

José Alberto PADRÓN NAVARTA

Born September 28th 1982

Spanish Citizen

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Freestyle summary

I am an Earth scientist looking at the cycling and fate of volatiles in the Earth's mantle. Constraining the deep Earth's water cycle is an outstanding scientific and societal challenge whose study necessarily needs a multidisciplinary approach. During the course of my career I have combined and applied tools from several disciplines ranging from Chemical Thermodynamics, Experimental Petrology (static equilibrium high-pressure and high-temperature experiments and dynamic rock deformation experiments), Mineral Physics (infrared spectroscopy, solid state diffusion, point defects chemistry, rheology), Geochemistry (major and trace elements, stable isotopes, EPMA and LA-ICPMS), Crystallography (Electron Backscattered Diffraction, Transmission Electron Microscopy), and natural observations (from high-pressure orogenic belts) to unravel the existence of the much-speculated ultra-deep hidden oceans.

Higher Education and Research Experience

09/2020 – 08/2025	Ramón y Cajal research fellow (Spanish Research Council CSIC).
10/2018	HDR, Habilitation à diriger des recherches, <i>Université de Montpellier</i> , France. Committee: J. Ingrin, E. Balan, B. Reynard, N. Bolfan-Casanova (examiner).
Since 10/2014	Permanent research position at the Centre National de la Recherche Scientifique (CNRS). UMR5243 Géosciences Montpellier (France). <i>On secondment for five years.</i>
7/2011 – 7/2014	Marie Curie Postdoctoral Fellow (International Outgoing Fellowship IOF, FP7 PIOF-GA-2010-273017, project HISLa-DR. From 7/2011 to 7/2014. Géosciences Montpellier (France)/Research School of Earth Sciences (Australia).
4/2010 – 4/2011	Postdoctoral Research Fellow at the Department of Mineralogy and Petrology – University of Granada (Spain).
3/2006 – 3/2010	Ph.D in Earth Sciences at University of Granada, Spain (PhD grant funded by the Spanish Government, FPU program).
09/2007	DEA (Master degree), University of Granada, Spain.
6/2004 – 12/2004	Undergraduate scholarship: Introduction to research (funded by the University of Granada, Spain).
2000-2005	Degree in Geology. University of Granada (Spain).

PhD on Earth Science (24th March 2010)

Thesis title: A coupled petrological and petrophysical study of high-pressure dehydration reactions in subduction settings: Insights from the Betic Cordillera and the Kohistan Paleo-Arc

<http://digibug.ugr.es/bitstream/10481/4942/1/18684889.pdf>

University of Granada (Spain)

Supervisors: Gómez-Pugnaire MT, Garrido CJ and López Sánchez-Vizcaíno V./ Committee: Prof. F. Gervilla, Prof. A. García Casco, Dr. A. Tommasi, Prof. M. Mellini, Dr. M. Sánchez-Gómez

2006 – 2010 PhD Scholarship funded by the Spanish Government (FPU program), University of Granada, Spain, including 3 research stay grants (total of 9 months) in Australia and France.

Teaching activity

2019-2020	Applied chemical thermodynamics in petrology (3 rd year undergraduate students). HLST608 (18 h per year). <i>Pétrologie approfondie</i> (Lectures given in French).
2014	Hydrogen diffusion in minerals. Theory and practical examples with Matlab (Master 2, Géoscience Montpellier). 3 hours course and supervising of a practical work (equivalent to 10 h). Lectures given in French.
2011-2013	Research School of Earth Sciences (Australian National University, Canberra). 3 hours of lectures and 9 hours of practicum of the course "Magmatism and Metamorphism" (EMSC 3024). Lectures given in English.
2008-2010	Dept. of Mineralogy and Petrology, University of Granada (Spain). Lectures and practical courses for undergraduate students in Geology on Phase Equilibria in Metamorphic Petrology. Lectures given in Spanish.

Awards

2016	CNRS for excellence in science and mentoring ("Prime d'encadrement doctoral et de recherche").
2007	University of Granada Medal in recognition of the first national prize for students majoring in Geology.
2006	Award from the Ministry of Education and Science (Spanish Government) for best academic record for students majoring in Geology in Spain (First prize, BOE nº 238).
2005	Award from the Academy of Mathematical, Physical, Chemical and Natural Sciences of Granada.

Workshops

June 28-29, 2021	Fluid-rock interaction and ore deposits in the Earth's crust: coupling of field and experimental methods with numerical modeling. Goldschmidt 2021 .
Aug 30- Sept. 3, 2021	Escuela Española de Altas Presiones (EEAP 2021). University of Valencia. MALTA group, Consolidator.
November 7-11, 2016	2 nd Summer School of Recrystallization Mechanisms in Materials (Sète, France).
February 1-5, 2016	CREEP (Marie Curie Initial Training Network of the EU Seventh Framework Programme) Short course 1 (Sète, France) "Introduction to numerical geodynamic modelling" by Paul Tackley and Taras Gerya from the ETH in Zurich.
January 27-31, 2016	CREEP (Marie Curie Initial Training Network of the EU Seventh Framework Programme) 1 st Workshop, Sète France.
September 7-9, 2015	CNRS course on Matlab.
October 22-23, 2013	MTEX: a MATLAB Toolbox for Quantitative Texture Analysis. Géosciences Montpellier (France).
October 2-3 & 15, 2012	Monte Carlo methods in a nutshell. Research School of Earth Sciences short course. RSES, ANU (Australia).
July 2-7, 2011	Nature of the plate interface in Subduction Zones. ILP Task force IX Workshop (Piemonte, Italy).

January 18-22, 2010	Crystal2Plate Workshop (CRYSTAL2PLATE Marie Curie Initial Training Network of the EU Seventh Framework Programme), Estepona (Málaga). Spain.
October 3-8, 2010	Delta-Min Network short-course on microstructures. Delta-Min (Marie Curie Initial Training Network of the EU Seventh Framework Programme). Santorini (Grecia).
July 5-8, 2010	Thermodynamics: calculating phase equilibria and physical properties using PERPLE_X by James Connolly, Crystal2Plate short-course (CRYSTAL2PLATE Marie Curie Initial Training Network of the EU Seventh Framework Programme), Géosciences Montpellier, Université Montpellier 2, France.
June 27 - July 5, 2009	European Intensive Seminars of Petrology (EURISPET, EU Sixth Framework Programme): high-pressure metamorphism and subduction zones. University of Granada, Spain.
August 21-31, 2008	European Intensive Seminars of Petrology (EURISPET, EU Sixth Framework Programme): Petrology of the lithosphere in extensional settings. Eötvös University Budapest, Hungary.
January 31-Feb 9, 2008	European Intensive Seminars of Petrology (EURISPET, EU Sixth Framework Programme): Isotopes applied to petrological problems. The Australian National University, Canberra, Australia.

Organization of scientific session and meetings

2022	Co-convenor of the session Minerals and rocks under stress: a way to unravel geological processes. Convener: Nicola Campomenosi Co-conveners: Mattia L. Mazzucchelli, & JA Padrón-Navarta (International Mineralogical Association, IMA Lyon 2022 , 18-22 July).
2022	Convener of the sesión Serpentinities and beyond: the back-and-forth journey of water into the mantle. Convener: JA Padrón-Navarta Co-conveners: Samuel Angiboust & Oliver Plümpner (International Mineralogical Association, IMA Lyon 2022 , 18-22 July).
2021	Co-convenor of the session 2b - Water in nominally anhydrous minerals: detection, distribution and consequences. Convener: M. Jollands Co-conveners: JA. Padrón-Navarta, S. Demouchy. Goldschmidt 2021 (4-9 July Lyon).
2021	Co-convenor of the session GMPV6.1 From the nano- to the orogen-scale: metamorphism, deformation and fluid-rock interaction. Convener: F. Giuntoli Co-conveners: F. Piccoli, R. Palin, A. Pluymakers, P. Manzotti, O. Plümpner, JA. Padrón-Navarta, E. Schwarzenbach (EGU Meeting , 19–30 April).
2020	Co-convenor of the session GMPV7.1 The metamorphic rock record: pieces of the lithospheric puzzle. Convener: M. Smit Co-conveners: D. Rubatto, T. Raimondo, L. Tajcmanova, F. Piccoli, JA. Padrón-Navarta, C. Tiraboschi (EGU Meeting , 4–8 May).
2020	Co-convenor of the session GMPV2.1 Earth as a tectonically living planet: the role of water. Convener: H. Ni Co-conveners: I. Kovács, J. Brodholt, JA. Padrón-Navarta, Q-K Xia, M. Hirschmann, R. Stalder, Y-F Zheng (EGU Meeting , 4–8 May).
2018	Co-organizer of the CNRS Petrochro Summer School 2018, 18-20 September, Sète, France. Main organizer: Bénédicte Cenki-Tok.
2018	Co-convenor of the session “How to apply for the Marie Skłodowska-Curie grants Individual Fellowship and European Training Network”, Vienna, Austria (EGU Meeting , 9-13 April). Convener: Sylvia Walter Co-Conveners: Jannick Ingrin, Daniela Henkel, José Alberto Padrón-Navarta
2016	Co-organizer of the 4th international “Serpentine days”. 25-29 September, Sète, France. http://serpentine2016.gm.univ-montp2.fr/
2016	Co-convenor of the session “Progress in Metamorphic Geology: From Ultrahigh-temperature Terrains to Subduction Zones” Vienna, Austria (EGU Meeting , 17-22 April). Convener: S. Ferrero Co-Conveners: E. Grosch, P. Goncalves, P. Lanari, JA Padrón-Navarta
2011	Co-convenor of the session GMPV34 The subduction interface: cross-disciplinary views from Geodynamics-Geochemistry-Seismology, Vienna, Austria (EGU Meeting , 03-08 April). Convener: P. Agard Co-Conveners: B. Hacker, A.I Okay, T. Gerya, JA. Padrón-Navarta, F. Tilmann, N. Kukowski, V. López Sánchez-Vizcaíno.

2009 Fieldtrip co-organizer together with Dr. Vicente López Sánchez-Vizcaíno to the Cerro del Almiraz (Almería, Spain) during the **EURISPET (EU Sixth Framework Programme)** workshop at the University of Granada (Spain).

Institutional responsibilities

2015 – 2019 School Seminar Coordinator (17 national and international seminars per year), Géosciences Montpellier, University of Montpellier (France).
2016 – 2019 Microprobe Scientific board, Géosciences Montpellier (France).
2015 – 2020 Elected member to represent CNRS researchers at Géosciences Montpellier (France).
2015 – 2017 Committee member of the internal information bulletin of Géosciences Montpellier (France).

Commission of trust

PhD Thesis committee (4):

- J. Muñoz Montecinos (Fluid pulses along the subduction interface: integrated field and retro-geochemical approaches, Institut de Physique du Globe de Paris - Université de Paris, 2021).
- L. Martinek (Effet de la fugacité d'oxygène sur le stockage des fluides C et H dans le manteau Terrestre, University of Clermont-Auvergne, 2019).
- H. Pilorgé (Perméabilité et transport des fluides dans les zones de subduction, University of Lyon, 2017).
- M. Merkulova (Comportement du fer et autres ions échangeurs d'électrons en contexte de subduction, University of Grenoble Alps, 2016).
- C. Villanova de Benavent (Compositional and structural characterisation of Ni-phyllosilicates in hydrous silicate type Ni-laterite deposits, University of Barcelona, 2015).

2021 Guest Editor for the Tectonophysics Special Issue *Deformation processes in the ductile crust and mantle, seismic anisotropy, ocean ridge dynamics: A special issue in honor of Adolphe Nicolas*.

Since 2019 Associate Editor of *Ofioliti*.

Since 2010 Active reviewer for A-ranks journals (Nature of Geosciences, Geology, Earth and Planetary Science Letters, Lithos, Journal of Petrology, Journal of Metamorphic Geology, Contributions to Mineralogy and Petrology, Physics and Chemistry of Minerals, European Journal of Mineralogy, American Mineralogist, International Journal of Earth Sciences, American Journal of Science, Geochimica et Cosmochimica Acta, Tectonophysics, Terra Nova). Between 5 to 8 per year.

Since 2010 Reviewer for ANR, NSF and DFG.

Membership of scientific societies

Since 2006 Member of the Mineralogical Society of America (MSA).

Since 2021 Member of the Geological Society of Spain (SGA).

Technical skills

Thermodynamics soft. PerpleX (phase diagrams, phase equilibria, thermodynamic data, creation of mineral solid solution models, fluid infiltration models, electrolytic speciation modelling), GEMS-Selektor (metasomatic fluid-rock interaction), Thermocalc (thermobarometry).

Laboratory High-pressure experiments using piston-cylinder apparatus, internally-heated gas medium triaxial apparatus (Paterson press), 1-atm high temperature gas mixing furnace, double polished section preparation for FTIR.

Analytical techniques Electron Backscattered Diffraction (EBSD), SEM, FTIR and Raman spectrometry, Electron microprobe, LA-ICPMS, optical microscopy.

Specific software	CSpace (3D compositional phase diagrams, chemographies), DataGraph, Sigmaplot, Matlab (MTEx), AZtec (EDS/EBSD software), OPUS (FTIR software).
Language programming	Matlab and Python (standard libraries).
Languages	Spanish: native English: fluent French: fluent

Grants and Funded projects

Funded projects as **Principal Investigator (PI)**

2020-2025	Ramón y Cajal fellowship (salary and 40,000 € research support funds).
2020-2023	Spanish National Funding. DESTINE. High-pressure Dehydration of Serpentinites and its Implications for Subduction Processes. Co-IP: C.J. Garrido. 114,950 € (<u>includes a PhD grant</u>). PID2019-105192GB-I00.
2017-2018	ANR Tremplin. Funding to improve an ERC proposal (Deep Earth Water Transport DeepW) that was favourably evaluated in the first round (A class). 30,000 €.
2016-2018	PHC PROTEUS. Bilateral project between Géosciences Montpellier (France) and the Department of Nanostructured material from the Jozef Stefan Institute (Slovenia). French PI. J.A. Padrón-Navarta and Slovenian PI N. Daneu. 8,000 € for two years.
2016-2017	Fluid transport mechanisms during dehydration: study case of Malenco serpentinite INSU-CNRS (France). (5,000 €). PI: J.A. Padrón-Navarta.
2015-2016	Fluid transport mechanisms during dehydration: study case of Malenco serpentinite INSU-CNRS (France). (7,000 €). PI: J.A. Padrón-Navarta.
2014-2015	Fluid transport and rheology during metamorphic devolatilization in subduction zones (MinCompact: mineral reaction and compaction). INSU-CNRS (France). (5,000 €). PI: J.A. Padrón-Navarta.
2011-2014	Hydrogen Incorporation in Subducting Lithosphere after Dehydration Reactions (HISLa-DR, POF-GA-2010-273017). MARIE CURIE FP7 (269,710 € including salary, research costs and participation to conferences). PI: J.A. Padrón-Navarta (J. Hermann and A. Tommasi as reference scientists in the outgoing and return phase respectively).

Funded projects as researcher associated

2020-2022	FEDER-Andalucía. Contribución de la subducción de oficarbonatos al ciclo profundo del carbono. University of Jaén. Funded by the Regional Spanish government (67,675 €). PI: V. López Sánchez-Vizcaíno. RFC/FEDER-UJA 1263042.
2016-2020	Spanish National Funding. Devolatilización, reciclaje de CO ₂ y balances redox asociados a la subducción de serpentinitas: implicaciones para el ciclo profundo del carbono". PI: V. López Sánchez-Vizcaíno. (62,920 €) CGL2016-75224-R.
2013-2016	Antigorite dehydration in subduction zones: Petrological, geochemical and petrophysical implications. University of Jaén. Funded by the Spanish government (68,000 €). PI: V. López Sánchez-Vizcaíno.
2010-2014	Formation, modification and emplacement of lithospheric mantle in the Betic-Rif Cordillera. CSIC, Spain. Funded by Junta de Andalucía (Spain). PI: C. J. Garrido.
2009-2012	Hydration and dehydration processes of ultramafic rocks in subduction settings: a petrological, geochemical and experimental study. University of Granada (Spain). Funded by the Spanish government (66,000 €). PI: M. T. Pugnaire.
2006-2009	Metamorphic, geochemical and petrophysical processes associated to dehydration reactions in subduction settings: Betic Cordillera and Himalaya. University of Granada (Spain). Funded by the Spanish government (60,000 €). PI: M. T. Pugnaire.

2006-2008 Thermo-mechanical and chemical erosion of the sublithospheric mantle: new insight from mantle peridotite. University of Granada (Spain) - Université de Montpellier 2 (France) – CNRS (France). Funded by the Spanish government HF2006 (55,000 €) PI: F. Gervilla & A. Tommasi.

Other granted proposals

2014 Beam-time proposal at Diamond Light Source (April – September 2014, UK): Low-temperature (4.2 K) FTIR spectroscopy of hydrogen at defect sites in the mineral olivine. PI: A.J. Berry. Co-investigators: J. Hermann, J.A. Padrón-Navarta, P. Schofield.

2015 Beam-time proposal at the European Synchrotron ESRF (22 – 27 January 2015, Grenoble, France): Water content and iron speciation in garnet from high pressure experiments in eclogites. PI: A. Rosenthal. Co-investigators: A. Berry, S. Petitgirard, G. Yaxley, D. Frost, J.A. Padrón-Navarta.

Supervision of graduate students

Main supervisor of PhD students

2021 – 2025 PhD main supervisor of Margherita Dalla Brida, Spanish National Funded PhD grant (FPI programme).

2015 – 2018 PhD main supervisor of Maxime CLEMENT: "Fluid transfer in subduction zones" – French Ministry of Education and Research funding –co-supervised by A. Tommasi, Géosciences Montpellier.

*Clément, M., Padrón-Navarta, J. A. & Tommasi, A. (2019). Interplay between Fluid Extraction Mechanisms and Antigorite Dehydration Reactions (Val Malenco, Italian Alps). *Journal of Petrology* **60**, 1935–1962.

*Clement, M. Padrón-Navarta, J. A., Tommasi, A. D. Mainprice (2018). Non-hydrostatic stress field orientation inferred from orthopyroxene (Pbc) to low-clinoenstatite (P2₁/c) inversion in partially dehydrated serpentinites. *American Mineralogist* **103**, 993–1001.

Advisor/mentoring of PhD students

2021 Mentoring of 1 visiting PhD student from the University of Milan (Italy), Ms. Sara Sibil Giuseppina Guerini on phase relations and thermodynamic modelling of CO₂ metasomatism.

2012 – 2018 Advisor of three PhD students from the RSES (ANU):

- Mr Mike Jollands 2012-2015 (experimental diffusion in olivine, now as postdoc at the Lamont-Doherty Earth observatory in New York)

* Jollands, M. C., Padron-Navarta, J. A., Hermann, J. & O'Neill, H. S. C. (2016). Hydrogen diffusion in Ti-doped forsterite and the preservation of metastable point defects. *American Mineralogist* **101**, 1571–1583.

* Jollands, M. C., Hermann, J., St. O'Neill, H. C., Spandler, C. & Padrón-Navarta, J. A. (2016). Diffusion of Ti and some divalent cations in olivine as a function of temperature, oxygen fugacity, chemical potentials and crystal orientation. *Journal of Petrology* **57**, 1983–2010.

- Mr Shayne Lakey (experimental investigation of the chlorite breakdown at high-pressure conditions and thermodynamic modelling, 2013-2018).

- Ms Maria Rosa Scicchitano (oxygen isotopes, fluid-rock interaction and oxygen diffusion in garnet, 2013-2018, now postdoc at GeoForschungsZentrum GFZ, Potsdam)

* Scicchitano, M. R., Rubatto, D., Hermann, J., Shen, T., Padrón-Navarta, J. A., Williams, I. S. & Zheng, Y. F. (2018). In Situ Oxygen Isotope Determination in Serpentine Minerals by Ion Microprobe: Reference Materials and Applications to Ultrahigh-Pressure Serpentinites. *Geostandards and Geoanalytical Research* **42**, 459–479.

2014 – 2015 Mentoring of 1 visiting PhD student from University of Zaragoza (Spain), Ms V. Colás on thermodynamic modelling of spinels, now as research associated at the National University of Mexico.

*Colás V, Padrón-Navarta JA, González-Jiménez JM, Griffin WL, Fanlo I, O'reilly SY, Gervilla F, Proenza JA, Pearson NJ, Escayola MP (2016) Compositional effects on the solubility of minor and trace elements in oxide spinel minerals: Insights from crystal- crystal partition coefficients in chromite exsolution. *American Mineralogist* **101**(6):1360-1372

*Colás, V., Padrón-Navarta, J. A., González-Jiménez, J. M., Fanlo, I., López Sánchez-Vizcaíno, V., Gervilla, F. & Castroviejo, R. (2017). The role of silica in the hydrous metamorphism of chromite. *Ore Geology Reviews* **90**, 274–286.

2011 – 2012 Advisor of Ms Tingting Shen during her 12 months stay at RSES, ANU (PhD candidate from Peking University, Beijing, China, now with a permanent position at the Chinese Academy of Geological Sciences) working on ultrahigh pressure hydrated peridotites from Tianshan orogenic belt, China.

* Shen, T. T. *et al.* (2015). UHP Metamorphism Documented in Ti-chondrodite- and Ti-clinohumite-bearing Serpentinized Ultramafic Rocks from Chinese Southwestern Tianshan. *Journal of Petrology* **56**, 1425–1458.

* Shen, T., Hermann, J., Zhang, L., Padrón-Navarta, J. A. & Chen, J. (2014). FTIR spectroscopy of Ti-chondrodite, Ti-clinohumite, and olivine in deeply subducted serpentinites and implications for the deep water cycle. *Contributions to Mineralogy and Petrology* **167**, 1–15.

Master students

2021 CSIC internship program (María del Carmen Romero Toribio – FTIR analyses of mantle xenolith from El Hierro island. 5 months.

2017 Supervision of one Master 2 student from an Erasmus+ research Stay (University of Pavia, Italy). Stefania Corvò: Hydrogen solubility in minerals from the Finero Complex (now PhD student at the University of Pavia, Italy).

2015 Main supervisor of one Master 1 student (Géosciences Montpellier): Mr. Thomas Leydier (now as postdoc at the University of Montpellier, France). “Hydrogen concentration and microstructure of Alpe Arami garnet peridotite (Leptontine Alps)”.

2015 Leonardo Garrido. Graduate visiting student from University of Chile, on thermodynamic modelling Géosciences Montpellier (France).

2012 – 2013 Mentoring of two international internship master students in the Experimental Petrology group of the Research School of Earth Sciences, Australian National University (Australia): (1) Ms. Celine Crepisson at RSES, ANU (ENS Paris, France, Hydrogen decoration of Yttrium diffusion profiles in olivine, 2013) and (2) Ms. Frauke Patersen at RSES, ANU (Bochum University, Germany pressure dependence on water solubility in Ti-doped forsterite, 2012).

List of peer-reviewed publications

Author of more than 50 articles in international peer-reviewed journals.

1940 citations, h=27 (Scopus, 17/03/2022)

<http://www.scopus.com/inward/authorDetails.url?authorID=24279069200&partnerID=MN8TOARS>

2378 citations, h=28 (Google Scholar, 17/03/2022)

<https://scholar.google.fr/citations?user=5x5JgplAAAAJ&hl=en>

Invited in preparation

61. Jollands MC, Padrón-Navarta JA, Dohmen R. Hide and Seek – Trace Elements in the Olivine Lattice. Elements: Olivine. Anticipated article submission: May 2022.

Submitted

60. Padrón-Navarta JA, López-Sánchez Vizcaíno V., Menzel M, Gómez-Pugnaire MT, Garrido CJ. Mantle wedge oxidation due to sediment-infiltrated deserpentinisation. Submitted to *Nature Geosciences* (24/11/21).
59. Jabaloy A, Padrón-Navarta JA, López-Sánchez Vizcaíno V., Hidas K, Gómez-Pugnaire MT, Garrido CJ. Olivine-rich veins in high-pressure serpentinites a far-field stress snapshot during subduction. Submitted to *Journal of Structural Geology* (29/10/21).
58. Jollands MC., Muir J, Padrón-Navarta JA., Demouchy S. Hydrogen mobility in forsterite re-evaluated in the framework of diffusion coupled to inter-site reaction. Submitted to *Contributions to Mineralogy and Petrology* (moderated revision submitted on 28/02/2022).

Published or in press

marked with * are PhD (or former PhD) or master student publications in which I was directly involved as a mentor or advisor.

57. Spránitz T*, Padrón-Navarta JA, Szabó C, Szabó A, Berkesi M, Abiotic nitrogen and methane enrichment during exhumation of subducted rocks: primary multiphase fluid inclusions in HP rocks from the Cabo Ortegal Complex, NW Spain. Submitted to *Journal of Metamorphic Geology* (in press).
56. Cerpa, N. G.; Arcay, D.; Padrón-Navarta, J. A. Sea-Level Stability over Geologic Time Owing to Limited Deep Subduction of Hydrated Mantle. *Nature Geosciences* (in press). <https://doi.org/10.31223/X51K5G>.
55. González-Jiménez, J. M., Piña, R., Saunders, J. E., Plissart, G., Marchesi, C., Padrón-Navarta, J. A., Ramón-Fernández, M., Garrido, L. N. F. & Gervilla, F. (2021). Trace element fingerprints of Ni-Fe-S-As minerals in subduction channel serpentinites. *Lithos*. **400–401**, 106432.
54. Padrón-Navarta, J. A., Barou, F. & Daneu, N. (2020). Twinning in SnO₂-based ceramics doped with CoO- and Nb₂O₅: morphology of multiple twins revealed by electron backscatter diffraction. *Acta Crystallographica Section B Structural Science, Crystal Engineering and Materials*. International Union of Crystallography (IUCr) **76**, 875–883.
53. Laborda-López, C., Marchesi, C., López Sánchez-Vizcaíno, V., Gómez-Pugnaire, M. T., Dale, C. W., Jabaloy-Sánchez, A., Padrón-Navarta, J. A., Román-Alpiste, M. J. & Garrido, C. J. (2020). Geochemical evolution of rodingites during subduction: insights from Cerro del Almirez (southern Spain). *Lithos* **370–371**, 105639.
52. Shen, T., Zhang, C., Chen, J., Hermann, J., Zhang, L., Padrón-Navarta, J. A., Chen, L., Xu, J. & Yang, J. (2020). Changes in the cell parameters of antigorite close to its dehydration reaction at subduction zone conditions. *American Mineralogist* **105**, 569–582.
51. Corvò, S., Langone, A., Padrón-Navarta, J. A., Tommasi, A. & Zanetti, A. (2020). Porphyroclasts: Source and Sink of Major and Trace Elements During Deformation-Induced Metasomatism (Finero, Ivrea-Verbano Zone, Italy). *Geosciences*. **10**, 196.
50. *Clément, M., Padrón-Navarta, J. A. & Tommasi, A. (2019). Interplay between Fluid Extraction Mechanisms and Antigorite Dehydration Reactions (Val Malenco, Italian Alps). *Journal of Petrology* **60**, 1935–1962.

49. Plissart, G., González-Jiménez, J. M., Garrido, L. N. F., Colás, V., Berger, J., Monnier, C., Diot, H. & Padrón-Navarta, J. A. (2019). Tectono-metamorphic evolution of subduction channel serpentinites from South-Central Chile. *Lithos*. Elsevier B.V. **336–337**, 221–241
48. * Maurice, J., Bolfan-Casanova, N., Padrón-Navarta, J. A., Manthilake, G., Hammouda, T., Hénot, J. M. & Andraut, D. (2018). The stability of hydrous phases beyond antigorite breakdown for a magnetite-bearing natural serpentinite between 6.5 and 11 GPa. *Contributions to Mineralogy and Petrology* **173**.
47. * Scicchitano, M. R., Rubatto, D., Hermann, J., Shen, T., Padrón-Navarta, J. A., Williams, I. S. & Zheng, Y. F. (2018). In Situ Oxygen Isotope Determination in Serpentine Minerals by Ion Microprobe: Reference Materials and Applications to Ultrahigh-Pressure Serpentinites. *Geostandards and Geoanalytical Research* **42**, 459–479.
46. Thoraval, C., Demouchy, S. & Padrón-Navarta, J. A. (2018). Relative diffusivities of hydrous defects from a partially dehydrated natural olivine. *Physics and Chemistry of Minerals* **46**.
45. Laborda-López, C., López-Sánchez-Vizcaíno, V., Marchesi, C., Gómez-Pugnaire, M. T., Garrido, C. J., Jabaloy-Sánchez, A., Padrón-Navarta, J. A. & Hidas, K. (2018). High-P metamorphism of rodingites during serpentinite dehydration (Cerro del Almirez, Southern Spain): Implications for the redox state in subduction zones. *Journal of Metamorphic Geology* **36**, 1141–1173.
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Book chapters

1. Jabaloy Sánchez, A., Martín-Algarra, A., Padrón-Navarta, J. A., Martín-Martín, M., Gómez-Pugnaire, M. T., López Sánchez-Vizcaíno, V. & Garrido, C. J. (2019). Lithological Successions of the Internal Zones and Flysch Trough Units of the Betic Chain. In: Quesada, C. & Oliveira, J. T. (eds) *The Geology of Iberia: A Geodynamic Approach: Volume 3: The Alpine Cycle*. Cham: Springer International Publishing, 377–432.
2. Jabaloy Sánchez, A., Padrón-Navarta, J. A., Gómez-Pugnaire, M. T., López Sánchez-Vizcaíno, V. & Garrido, C. J. (2019). Alpine Orogeny: Deformation and Structure in the Southern Iberian Margin (Betics s.l.). In: Quesada, C. & Oliveira, J. T. (eds) *The Geology of Iberia: A Geodynamic Approach: Volume 3: The Alpine Cycle*. Cham: Springer International Publishing, 453–486.

List of contributions to conferences

I have attended 21 international (EGU: 2008, 2010, 2011, 2014, 2016, 2017, 2018, 2020*, 2021*; Goldschmidt: 2009, 2010, 2011, 2013, 2019, 2021*; International Geological Congress: 2012, AGU: 2013, 2014, 2017; EMPG-XVI 2018; TiGeR 2018) and 5 national conferences (Spain: 2006, 2008, 2011; Germany, 2010; Australia: 2011). Over 100 communications to national and international meetings (more than 30 as first author and more than 27 of them as oral presentation), **6 invited talks in international meetings** (2 American Geoscience Union, 1 European Geosciences Union, 1 Goldschmidt, 1 International Geological Conference and 1 TiGeR Conference). *online meetings.

2022

1. Padrón-Navarta, J.A.*, López Sánchez-Vizcaíno, V., Manuel D. Menzel, María Teresa Gómez-Pugnaire, Garrido, C.J. Mantle wedge oxidation due to sediment-infiltrated deserpentinisation. Goldschmidt 2022 (10-15 July, Hawaii).
2. Spránitz T., Padrón-Navarta J.A., Szabó CS., Gilio M., Alvaro M., Szabó Á., Berkesi M.. Evolution of fluids from a subduction zone: unraveling P-T and compositional evolution path based on complex inclusion study. Goldschmidt 2022 (10-15 July, Hawaii).
3. Padrón-Navarta, J.A., A. Jabaloy-Sánchez, López Sánchez-Vizcaíno, V., Gómez-Pugnaire, M.T., K. Hidas, Garrido, C.J. On the potential role of reactive flow precipitation due to fluid-pressure gradients for the genesis of olivine veins in subducted metaserpentinite. Geophysical Research Abstracts Vol. XXII, EGU General Assembly 2022.
4. Arcay D., Cerpa N., Padrón-Navarta JA. Reconciling extensive mantle hydration at subduction trenches and limited deep H₂O fluxes. Geophysical Research Abstracts Vol. XXII, EGU General Assembly 2022.
5. López Sánchez-Vizcaíno, V., Padrón-Navarta, J.A., Laborda-López, C., Gómez-Pugnaire, M.T., Menzel, M.D., Garrido, C.J.. Metaserpentinite carbonation and decarbonation reactions during subduction metamorphism and subsequent tectonic exhumation. Geophysical Research Abstracts Vol. XXII, EGU General Assembly 2022.

2021

6. N. Daneu (**invited**), J. A. Padrón-Navarta, F. Barou, G. Dražić, A. Rečnik. Twinning in minerals with the rutile-type structure: insights from TEM and EBSD. MC 2021 (Microscopy Conference 22-26 August 2021).

7. Hidas K. (**Keynote**) and Padrón-Navarta JA. Insight into the impact of melt/fluid percolation on the microstructural evolution of the lithospheric mantle. Book of Abstracts 3rd European Mineralogical Conference EMC 2020, Cracow, Poland.
8. Michael C. Jollands, Joshua Muir, José Alberto Padrón-Navarta, and Sylvie Demouchy, Geosciences Montpellier. Hydrogen mobility in forsterite re-evaluated in the framework of diffusion coupled to inter-site reaction. Goldschmidt 2021 (4-9 July, Lyon).
9. Nora Liptai, Thomas Pieter Lange, Levente Patko, László Előd Aradi, Marta Berkesi, Peter M Tollan, José Alberto Padrón-Navarta, Jörg Hermann, Csaba Szabó and István János Kovács. Infrared spectroscopy of amphibole lamellae in pyroxenes from mantle xenoliths of the Carpathian-Pannonian region. Goldschmidt 2021 (4-9 July, Lyon).
10. Fernando Gervilla, Jose Maria González-Jiménez, Rubén Piña, James Saunders, Gaelle Plissart, Claudio Marchesi and José Alberto Padrón-Navarta. Mineral-scale mobility of PGE and TABS in subducted serpentinites. Goldschmidt 2021 (4-9 July, Lyon).
11. Tamás Spráncz, José Alberto Padrón-Navarta, Csaba Szabó and Marta Berkesi. Nitrogen enrichment during exhumation: new insights from multiphase inclusions in subducted rocks (Cabo Ortegal Complex, NW-Spain)
12. Thermodynamic modelling of hydrogen in Nominally Anhydrous Minerals (NAMs): current strategies. Goldschmidt 2021 (4-9 July, Lyon).
13. Menzel, M.D., Garrido, C.J., Hidas, K., López Sánchez-Vizcaíno, V. and Padrón-Navarta, J.A. Deformation and texture evolution during devolatilization of meta-ophicarbonate in subduction zones. Metamorphic Studies Group (MSG) Research in Progress (RiP) 29-31 March 2021.
14. Cerpa N. G., Arcay, D. Padrón-Navarta, J.A. Limited subduction of water to mid-upper mantle depths predicted by the phase assemblages in hydrated peridotites with natural chemical composition at high-PT conditions. Geophysical Research Abstracts Vol. XXI, EGU General Assembly 2021.

2020

15. Cerpa N. G., Padrón-Navarta, J.A., Arcay, D. Accounting for the natural post-antigorite UHP hydrous phases in thermo-petrological models of subduction zones: implications for water retention into the deep upper mantle
16. Padrón-Navarta, J.A., Clément, M., Tommasi, A. Olivine dis-equilibrium growth in the Val Malenco contact aureole (Northern Italy), sparks before the fireworks? Geophysical Research Abstracts Vol. XX, EGU General Assembly 2020.
17. Cerpa N. G., Padrón-Navarta, J.A., Arcay, D. Uncertainties in the stability field of UHP hydrous phases (10-A phase and phase E) and deep-slab dehydration: potential implications for fluid migration and water fluxes at subduction zones. Geophysical Research Abstracts Vol. XX, EGU General Assembly 2020.

2019

18. Daneu N., Padrón-Navarta, J.A., Barou F., Dražić G., Tominc S., Rečnik A. EBSD and STEM analysis of cyclic twins in SnO₂ ceramics doped with CoO and Nb₂O₅. 14th Multinational Congress on Microscopy, September 15-20, 2019.
19. Padrón-Navarta, J.A. (invited). Phase Diagrams for Nominally Anhydrous Minerals. 18-23 August Goldschmidt Barcelona 2019.
20. Marchesi C, González-Jiménez JM, Padrón-Navarta, J.A., López Sánchez-Vizcaíno V & Gómez-Pugnaire MT. The Role of Dehydration of Subducted Serpentinites in the Genesis of Gold-Rich Magmatic-Hydrothermal Ore Deposits. 18-23 August Goldschmidt Barcelona 2019.

2018

21. Padrón-Navarta, J.A. Invited Speaker. TIGeR Conference 2018. Coupling between Metamorphism and Deformation. 12-14 September 2018 Curtin University, Perth, Western Australia

22. *Clément M., Padrón-Navarta, J.A., Demouchy S. Tommasi A., Oriented growth of metamorphic olivine under disequilibrium drained conditions. Sixteenth International Symposium on Experimental Mineralogy, Petrology and Geochemistry (EMPG-XVI), 17-21 September 2018, Clérmont-Ferrand, France.
23. Padrón-Navarta J.A. and Hermann J. Experimental determination of the hydrogen storage capacity of olivine in the subducting slab and the mantle wedge. Sixteenth International Symposium on Experimental Mineralogy, Petrology and Geochemistry (EMPG-XVI), 17-21 September 2018, Clérmont-Ferrand, France.
24. Hermann J., *Lakey S., Padrón-Navarta J.A. Water transport in subduction zone peridotites beyond the stability of chlorite. Sixteenth International Symposium on Experimental Mineralogy, Petrology and Geochemistry (EMPG-XVI), 17-21 September 2018, Clérmont-Ferrand, France.
25. Padrón-Navarta, J.A. Challenges and (thermodynamic) solutions in modeling hydrogen solubility in Nominally Anhydrous Minerals. European Geosciences Union General Assembly 2018, 8-13 April, 2018, Vienna, Austria, Geophysical Research Abstracts 20, EGU2018-18016.
26. Hermann J. Padrón-Navarta J.A., Kempf E., Lakey S., The sources and sinks of H₂O in subduction zones. European Geosciences Union General Assembly 2018, 8-13 April, 2018, Vienna, Austria, Geophysical Research Abstracts 20, EGU2018-6755.
27. Dilissen, N., Garrido, C.J., Lopez-Sanchez Vizcaino, V., Padrón-Navarta, J.A., Jabaloy-Sanchez, A., Gerya, T., Hidas, K. Episodic fluid release during high-pressure dehydration of Antigorite-serpentine in subducting slabs. European Geosciences Union General Assembly 2018, 8-13 April, 2018, Vienna, Austria, Geophysical Research Abstracts 20, EGU2018-4478.
28. Laborda-López C., Marchesi C., López Sánchez-Vizcaino V., Gómez-Pugnaire M.T., Garrido C.J., Jabaloy-Sánchez A., and Padrón-Navarta J.A. Fluid-assisted remobilization of major and trace elements in rodingites from their formation on the seafloor to high-pressure dehydration of enclosing serpentinites (Cerro del Almirez, southern Spain). European Geosciences Union General Assembly 2018, 8-13 April, 2018, Vienna, Austria, Geophysical Research Abstracts 20, EGU2018-14242.

2017

29. Padrón-Navarta J.A. and Hermann J. Site-specific Subsolvus Olivine Water Solubility Equation for the Earth's Upper Mantle. AGU Fall Meeting 2017, 11-15 December, 2017, New Orleans, USA, V31E-04.
30. Zanetti A., Langone A., Tommasi A., Vauchez A., Padrón-Navarta J.A., Giovanardi T. and Mazzucchelli M. Is the mantle-crust transition in the Finero complex (southern alps) a fossil continental moho? AGU Fall Meeting 2017, 11-15 December, 2017, New Orleans, USA V23D-0505.
31. *Shen T, Zhang L, Hermann J, Padrón-Navarta JA, Yang J & Zhang C, Element Redistribution and Seawater Imprint in UHP Serpentinites from Tianshan, China
32. Zanetti A., Langone A., Tommasi A., Vauchez A., Padrón-Navarta J.A., Giovanardi T., and Mazzucchelli M. On the nature of the transition between the mantle and crustal units in the Finero Complex (Ivrea-Verbano Zone, Southern Alps. Geophysical Research Abstracts Vol. 19, EGU2017-19618, 2017 EGU General Assembly 2017
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List of contributions to workshops

1. Padrón-Navarta J.A (invited). Hydrogen under pressure and the hidden oceans of the Earth. Escuela Española de Altas Presiones (EEAP – 2021) Grupo MALTA, 2 September 2021, University of Valencia.

2. Padrón-Navarta J.A. Antigorite dehydration Kinetics: a punctuated and continuous model. Interplay between mineral reactions and deformation workshop 4-6 September 2017, ETH Zurich.
3. Clément M, Padrón-Navarta JA, Tommasi A., Mainprice D. Local stress field in dehydrating serpentinites inferred from orthopyroxene inversion to clinoenstatite. Interplay between mineral reactions and deformation workshop 4-6 September 2017, ETH Zurich.
4. Hidas, K., Garrido, C.J., Tommasi, A., Padrón-Navarta, J.A., Mainprice, D., Vauchez, A., Marchesi, C., Barou, F. (2017) Role of fluids in ductile strain localization in the shallow subcontinental lithospheric mantle. FLOWS-COST Final Meeting, 9-11 October, 2017, Granada, Spain, Abstract Book
5. Hidas, K., Garrido, C.J., Tommasi, A., Padrón-Navarta, J.A., Thielmann, M., Konc, Z., Frets, E., Marchesi, C. (2013) Ductile strain localization in mantle pyroxenite by reaction enhanced softening. 4th Crystal2Plate Workshop, 27-31 January, 2013, Frejus, France, Poster Abstracts.
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7. Garrido C.J., Alt J.C., Shanks W.C., Turchyn A., Padrón-Navarta J.A., López-Sánchez Vizcaíno V., Gómez-Pugnaire M.T., Marchesi C. Tracing the Recycling of Water, Carbon, and Sulfur during Subduction Metamorphism of Seafloor Serpentinites: A Stable Isotope Study of the Almirez Massif, Spain. ILP Nature of the plate interface in Subduction Zones. ILP Task force IX - Workshop July, 2-7, 2011, W. Alps (Piemonte Italy).
8. Marchesi C., Garrido C.J., Padrón-Navarta J.A., Gómez-Pugnaire M.T., López-Sánchez Vizcaíno V. Major and trace element composition of antigorite serpentinite and chlorite harzburgite from the Cerro del Almirez (southern Spain): insights into element mobility during high-pressure dehydration of mantle serpentinite. ILP Nature of the plate interface in Subduction Zones. ILP Task force IX - Workshop July, 2-7, 2011, W. Alps (Piemonte Italy).
9. Padrón-Navarta JA, López Sánchez-Vizcaíno V, Garrido CJ, Gómez-Pugnaire MT. A unique natural laboratory to investigate geochemical and petrophysical processes affecting the hydrated mantle in subduction zones: Cerro del Almirez (Betic Cordillera, Spain). ILP Nature of the plate interface in Subduction Zones. ILP Task force IX - Workshop July, 2-7, 2011, W. Alps (Piemonte Italy).
10. Padrón-Navarta J.A. (invited). Microtextures related with mineral replacement reactions: a natural example of a high-pressure dehydration reaction. Delta-Min Network short-course, Santorini (3-8 October 2010). Delta-Min is a Marie Curie Initial Training Network of the EU Seventh Framework Programme.