

# Dr. Ana Černok/Anna Csernok

Assistant professor in geochemistry



## Personal Data:

Place of birth: Pančevo, Serbia

Nationality: Serbian; Hungarian (EU)

Affiliation and contact: University of Trieste, Via Edoardo Weiss 8, Palazzina N, 34128 Trieste, Italy;

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Languages: Serbian/Croatian/Bosnian (*native*); English, German (*fluent*); Italian (*beginner*)

## Research focus

I am an international researcher with a background in geoscience. My recent research focused on studying high-precision elemental and isotopic composition and structure of lunar samples (obtained from NASA Apollo missions), meteorites (from various museum collections) and analogue terrestrial rocks to resolve processes related to their formation or response to impacts.

## Academic Employment

Since 06/2023 **University of Trieste, Italy** — Tenure-track assistant professor (RTDb) in geochemistry  
Leading research projects in planetary geochemistry and mineralogy

10/2021 – 06/2023 **Freie Universität Berlin, Germany** — Research collaborator, Dept. of Geochemistry  
Obtaining precise ages of impact-related rocks from the Moon (focused on NASA Apollo 16 and 17 missions)

11/2018 – 06/2020 **Royal Ontario Museum, Canada** — Hatch Ltd. Postdoctoral Research Fellow  
Studying rocks from the Moon and meteorites, museum curatorial activities & public outreach events

10/2016 – 09/2018 **The Open University, UK** — Marie Skłodowska-Curie Research Fellow  
Studying rocks from the Moon & public outreach events

07/2011 – 03/2015 **Bayerisches Geoinstitut (BGI), University of Bayreuth, Germany** — Research Assistant  
Experimental mineralogy and crystal structure of various SiO<sub>2</sub> polymorphs at high pressures and temperatures

## Habilitation

06/06/2022 **National scientific habilitation** at the associate professorship level in sector 04/A1 – Geochemistry, Mineralogy, Petrology, Volcanology, Georesources and applications, ASN, Italy

## Other Employment

11/2020– 10/2022 **Cactus Communications, Int.** — Specialist Editor in Earth Sciences

Editing manuscripts in a wide range of geoscience disciplines (mining, geology, hydrogeology, environmental science) for non-native (Asian, South American, and African) clients

## Education

07/2011 – 12/2015 **University of Bayreuth, Germany** — Doctorate (*Magna cum laude*) 

03/2009 – 04/2011 **University of Vienna, Austria** — MSc in Geoscience (*With distinction*) 

03/2005 – 02/2009 **University of Vienna, Austria** — BSc in Geoscience (*With distinction*)

10/2004 – 03/2005 **University of Vienna, Austria** — Pre-university courses in German language

06/2004 School leaving examinations/**Matura**, Pančevo, Serbia (*Graded excellent*)

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## Selected awarded projects

- 06/2022 – 06/2025 **Rita Levi Montalcini Fellowship** awarded by the Ministero dell'Università e della Ricerca, Italy; Title: *The earliest bombardment history of the Moon revealed by coordinated compositional, microstructural, and geochronological investigations of the Mg suite samples* Role: **PI (~230,000€)**
- 03/2022 – 09/2022 Research stipend by Italian Il Ministero degli Affari Esteri e della Cooperazione Internazionale to perform a project at University of Trieste; Title: *Phosphate minerals and graphite as recorders of the timing, thermodynamic conditions, and life-supporting environment in deep-crustal rocks of the Ivrea-Verbano Zone (Italy)*; Role: **PI (~5,000 €)**
- 10/2021 – 10/2023 Pacific Northwest National Laboratory, USA; Title: *The origin, occurrence and distribution of water and volatiles in nominally anhydrous minerals*; Role: **Co-I (~\$100,000)**
- 04/2021 – 12/2022 Europlanet2024-RI, Trans-national access visit, EU; Title: *Water in silica-bearing iron meteorites: implications for early Solar System dichotomy*; Role: **PI (~£ 20,000)**
- 10/2019 – 10/2021 Pacific Northwest National Laboratory, USA; Title: *Probing the Martian atmosphere and hydrosphere using micro and nanoscale analyses*; Role: **Co-I (~\$ 100,000)**
- 10/2016 – 09/2018 **Marie Skłodowska-Curie Individual Fellowship** awarded by the European Commission, UK; Title: *RESOLVE - Reconstructing the History of Lunar Volatiles*; Role: **PI (183,455 €)**
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## Selected professional services

- Since 02/2023 European Lunar Symposium (ELS), Science Organizing Committee Co-chair
- 2021 and 2022 Science and Technology Facilities Council (STFC) grant reviewer
- 2019 and 2020 NASA Grant reviewer and panellist (SSERVI and ROSES solicitations)
- Since 2017 Co-convener (e.g. American Geophysical Union Fall Meeting), SOC (European Lunar Symposium, and in the organizing committee of several international workshops)
- Since 2016 Reviewer for ~13 international scientific journals (e.g. *Nature*, *PNAS*, *GCA*, *JGR Planets*)
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## Selected media coverage of research discoveries

- 12/2023 **Serbian National Radio (RTS 2)** interview on geochemistry in planetary science [🔗](#)
- 06/2021 **Serbian CNN broadcaster (N1)** interview regarding a recent discovery on Moon [🔗](#)
- 05/2020 **Forbes Magazine** covering 2020 & 2021 discoveries on craters on the Moon [🔗](#) [🔗](#)
- 06/2017 **High-pressure experiments solve meteorite mystery** [🔗](#) [🔗](#)
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**Invited lectures** Thirteen invited international lectures, including *Keynote presentations at the Goldschmidt conference* in 2019, Barcelona, Spain.

**Supervision** Mentoring 1 MSc student (University of Trieste), Co-mentoring 1 PhD student (University of Toronto), Co-mentoring an intern student (Open University)

**Teaching** *Isotopic geochemistry of rocks* (6 ETCS) – University of Trieste, creator of the course  
*Planetary geology* (in preparation) – University of Trieste, creator of the course

**Outreach** Participating and organizing public talks, exhibitions, guided tours, etc., since 2007

## Academic peer-reviewed publications and conference contributions

16 authored and co-authored publications in top ranked international journals (5 in Science and Nature portfolios), 4 co-authored manuscripts in review and revision, 35 international conference abstracts (12 oral and 22 poster presentations at >30 international geoscience conferences)

### List of academic peer-reviewed publications

1. L.F. White, G. Kenny, K. Tait, B. Langelier, T. Kizovski, T. Davison, **A. Černok** et al. (2023). Constraining the thermal evolution of the Ilyinets impact crater: Implications for nanoscale trace element mobility and high P-T phase preservation in dissociated zircon. *Geochimica et Cosmochimica Acta*, in revision.
2. G. Roncoroni, E. Forte, I. Santin, **A. Černok** et al. (2023). Deep Learning driven interpretation of Chang'E4 Lunar Penetrating Radar. *Journal of Geophysical Research – Planets*, in revision.
3. G. Roncoroni, E. Forte, I. Santin, **A. Černok** et al. (2023). High frequency Lunar Penetrating Radar quality control, editing and processing of Chang'E-4 lunar mission. *Nature Scientific Data*, accepted.
4. C. R. Walton, H. Jeon, **A. Černok** et al. (2023). In-situ phosphate U-Pb ages of the L chondrites. *Geochimica et Cosmochimica Acta* 359, 191-204. DOI: <https://doi.org/10.1016/j.gca.2023.07.012>.
5. C. R. Walton, O. Shorttle, S. Hu, J. Jianglong, **A. Černok**, et al. (2022). Ancient and recent collisions revealed by phosphate minerals in the Chelyabinsk meteorite. *Nature Communications Earth & Environment*, 3, 40. DOI: [10.1038/s43247-022-00373-1](https://doi.org/10.1038/s43247-022-00373-1).
6. **A. Černok**, et al. (2021). Lunar samples record an impact 4.2 billion years ago that may have formed the Serenitatis Basin. *Nature Communications Earth & Environment*, 120. DOI: [10.1038/s43247-021-00181-z](https://doi.org/10.1038/s43247-021-00181-z).
7. C. R. Walton, I. Baziotis, **A. Černok**, et al. (2021). Microtextures in the Chelyabinsk impact breccia reveal the history of Phosphorus-Olivine-Assemblages in chondrites. *Meteoritics & Planetary Science* 56, 1-25. DOI: [10.1111/maps.13648](https://doi.org/10.1111/maps.13648).
8. T. Barret, **A. Černok**, et al. (2021). Exploring relationships between shock-induced microstructures and H<sub>2</sub>O and Cl in apatite grains from eucrite meteorites. *Geochimica et Cosmochimica Acta* 302, 120-140. DOI: [10.1016/j.gca.2021.03.018](https://doi.org/10.1016/j.gca.2021.03.018).
9. J. Darling, L.F. White, T. Kizovski, **A. Černok**, et al. (2021). The shocking state of apatite and merrillite in shergottite NWA 5298 and extreme nanoscale chlorine isotope variability revealed by atom probe tomography. *Geochimica et Cosmochimica Acta* 293, 422-437. DOI: [10.1016/j.gca.2020.11.007](https://doi.org/10.1016/j.gca.2020.11.007).
10. **A. Černok** et al. (2020). Preservation of primordial signatures of water in highly shocked ancient lunar rocks. *Earth and Planetary Science Letters* 544, 116364. DOI: [10.1016/j.epsl.2020.116364](https://doi.org/10.1016/j.epsl.2020.116364).
11. L. F. White, K. T. Tait, B. Langelier, E. A. Lymer, **A. Černok**, et al. (2020). Evidence for sodium rich alkaline water in the Tagish Lake parent body and implications for amino acid synthesis and racemization. *Proceedings of the National Academy of Sciences of the United States of America*, 202003276. DOI: [10.1073/pnas.2003276117](https://doi.org/10.1073/pnas.2003276117).
12. L. F. White, **A. Černok**, et al. (2020). Evidence of extensive lunar crust formation in impact melt sheets 4330 Myr ago. *Nature Astronomy* 4, 974–978. DOI [10.1038/s41550-020-1092-5](https://doi.org/10.1038/s41550-020-1092-5).
13. **A. Černok** et al. (2019). Shock-induced microtextures in lunar apatite and merrillite. *Meteoritics & Planetary Science* 54, 1262-1282. DOI: [10.1111/maps.13278](https://doi.org/10.1111/maps.13278).
14. I. Baziotis, P. D. Asimow, J. Hu, L. Ferrière, C. Ma, **A. Černok**, M. Anand and D. Topa (2018). High pressure polymorphs in the Château-Renard (L6) ordinary chondrite: implications for collisions on its parent body. *Scientific Reports*, 8(1), 9851. DOI: [s41598-018-28191-6](https://doi.org/10.1038/s41598-018-28191-6)
15. E. Bykova, M. Bykov, **A. Černok** et al. (2018). Metastable silica high pressure polymorphs as structural proxies of deep Earth silicate melts, *Nature Communications* 9, 4789. DOI: [10.1038/s41467-018-07265-z](https://doi.org/10.1038/s41467-018-07265-z).
16. **A. Černok** et al. (2017). High-pressure behaviour of cristobalite: bridging the gap towards the "seifertite enigma", *Nature Communications* 8, 15647. DOI: [10.1038/ncomms15647](https://doi.org/10.1038/ncomms15647).
17. M. Millot, N. Dubrovinskaia, **A. Černok**, et al. (2015). Melting of silica at planetary interior conditions using shock compression of stishovite, *Science* 347, 418-420. DOI: [10.1126/science.1261507](https://doi.org/10.1126/science.1261507).
18. **A. Černok** et al. (2014). High-pressure crystal chemistry of coesite-I and its transition to coesite-II. *Zeitschrift für Kristallographie - Crystalline Materials* 229, 761-773. DOI: [10.1515/zkri-2014-1763](https://doi.org/10.1515/zkri-2014-1763).
19. **A. Černok** et al. (2014). Pressure-induced phase transitions in coesite. *American Mineralogist* 99, 755-763. DOI: [10.2138/am.2014.4585](https://doi.org/10.2138/am.2014.4585).

