Moser, Yuen and Matyska, *Geophys. Res. Lett.*, 20, 2495-2496, 1993.
- ³⁰Corrieu, V., **Y. Ricard** and C. Froidevaux, Radial viscosity of the Earth deduced from mantle tomography, *Phys. Earth Planet. Inter.*, 84, 3-13, 1994.
- ³¹Corrieu, V., C. Thoraval and **Y. Ricard**, Mantle dynamics and Geoid green functions, *Geophys. J. Int.*, 120, 516-523, 1995.
- ³²Le Stunff, Y., and **Y. Ricard**, Topography and geoid due to mass anomalies, *Geophys. J. Int.*, 122, 982-990, 1995.
- ³³Deparis, V., H. Legros and **Y. Ricard**, Mass anomalies due to subducted slabs and simulations of plate motion since 200 My, *Phys. Earth Planet. Inter.*, 89, 271-280, 1995.
- ³⁴**Ricard Y.**, Plate motions and mantle convection, Proceedings of the VIII Summer School Earth and Planetary Sciences, Sienna, 79-88, 1995.
- ³⁵**Ricard, Y.**, H.-C. Nataf, and J.-P., Montagner, The 3-SMAC model: confrontation with data, *J. Geophys. Res.*, 101, 8457-8472, 1996.
- ³⁶Nataf, H.-C., and **Y. Ricard**, 3-SMAC: an a priori model of the upper mantle based on geophysical tomography, *Phys. Earth Planet. Inter.*, 95, 101-122, 1996.
- ³⁷Guyot, F., Y. Wang, P. Gillet and **Y. Ricard**, Quasi-harmonics computations of thermodynamic parameters of olivines at high-pressure and high-temperature. A comparison with experimental data, *Phys. Earth Planet. Inter.* 98, 17-29, 1996.
- ³⁸Guyot F., Jiangzhong Zhang, I. Martinez, J. Matas, **Y. Ricard** and M. Javoy, PVT measurements of fersilicite (FeSi). Implications for silicate-metal interactions in the early Earth, *Eur. J. Mineral.*, 9, 277-285, 1997.
- ³⁹Richards, M. A., **Y. Ricard**, C. Lithgow-Bertelloni, G. Spada, and R. Sabadini, An explanation for Earth's long-term rotational stability, *Science*, 275, 372, 1997.
- ⁴⁰Lecroart, P. A. Cazenave, **Y. Ricard**, C. Thoraval and D. G. Pyle, Along-axis dynamic topography constrained by major-element chemistry, *Earth Planet. Sci. Lett.*, 149, 49-56, 1997.
- ⁴¹Piromallo, C., Spada, G., Sabadini, R., and **Y. Ricard**, Sea level fluctuations due to subduction, *J. Geophys. Lett.*, 24, 1587-1590, 1997.
- ⁴²Le Stunff, Y., and **Y. Ricard**, Partial advection of equidensity surfaces: a solution for the dynamic topography problem? *J. Geophys. Res.*, 102, 24655-24667, 1997.
- ⁴³Pili, E., **Y. Ricard**, J.M. Lardeaux and S.M.F. Sheppard, Lithospheric shear zones and mantle-crust connections, *Tectonophysics*, 280, 15-29, 1997.
- ⁴⁴Ferrachat S., and **Y. Ricard**, Regular vs. chaotic mantle mixing, *Earth Planet. Sci. Lett.*, 155, 75-86, 1998.
- ⁴⁵Lecuyer C. and **Y. Ricard**, Long-term fluxes of ferric iron: implication on the redox state of Earth mantle, *Earth Planet. Sci. Lett.*, 165, 197-211, 1999.
- ⁴⁶Leloup Ph. H., **Y. Ricard**, J. Battaglia and R. Lacassin, Numerical estimates of shear heating along continental lithospheric strike slip shear zones, *Geophys. J. Int.*, 136, 19-40, 1999.
- ⁴⁷Giunchi C. and **Y. Ricard**, High pressure-low temperature metamorphism and the dynamics of an accretionary wedge, *Geophys. J. Int.*, 136, 620-628, 1999.
- ⁴⁸Richards, M., H.P. Bunge, **Y. Ricard**, and Baumgardner, J. R., Polar wandering and inertial interchange events in mantle convection models, *J. Geophys. Lett.*, 26, 1777-1780, 1999.

- ⁴⁹Gillet Ph. Matas, J., Guyot, F. and **Y. Ricard**, Thermodynamic properties of minerals at high pressures and temperatures from vibrational spectroscopic data, "Microscopic properties and processes in Minerals", K. Wright and R. Catlow eds., Kluwer Academic Publishers, Netherlands, 1999.
- ⁵⁰Coltice, N. and **Y. Ricard**, Geochemical observations and one layer mantle convection, *Earth Planet. Sci. Lett.*, 174, 125-137, 1999.
- ⁵¹Bercovici, D., **Y. Ricard**, and M. Richards, The relation between mantle dynamics and plate tectonics: a somewhat biased primer, AGU monography, 121, Richards, Gordon and van der Hilst, eds, pp5-46, 2000.
- ⁵²Matas, J., P. Gillet, **Y. Ricard**, I. Martinez, Thermodynamic properties of carbonates at high pressures from vibrational modelling, *Eu. J. Miner.*, 12, 703-720, 2000.
- ⁵³Lemery, C., **Y. Ricard** and J. Sommeria, A boundary layer model of Rayleigh-Taylor convection at infinite Prandtl number, *J. Fluid Mech.*, 414, 225-250, 2000.
- ⁵⁴Matas, J., **Y. Ricard**, L. Lemelle, and F. Guyot, An improved thermodynamic model of metal-olivine-pyroxene stability domains, *Contrib. Mineral. Petrol.*, 140, 73-83, 2000.
- ⁵⁵Coltice N., S. Ferrachat and **Y. Ricard**, Box modeling the chemical evolution of geophysical systems: case study of the Earth's mantle, *Geophys. Res. Lett.*, 27, 1579-1582, 2000.
- ⁵⁶Bunge P., **Y. Ricard** and J. Matas, Non-adiabaticity in mantle convection, *Geophys. Res. Lett.*, 28, 879-882, 2001.
- ⁵⁷Bercovici D., **Y. Ricard** and G. Schubert, A two phase model for compaction and damage, 1: General theory, *J. Geophys. Res.*, 106, 8887-8906, 2001.
- ⁵⁸**Ricard Y.**, D. Bercovici and G. Schubert, A two phase model for compaction and damage, 2: Compaction, *J. Geophys. Res.*, 106, 8907-8924, 2001.
- ⁵⁹Bercovici D., **Y. Ricard** and G. Schubert, A two phase model for compaction and damage, 3: Damage, *J. Geophys. Res.*, 106, 8925-8935, 2001.
- ⁶⁰Ferrachat S. and **Y. Ricard**, Mixing properties in the Earth's mantle: effects of the viscosity stratification and of oceanic crust segregation, *Geochem. Geophys. Geosyst.*, 2, 2001.
- ⁶¹**Ricard, Y.** Mantle convection in the Earth and Planets, G Schubert, D. L. Turcotte, P. Olson, *Science*, 802, 2002.
- ⁶²Rabinowicz M., **Y. Ricard** and M. Gregoire, Compaction in the mantle with a very small melt concentration: implications for the generation of carbonatitic and carbonate-bearing high alkaline mafic melts impregnations, *Earth Planet. Sci. Lett.*, 2002.
- ⁶³Coltice N. and **Y. Ricard**, On the origin of noble gases in mantle plumes, *Phil. Trans. Royal Soc.*, 360, 2633-2648, 2002.
- ⁶⁴Bercovici D. and **Y. Ricard**, Energetics of a two phase model of lithospheric damage, shear localization and plate-boundary formation, *Geophys. J. Int.*, 152, 581-596, 2003.
- ⁶⁵**Ricard Y.**, and Bercovici D., Two-phase damage theory and crustal rock failure: the theoretical "void" limit, and the prediction of experimental data, *Geophys. J. Int.*, 155, 1057-1061, 2003.
- ⁶⁶**Ricard Y.**, and N. Coltice, Geophysical and geochemical models of mantle convection: agreements and disagreements, in: *The State of the Planet: Frontiers and Challenges in Geophysics*, Geophysical Monograph Series, R. Stephen, J. Sparks and C. J. Hawkesworth editors, 150, 2004.
- ⁶⁷Bourgoin M., P. Odier, J.F. Pinton and **Y. Ricard**, An iterative study of time independent induction effects in magnetohydrodynamics, *Phys. Fluids.*, 16, 7, 2529-2547, 2004.
- ⁶⁸Husson L. and **Y. Ricard**, Stress balance above subduction: Application to the Andes, *Earth Planet Sci. Lett.*, 222, 1037-1050, 2004.

- ⁶⁹Bercovici D. and **Y. Ricard**, Tectonic plate generation and two-phase damage: void growth versus grainsize reduction, *J. Geophys. Res.*, 110, B03401, doi:10.1029/2004JB003181, 2005.
- ⁷⁰Mattern E., Matas J., **Y. Ricard** and J. Bass, Lower mantle composition and temperature from mineral physics and thermodynamic modelling, *Geophys. J. Int.*, 160, 3, 973-990, 2005.
- ⁷¹**Ricard Y.** and L. Husson, Propagation of tectonic waves, *Geophys. Res. Lett.*, 32, L17308, doi:10.1029/2005GL023690, 2005.
- ⁷² **Ricard Y.**, E. Mattern and J. Matas, Synthetic Tomographic Images of Slabs from Mineral Physics, Geophysical Monograph Series, editors R. D. van der Hilst, J. D. Bass, J. Matas, and J. Trampert, 285-302, 2005.
- ⁷³Chambat F. and **Y. Ricard**, Empirical 3D basis for the internal density of a planet, *Geophys. J. Int.*, in press, 62, 32-35, 2005.
- ⁷⁴**Ricard Y.**, F. Chambat and C. Carolina Lithgow-Bertelloni, Gravity observations and 3D structure of the Earth, *CRAS*, 338, 992-1001, 2006.
- ⁷⁵Hier Majumder S., **Y. Ricard** and D. Bercovici, Grain boundary wetting and melt migration, *Earth Planet. Sci. Lett.*, 248, 735-749, 2006.
- ⁷⁶Sramek, O., **Y. Ricard** and D. Bercovici, Simultaneous melting and compaction in deformable two phase media, *Geophys. J. Inter.*, 168, 964-982, 2007.
- ⁷⁷J. Matas, J. Bass, **Y. Ricard**, E. Mattern and M.S.T. Bukowinski, On the bulk composition of the lower mantle: predictions and limitations from generalized inversion of radial seismic profiles, *Geophys. J. Int.*, 170, 764-780, 2007.
- ⁷⁸Coltice N., H. Bertrand, B. Phillips, **Y. Ricard** and P. Rey, Global warming of the mantle at the origin of flood basalts over supercontinents, *Geology*, 35, 391-394, 2007.
- ⁷⁹**Y. Ricard**, Physics of mantle convection, Treatise of Geophysics, Elsevier, 6054 pp, vol 7. 2007.
- ⁸⁰Monteux J, Coltice N, Dubuffet F, et al. Thermo-mechanical adjustment after impacts during planetary growth *Geophys. Res. Lett.*, 34, L24201, 2007.
- ⁸¹Landuyt, W., D. Bercovici and **Y. Ricard**, Two-phase damage and plate generation in a 2-D model of mantle convection, *Geophys. J. Inter.*, doi:10.1111/j.1365-246X.2008.03844, 2008.
- ⁸²**Y. Ricard** and D. Bercovici, A grained continuum model of damage and coarsening, *J. Geophys. Res.*, 114, B01204, doi:10.1029/2007JB005491, 2009.
- ⁸³Coltice N., Bertrand H., Rey P., Jourdan F., Philipps BR, and **Y. Ricard**, Global warming of the mantle beneath continents back to the Archean, *Gondwana Res.*, 15, 254-266, 2009.
- ⁸⁴**Y. Ricard**, O Sramek and F. Dubuffet, A multi-phase model of runaway core-mantle segregation in planetary embryos, *Earth Planet. Sci. Lett.*, 284, 144-150, 2009.
- ⁸⁵**Y. Ricard**, J. Matas and F. Chambat, Seismic attenuation in a phase change coexistence loop, *Physics Earth Planet. Int.*, 176, 124-131, 2009.
- ⁸⁶J. Monteux, **Y. Ricard**, N. Coltice, F. Dubuffet and M. Ulvrova, A model of metal-silicate separation on growing planets, *Earth Planet. Sci. Lett.*, 287, 353-362, 2009.
- ⁸⁷O. Šrámek, **Y. Ricard**, F. Dubuffet, A multiphase model of core formation, *Geophys. J. Inter.*, 181, 198-220, 2010.
- ⁸⁸Chambat F., **Ricard Y.**, Valette B, Flattening of the Earth: further from hydrostaticity than previously estimated, *Geophys. J. Inter.*, 183, 727-732, 2010.
- ⁸⁹Cambiotti G., **Ricard Y.**, Sabadini R., Ice age True Polar Wander in a compressible and non-hydrostatic Earth, *Geophys. J. Inter.*, 183, 1248-1264, 2010.

- ⁹⁰Rozel A., **Ricard Y.**, Bercovici D., A thermodynamically self-consistent damage equation for grain size evolution during dynamic recrystallization *Geophys. J. Inter.*, 184 , 719-728, 2011.
- ⁹¹Durand S., Montagner J. P., Roux P., Brenguier F., Nadeau RM., **Ricard Y.**, Passive monitoring of anisotropy change associated with the Parkfield 2004 earthquake, *Geophys. Res. Lett.*, 38, DOI: 10.1029/2011GL047875, 2011.
- ⁹²M. Ulvrova, N. Coltice, F. Dubuffet, **Y. Ricard**, S. Labrosse, J. Velimsky, and O. Sramek, Compositional equilibration between sinking iron droplets and silicate magma ocean, *G³*, 12, Q10014, 2011..
- ⁹³Cambiotti G., **Ricard Y.**, Sabadini R., New insights into mantle convection true polar wander and rotational bulge readjustment, *Earth Planet. Sci. Lett.*, 310, 3-4, 538-543, DOI: 10.1016/j.epsl.2011.08.009, 2011.
- ⁹⁴Sramek O., Milelli L., **Y. Ricard**, and S. Labrosse, Thermal evolution and differentiation of planetesimals and planetary embryos, *Icarus*, 217, 1, 339-354, DOI: 10.1016/j.icarus.2011.11.021, 2012.
- ⁹⁵S. Durand, Chambat F., J. Matas and **Y. Ricard**, Constraining the kinetics of mantle phase changes with seismic modes data, *Geophys. J. Inter.*, 189, 1557-1566, 2012.
- ⁹⁶Bercovici D. and **Y. Ricard**, Generation of plate tectonics by two-phase grain-damage and pinning, *Phys. Earth Planet. Int.*, 202-203, 27-55, 2012.
- ⁹⁷E. Debayle and **Y. Ricard**, A global shear velocity model of the upper mantle from new fundamental and higher Rayleigh mode measurements, *J. Geophys. Res.*, 117, B10308, doi:10.1029/2012JB009288, 2012.
- ⁹⁸D. Bercovici and **Y. Ricard**, Generation of plate tectonics with two-phase grain-damage and pinning: Source-sink model and toroidal flow, *Earth Planet. Sci. Lett.*, 365, p 275-288, 2013.
- ⁹⁹B. Tauzin, R.D. Van der Hilst, G. Wittlinger and **Y. Ricard**, Multiple transition zone seismic discontinuities and low velocity layers below western US, *J. Geophys. Res.*, 118, doi:10.1002/jgrb.50182, 2013.
- ¹⁰⁰T. Alboussière and **Y. Ricard**, Reflections on energy dissipation within thermal convection in liquids, *J. Fluid Mech.*, 725, R1 doi:10.1017/jfm.2013.241, 2013.
- ¹⁰¹S. Durand, J. Matas, S. Ford, **Y. Ricard**, B. Romanowicz and J-P. Montagner, Insights from ScS-S measurements on deep mantle attenuation, *Earth Planet. Sci. Lett.*, <http://dx.doi.org/10.1016/j.epsl.2013.05.026>, 2013.
- ¹⁰²E. Boutonnnet, P.H. Leloup, C. Sassier, V. Gardien and **Y. Ricard**, Ductile strain rate measurements reveal continental crust long-term deformation modes, *Geology*, 41, 819-822, doi:10.1130/G33723.1, 2013.
- ¹⁰³C. Michaut, **Y. Ricard**, D. Bercovici and R.S.J. Sparks, Eruption cyclicity at silicic volcanoes potentially caused by magmatic gas waves, *Nature Geoscience*, doi:10.1038/NNGEO1928, 2013.
- ¹⁰⁴E. Debayle and **Y. Ricard**, Seismic observations of large-scale deformation at the bottom of fast-moving plates, *Earth Planet. Sci. Lett.*, 165-177, 2013.
- ¹⁰⁵**Ricard, Y.**, Durand, S., Montagner, J-P and Chambat, F., Is there seismic attenuation in the mantle? *Earth Planet. Sci. Lett.*, 388, 257-264, 2014.
- ¹⁰⁶D. Bercovici and **Y. Ricard**, Plate tectonics, damage and inheritance, *Nature*, doi:10.1038/nature13072, 2014.
- ¹⁰⁷F. Chambat, S. Benzoni-Gavage and **Y. Ricard**, Jump conditions and dynamic surface tension at permeable interfaces such as the inner core boundary, *C. R. A. S.*, 346, 110-118, Doi : 10.1016/j.crte.2014.04.006, 2014.
- ¹⁰⁸B. Tauzin and **Y. Ricard**, Seismically deduced thermodynamics phase diagrams for the mantle transition zone, *Earth Planet. Sci. Lett.*, DOI: 10.1016/j.epsl.2014.05.039, 2014.
- ¹⁰⁹T. Alboussière and **Y. Ricard**, Reflections on energy dissipation within thermal convection in liquids, Corrigendum, *J. Fluid Mech.*, 751, 749-751, 2014.

- ¹¹⁰**Y. Ricard**, S. Labrosse and F. Dubuffet, Lifting the cover of the cauldron: Convection in hot planets, Gcubed, DOI: 10.1002/2014GC005556, 2014.
- ¹¹¹D. Bercovici, G. Schubert, and **Y. Ricard**, Abrupt tectonics and rapid slab detachment with grain damage, PNAS, www.pnas.org/cgi/doi/10.1073/pnas.1415473112, 2015.
- ¹¹²**Y. Ricard**, Physics of mantle convection, Treatise of Geophysics, Elsevier, Pages 23-71, 2015.
- ¹¹³D. Bercovici, P. Tackley and **Y. Ricard**, Generation of plate tectonics from mantle convection, Treatise of Geophysics, Elsevier, Pages 272-311, 2015.
- ¹¹⁴S. Durand, E. Debayle and **Y. Ricard**, Rayleigh wave phase velocity and error maps up to the fifth overtone, Geophys. Res. Lett., 42, 9, 32663272, 10.1002/2015GL063700, 2015.
- ¹¹⁵M. Thielmann, A. Rozel, B. J. P. Kaus and **Y. Ricard**, Grain size assisted thermal runaway: Implications for intermediate-depth earthquake generation, Geology, 43 (9), 791-794, 2015.
- ¹¹⁶C.E. Boukaré, **Y. Ricard** and G. Fiquet, Thermodynamics of the MgO-FeO-SiO₂ system up to 140 GPa: Application to the crystallization of Earth magma ocean, J. Geophys. Res., 120 (9), 6085-6101.
- ¹¹⁷D. Bercovici and **Y. Ricard**, Grain-damage hysteresis and plate tectonic states, Phys. Earth Planet. Int., 253, 31-47.
- ¹¹⁸S. Durand, E. Debayle, **Y. Ricard** and S. Lambotte, Seismic evidence for a change in the large scale tomographic pattern across the D'' layer, Geophys. Res. Lett., 43 (15), 7928-7936.
- ¹¹⁹T. Alboussière and **Y. Ricard**, Rayleigh-Bénard stability and the validity of quasi-Boussinesq or quasi-anelastic liquid approximations, J. Fluid Mech., 817, 264-305.
- ¹²⁰**Y. Ricard**, D. Bercovici and F. Albarde, Thermal evolution of planetesimals during accretion, Icarus, 285, 103-117.
- ¹²¹Adenis A., E. Debayle and **Y. Ricard**, Seismic evidence for broad attenuation anomalies in the asthenosphere beneath the Pacific ocean, Geophys. J. Inter., 209, 1677-1698.
- ¹²²Boukaré C-E and **Y. Ricard**, Modeling phase separation and phase change for magma ocean solidification dynamics, Geochem., Geophys., Geosys., DOI 10.1002/2017GC006902.
- ¹²³Adenis, A. E. Debayle and **Y. Ricard**, Attenuation tomography of the upper mantle, Geophys. Res. Lett., 44, 7715-7724, doi:10.1002/2017GL073751.
- ¹²⁴S. Durand, E. Debayle and **Y. Ricard**, C. Zaroli and S. Lambotte, Evidence for a change in the global shear velocity pattern at around 1,000 km depth, Geophys. J. Inter., 211 (3), 1628-1639.
- ¹²⁵C. Alder, T. Bodin, **Y. Ricard**, Y. Capdeville, E. Debayle and J-P. Montagner, Quantifying extrinsic anisotropy induced by small-scale chemical heterogeneities, Geophys. J. Inter., 211 (3), 1585-1600.
- ¹²⁶J. Curbelo, L. Duarte, T. Alboussière, F. Dubuffet, S. Labrosse, and **Y. Ricard**, Numerical solutions of compressible convection with an infinite Prandtl number: comparison of the anelastic and anelastic liquid models with the exact equations, J. Fluid Mech. 873, 646-687.
- ¹²⁷E. Debayle, T. Bodin, S. Durand and **Y. Ricard**, Seismic evidence for partial melt below tectonic plates, Nature, 586 (7830), 555-559.
- ¹²⁸**Y. Ricard**, S. Labrosse, Terasaki H. and D. Bercovici, Thermocapillary effects in two-phase medium and applications to metal-silicate separation, Phys. Earth Planet. Int., 311, 106640.
- ¹²⁹Magali J.K., Bodin T., Hedjazian, N., **Ricard, Y.**, Capdeville Y., Debayle, E., Quantifying Intrinsic Contributions to Radial Anisotropy in Tomographic models, J. Geophys. Res., 126 (10), e2021JB022322.
- ¹³⁰**Ricard, Y.**, Alboussière, T., Curbelo J., Dubuffet, F., and Labrosse S. Fully compressible convection for planetary mantles, Geophys. J. Inter., 230, 932956.
- ¹³¹Alboussière, T., Curbelo J., Dubuffet, F., Labrosse S., and Ricard Y., A playground for compressible natural convection with a nearly uniform density, J. Fluid Mech., 940, A9.

- ¹³²Baron M.A., Fiquet G., Morard G., Miozzi F., Esteve I., Doisneau B., **Ricard, Y.**, and Guyot F., Melting of basaltic lithologies in the Earth's lower mantle, *J. Fluid Mech.*, 333, e2021JB022322. 2023
- ¹³³Li Lei, S. Durand, Ricard Y., E. Debayle, An efficient algorithm to measure arrival times of weak seismic phases, *Geophys. J. Inter.*, 235, 1944-1958.
- ¹³⁴**Ricard, Y.**, T. Alboussire, Compressible convection in super-earths, *Physics Earth Planet. Int.*, 341, 107062.
- ¹³⁵B. Gardonio, D. Marsan, T. Bodin, A. Socquet, S. Durand, M. Radiguet, A. Schubnel, Ricard Y., Impact of a large megathrust earthquake on deep subduction seismicity, *soumis*.
- ¹³⁶**Ricard, Y.** and Chambat F., Contraction of a condensed planet by cooling or despinning , *soumis*.