CURRICULUM VITAE
FOR
MATTEO ALVARO

(Last update May 2020)

• PERSONAL DETAILS

Date of birth: December 3rd 1982 (37 years old)
City of birth: Milan (Italy)
Nationality: Italian
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Current Position: Professor of mineralogy and Rector's delegate for international affairs in Europe
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Scopus ID: 24173188200
ResearcherID: B-8451-2013, L-1870-2019
Google Scholar: https://scholar.google.it/citations?hl=en&user=_N16v4gAAAAJ

• EDUCATION

2001 – 2004 Bachelor degree – Geology, (110/110 with honors): "Study of chondritic meteorite Trenzano". Department of Earth Sciences, University of Pavia, Italy. Advisor: M.C. Domeneghetti

2004 – 2006 Masters degree in Geology (110/110 with honors): "Investigation on the Fe^{2+}- Mg exchange reaction kinetics for PCA 82506 ureilitic meteorite. Department of Earth Sciences, University of Pavia, Italy. Advisor: M.C. Domeneghetti

2006 – 2009 Ph. D. Research: "The $P2_1/c$ – $C2/c$ phase transition of pigeonite". Department of Earth Sciences, University of Pavia, Italy. Advisor: M.C. Domeneghetti

• POSITIONS

Jan 2010 – Dec 2011 Postdoctoral fellow, "Framework minerals at non-ambient conditions" at Virginia Tech Polytechnic Institute and State University, USA. NSF - EAR 0738692. Advisors: Ross J. Angel and N. Ross

Apr 2012 – Apr 2013 Postdoctoral fellow, "Comparison between Martian meteorites and their terrestrial analogues for MARS-XRD experiment" at University G. D'Annunzio Chieti-Pescara, Italy. Italian Space Agency grant (n. I/060/10/0) for the MARS-XRD/ExoMars project. Advisor: L. Marinangeli

Apr 2013 – Jan 2015 Postdoctoral fellow, "Thermoelastic behavior of mineral inclusions in diamonds" at University of Padua, Italy. ERC – INDIMEDEA (#307322). Advisor: F. Nestola.

Feb 2015 – Feb 2016 Postdoctoral fellow, "Elastic geobarometry for UHP metamorphic rocks" at University of Pavia, Italy. Excellence research fellowship from University of Pavia.

Feb 2016 – Oct 2018 Research Scientist, "Elastic geobarometry for UHP metamorphic rocks" at University of Pavia, Italy. SIR-MIUR MILE DEEp, RBSI140351.

Jun 2017 – Oct 2018 Research Scientist, "Subduction for UHP metamorphic rocks" at University of Pavia, Italy. ERC-StG True Depths, n.714936.

Jan 2018 – Oct 2018 Research Scientist, "Impact cratering processes" at University of Pavia, Italy. FARE-MIUR IMPACt, n. R164WEJAHH.

Nov 2018 – present Associate Professor at Department of Earth and Environmental Sciences of the University of Pavia

• FELLOWSHIPS AND GRANTS

- **Funded research proposals**: 3 funded research proposals as principal investigator and 10 national and international funded research projects as team member.

2006 – 2007 PRIN-MIUR: Studi sperimentali su materiali geologici alle alte pressioni e temperature: applicazioni alla comprensione del sistema Terra (PRIN 2006047943 - € 120,000 - PI: PF Zanazzi). Team member.

2008 – 2010 PRIN MIUR: Meteoriti marziane (nakhliti): storia termica e contenuto in acqua del pirosseno. Confronto con analoghi terrestri (PRIN 2007H8XWKC – 27,260€ - PI: M. Zema). Team member.

2010 – 2012 NSF Earth Science division (EAR): Structure-Based Thermodynamic Properties of Feldspars (EAR-0738692 - PI: N.L. Ross). Post-doctoral fellow.

2010 – 2013 Italian Space Agency: MARS-XRD/ExoMars (ASI n.I/060/10/0 - PI: L. Marinangeli). Post-doctoral fellow.

2011 – 2012 PRIN-MIUR: Dalle materie prime del Sistema Terra alle applicazioni tecnologiche: studi cristallochimici e strutturali (PRIN-2010EARRRZ - € 469,693 - PI: M.F. Brigatti). Team member.

2013 – 2018 ERC Starting grant: Inclusion in diamond messenger from the Deep Earth (INDIMEDEA, ERC-StG n.307322 - € 1.423,464 - PI: F. Nestola). Team member

2014 – 2016 PRNA-PEA: Meteoriti Antartiche (2013/AZ2.04 - € 88,000 - PI: L. Folco). Team member.

2015 – 2018 Italian Space Agency: (TOMOX - PI: L. Marinangeli). Team member.

2015 – 2018 SIR-MIUR: Mineral inclusion elasticity for a new deep subduction geobarometer (MILE DEEp, n.RBSI140351 - € 449,900). **Principal Investigator**.

2016 – 2018 PRNA-PEA: Meteoriti Antartiche (PRNA16_00029 - € 87,900 - PI: L. Folco). Team member.

2017 – 2022 ERC Starting grant: Determine the true depth of deep subduction from piezobarometry on host – inclusions systems (TRUE DEPTHS, ERC-StG n.714936 - € 1.697,500). **Principal Investigator**.

2018 – 2021 FARE-MIUR: StackIng disorder in diaMonds as a marker for the history of Pre-solAr Carbon (IMPACt, FARE-MIUR n. R164WEJAHH- € 234,255). **Principal Investigator**.

2019 – 2022 PRIN-MIUR: The Dynamic Mass Transfer from Slabs to Arcs (Dynastars, PRIN-MIUR n. 2017ZE49E7 - € 384,084). **Co-PI** responsible for the research unit at University of Pavia.

2019 – 2022 PNRA-MIUR: Carbon minerals in Frontier Mountain ureilites of the Museo nazionale dell'Antartide, Siena, Italy ("Commander", Programma Nazionale di Ricerca in Antartide - PNRA D.D. 1314 del 25/05/2018 PNRA18_00247 - A - € 58,200). **Co-PI**.

2019 – 2022 INAF-ASI: "OL-Bodies" **Co-PI**.

- **Funded research proposals at large scale facilities:** Principal investigator and co-investigator of 7 funded applications for beamtime at three beamlines.

2013: Chromite inclusion in natural diamonds: a picture of deep earth (Diamond Light Source, DLS: I15 experiment number EE7616)

2014: Diopsides in diamonds: new geobarometric approaches (Diamond Light Source, DLS: I15 experiment number EE8754)

2015: The effect of cracking systems on diamond-inclusion geobarometry (Swiss Light Source, SLS: TOMCAT experiment number e15427)

2016: Coesite in Diamond: a unique piezothermometer for geology (Diamond Light Source, DLS: I19, experiment number EE14928)

2016: The smaller, the harder: multiphase micro-inclusions in majoritic garnet as signatures of deep Earth mantle conditions (Diamond Light Source, DLS: I15, experiment number EE14855)

2017: The smaller, the harder: multiphase micro-inclusions in majoritic garnet as signatures of deep Earth mantle conditions (Diamond Light Source, DLS: I15, experiment number EE14855_2)

2018: Bringing together growth mechanism and oxidation state in the environment of diamond formation (Swiss Light Source, SLS: TOMCAT proposal ID: 20180858)

• PRIZES AND AWARDS

2015 IUCr prize for the best scientific communication at the European Crystallography meeting, Croatia.

2016 "Ugo Panichi" prize from the Italian society of Mineralogy and Petrology for significant scientific contributions in the field of mineralogy.

2017 Italian Scientific Habilitation (ASN) as associate Professor ("Professore Associato") in

Mineralogy (SSD GEO/06).

2018 Mario Nardelli Prize for researchers who contributed significantly to the development of the Italian crystallography.

2018 Italian Scientific Habilitation (ASN) as full Professor ("Professore Ordinario") in Mineralogy (SSD GEO/06).

- **SUPERVISION ACTIVITIES:** Advisor or Co-advisor for over 20 students (BSc, MSc, PhD and post-docs)
  - **Postdoctoral researchers**

2017 – 2018 Claudia Stangarone (Ab-initio calculations, crystallography)
2017 – Mattia Gilio (metemorphic petrology, geochemistry)
2017 – Marco Piazzi (solid state physics, magnetism)
2018 – Mattia Luca Mazzucchelli (Finite Element Modeling)
2018 – 2019 Davide Comboni (complex structures at high-P and T)
2019 – 2020 Davide Novella (synthesis at high-P and T)
2019 – 2020 Mara Murri (DFT on mineral inclusions)

  - **Graduate students (PhD, 8 students)**

2013 – 2016 *Lorenzo Scandolo*: Thermal expansion of mantle minerals inclusions in diamonds. (Now at IGI - Istituto Gemmologico Italiano)
2015 – 2018 *Mattia L. Mazzucchelli*: Finite Element Modelling (FEM) of elastic anisotropy for host inclusion systems.
2016 – 2019 *Nicola Campomenosi*: Depth of subduction for the UHP units from Dora Maira.
2016 – 2019 *Mara Murri*: Raman investigation of inclusion under non-hydrostatic deviatoric stress. (Now at Uni Milano Bicocca)
2016 – 2019 *Gabriele Zaffiro*: Elastic properties of UHP metamorphism index minerals.
2016 – 2019 *Mattia Bonazzi*: Synthesis of host-inclusion systems under known stress-T conditions: Investigation of the validity of single inclusion piezobarometery using experimentally produced UHPM rocks analogous.
2017 – 2020 *Hugo van Schrojenstein Lantman*: Elastic geobarometry: bringing back together P-T-t paths and deformation history of Lago di Cignana and Western Gneiss Region, Norway.
2017 – 2020 *Marta Morana*: Geobarometry on inclusions in UHP metamorphic rocks: determining the triple point of Al_2SiO_5 polymorphs (kyanite andalusite sillimanite).

  - **Undergraduate students (M.Sc. and B.Sc. 15 Students)**

2013: *Davide Comboni* (Now PhD at University of Milan, I): New thermoelastic parameters, thermal expansion behaviour and dehydration of cancrinite (B.Sc. July 2013).
Mattia Luca Mazzucchelli: Diamond inclusions: new thermoelastic parameters for pyrope (B.Sc. July 2013).
2014: *Mara Murri*: Critical reassessment of the thermoelastic properties for diamond (B.Sc. July 2014).
Greta Rustioni (now PhD at University of Bayreuth): The role of fractures on the entrapment pressure for diamond-inclusion pair (B.Sc. September 2014).
2015: *Gabriele Zaffiro*: Development of a new resistance furnace for in situ high temperature single-crystal X-Ray diffraction (B.Sc. January 2015).
Matteo Di Prima (Now at ENI): Almandine garnet at high-temperature: the role of controlled oxygen fugacity (B.Sc. July 2015).
Mattia Luca Mazzucchelli: Pressure of formation determination for host-inclusion system (M.Sc. July 2015)
2016: *Mara Murri*: Geothermometer calibration for augites. Partially funded by The Barringer award for Impact related research (M.Sc. July 2016).
Greta Rustioni (Now PhD at BGI, Bayreuth, Germany): Brittle deformation in minerals (M.Sc. July 2016)
Gabriele Zaffiro: Characterization of the stress distribution in synthetic host-inclusion pairs (M.Sc. July 2016).
2017: *Vanessa Fontana*: Rubies from Madagascar and Sri Lanka (M.Sc. July 2017)
2018: *Pietro Bernocchi*: Raman spectroscopy of zircon inclusions in Dora Maira Garnets (B.Sc. February 2018)
2018: *Mattia La Fortezza:* Inclusioni multifase in harzburgiti della Cordigliera Betica (Almirez, Spagna):

meccanismi di crescita e orientazione di magnetite in olivina (co-supervised with N. Malaspina and M. Campione)

2018: *Federico Vercesi:* Magnetic properties of inclusions in diamonds (B.Sc. December 2018)

2019: *Zeno Geddo:* FEM modeling for multiple inclusions (co-supervised with M.L. Mazzucchelli)

2019: *Kira Musyachenko:* Ab initio calculations and Raman measurements of inclusions in garnets

2019: *Alice Girani:* Structural refinement for crystalline inclusions trapped in their host (co-supervised with R.J. Angel)

2020: *Edoardo Mangieri:* Geotermometria intracristallina e geospeedometria su cristalli di clinopirosseno provenienti da gabbri abissali campionati presso l'IODP hole U1473A (Atlantis Bank, south west indian ridge) (co-supervised with A. Sanfilippo and M. Murri)

2020: *Katriel Bernabè (Ing. Edile e Architettura):* Metodi computazionali per la determinazione del tensore di rilassamento per sistemi host-inclusione anisotropi in applicazioni di geobarometria elastica (co-supervised with S. Morganti, M.L. Mazzucchelli e A. Reali)

2020: *Elia Cattaneo:* (co-supervised with M.C. Domeneghetti, M. Murri and A. Barbaro)

2020: *Giulia Mingardi:* Mineral inclusions in garnet megablast from Dora Maira (co-supervised with M.C. Domeneghetti, C. Chopin and N. Campomenosi)

- **TEACHING ACTIVITIES (in bold academic commitment as tenure)**

2006 – 2013 Teaching support – Mineralogy and Laboratory (B.Sc, 12 CFU) Geological Sciences, University of Pavia.

2015 – 2016 Course taught – Elasticity of crystalline solids (PhD programme in Geology, 3CFU), University of Pavia, Italy.

2015 – 2016 Course taught – Analytical methodologies (M.Sc., 3 CFU), University of Pavia, Italy

2016 – Course taught – Analytical methodologies applied to geosciences (M.Sc. degree, 6CFU), University of Pavia, Italy

2017 – Course taught – Computational mechanics for scientific problems (PhD programme SAFD, 6CFU), University of Pavia, Italy

2019 – 2019 Course taught – Pomeriggi all'univeristà "Diamanti il viaggio del carbonio all'interno della Terra" (Piano Lauree Scientifiche), University of Pavia, Italy

2019 – 2019 Course taught – PhD Corse on scientific approach at University of Milan, Italy (2 CFU)

2019 – **Course taught – Materiali extraterrestri (Metorites and their planetary bodies, M.Sc. degree, 6CFU), University of Pavia, Italy**

2019 – **Course taught – Physical Properties of Rocks (co-teaching with RJ Angel and ML Mazzucchelli, M.Sc. degree, 6CFU), University of Pavia, Italy**

- **ORGANIZATION OF SCIENTIFIC MEETINGS:** Member of the organizing committee and convener for several national and international workshops, conferences and meetings.

2015 Organization committee and lecturer for International Diamond School "The nature of diamonds and their use in Earth's study". Bressanone-Brixen, 27-31st January 2015.

2015 Co-convener for the session "High-pressure and high-temperature mineral physics: a link between petrology, geophysics and geodynamics" (GMPV3.2) at EGU 2015 (European Geoscience Union 2015), Wien.

2015 Co-convener for the session "Inclusion-host systems: melt, fluid and solid inclusions and their importance in Earth Sciences" (GMPV4.2) at EGU 2015 (European Geoscience Union Assembly 2015), Wien.

2015 Organizer EosFit Workshop at 29th European Crystallographic Meeting (ECM-2015) in Rovinj, Croatia.

2016 Sponsorship organization committee for EMC 2016 (European Mineralogical Conference 2016), Rimini.

2016 Convener for session "Inclusions in minerals as record of geological processes: new analysis methods and application" (S9) at EMC 2016 (European Mineralogical Conference 2016), Rimini.

2016 Organizing committee and lecturer for the workshop "Inclusions in minerals as record of geological processes: New analysis methods and application" at EMC 2016 (European

Mineralogical Conference 2016), Rimini.

2017 Convener for session "Inclusions in minerals: a record of geological processes" at EGU 2017 (European Geoscience Union Assembly 2017), Wien.

2017 Co-convener for the session "Metamorphic and melting processes: from subduction zones to ultra-high temperature terranes" at Goldschmidt 2017, Paris.

2017 Convener for the session "An entire rock entrapped inside a mineral grain. What we can learn from it?" at SIMP, Pisa.

2018 Organization committee and lecturer for International Diamond School "Diamonds: Geology, Gemology and Exploration". Bressanone-Brixen, 29th January – 2nd February 2018.

2019 Co-convener for session "At the limits of geoscience: the nanoscale control of the solid Earth" at EGU 2019 (European Geoscience Union Assembly 2019), Wien.

2019 Organizing and scientific committee for the Fifth Meeting of the Italian (AIC) and Spanish Crystallographic (GE3C) Associations (MISCA V), Naples.

2020 Co-convener for session "The Big Fat Session of the Year: Microstructures, a Journey into Tiny Things" at EGU 2020 (European Geoscience Union Assembly 2020), Wien.

• INSTITUTIONAL RESPONSIBILITIES (in bold academic roles)

2016 – Faculty member, Dept. of Earth and Environmental Sciences, University of Pavia, Italy

2017 – 2018 Member of the Research Committee, Dept. of Earth and Environmental Sciences, University of Pavia, Italy

2017 – Member of the Graduate Student Advisory board (PhD Committee), Dept. of Earth and Environmental Sciences, University of Pavia, Italy

2017 – Scientific advisor and panel member for the pre-evaluation of Horizon 2020 proposals (INROAD) at University of Pavia, Italy

2018 – Panel member for "valutazione commissari ASN" for the evaluation of the applicants to the committee for the national scientific habilitation (ASN) of the University of Pavia, Italy

2018 – Committee member for the "commissione scatti" to evaluate request for career advancement of professors and researchers at University of Pavia, Italy

2019 – Rector's delegate for international affairs in Europe

• COMMISSIONS OF TRUST

2014 – Reviewer for Acta Crystallographica section B; American Mineralogist; Mineralogical Magazine; Physics and Chemistry of Minerals, Science China, Lithos, Journal of Alloys and Compounds, Frontiers in Earth Science, Geophysical Research Letters, Journal of the Geological Society of London. Nature (2018), Energies (2018), Minerals (2018); Science Advances (2019).

2015 – Editorial board member for Frontiers (Earth and Planetary Material division)

2016 – Guest editor for Lithos (for the special issue "The nature of diamonds and their use in Earth's sciences)

2018 – Proposal reviewer for DFG-grant applications

2020 – Editorial board member for Geosciences.

• MEMBERSHIPS OF SCIENTIFIC SOCIETIES (in bold elective roles)

2011 – Member, of the Italian Society of Mineralogy and Petrology (SIMP)

2012 – Member of the Mineralogical Society of America (MSA)

2013 – Member of the European Geoscience Union (EGU)

2017 – Member of the Italian Association for Crystallography (AIC)

2019 – Council Member of the Italian Society of Mineralogy and Petrology (SIMP)

• BIBLIOMETRIC RECORD

- 73 Research publications in ISI journals (52 in the past 5 years)
- >180 scientific communications to national and international conferences (>130 in the past 5 years)
- 12 invited talks and seminar to national and international institutions
- >1200 citations (>1100 in the past 5 years)
- H-index = 18

- **PUBLICATIONS IN PEER-REVIEWED JOURNALS:** 73 publications in high-ranked international peer reviewed journals with more than 1100 citations in the past 5 years.

2007.

1. Fioretti A.M., Domeneghetti M.C., Molin G., Cámara F., **Alvaro M.**, Agostini L. (2007) - Reclassification and thermal history of Trenzano chondrite. *Meteoritics & Planetary Science*, 42: 10 (IF:2.371).

2010.

2. **Alvaro M.**, Nestola F., Ballaran T.B., Camara F., Domeneghetti M.C., and Tazzoli V. (2010) High-pressure phase transition of a natural pigeonite. *American Mineralogist*, 95(2-3): 300-311 (IF:2.026).
3. Redhammer G.J., Cámara F., **Alvaro M.**, Nestola F., Tippelt G., Prinz S., Simons J., Roth G. and Amthauer G. (2010) Thermal expansion and high-temperature $P2_1/c$–$C2/c$ phase transition in clinopyroxene-type $LiFeGe_2O_6$ and comparison to $NaFe(Si,Ge)_2O_6$. *Physics and Chemistry of Minerals*, 37(10): 685-704 (IF: 1.876).

2011.

4. **Alvaro M.**, Nestola F., Cámara F., Domeneghetti M.C., And Tazzoli V. (2011) High-pressure displacive phase transition of a natural Mg-rich pigeonite. *Physics and Chemistry of Minerals*, 38(5): 379-385 (IF: 1.730).
5. **Alvaro M.**, Cámara F., Domeneghetti M.C., Nestola F., And Tazzoli V. (2011) HT $P2_1/c$ to $C2/c$ phase transition and kinetics of Fe^{2+}-Mg order-disorder of an Fe-poor pigeonite: implications for cooling history of ureilites. *Contributions to Mineralogy and Petrology*, 163(3): 599-613. (IF: 3.441)
6. Gatta G.D., Angel R.J., Zhao J., **Alvaro M.**, Rotiroti N., Carpenter M.A. (2011) Phase-stability, elastic behavior and pressure-induced structural evolution of kalsilite: a ceramic material and high-T/high-P mineral. *American Mineralogist*, 96(8-9): 1363-1372 (IF:2.169).

2012.

7. Gatta G.D., **Alvaro M.**, Bromiley G. (2012) A low temperature X-ray single-crystal diffraction and polarised infra-red study of epidote. *Physics and Chemistry of Minerals*, 39(1), 1-15 (IF: 1.304).
8. Periotto B., Nestola F., Balic-Zunic T., Pasqual D., **Alvaro M.**, Ohashi H. (2012) High-pressure systematic of $NaMe^{3+}Si_2O_6$ silicates. *Solid State Communication*, 152(2): 132-137 (IF: 1.534).
9. **Alvaro M.**, Angel R.J., Cámara F. (2012) High-pressure behaviour of zoisite. *American Mineralogist*, 97: 1165-1176 (IF:2.204).

2013.

10. Periotto B., Angel R., Nestola F., Balić-Žunić T., Fontana C., Pasqual D., **Alvaro M.**, Redhammer G. (2013). High-pressure X-ray study of $LiCrSi_2O_6$ clinopyroxene and the general compressibility trends for Li-clinopyroxenes. *Physics and Chemistry of Minerals*, 40: 378-399 (IF: 1.403).
11. Dobson D. P., Miyajima N., Nestola F., **Alvaro M.**, Casati N., Liebske C., Wood I.G. and Walker A.M. (2013) Inherited textures during the perovskite to post-perovskite transition and seismic anisotropy in D". *Nature Geosciences*, 6: 575-578 (IF: 11.668).
12. Domeneghetti M.C., Fioretti A.M., Cámara F., McCammon C., **Alvaro M**. (2013) Thermal history of nakhlites: a comparison between MIL-03346 and its terrestrial analogue Theo's flow. *Geochimica and Cosmochimica acta*, 121: 571-581 (IF: 4.250).
13. Guastoni A., Nestola F., Gentile P., Zorzi F., **Alvaro M.**, Lanza A., Peruzzo L, Schiazza M., and Casati N. (2013) Deveroite-(Ce) : a new REE-oxalate from Mount Cervandone, Devero Valley, Western-Central Alps, Italy. *Mineralogical Magazine*, 77(7): 3019-3026 (IMA 2013-003. CNMNC Newsletter No. X, Month 2013, page X). (IF: 1.898)
14. R. Arletti, G. Vezzalini, S. Quartieri, F. Cámara, **M. Alvaro** (2013) A new framework topology in the dehydrated form of zeolite levyne. *American Mineralogist*, 98: 2063-2074 (IF: 2.059)

2014.

15. Ferrari S., Nestola F., Massironi M., Maturilli A., Helbert J., **Alvaro M.**, Domeneghetti M.C., Zorzi F. (2014) In-situ high-temperature emissivity spectra and thermal expansion of C2/c pyroxenes. *American Mineralogist*, 99(4): 786-792 (DOI: 10.2138/am.2014.4698, IF:1.964)

16. Gatta G.D., Comboni D., **Alvaro M**., Lotti P., Cámara F., Domeneghetti M.C. (2014) Thermoelastic behavior and dehydration process of cancrinite. *Physics and Chemistry of Minerals*, 41(5): 373-386 (DOI: 10.1007/s00269-014-0656-2, IF: 1.538).
17. **Alvaro M**., Nestola F., Ross N.L., Domeneghetti M.C. and Reznitsky L. (2014) High pressure behavior of thiospinel $CuCr_2S_4$. *American Mineralogist* 99(5): 908-913 (DOI: 10.2138/am.2014.4689, IF: 1.964).
18. Angel R.J., Gonzalez-Platas J., **Alvaro M**. (2014) EosFit-7 and a Fortran module (library) for equation of state calculations. *Zeitschrift fuer Kristallographie*, 229(5): 405-419 (DOI: 10.1515/zkri-2013-1711, IF: 1.310)
19. Angel R.J., Mazzucchelli M.L., **Alvaro M.**, Nimis P., and Nestola F. (2014) Geobarometry from host-inclusion systems: the role of elastic relaxation. *American Mineralogist*, 99(10): 2146-2149 (DOI: 10.2138/am-2014-5047, IF: 1.964).
20. Dobson D., Lindsay-Scott A., Wood I.G., Nestola F., **Alvaro M**., Casati N., Liebske C., Knight K.S. (2014) Time-of-flight neutron powder diffraction with milligram samples: the crystal structures of $NaCoF_3$ and $NaNiF_3$ post-perovskites. *Journal of Applied Crystallography* 47: 1-9 (doi:10.1107/S1600576714021803, IF: 3.984).

2015.

21. Pandolfo F., Cámara F., Domeneghetti M.C., **Alvaro M.**, Nestola F., Karato S., Amulele G. (2015) Volume thermal expansion along the jadeite–diopside join. *Physics and Chemistry of Minerals*, 42(1): 1-14 (DOI: 10.1007/s00269-014-0694-9, IF: 1.585)
22. Angel R.J., **Alvaro M**., Nestola F., Mazzucchelli M.L. (2015) Diamond thermoelastic properties and implications for determining the pressure of formation of diamond inclusion systems. *Russian Geology and Geophysics*, 56: 225-234. (IF: 2.019)
23. **Alvaro M.**, Domeneghetti M.C., Marinangeli, L. (2015) A new calibration to determine the closure temperatures of Fe-Mg ordering in augite from nakhlites. *Meteoritics and Planetary Science*, 50(3): 499-507 (IF: 2.819).
24. Malaspina N., **Alvaro M.**, Campione M., Wilhelm W., Nestola F. (2015) Dynamics of mineral crystallization from precipitated slab-derived fluid phase: first in-situ synchrotron x-ray measurements. *Contributions to Mineralogy and Petrology*, 169: 26: 1-12. (IF: 3.218)
25. Scandolo L., Mazzucchelli M.L., **Alvaro M.**, Domeneghetti M.C., Nestola F. (2015) Thermal expansion behavior of orthopyroxenes: the role of the Fe-Mn substitution. *Mineralogical Magazine*, 79(1): 71-87. (IF: 2.212)
26. Milani S., Nestola F., **Alvaro M**., Mazzucchelli M.L., Domeneghetti M.C., Geiger C.A. (2015) Diamond-garnet geobarometry: The role of garnet compressibility and expansivity. *Lithos*, 227: 140-147. (IF: 3.723)
27. Angel R.J., Nimis P., Mazzucchelli M.L., **Alvaro M.**, and Nestola F. (2015) How large are departures from lithostatic pressure? Constraints from host-inclusion elasticity. *Journal of Metamorphic Geology*, 33 (8): 801-813 (doi: 10.1111/jmg.12138, IF: 3.673).
28. Periotto B., Anzolini C., Andreozzi G., Woodland A., Lenaz D., **Alvaro M.**, Princivalle F. (2015) Equation of state of hercynite spinel, $FeAl_2O_4$, and high-pressure systematics of Mg-Fe-Cr-Al spinels. *Mineralogical Magazine*, 72(2): 285-294. (IF: 2.212)
29. **M. Alvaro**, R.J. Angel, C. Marciano, S. Milani, G. Zaffiro, L. Scandolo, M.L. Mazzucchelli, G. Rustioni, M.C. Domeneghetti, F. Nestola (2015) A new micro-furnace for "in situ" high-temperature single crystal X-ray diffraction measurements. *Journal of Applied Crystallography,* 48 (4): 1192-1200. (IF: 2.570)
30. Angel R.J., Milani S., **Alvaro M.**, Nimis P., Nestola F. (2015) OrientXplot: A software for processing host inclusion orientation data. *Journal of Applied Crystallography*, 48 (4): 1330-1334. (IF: 2.570)

2016.

31. Nestola, F., Burnham, A.D., Peruzzo, L., Tauro, L., **Alvaro, M.**, Walter, M.J., Gunter, M., Kohn, S.C. (2016): Tetragonal Almandine-Pyrope Phase, TAPP: finally a name for it, the new mineral jeffbenite. *Mineralogical Magazine*, 79(7):1219-1232.

32. P. Nimis, **M. Alvaro**, F. Nestola, R.J. Angel, K. Marquardt, G. Rustioni, J. Harris (2016) First evidence of hydrous silicic fluid films around solid inclusions in gem-quality diamonds. *Lithos*, 260: 384-389. (RBSI140351: MILE DEEp)
33. J. Gonzalez-Platas, **M. Alvaro**, F. Nestola and R.J. Angel (2016) EosFit7-GUI: A new GUI tool for equation of state calculations, analyses, and teaching. *Journal of Applied Crystallography*, 49: 1377-1382 (10.1107/S1600576716008050). (RBSI140351: MILE DEEp)
34. Nestola F., **Alvaro M.**, Casati M.N., Wilhelm H., Kleppe A., Jephcoat A.J., Domeneghetti M.C., Harris J.W. (2016) Source assemblage types for cratonic diamonds from X-ray synchrotron diffraction. *Lithos*, 265: 334-338. (RBSI140351: MILE DEEp)
35. M. Murri, L. Scandolo, A. Fioretti, M.C. Domeneghetti and **M. Alvaro** (2016). Fe-Mg equilibrium behaviour in augite: implications for the thermal history of terrestrial and extraterrestrial rocks. *American mineralogist* 101 (12), 2747-2750. (RBSI140351: MILE DEEp)
36. Angel R.J., Milani S., **Alvaro M.**, Nestola F. (2016) High quality structures at high pressure? Insights from inclusions in diamonds. *Zeitschrift für Kristallographie*, 231(8): 467-473.
37. Nestola F., **Alvaro M.**, Pearson D.G., Shirey S.B. (2016) "The nature of diamonds and their use in Earth's study", Special issue preface. *Lithos*, 265: 1-3. (RBSI140351: MILE DEEp)
38. Jones AP, **Alvaro M**, Nestola F, Dobson D, Hazael R, McMillan P, Moore M, Prencipe M, Salzmann C, Wyllie R (2016) Structural characterization of natural diamond shocked to 60 GPa; implications for Earth and planetary systems. *Lithos*, 265: 214-221. (RBSI140351: MILE DEEp)

2017.

39. S. Milani, R.J. Angel, L. Scandolo, M.L. Mazzucchelli, T. Boffa-Ballaran, S. Klemme, M.C. Domeneghetti, R. Miletich, K. Scheidl, M. Derzsi, K. Tokár, M. Prencipe, **M. Alvaro**, F. Nestola (2017) Elastic behaviour of grossular garnets at high pressure and temperature. *American Mineralogist*, 102(4): 851-859. (RBSI140351: MILE DEEp)
40. R.J. Angel, **M. Alvaro**, J. Gonzalez-Platas, F. Nestola (2017) A simple and general PVT Eos for structural phase transitions, implemented in EosFit and applied to quartz. *Contribution to Mineralogy and Petrology*, 172(5): 29. (RBSI140351: MILE DEEp)
41. Mills S.J., Kampf A., Nestola F., Williams P., Leverett P., Hejazi L., Hibbs D., **Alvaro M.**, Kasatkin A. (2017) Wampenite, $C_{18}H_{16}$, a new organic mineral from the fossil conifer locality at Wampen, Bavaria, Germany, *European Journal of Mineralogy*, 29: 511-515.
42. Ross J. Angel, Mattia L. Mazzucchelli, **Matteo Alvaro**, Fabrizio Nestola (2017) EosFit-Pinc: a simple GUI for host-inclusion elastic barometry (Letter). *American Mineralogist,* 102(9): 1957-1960. (RBSI140351: MILE DEEp)

2018.

43. R.J. Angel, **M. Alvaro**, F. Nestola (2018) 40 years of mineral elasticity: a critical review and a new parameterisation of Equations of State for mantle olivines and diamond inclusions. *Physics and Chemistry of Minerals*, 1-19. DOI 10.1007/s00269-017-0900-7 (Invited Review, RBSI140351: MILE DEEp)
44. Mattia L. Mazzucchelli, Ross J. Angel, Pamela Burnley, Fabrizio Nestola, **Matteo Alvaro** (2018) Elastic geothermobarometry: Corrections for the geometry of the host-inclusion system. *Geology*, 46(3), 231-234. (RBSI140351: MILE DEEp, 714936: TRUE DEPTHS, doi: 10.1130/G39807.1)
45. C. Anzolini, M. Prencipe, **M. Alvaro**, C. Romano, A. Vona, S. Lorenzon, E. M. Smith, and F. Nestola (2017) Depth of formation of super-deep diamonds: Raman barometry of $CaSiO_3$-walstromite inclusions. *American Mineralogist*, 103 (1), 69-74. (RBSI140351: MILE DEEp, 714936: TRUE DEPTHS)
46. Murri M., Camara F., Adam J., Domeneghetti M.C., **Alvaro M.** (2018) Intracrystalline "geothermometry" assessed on clino- orthopyroxenes bearing synthetic rocks. *Geochimica et Cosmochimica Acta*, 227, 133-142. (RBSI140351: MILE DEEp, R164WEJAHH: IMPACT, 714936: TRUE DEPTHS)
47. F. Nestola, N. Korolev, M. Kopylova, N. Rotiroti, D.G. Pearson, M.G. Pamato, **M. Alvaro**, J. Gurney, A.E. Moore, J. Davidson (2018) $CaSiO_3$ perovskite in diamond indicates the recycling of oceanic crust into the lower mantle. *Nature* 555, 237–241 (RBSI140351: MILE DEEp, 714936: TRUE DEPTHS).
48. Campomenosi N., Mazzucchelli M.L., Mihailova M.D., Scambelluri M., Angel R.J., Nestola F., Reali A., **Alvaro M.** (2018) How geometry and anisotropy affect residual strain in host-inclusion systems: Coupling

experimental and numerical approaches. *American Mineralogist*, 103 (12), 2032-2035. (RBSI140351: MILE DEEp, 714936: TRUE DEPTHS)

49. Mara Murri, Mattia L. Mazzucchelli, Nicola Campomenosi, Andrey V. Korsakov, Mauro Prencipe, Boriana D. Mihailova, Marco Scambelluri, Ross J. Angel, **Matteo Alvaro** (2018) Raman elastic geobarometry for anisotropic mineral inclusions. *American Mineralogist,* 103 (11), 1869-1872. (RBSI140351: MILE DEEp, 714936: TRUE DEPTHS)

2019.

50. Angel R.J., Murri M., Mihailova B., **Alvaro M.** (2019) Stress, Strain and Raman Shifts. *Zeitschrift für Kristallographie*, 234(2), 129–140. (RBSI140351: MILE DEEp, 714936: TRUE DEPTHS)
51. Murri, M., **Alvaro, M.**, Angel, R.J., Prencipe, M., and Mihailova, B.D. (2019) The effects of non-hydrostatic stress on the structure and properties of alpha-quartz. Physics and Chemistry of Minerals, in press. [714936: TRUE DEPTHS; R164WEJAHH: IMPACt].
52. Anzolini C., Nestola F., Mazzucchelli M.L., **Alvaro M.**, Nimis P., Gianese A., Morganti S., Marone F., Campione M., and Harris J. (2019) Depth of diamond formation obtained from single periclase inclusions. *Geology*, in press. (RBSI140351: MILE DEEp, 714936: TRUE DEPTHS)
53. Nimis, P., Angel, R.J., **Alvaro, M.**, Nestola, F., Harris, J.W., Casati, N., and Marone, F. (2019) Crystallographic orientations of magnesiochromite inclusions in diamonds: what do they tell us? Contributions to Mineralogy and Petrology, in press. [714936: TRUE DEPTHS].
54. Stangarone, C., Angel, R.J., Prencipe, M., Campomenosi, N., Mihailova, B., and **Alvaro, M.** (2019) Measurement of strains in zircon inclusions by Raman spectroscopy. European Journal of Mineralogy, in press. [R164WEJAHH: IMPACt; 714936: TRUE DEPTHS].
55. Stangarone, C., Angel, R.J., Prencipe, M., Mihailova, B., and **Alvaro, M.** (2019) New insights into the zircon-reidite phase transition. American Mineralogist, 104(6), pp. 830-837. [714936: TRUE DEPTHS; R164WEJAHH: IMPACt].
56. G. Zaffiro, R.J. Angel, **M. Alvaro** (2019) Constraints on the Equations of State of stiff anisotropic minerals: rutile, and the implications for rutile elastic barometry. Mineralogical Magazine, 83(3), pp. 339-347. [714936: TRUE DEPTHS]
57. F. Vetere, M. Murri, **M. Alvaro**, C. M. Domeneghetti, S. Rossi, A. Pisello, D. Perugini, F. Holtz (2019) Viscosity of Pyroxenite Melt and its Evolution during Cooling. Journal of Geophysical Research – Planets, in press [714936: TRUE DEPTHS; R164WEJAHH: IMPACt]
58. Boriana Mihailova, Naemi Waeselmann, Claudia Stangarone, Ross J. Angel, Mauro Prencipe, **Matteo Alvaro** (2019) The pressure-induced phase transition(s) of ZrSiO4: revised Experimental proof for the existence of a new high-pressure polymorph of zircon. Physics and Chemistry of Minerals, in press.
59. Mara Murri, Rachael L. Smith, Kit McColl, Martin Hart, **Matteo Alvaro**, Adrian P. Jones, Péter Németh, Christoph G. Salzmann, Furio Corà, Maria C. Domeneghetti, Fabrizio Nestola, Nikolay V. Sobolev, Sergey A. Vishnevsky, Alla M. Logvinova, Paul F. McMillan (2019) Quantifying hexagonal stacking in diamond. Scientific Reports, in press [R164WEJAHH: IMPACt]
60. Mattia Bonazzi, Simone Tumiati, Jay Thomas, Ross J Angel, **Matteo Alvaro** (2019) Assessment of the reliability of elastic geobarometry with quartz inclusions. Lithos, in press. [714936: TRUE DEPTHS]
61. Mara Murri, Maria C. Domeneghetti, Anna M. Fioretti, Fabrizio Nestola, Francesco Vetere, Diego Perugini, Alessandro Pisello, Manuele Faccenda, **Matteo Alvaro** (2019) Cooling history and emplacement of a pyroxenitic lava as proxy for understanding Martian lava flows. Scientific Reports, in press. [R164WEJAHH: IMPACt; 714936: TRUE DEPTHS]
62. Marco Piazzi, Marta Morana, Marco Coïsson, Federica Marone, Marcello Campione, Luca Bindi, Adrian P Jones, Enzo Ferrara, Matteo Alvaro (2019) Multi-analytical characterization of Fe-rich magnetic inclusions in diamonds. Diamond and Related Materials, 98, 107489. [R164WEJAHH: IMPACt]
63. Mattia Luca Mazzucchelli; Alessandro Reali; Simone Morganti; Ross J Angel; **Matteo Alvaro** (2019) Elastic geobarometry: relaxation of elastically anisotropic inclusions. Lithos, 350-351,105218 [714936: TRUE DEPTHS]
64. Joseph P. Gonzalez, Jay B. Thomas, Suzanne L. Baldwin, **Matteo Alvaro** (2019) Quartz-in-garnet and Ti-in-Quartz (QuiG-TiQ) thermobarometry: Methodology and first application to a quartzofeldspathic gneiss from the (ultra)high-pressure terrane in eastern Papua New Guinea. Journal of Metamorphic Geology, in press. [714936: TRUE DEPTHS]
65. Ross J Angel, Francesca Miozzi, Matteo Alvaro (2019) Limits to the Validity of Thermal-Pressure Equations of State. Minerals, 9 (9), 562 [714936: TRUE DEPTHS].
66. Martha G Pamato, Fabrizio Nestola, Davide Novella, Joseph R Smyth, Daria Pasqual, G Gatta, Matteo Alvaro, Luciano Secco (2019) The High-Pressure Structural Evolution of Olivine along the Forsterite–Fayalite Join. Minerals 9(12), 790 [714936: TRUE DEPTHS]

2020.

67. **Alvaro, M.**, Mazzucchelli, M.L., Angel, R.J., Murri, M., Campomenosi, N., Scambelluri, M., Marone, F., Korsakov, A., and Morana, M. (2020) Fossil subduction recorded by quartz from the coesite stability field. Geology 48 (1), 24-28 [714936: TRUE DEPTHS]
68. N. Campomenosi, M. L. Mazzucchelli, B. D. Mihailova, R. J. Angel, **M. Alvaro** (2020) Using polarized Raman spectroscopy to study the stress gradient in mineral systems with anomalous birefringence. Contributions to Mineralogy and Petrology 175 (2), 16 [714936: TRUE DEPTHS]
69. RJ Angel, **M Alvaro**, P Schmid-Beurmann, H Kroll (2020) Commentary on 'Constraints on the Equations of State of stiff anisotropic minerals: rutile, and the implications for rutile elastic barometry'. Mineralogical Magazine, 1-10. [714936: TRUE DEPTHS]
70. S Morganti, ML Mazzucchelli, **M Alvaro**, A Reali (2020) A numerical application of the Eshelby theory for geobarometry of non-ideal host-inclusion systems. Meccanica, 1-14. [714936: TRUE DEPTHS]
71. Péter Németh, Kit McColl, Rachael L Smith, Mara Murri, Laurence AJ Garvie, **Matteo Alvaro**, Béla Pécz, Adrian P Jones, Furio Cora, Christoph G Salzmann, Paul F McMillan (2020) Diamond-graphene composite nanostructures. Nano Letters. [R164WEJAHH: IMPACt; 714936: TRUE DEPTHS]
72.

- **PUBLICATIONS (NON-PEER-REVIEWED JOURNALS):** 5 publications for scientific outreach
- **MEETINGS CONFERENCES, SEMINARS AND WORKSHOPS:** Over 200 contributions to national and international conferences and several invited talks and seminars
- **RESEARCH INTERESTS AND TRACK RECORD**