

# CURRICULUM VITAE

EUROPEAN FORMAT

## PERSONAL INFORMATION

Name, Surname	Antonio Langone
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Website	<a href="http://iggcnrpavia.unipv.it/antoniolangone/Benvenuto.html">http://iggcnrpavia.unipv.it/antoniolangone/Benvenuto.html</a>
Nationality	<b>Italian</b>
Place and Date of birth	<b>Napoli, 13/12/1979</b>

## WORK EXPERIENCE

Actual position	PROFESSOR OF GEOCHEMISTRY AT THE DEPARTMENT OF EARTH AND ENVIRONMENTAL SCIENCES – UNIVERSITY OF PAVIA
November 2011 – July 2022:	RESEARCHER AT THE NATIONAL RESEARCH COUNCIL OF ITALY – INSTITUTE OF GEOSCIENCES AND EARTH RESOURCES (IGG-CNR) MANAGER OF THE LA-ICP-MS AND SEM LABORATORIES AT THE IGG-CNR OF PAVIA
Academic positions	<b>2013-2021</b> Adjunct Professor at the Earth and Environmental Sciences Department of the Pavia University: 2021-2022 Petrology and geology of the Alps – 3 CFU 2013-2021 Laboratory of petrography - 3CFU/year <b>Since 2017</b> Member board of the PhD program in Earth and Environmental Sciences (University of Pavia)
Post-doc experiences	<b>July 2010 - October 2011</b> research grant at the National Research Council of Italy, Institute of Geosciences and Earth Resources - Pisa, on the topic: “Petrographic, geochemical and isotopic analyses of ophiolites and their alteration products”. Supervisor: Dr. Tonarini S.  <b>March 2010 - June 2010:</b> research grant at the Dipartimento di Scienze della Terra e Geologico-Ambientali - Bologna, on the topic: “Crustal melting”. Supervisor: Dr. Braga R.  <b>June 2008 - February 2010:</b> research grant at the National Research Council of Italy, Institute of Geosciences and Earth

Resources - Pavia, on the topic: "U-Th-Pb isotopic characterisation by LA-ICP-MS of accessory minerals in magmatic and metamorphic systems". Supervisor: Dr. Tiepolo M.

## EDUCATION AND TRAINING

**March 2008:** *Ph.D. in Geological Sciences. Thesis title: Low-Pressure Hercynian metamorphism: tectono-metamorphic evolution of the Mandatoriccio complex (Sila Massif - Calabria). Main tutor: Prof. Alessandro Rottura (Bologna University).*

**2005 - 2008:** *Ph.D. student at the Department of the Earth and Geological-Environmental Sciences of the Bologna University (Italy).*

**July 2004:** Degree on geological sciences (cum laude). Thesis title: Structural and kinematics analyses of the eastern sector of the Curinga-Girifalco Shear Zone (northern Serre - Calabria): geodynamic implications. Supervisor: Prof. Giacomo Prosser (Basilicata University) and Dr. Erwan Gueguen (National Research Council of Italy).

## RESEARCH INTERESTS

Since the beginning of my research activity I was attracted by topics dealing with metamorphic and magmatic petrology. During the master and PhD theses I always followed a multidisciplinary approach and I developed skills at determining the petrological and geochronological evolution of microstructures and/or rock microdomains. Thanks to these abilities I started my post-doc activity at the LA-ICP-MS laboratory of the IGG-CNR of Pavia as the researcher in charge for geochronological analyses of accessory minerals (zircon and monazite) directly on rock thin sections. The ability to date and interpret the geochronological data in the textural sites gave to me the opportunity to collaborate with several Italian and foreigner researchers on different geological contexts. Recently I developed the U-Pb methods for dating other accessory minerals such as rutile and titanite. Since the beginning I always combined the isotopic analyses with trace element characterization of accessory minerals by LA-ICP-MS or EMPA. The chemical composition of accessory minerals can provide useful petrological information about the protolith, the temperature history and the mineral assemblages evolution. Recently, thanks to the installation in the LAICPMS lab of Pavia of a new Mass Spectrometer (Triple Quadrupole 8900 Agilent) with high resolution and sensitivity, I developed analytical methods allowing to determine both U-(Th)-Pb isotopes and some trace elements on the same laser spot (the so called petro-chronology).

In the last years I dedicated large part of my research activities on the petrological and geochemical evolution of rocks at the crust-mantle boundary. In particular I focused on the magmatic, metasomatic and metamorphic processes occurring at this important discontinuity. Studying the high temperature environment at the crust-mantle boundary I was attracted by the deformation-induced geochemical changes at both the mineral

and rock scales. In particular, I'm studying the geochemical perturbation (isotopes and trace elements) of minerals in rocks affected by high-temperature deformation. On these topics I supervised several bachelor/master students as well as PhD students. The deformation-induced geochemical variations are also studied at rock sample scale by analysing and interpreting the major (XRF analyses) and trace element composition (ICP-MS analyses) of bulk rocks. The deformation-induced geochemical variations have been studied in both sub-solidus and supra-solidus conditions. The melt fluxing through deforming lower crustal/mantle rocks can severely change the chemistry without apparent microstructural evidence. On these topics I was involved in different research projects with colleagues from Australia, UK and France. All these skills allowed me to be involved, as participant or adjunct investigator, in several research projects.

## **FIELD WORK EXPERIENCES**

Since the beginning of my research activities, I was involved in several field trips with the aim of mapping and sampling basement rocks. I was involved in field works with Italian and foreigner colleagues in several remote localities, such as the north (2008) and southern Iran (2017) and Himalaya (Kali Gandaki valley; 2010), in the Alps (Adamello batholith; Cima di Gagnone; Ivrea-Verbano Zone) and other basement rocks exposed in Italy (Calabria, Tuscany, Elba Island and Sardinia). All the field works were framed and funded by national and international projects. My contribution to the field work was fundamental in order to study the field relationships among rock types and generally I had the role to select the more appropriate samples for the geochemical (bulk chemistry and isotopes) and/or geochronological purposes.

## **FIELD LEADERSHIP**

- Field leader for the field trip entitled "The Tethyan Ocean-Continent transition (from the Pollino area to the lower crust of the Serre Massif)", organized in the frame SGI-SIMP meeting - Potenza 2023.

- Field leader for the field trip entitled "From the upper to the lower continental crust exposed in Calabria", organized in the frame of the 86° Congresso Nazionale della Società Geologica Italiana - Arcavacata di Rende (CS) 2012. The field book was published on GFT - Geological Field Trips - Servizio Geologico d'Italia - ISPRA e della Società Geologica Italiana Geol.F.Trips, Vol. 5 No.1.2 (2013), 49 pp., 26 figs., 2 tabb. (DOI 10.3301/GFT.2013.02) dal 18-09-2012 al 20-09-2012;

- Field leader for the field trip entitled "Emplacement mechanisms of mantle peridotites at crustal levels and multi-stage igneous evolution of the continental crust." Ivrea-Verbano Zone, 28th-30th June 2018. The field trip was organized in the frame of the 3rd European Mantle Workshop (EMAW).

**NATIONAL AND  
INTERNATIONAL RESEARCH  
PROJECTS**

ANR-JCJC project (French National Research Agency- Jeunes Chercheuses - Jeunes Chercheurs Program) 2021 - Using underexplored accessory minerals to treat the AMNESIA of the Earth's continental crust history – 4 years project - Principal Investigator: Emilie Bruand (CNRS-France). Role: participant

International Continental Drilling Project 2020 – Drilling the Ivrea-Verbano Zone (DIVE). Principal Investigator: Muntener O., Pistone M., Ziberna L., Zanetti A. Role: Co-operating Principal Investigator.

ASI-INAF n2018-16-HH.O. - “Olivine-bearing ungrouped achondrites and their parent bodies in the Solar System” (OL-BODIES) -Principal Investigator: Carli C. Role: Associate Investigator of the Pavia CNR Research Unit (12k euro).

MIUR - PNRA2018 - Chemical and physical characteristics of orthopyroxene-dominated ultramafic lens in the lithospheric mantle of the West Antarctic system. Principal Investigator Alberto Zanetti. Role: participant.

European Plate Observing System (EPOS) European Project – Implementation Phase (IP) H2020-EU.1.4.1.1 Grant agreement 676564 - 01-01-2015 / 31-12-2019. Role: participant

European Plate Observing System (EPOS) European Project – FP7 (Infrastructures, Specific Programme Capacities: Research Infrastructures) - H2020 Grant agreement 262229. 01-01-2017 - today. Role: participant

European Network of Observatories and Research Infrastructures for Volcanology” (EUROVOLC) - Grant Agreement 731070 — EUROVOLC — H2020- INFRAIA-2016-2017/H2020-INFRAIA-2017-1-two-stage. 01-01-2017 – today. Role: Participant.

MIUR PRIN 2017 (20178LPCPW) “Micro to Macro: How to unravel the nature of the Large Magmatic Events”. Principal Investigator, Massimo Coltorti (Ferrara University). Role: Associate Investigator of the Pavia CNR Research Unit (94k euro).

MIUR PRIN 2015 (20158A9CBM) “Geochemical and isotopic budget of highly metasomatised sub-continental mantle in the Africa and Europe geodynamic systems: Modern and fossil analogues.” Principal Investigator, Sandro Conticelli (Firenze University). Role: participant.

**TEACHING & SUPERVISING  
STUDENT SUPERVISION**

(Co)supervisor of more than 30 bachelor/master theses of students from Pavia, Pisa, Bari. The theses are mainly dealing with petrology, geochronology and geochemistry of basement rocks..

(Co)supervisor of the following Phd students:

- Theo Biget (Universities of Brest and Clermont-Ferrand) 2021-2024.
- Chinedu Ibe (DISTEGEO-UniBa) 2020-2023: Exposed young granites, testimony of fast exhumation process
- Stefania Corvò (DSTA-UniPv) 2018-2021: Petrological, geochemical and geochronological variations at the lithological interface
- Jonathan K. Munnikhuis (Macquarie University - Sydney Australia) 2017-2020: The metasomatic history of the Finero Mafic Complex, Ivrea-Verbano Zone, Italy: melt migration, melt-rock interaction, and effects on geochronology

**POST-DOC SUPERVISION**

(Co)Supervisor of 2 postdoctoral researchers:

- Mattia Bonazzi: Caratterizzazione di fasi minerali in rocce e meteoriti mediante spettroscopia RAMAN e LAICPMS: gli elementi del gruppo del platino (PGE); one year post-doc;
- Matteo Simonetti: Analisi geochimica, geocronologica e microstrutturale di zone di taglio di alta temperatura in crosta continentale profonda. One year post-doc.

**SEMINAR FOR  
BACHELOR/MASTER  
STUDENTS AS INVITED  
LECTURE**

- Linking geochronology and microstructures: examples from the Sila Massif (Calabria) and the Ulten Zone (Alps).  
16<sup>th</sup> December 2010 – Dipartimento di Scienze della Terra of Cosenza; 2 hours.

- Complexities related to P-T and age determinations in basement rocks: examples from the Sila Massif (Calabria) and the Ulten Zone (Alps).  
20<sup>th</sup> June 2011 – Dipartimento di Geoscienze of Padova 2 hours

- U-Th-Pb dating of accessory minerals by LA-ICP-MS: examples from the Sila Massif (Calabria) and the Ulten Zone (Alps);  
- Exploring the biosphere by LA-ICP-MS how geochemistry supports other sciences.  
February 2014 – Dipartimento di Scienze of Potenza 2hours

- U-Th-Pb dating of accessory minerals by LA-ICP-MS: principles and applications;  
- Exploring the biosphere by LA-ICP-MS how geochemistry supports other sciences  
19<sup>th</sup> May 2016 – Dipartimento di Fisica e Scienze della Terra of Ferrara; 2 hours.

- The evolution of the lithosphere: U-Th-Pb dating of accessory minerals by LA-ICP-MS.  
12<sup>th</sup> October 2016 – Dipartimento di Scienze della Terra e  
September 2022

dell'Ambiente of Pavia; 2 hours.

- Isotope geochemistry: a brief introduction to the analytical techniques;

- Climate change/paleoclimate & geochronology

06<sup>th</sup> November 2017 – Dipartimento di Scienze della Terra e dell'Ambiente of Pavia; 2 hours.

- Petrochronology: how and when the continental crust evolves.

18<sup>th</sup> December 2020 – Dipartimento di Scienze della Terra e Geoambientali of Bari. 2 hours (webinar).

- Exploring the geosphere and the biosphere by LA-ICP-MS.

31<sup>st</sup> January 2022 – Dipartimento di Scienze della Terra of Torino. 1 hours (webinar).

- Lecturer for the 9<sup>th</sup> cycle of Distinguished Lecturers 2024 promoted by SGI-SIMP on the topic "Quando e per quanto tempo? La variabile tempo nelle Geoscienze, dal record geologico alla sfida analitica".

**ORGANIZER AND/OR  
LECTURER AT NATIONAL  
AND INTERNATIONAL  
WINTER/SUMMER SCHOOLS**

- Organizer of the international summer school for PhD and researchers entitled: Zircon - a key mineral for dating and tracking geological processes. The school was funded by CARIPO and the Earth and Environmental Sciences PhD Program of Pavia. 08-13 September 2013.
- Organizer and field leader of the multidisciplinary field trip at the Central Alps (Cima di Gagnone) for PhD and master students. The field trip has been promoted and funded by the Earth and Environmental Sciences PhD Program of Pavia. 21-23 June 2016 (3 CFU).
- Organizer of the International Winter School for PhD students and young researchers entitled "Melting and fluid/melt-rock reactions in the mantle". 13-17 February 2017
- Organizer and field leader of the multidisciplinary field trip at the Adamello batholith (Relationship among magmatism, deformation and metamorphism during the Alpine orogenesis) for PhD and master students. The field was promoted and funded by the Earth and Environmental Sciences PhD Program of Pavia. 11-13 July 2017 (3 CFU).
- Organizer and field leader of the multidisciplinary field trip at the Asinara Island (Relationship among magmatism, deformation and metamorphism during the Variscan orogenesis) for PhD and master students. The field trip was promoted and funded by the Earth and Environmental Sciences PhD Program of Pavia. 17-20 June 2018 (3 CFU).
- Organizer and field leader of the 3rd European Mantle Workshop held in Pavia. 26-28 June 2018.
- Organizer and lecturer for the workshop "Frontiers in ICP-MS/MS Application in Earth and Environmental Sciences" funded by the Earth and Environmental Sciences PhD Program of Pavia, CNR, Agilent and SIMP. Title of the lecture: "Applications of the LA-ICP-MS technique to the geological, environmental and biological sciences". Pavia, 27 May 2019
- Organizer of the multidisciplinary field trip at the Western Alps (From rifting to the Alpine chain) for PhD and master students. The field trip has been promoted and funded by the Earth and Environmental Sciences PhD Program of Pavia. 19-21 July 2019 (3 CFU).
- Organizer and lecturer for the International summer school "Structure and Composition of the Lower Continental Crust", promoted and funded by the Earth and Environmental Sciences PhD Program of Pavia. Title of the lecture: "U-Th-Pb geochronology of zircon and monazite in the lower continental crust: role of high temperature and deformation". Pavia, 07-10 October 2019

- Organizer of the Granulites&Granulites 2024 conference.  
Verbania 1-10 September 2024

**NATIONAL AND  
INTERNATIONAL MEETINGS  
AND WORKSHOPS**

As a co-author I was involved in many other abstracts presented to international meetings and below I report only the list of oral/poster presentations (title/authors/conference) at international and national conferences.

**ATTENDANCE AND  
PRESENTATION AT  
INTERNATIONAL MEETINGS**

- Zircon Geochronology of Amph-Rich Gabbroic Rocks and Associated Granitoids from Kyushu Island (Southwest Japan Arc). Langone A, Morishita T & Tiepolo M. - Goldschmidt 2009 Davos, Switzerland; 21-26 June 2009. *Geochimica and Cosmochimica Acta* ISSN:0016-7037 DOI: <https://doi.org/10.1016/j.gca.2009.05.010> - Poster presentation

- Cretaceous amphibole-rich intrusives with high-mg andesite affinity from Japan: a petrological and geochronological study. Langone A, Tiepolo M, Morishita T & Tribuzio R. AGU 2009 San Francisco, California, USA; 14-18 December 2009. - Poster presentation

- Chromium behaviour during water-serpentinites interaction: first results from RESPIRA project in a Tuscan quarry (Italy). International Applied Geochemistry Symposium, Rovaniemi, Finland, 22-26 August 2011. Baneschi I., Langone A., Boschi C., Agostini S., Dallai L., Dini A., Guidi M., Tonarini S. - Poster presentation

- New Insights into the Evolution of the Finero Mafic Complex. Langone A., Renna M.R., Tiepolo M., Zanetti A., Mazzucchelli M. & Giovanardi T. Goldschmidt conference 2013 Florence, Italy, 25-30 August 2013.. - Poster presentation

- Zircon U-Pb dating of high-temperature lower crustal deformation within mafic granulites: the lucky case from the Val Cannobina (Ivrea-Verbanio Zone; Southern Alps; Italy). Langone A., Zanetti A., Daczko N.R., Piazzolo S., Tiepolo M., Mazzucchelli M. European Geosciences Union (EGU) - 2016 Wien | Austria | 17-22 April 2016. - Poster presentation

- Dating the onset of a lower crustal shear zone: a (lucky) case from the northern sector of the Ivrea-Verbanio Zone (Val Cannobina, Italy). Langone A., Zanetti A., Tiepolo M. & Mazzucchelli M. 2nd European Mineralogical Conference (EMC), Rimini, Italy. 11-15 September 2016. - Poster presentation

- The T-t Evolution of the Ivrea-Verbanio Zone in Val Cannobina. Langone A., Tiepolo M. & Zanetti A. Goldschmidt conference 2019 – Barcelona, Spain; 18-23 August 2019. - Poster presentation

- Relict but not inert: the geochemical variations of garnet porphyroclasts during deformation. Langone A., Corvò S., Maino

M., Piazzolo S. 3rd European Mineralogical Conference (EMC2) – Cracow - Poland – 29 August/2 September 2021- - Poster presentation

- Coupling monazite and titanite dating to unravel the evolution of an amphibolite-facies shear zone (Ivrea-Verbanò Zone; Italy). . Langone A., Corvò S., Maino M., Bonazzi M., Simonetti M., Piazzolo S., Braschi E., Orlando A. Goldschmidt 2023 Lyon (France).

**ATTENDANCE AND PRESENTATION AT NATIONAL MEETINGS**

I attended several national meetings organized by SIMP, SGI, AIV, SOGEI and I submitted many contributions as presenting author and co-author:

SGI-SIMP 2023: 12 abstracts  
SGI-SIMP 2022: 12 abstracts  
SGI 2021: 6 abstracts;  
SIMP, SGI, AIV, SOGEI 2019: 14 abstracts;  
SGI-SIMP 2018: 14 abstracts;  
SIMP, SGI, AIV, SOGEI 2017: 20 abstracts;  
SGI-SIMP 2014: 10 abstracts;  
SGI 2012: 5 abstracts;  
GeolItalia 2011: 7 abstracts;  
SIMP 2010: 4 abstracts.

**CONVENER**

- Convener of the session entitled: The continental crust through space and time: unraveling igneous, metamorphic and mineralization processes. SIMP-SGI-AIV-So.Ge.I. meeting Potenza 19-21 September 2023. Conveners and chairpersons: Roberto Braga (UniBo); Antonio Langone (UniPv), Giulia Consuma (University of Western Australia); Alessia Borghini (Universität Potsdam).

- Convener of the session entitled: "Geochronology and geochemistry of accessory minerals: timing of petrogenetic processes and deformation" SIMP-SGI-AIV-So.Ge.I. meeting. Pisa 03-06 September 2017. Conveners and chairpersons: Deborah Lo Po' (UniBo), Antonio Langone (IGG-CNR), Leonardo Casini (UniSs), Matteo Maino (UniPv)

- Convener of the session entitled: "A multidisciplinary approach to unravel the evolution of basement geology". SIMP-SGI-SOGEI meeting, Parma 16-19 September 2019. Conveners and chairpersons: Langone A. (IGG-CNR), Montomoli C. (UniTo) & Iaccarino S. (UniTo)

**WORKSHOPS ON LA-ICP-MS**

- "Data Handling in LA-ICP-MS U-Th-Pb Geochronology" - San Francisco, California, 12–13 December 2009" 12-13 December 2009 – Workshop organized by the LA-ICP-MS scientific community. Participant as member of a LA-ICP-MS lab involved in interlabs comparison works.

- "Handling, Processing and Archiving of LAICPMS U-Th-Pb Data: Statistical Interpretation of Age Information, LAICPMS and Beyond - College of Charleston, SC USA" 06-08 March 2013 – Participant. Workshop organized by the LA-ICP-MS scientific community. Participant as member of a LA-ICP-MS lab involved in interlabs comparison works.

- "Reaction Gases + ICP MS = New Frontiers for Earth Sciences" – Barcelona, Spain, 18-23 August 2019 – Workshop organized in the frame of the Goldschmidt 2018 conference. Participant

**ACTIVITY AS EDITOR  
REVIEWER**

- Topic Editor for the International Journal of Earth Sciences.

- Guest editor for the Special Issue "LA-ICP-MS Geochronology: From Petrology to Provenance and Sedimentation" Geosciences (MDPI) 2018-2020

- Guest editor for the Special Issue "Subduction and Exhumation of the Lithosphere: The Contribution of Structural Geology, Petrology and Geochronology" Geosciences (MDPI) 2020

I've been reviewer for several international journals such as Lithos, Journal of Metamorphic Geology, Contribution to Mineralogy and Petrology; European Journal of Mineralogy, Solid Earth; Chemical Geology; Minerals; Rendiconti Online

**THESIS EXAMINER**

I've been the examiner of master and PhD theses and I was involved as member of the committee for the examination of PhD theses.

**AWARDS**

*2017 – Short Term Mobility Program CNR – 3 weeks stay at the School of Earth and Environment of Leeds - UK*

*2015 – Short Term Mobility Program CNR – 3 weeks stay at the "Geosciences Montpellier" - France*

*2014 - Winner of 'Giorgio Dal Piaz' Award sponsored by the Società Geologica Italiana (SGI)*

*2011 - Winner of a grant for a short-term mobility, sponsored by the Società Italiana di Mineralogia e Petrologia (SIMP) – one month stay at the "Institut de Physique du Globe de Paris" – France*

## SCIENCE COMMUNICATION

- Il ruolo della geologia nell'ambito della transizione energetica. Serie di seminari a licei e scuole nella provincial di Pavia e Piacenza (A.A. 2023-2024).
- *Il lavoro del geologo e la formazione delle montagne. Invited talk at the Primary and secondary schools of Buccinasco (Mi) 17-11-2017*
- *La "fiumara" di Tito: caratteristiche geologiche e geomorfologiche. Invited by the Pro-loco association. Tito (Pz) 03-05-2019*
- *Il 23 novembre 1980: a quarantanni dal terremoto dell'Irpinia. Invited by town councillors. Tito (Pz) 23-11-2020 webinar.*

## MEMBERSHIP OF SOCIETIES

Since 2003 member of the Società Geologica Italiana (SGI). 2018 -today member of the SGI awards committee (Divisione Valorizzazione Eccellenza Scientifica). Since 2015 member of the Società Italiana di Mineralogia e Petrologia (SIMP) – Since 2024 councillor of the Society. Since 2023 member of the Società Geochimica Italiana.

## BOOKS AND ARTICLES

97 refereed articles in international journals and 3 book chapters amounting to more than 1900 citations (Google Scholar). I'm first author of 8 publications; 8 publications were published with student and post-doc I directly supervised. Large part of the other publications was in the frame of collaborative projects to which I was a major contributor.

1. Ibe C.U., **Langone A.**, Stuart F.M., Brogi A., Caggianelli A., Liotta D., and Tursi F. (2023) - Rapid exhumation of young granites in an extensional domain: the example of the Giglio Island pluton (Tuscany). *Geological Magazine* 160: 1241–1253.  
<https://doi.org/10.1017/S0016756823000420>
2. Dallara E., Fulignati P., Costa S., Gioncada A., **Langone A.**, Pistolesi M. Apatite chemistry in shoshonitic magmas: Insights into the volatile evolution at La Fossa volcano (Vulcano Island, Aeolian Arc, Italy). *LITHOS* 454–455 (2023) 107238
3. Corvò S., Maion M., Piazzolo S., Kylander-Clark A.R.C., Orlando A., Seno S., **Langone A.** - Crystal plasticity and fluid availability govern the ability of titanite to record the age of deformation. *Earth and Planetary Science Letters* 620 (2023) 118349
4. Simonetti M., **Langone A.**, Bonazzi M., Corvò S., Maino M. Tectono-metamorphic evolution of a post-variscan mid-crustal shear zone in relation to the Tethyan rifting (Ivrea-Verbano Zone, Southern Alps). *Journal of Structural Geology* 173 (2023) 104896

5. Zucchi M., Tursi F., Brogi A., Liotta D., Spiess R., Caggianelli A., Ventruti G., **Langone A.** 2023. Syn-tectonic contact aureole and metasomatic reaction zones in carbonate and pelitic host rocks (Elba Island, Italy). *Tectonophysics* 853 (2023) 229782
6. Carli C., Barbaro A., Murri M., Domeneghetti M.C., **Langone A.**, Bruschini E., Stephant A., Alvaro M. Stefani S., Cuppone T., Casalini M., Migliorini A., Roush T.L., Pratesi G. 2023. Al Huwaysah 010: the most reduced brachinities, so far. *Meteoritics & Planetary Science*; doi: 10.1111/maps.13998
7. Munnikhuis J.K., Daczko, N.R., **Langone A.** 2023. Open system reaction between hydrous melt and gabbroic rock in the Finero Mafic Complex. *Lithos* <https://doi.org/10.1016/j.lithos.2023.107027>
8. Tribuzio R., Renna MR., Antonicelli M., Liu T., Wu F-Y., **Langone A.**, 2023. The peridotite-pyroxenite sequence of Rocca d'Argimonia (Ivrea-Verbano Zone, Italy): Evidence for reactive melt flow and slow cooling in the lowermost continental crust. *Chemical Geology* <https://doi.org/10.1016/j.chemgeo.2023.121315>
9. Gliozzo E., Brogi A., Ruggieri G., **Langone A.** 2022. Sb–Au-bearing chalcedonies in hot geothermal systems: insights from the jasperoids of Poggio Peloso (southern Tuscany, Italy). *Geological Magazine* <https://doi.org/10.1017/S0016756822001200>
10. Casini L., Maino M., **Langone A.**, Oggiano G., Corvò S., Estrada J.R., Liesa M., - HT-LP metamorphism and fluid-fluxed melting during multi-stage anatexis of continental crust (N Sardinia, Italy). *J. of Metamorph. Geol.* <https://doi.org/10.1111/jmg.12687>
11. Verberne R., van Schrojenstein Lantman H.W., Reddy S.M., Alvaro M., Wallis D., Fougereuse D., **Langone A.**, Saxey D.W., Rickard W.D.A., - Trace-element heterogeneity in rutile linked to dislocation structures: Implications for Zr-in-rutile geothermometry. *J Metamorph Geol.* 2022;1–22 - DOI: 10.1111/jmg.12686
12. Corvò S., Maino M., Piazzolo S., Seno S., **Langone A.** 2022 - Role of inherited compositional and structural heterogeneity in shear zone development at mid-low levels of the continental crust (the Anzola shear zone; Ivrea-Verbano Zone, Southern Alps). *Lithos* 422-423 (2022) 106745 - <https://doi.org/10.1016/j.lithos.2022.106745>
13. Fanti F., Bell P.R., Vavrek M., Larson D., Koppelhus E., Sisson R.L., **Langone A.**, Campione N.E., Sullivan C. 2022 - Filling the Bearpaw Gap: evidence for

palaeoenvironment-driven taxon distribution in a diverse, non-marine ecosystem from the late Campanian of west-central Alberta, Canada. *Palaeogeography, Palaeoclimatology, Palaeoecology*; <https://doi.org/10.1016/j.palaeo.2022.110923>

14. Bash V., Sanfilippo A., Vigliotti L., **Langone A.**, Rasul N., Khorsheed M., Al Nomani S., Al Qutub A., Ligi M., 2022 - Crustal Contamination and Hybridization of an Embryonic Oceanic Crust during the Red Sea Rifting (Tihama Asir Igneous Complex, Saudi Arabia). *Journal of Petrology*, Volume 63, Issue 3, March 2022
15. Piazza G., Bracchi V.A., **Langone A.**, Meroni A.N., Basso D. 2021 - Growth rate rather than temperature affects the B/Ca ratio in the calcareous red alga *Lithothamnion corallioides*. *Biogeosciences*, 19, 1047–1065, 2022
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