



DR. ANNA GÜLCHER

Computational Earth and planetary scientist

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PROFESSIONAL EXPERIENCE

- 11.2024 - present **CSH Fellow**, University of Bern Bern, Switzerland
Center for Space and Habitability, Space Research & Planetary Sciences division
- 01.2023 - 11.2024 **Postdoctoral Researcher**, NASA JPL/Caltech Pasadena, CA, US
Planetary Interiors and Geophysics Division, NASA Jet Propulsion Laboratory
Division of Geological and Planetary Sciences, California Institute of Technology
- Summer 2023 **Planetary sciences guest lecturer**, Metavisionaries Academy (*part-time*) Remote
- 11.2022 - 12.2022 **Postdoctoral Researcher**, Institute of Geophysics, ETH Zürich Zürich, Switzerland
Geophysical Fluid Dynamics group
- 11.2018 - 10.2022 **Research assistant**, Institute of Geophysics, ETH Zürich Zürich, Switzerland
Geophysical Fluid Dynamics group
- 08.2015 - 08.2016 **Consultant Board of Education**, Geosciences Dept., Utrecht University Utrecht, the Netherlands
- 09.2014 - 07.2016 **Teaching assistant**, Geosciences Dept., Utrecht University Utrecht, the Netherlands
- 06.2011 - 09.2016 **Outdoor instructor and coordinator** the Netherlands; Italy
Zeilschool Oer't Hout (NL) and Elba Travels (IT)

ACADEMIC QUALIFICATIONS

- 11.2018 - 10.2022 **Ph.D in Geophysics | Planetary Sciences**, ETH Zürich Zürich, Switzerland
Thesis: 'Shaping Earth's mantle flow through chemical and rheological heterogeneity in the lower mantle'
Advisors: Maxim D. Ballmer (UCL) and Paul J. Tackley (ETH)
- 09.2016 - 09.2018 **MS.c in Earth Sciences | Geophysics**, ETH Zürich (*With distinction: 4.0/4.0 GPA*) Zürich, Switzerland
Thesis: 'Plume penetration into Venusian lithosphere and the origin of coronae: 3D thermomechanical modelling'. Advisors: Taras V. Gerya (ETH) and Laurént Montési (UMD)
- 09.2013 - 07.2016 **BS.c in Earth Sciences**, Utrecht University (*Cum Laude: 4.0/4.0 GPA*) Utrecht, the Netherlands

LANGUAGES

- Dutch: native
- English: fluent
- German: excellent
- French: basic

SOFT SKILLS

- Goal-oriented and focused
- Excellent communication
- Storytelling; creative writing; design
- Team-worker and social

TECHNICAL (SELECTED)

- Maths, physics, chemistry, geology
- Coding and programming languages
- Finite differences and finite elements
- Adobe Illustrator, Affinity Designer

PRIZES, AWARDS, AND GRANTS

Total of research/award grants in EUR/CHF/USD: 2,1 million EUR / 2,0 million CHF / 2,3 million USD

- 10.2024 **Grant for research group leader in Earth and Planetary Geodynamics**, Earth System Science call, Volkswagen Foundation, Germany (1.6 million EUR)
- 02.2024 **Research fellowship grant**, Center for Space and Habitability, University of Bern, Switzerland (300k CHF)

- 07.2022 Postdoctoral **research fellowship grant**, Swiss National Science Foundation (140k CHF)
- 09.2021 **Women-in-STEM grant** for peer-mentoring group, 'Fix the Leaky Pipeline' program, ETH Zürich (2k CHF)
- 05.2019 **Outstanding Presentation Award**, EGU General Assembly, Vienna
- 10.2018 **ETH MSc thesis Medal**: best MSc research thesis in Dept. of Earth Sciences, ETH Zürich, Switzerland
- 2016-2018 **Excellence Master Scholarship**, ETH Zürich, Switzerland (40k CHF)
- 05.2016 **Awardee** of research grant, Molengraaff Fonds, TU Delft, the Netherlands(10k CHF)

SPACE MISSION INVOLVEMENT ---

- 05.2023 - present **VERITAS space mission**, NASA JPL, Scientific collaborator
- 06.2022 - present **EnVision space mission**, ESA, Radio Experiment Science (RSE) science team affiliate

PROFESSIONAL SERVICE (SELECTED) ---

- 2024 - present **National Center of Competence in Research (NCCR) Planets**, member
 - Active member of center, established by the Swiss National Science Foundation, that takes a leading role in planetary science research, technology, and education in Switzerland.
- 2023 - present **NASA Venus Exploration and Analysis Group (VExAG) Steering committee**, member
 - **Leading** the 'Venus Data and Resources' working group
 - Member of the 'Exploration Strategy', 'Venus Geological Mapping', and 'Mentoring/DEI' working groups
 - **Mentor** to Venus early career scientists
- 2021 - present **International Space Science Institute (ISSI) international team member**, Bern, Switzerland
 - Seismicity on Venus: Prediction & Detection (2023-2024)
 - Venus: Evolution through Time (2021-2022)
- 2020 - present **Reviewer** for scientific papers (17) and grant proposals (5)
 - Science Advances, Nature Communications, Earth and Planetary Science Letters, Journal of Geophysical Research (JGR): Planets, JGR: Solid Earth, Icarus, Geophysical Research Letters, Planetary and Space Science
 - Funding agencies: NASA Solar System Workings panel, NSF, ANR (Agence Nationale de la recherche)
- 2020 - present **Conference organisation; session convener/chair** (18)
 - Leading scientific panels and foster discussions as session convener/chair (15)
 - Responsible for full geodynamic workshop and conference organisation (3)
- 05.2020 - 05.2022 **Early Career Scientist Representative**, European Geosciences Union (EGU)
 - Vital link between the scientific community, the Division leaders, and the Union board
- 05.2019 - 05.2022 **Science communicator and outreach manager**, European Geoscience Union (EGU)
 - Blog editor and author for the Geodynamics blog webpage
 - Social media manager for the Geodynamics outreach channels
- 05.2021, 04.2022 **Mentor** for female Early Career Scientists, EGU
- 07.2015 - 07.2016 **President of the Geological Women's Society Utrecht** (U.G.D.D. Saxifraga)

PEER-REVIEWED JOURNAL PUBLICATIONS ---

Google scholar citation count: 377 | h-index: 9 | i-10 index: 9 | * co first-authorship

Under review

10. **Gülcher, A. J. P.**, Gurnis, M., and Smrekar, S. E., Dynamics of Venusian rifts and their interactions with plumes and intrusions, (*Under review for Earth and Planetary Science Letters*)
9. Cascioli, G.* and **Gülcher, A. J. P.***, Mazarico, E., and Smrekar, S. E., A spectrum of tectonic processes at coronae on Venus, (*Under review for Science Advances*)

8. **Gülcher, A. J. P.**, Sabbeth, L., E. Stofan, and Smrekar, S. E., Coronae on Venus: an updated global database and insights into morphology, spatial distribution, geological setting, and lithospheric properties, (*Under review for Journal of Geophysical Research: Planets*)

Published

8. Garcia, F. R., Van Zelst, I., Kawamura, T., Näsholm, S. P., Horleston, A., Klaasen, S. Solberg, C. M., Plesa, A.-C., Brissaud, Q., Maia, J., Stähler, S., Lognonné, P., Panning, M., **Gülcher, A. J. P.**, Ghail, R., De Toffoli, B. (2024), Seismic wave detectability on Venus using ground deformation sensors, infrasound sensors on balloons and airglow imagers, *Earth and Space Science*, vol. 11 (11), e2024EA003670, DOI: <https://doi.org/10.1029/2024EA003670>
7. Schouten, T., Gebraad, L. Noe, S., **Gülcher, A. J. P.**, Thrastarsson, S., van Herwaarden, D., and Fichtner, A. (2024), Global full-waveform inversion reveals complex mantle structure: not all positive wave speed anomalies are subducted slabs, *Scientific Reports*, 14, 26708, DOI: <https://doi.org/10.1038/s41598-024-77399-2>
6. **Gülcher, A. J. P.**, Yu, T., and Gerya, T. V. (2023). Tectono-magmatic evolution of asymmetric coronae on Venus: Topographic classification and 3D thermo-mechanical modeling. *Journal of Geophysical Research - Planets*, 128, e2023JE007978, DOI: <https://doi.org/10.1019/2023JE007978>
5. **Gülcher, A. J. P.**, Golabek, G., Thielmann, M., Ballmer, M.D., and Tackley, P.J. (2022). Narrow, fast, and “cool” mantle plumes cause by strain-weakening rheology in the lower mantle. *Geochemistry, Geophysics, Geosystems*, vol. 23, issue 10, e2021GC010314, DOI: <https://doi.org/10.1029/2021GC010314>
4. **Gülcher, A. J. P.**, Ballmer, M.D. and Tackley, P.J. (2021). Coupled dynamics and evolution of primordial and recycled heterogeneity in Earth’s lower mantle. *Solid Earth*, vol. 12, pp. 2097-2107, DOI: [10.5194/se-12-2087-2021](https://doi.org/10.5194/se-12-2087-2021)
3. **Gülcher, A. J. P.**, Gerya, T.V., Montési, L.G.J. and Munch, J. (2020) Corona structures driven by plume-lithosphere interactions and evidence for ongoing plume activity on Venus. *Nature Geoscience*, vol. 13, pp. 547-554, DOI: [10.1038/s41561-020-0606-1](https://doi.org/10.1038/s41561-020-0606-1)
2. **Gülcher, A. J. P.**, Gebhardt, D., Ballmer, M.D. and Tackley, P.J. (2020). Variable dynamic styles of primordial heterogeneity preservation in Earth’s lower mantle. *Earth and Planetary Science Letters*, vol. 536, 116160, DOI: [10.1016/j.epsl.2020.116160](https://doi.org/10.1016/j.epsl.2020.116160)
1. **Gülcher, A. J. P.**, Beaussier, S. J. and Gerya, T.V., (2019). On the formation of oceanic detachment faults and their influence on intra-oceanic subduction initiation: 3D thermomechanical modeling. *Earth and Planetary Science Letters*, vol. 506, pp. 195-208, DOI: [10.1016/j.epsl.2018.10.042](https://doi.org/10.1016/j.epsl.2018.10.042)

BOOK CHAPTERS / REVIEW PAPERS / TECHNICAL PAPERS

Published

6. The VEXAG Exploration Strategy Study Analysis Workgroup (Byrne, P. et al. (**Gülcher, A. J. P.**)) (2024), Strategy for enabling Venus science, technology, and exploration in the near future, <https://doi.org/10.48550/arXiv.2412.06830>
5. Gillman, C., Golabek, G. J., **Gülcher, A. J. P.**, Lefèvre, M., and Avibe, G. (2025) Venus, chapter in: *Treatise on Geochemistry (3rd edition)*, Elsevier, vol. 7, pp. 289-323. <https://doi.org/10.1016/B978-0-323-99762-1.00099-1>
4. Smrekar, S., Ghail, R., Byrne, P., **Gülcher, A. J. P.**, O’Rourke, J. G., Borrelli, M. E., Gilmore, M. S., Herrick, R. R., Ivanov, M. A., Plesa, A.-C., Rolf, T., Sabbeth, L., Schools, J. W., & Shellnutt, J. G. (2024), Volcanic and Tectonic Constraints on the Evolution of Venus, *Space Science Reviews*, vol. 220, 36, DOI: <https://doi.org/10.1007/s11214-024-01065-2> (Chapter in book ‘Venus: Evolution through Time’, Springer)
3. O’Rourke, J., Wilson, C., Ghail, R., Byrne, P. K., Dumoulin, C., Ghail, R., **Gülcher, A. J. P.**, Jacobson, S. A., Korablev, O., Spohn, T., Way, M. J., Weller, M., & Westall, F. (2023), Venus, the Planet: Introduction to Earth’s Sister Planet. *Space Science Reviews*, vol. 219, 10. DOI: <https://doi.org/10.1007/s11214-023-00956-0> (Chapter in book ‘Venus: Evolution through Time’, Springer)
2. Rolf, T., Weller, M., **Gülcher, A. J. P.**, Byrne, P., O’Rourke, J. G., Herrick, R., Bjonnes, E., Davaille, A., Ghail, R., Gillmann, C., Plesa, A.-C., & Smrekar, S. (2022), Venus mantle dynamics and evolution through time. *Space Science Reviews*, vol. 218, 70. DOI: <https://doi.org/10.1007/s11214-022-00937-9> (Chapter in book ‘Venus: Evolution through Time’, Springer)
1. Cutts, J. A., et al. (**Gülcher, A. J. P.**), (2020) Venus Coronae and Tessera Explorer (VeCaTeX) Mission Concept Investigating the Surface of Venus from beneath the Clouds, *Bulletin of the American Astronomical Society*, American Astronomical Society, 53 (345)

OUTREACH ARTICLES (SELECTED)

See full list: www.annagulcher.com/outreach/

2. **Gülcher, A. J. P.** (2021). A surprisingly geologically active Venus – evidence for recent volcanic and tectonic activity. *The Science Breaker, Earth and Space*, DOI: [10.25250/thescbr.brk555](https://doi.org/10.25250/thescbr.brk555)
1. **Gülcher, A. J. P.** (2020). Evidence for a hotspot Venus - clues from mysterious coronae. *Nature Astronomy* “behind the paper”, <https://go.nature.com/30HTHYP>

SUPERVISION

Student research internship mentoring and supervision

- **2024**, Shiori Nakaya, SOAR undergraduate summer intern at the NASA Jet Propulsion Laboratory to work on ‘*Identifying geologic features on Venus using machine learning*’, linked to a wider SOAR-internship program within the VERITAS mission
- **2024**, Sylvia Mendoza, SOAR undergraduate summer intern at the NASA Jet Propulsion Laboratory to work on ‘*Identifying geologic features on Venus using machine learning*’, linked to a wider SOAR-internship program within the VERITAS mission
- **2023**, K. Hearst, US San Diego, NASA Summer Undergraduate Program for Planetary Research 2023, ‘*Topography and gravity analysis of Venus*’
- **2022**, T. Yu, Georgia Institute of Technology, GA, ThinkSwiss Research Scholarship 2022, ‘*3D thermo-mechanical modelling of coronae on Venus*’

Undergraduate (BS.c) or graduate (MS.c) thesis research supervision

- **2025**, MS.c, Hoaqi Li, Dept. of Earth and Planetary Sciences, ETH Zürich, Switzerland ‘*Numerical Modeling for Venustian Rifting Evolution Through Multi-Directional Extension*’
- **2024**, MS.c, Xi Yang, Dept. of Earth and Planetary Sciences, ETH Zürich, Switzerland ‘*Active rifting on Venus revealed by wide rift flank uplift zones*’
- **2021**, BS.c, Theresa Eingartner, Dept. of Computer Science (Visual Computing), Friedrich-Alexander-University Erlangen-Nürnberg, Germany, ‘*Scientific visualisation of 3D mantle domains inside the Earth*’
- **2019**, MS.c, Timothy Gray, Dept. of Earth sciences, ETH Zürich, ‘*Numerical models of mantle flow driven craton motions on Venus*’
- **2019**, BS.c, Deborah Stahler, Dept. of Earth sciences, ETH Zürich, ‘*The origin of asymmetrical coronae on Venus: insights from 3D thermomechanical modelling*’
- **2018**, MS.c, Alejandro Cortes, Dept. of Earth sciences, ETH Zürich, ‘*3D thermo-mechanical modelling of oblique subduction zones*’

TEACHING

09.2019 - 06.2022 **Course teaching**, ETH Zürich, Switzerland

- 3rd yr Undergraduate / 1st yr graduate course ‘Dynamics of Mantle and Lithosphere’
- 2nd yr Undergraduate course ‘Geophysical fieldwork’

09.2014 - 07.2016 **Course teaching**, Utrecht University, the Netherlands

- 2nd yr Undergraduate mathematical courses ‘Differential Equations in Earth Sciences’ and ‘Linear Algebra and Vector Analysis’
- 2nd yr Undergraduate Earth sciences courses ‘Deformation and Metamorphism of the Crust’ and ‘Geological fieldwork preparation’
- 1st yr Undergraduate courses ‘Physics’, ‘Mathematics’, and ‘Geology’

INSTITUTIONAL RESPONSIBILITIES

Center for Space and Habitability, University of Bern, Switzerland (selected)

- **02.2025 - present**, Co-organization of weekly seminar program, organizing and hosting invited (international) scientists.

Dept. of Earth Sciences, ETH Zürich, Switzerland (selected)

- **09.2021 - 09.2022**, **Fix the Leaky Pipeline** peer-mentoring group **co-organiser** (Women in STEM program)
- **05.2019 - 05.2022**, **Leading organiser** of the **D-ERDW Doctoral Retreat**
- **01.2019 - 12.2022**, Group meetings organisation, Geophysical Fluid Dynamics group
- **06.2019 - 09.2022**, Weekly Department networking event organisation (**‘Friday Beers/Peers’**)

Geosciences Dept., Utrecht University, the Netherlands (selected)

- 2015 - 2016, Study Program's Board of Advice, **student consultant**
- 2014 - 2016, **Writer and editor** of the Earth Sciences magazine 'PanGeo'

APPEARANCE IN/COVERAGE BY MEDIA (SELECTED)

- Interviewed for, and quoted in the article [Oldest and largest impact crater on Venus](#), *Sky & Telescope, Solar System news*, 11.2024
- Interviewed for, and quoted in the article [Life Lessons from Hell-House Venus](#), *Nautilus Astronomy*, 06.2024
- On-camera appearance in the TV show '[The UnXplained: Mysteries of the Universe](#)' documentary, episode 4: 'Venus: Earth's Evil Twin', aired on *The History Channel*, 05.2024
- On-camera appearance in the TV show '[The UnXplained: Mysteries of the Universe](#)' documentary, episode 3: 'Mysterious Earth', aired on *The History Channel*, 05.2024
- Quoted in news article [Rivers of Lava on Venus Reveal a More Volcanically Active Planet](#), *The New York Times*, 05.2024
- Quoted in news article [New map reveals secrets of Io, the solar systems most volcanic moon](#), *Scientific American*, 11.2023
- Quoted in news article [Billions of Years Ago, Venus May Have Had a Key Earthlike Feature](#), *The New York Times*, 10.2023
- Interviewed for, and quoted in, the news article [Lava für die Liebesgöttin](#), *Frankfurter Allgemeine Zeitung*, 03.2023
- Quoted in the article [Venus is volcanically alive, stunning new find shows](#), *National Geographic*, 03.2023
- Interviewed for a Women-in-STEM interview by GAIA (*Dutch network for women in Earth Sciences*): '[Interview with dr. Anna Gülcher](#)', 12.2022
- Scientific guest in podcast episode '[Unraveling the geologic history of Venus](#)', '*The Cosmic Cast*', 04.2022
- [Vénus coronae et panaches actifs](#), *L'Astronomie*, vol. 145, pp. 4-7, 01.2021
- [Venus has crown-shaped hotspots that form its own 'Ring of Fire'](#), *CNN Space + Science*, 07.2020
- [Venus has dozens of volcanic hotspots, says study](#), *Forbes*, 07.2020
- [The Venus 'Ring of Fire'](#), *ETH News*, 07.2020
- [Scientists identify 37 recently active volcanic structures on Venus](#), *Reuters*, 07.2020
- [Volcanoes are still active on Venus](#), *Cosmos Magazine*, 07.2020
- ["Dit verandert onze kijk op Venus grondig": volgens nieuwe studie is planeet actiever dan gedacht](#), *VRT nieuws* (July 2020)
- [Vulkanen op Venus zijn nog steeds actief](#), *Scientias.nl*, 07.2020

INVITED SEMINAR AND KEYNOTE TALKS

28. 10.2024, CSH Colloquium, Center for Space and Habitability, University of Bern, Bern, Switzerland (**Seminar speaker**)
27. 09.2024, Lithosphere dynamics seminar series, University of Southern California (USC), Los Angeles, USA (**Seminar speaker**)
26. 09.2024, Ada Lovelace Workshop on Numerical Modeling of Mantle and Lithosphere dynamics, Sète, France (**Invited keynote speaker**)
25. 04.2024, Max Planck Institute for Solar System Science seminar series, Göttingen, Germany (**Seminar speaker**)
24. 04.2024, Institute of Geophysics seminar series, University of Münster, Germany (**Seminar speaker**)
23. 02.2024, Dept. of Environmental, Earth, and Planetary Sciences (DEEPS), Brown University, DEEPS colloquium (**Seminar speaker**)
22. 12.2023, Earth and Planetary Sciences dept., UC Riverside, Hewett Club Lecture Series (**Seminar speaker**)
21. 11.2023, Earth, Planetary, and Space Sciences, University of California Los Angeles (UCLA), Geophysics (**Seminar speaker**)
20. 10.2023, 31st Venus Exploration and Analysis Group meeting, status report on 'Venus data accessibility' (**Invited speaker**)
19. 10.2023, Dept. of Earth, Environmental & Planetary Sciences, Brown University, Lunch Bunch seminar series (**Seminar speaker**)
18. 10.2023, Dept. of Earth & Planetary Sciences, Yale University, EPS Colloquium (**Seminar speaker**)
17. 10.2023, Institute of Geophysics and Planetary Physics (IGPP), Scripps Institution of Oceanography, UCSD, Institute seminar (**Invited keynote speaker**)
16. 10.2023, Geological Society of America (GSA), 'Venus: Earth's hotter twin' session (*declined due to conflict of schedule*) (**Invited keynote speaker**)
15. 09.2023, Humans2Venus foundation Venus speaker series (**Invited speaker**)
14. 05.2023, Caltech seismolab geophysics seminar series (**Seminar speaker**)
13. 02.2023, LPI Venus Surface and Atmosphere meeting, 'Venus Tectonism' session (*declined due to conflict of schedule*) (**Invited keynote speaker**)
12. 12.2022, AGU Fall Meeting 2022, session 'Advances in Mantle Convection and Planetary Evolution' (**Invited speaker**)

11. [12.2022](#), Charles University Prague geophysics seminar (**Seminar speaker**) [1005.2022](#), EGU General Assembly 2022, session 'Towards the Decade of Venus' (**Invited session speaker**)
10. [04.2022](#), VEXAG "Second Planet Second Tuesdays" Colloquium (**Seminar speaker**)
9. [08.2021](#), German/Swiss Geodynamics Workshop 2021, Bad Belzig, Germany (**Keynote speaker**)
8. [03.2021](#), NAS Planetary Science and Astrobiology Decadal Survey 2023-2032. 'Venus Geodynamics' open session (**Keynote speaker and panelist**)
7. [03.2021](#), Imperial College Earth and Planets Seminar (**Seminar speaker**)
6. [02.2021](#), Zehijang University Earth and Data seminar (**Seminar speaker**)
5. [02.2021](#), Oxford University Geophysics seminar (**Seminar speaker**)
4. [11.2020](#), ETH Planetary Geophysics seminar (**Seminar speaker**)
3. [10.2020](#), University of Maryland, Dept.of Geology seminar series (**Seminar speaker**)
2. [08.2020](#), NASA GISS mini-conference 'Venus Science Today' (**Invited speaker and panelist**)
1. [07.2020](#), IGCP 648 seminar series 'Supercontinent Cycles and Global Geodynamics' (**Seminar speaker**)

CONFERENCE/WORKSHOP CONTRIBUTIONS (SELECTED) ---

Conference/workshop talks (*as presenting author*)

33. **Gülcher, A. J. P.**, Gurnis, M., and Smrekar, S. (2025) Diverse tectonic processes at coronae on Venus revealed by joint analysis of modeled topography and gravity. LPSC, Houston, USA
32. **Gülcher, A. J. P.**, Gurnis, M., and Smrekar, S. (2024) The Peculiar Case of Rift Tectonics on Venus: 3D Models of Rift Interactions with Thermal Plumes and Crustal Intrusions. LPSC, Houston, USA
31. **Gülcher, A. J. P.** (2024) Unveiling Venus' tectonic furnace: geodynamic modeling, future missions, and insights into rocky planets. Rocky Worlds III workshop, Zürich, Switzerland
30. **Gülcher, A. J. P.** and Gerya, T. (2023) Prolonged magmatic activity and eclogite recycling at asymmetric coronae on Venus. AGU Fall meeting, San Francisco, USA
29. **Gülcher, A. J. P.** and Hahn, B. (2023) Venus data and resources transparency. 21st Annual Meeting of the Venus Exploration and Analysis Group. Albuquerque, New Mexico, USA (**invited talk**)
28. **Gülcher, A. J. P.**, Yu, T-Y., Stadler, and Gerya, T. (2023) The role of geodynamic modelling of Venus' tectonics and volcanism in paving the way for the 'Decade of Venus'. International EnVision Venus Science Workshop, Berlin, Germany
27. **Gülcher, A. J. P.**, Yu, T-Y., Stadler, and Gerya, T. (2023) Corona Structures at Topographic Margins on Venus Reveal Interior Dynamic Processes. Lunar and Planetary Sciences Congress, The Woodlands, TX, USA
26. **Gülcher, A. J. P.**, Ballmer, M., and Tackley, P. (2022). 3D Spherical Mantle Convection Models illuminate the Coupled Preservation of Recycled and Primordial Heterogeneity in Earth's Lower Mantle. AGU Fall meeting (virtual) (**invited talk**)
25. **Gülcher, A. J. P.**, Golabek, G., Thielmann, M., Ballmer, M., and Tackley, P. (2022). Narrow, fast, and "cold" mantle plumes on Earth explained by strain-weakening rheology in the lower mantle. EGU General Assembly, Vienna, Austria
24. **Gülcher, A. J. P.**, Gerya, T., and Montesi, L. (2022). Corona structures as a window into volcano-tectonic activity on Venus: key insights and ways forward. EGU General Assembly, Vienna, Austria (**invited talk**)
23. **Gülcher, A. J. P.**, Golabek, G., Thielmann, M., Ballmer, M., and Tackley, P. (2021) Shaping Earth's mantle convection via strain-weakening rheology in the lower mantle, AGU Fall Meeting (virtual)
22. **Gülcher, A. J. P.**, Ballmer, M., and Tackley, P. (2021) Breakdown of primordial layering in the early Earth: implications for the tectonic regime and ancient geochemical signals through time, Goldschmidt 2021 conference (virtual)
21. **Gülcher, A. J. P.**, Ballmer, M., and Tackley (2021). Coupled dynamics of primordial and recycled heterogeneity in Earth's lower mantle, and their present-day seismic signatures. EGU General Assembly (virtual)
20. **Gülcher, A. J. P.**, Ballmer, M. and Tackley, P. (2020). The coexistence of recycled and primordial heterogeneity in Earth's lower mantle: a geodynamical perspective. AGU 2020 Fall Meeting (virtual)
19. **Gülcher, A. J. P.**, Montesi, L. and Gerya, T. (2020). Widespread ongoing plume activity on Venus revealed by variations in the morphology of large coronae. Europlanet Science Congress (virtual)
18. Cutts, J. A. **et al.** (**Gülcher, A. J. P.**), (2020) Venus Coronae and Tessera Explorer (VeCaTeX) Mission Concept Investigating the Surface of Venus from beneath the Clouds, Venus Exploration and Analysis Group (VEXAG) annual meeting (virtual)
17. **Gülcher, A. J. P.**, Yan, J., Ballmer, M., and Tackley, P. (2020) The formation, preservation and seismic signatures of chemical heterogeneities in the lower mantle. Goldschmidt 2020 conference (virtual)

16. **Gülcher, A. J. P.**, Ballmer, M., Tackley, P., and Koelemeijer, P. (2020) The formation, preservation and seismic signatures of chemical heterogeneities in the lower mantle. EGU General Assembly (virtual)

Conference/workshop posters (as presenting author)

15. **Gülcher, A. J. P.**, Sabbeth, L., Stofan, E., and Smrekar, S. (2025) Coronae on Venus: an updated database and insights into morphology, geology, and lithospheric properties. Lunar and Planetary Sciences Congress, The Woodlands, TX, USA
14. Cascioli, G., **Gülcher, A. J. P.**, Mazarico, E., Smrekar, S., and Schools, J. W. (2024) Detectability of Tectono-Magmatic Structures in the Venus Gravity Field. Lunar and Planetary Sciences Congress, The Woodlands, TX, USA
13. **Gülcher, A. J. P.**, Sabbeth, L., Stofan, E., and Smrekar, S. (2024) An updated corona database for Venus. Lunar and Planetary Sciences Congress, The Woodlands, TX, USA
12. **Gülcher, A. J. P.**, Smrekar, S., and Gurnis, M. (2023) Applying 3D rift models to Venus. AGU. San Francisco, USA
11. **Gülcher, A. J. P.**, Smrekar, S., and Gurnis, M. (2023) The peculiar case of rift tectonics on Venus. Lunar and Planetary Sciences Congress, The Woodlands, TX, USA
10. **Gülcher, A. J. P.**, Yu, T-Y., Stadler, D., and Gerya, T. (2022) The origin of asymmetrical coronae on Venus: Morphology classification and 3D models of plume-margin interactions. AGU Fall meeting (virtual)
9. **Gülcher, A. J. P.** (2021) The enigma of Venusian coronae and tectonics. AGU Fall Meeting (virtual)
8. **Gülcher, A. J. P.**, Golabek, G., Thielmann, M., Tackley, P., and Ballmer, M. (2020) Strain-weakening rheology in Earth's lower mantle and its control on mantle convection and tectonics. AGU Fall Meeting (virtual)
7. Golabek, G., **Gülcher, A. J. P.**, Thielmann, M., Tackley, P., and Ballmer, M. (2020) Strain-weakening rheology in Earth's lower mantle: a multi-scale numerical endeavour. EGU General Assembly (virtual)
6. **Gülcher, A. J. P.**, Ballmer, M., and Tackley, P. (2019) Constraints on Primordial Heterogeneity Preservation in the Lower Mantle and Implications for Global-Scale Mantle Dynamics. AGU 2019 Fall Meeting, San Fransisco, USA
5. **Gülcher, A. J. P.**, Ballmer, M., and Tackley, P. (2019) Rheological constraints on primordial heterogeneity preservation in Earth's lower mantle. Ada Lovelace workshop on modeling lithosphere and mantle dynamics, Sienna, Italy
4. **Gülcher, A. J. P.**, Ballmer, M., and Tackley, P. (2019) Investigating the effect of rheological and tectonic parameters on the preservation of primordial reservoirs in Earth's lower mantle: a numerical study. EGU General Assembly, Vienna, Austria (**Outstanding Student Poster Presentation award**)
3. **Gülcher, A. J. P.**, Gerya, T., and Montesi, L. (2018) Plume Penetration into Venusian Lithosphere and the Origin of Coronae. AGU Fall Meeting, Washington DC, USA
2. Ballmer, M., **Gülcher, A. J. P.**, Gebhardt, D., and Waszek, L. (2018) The formation and preservation of large-scale primordial heterogeneity in the Earth's mantle. AGU Fall Meeting, Washington DC, USA
1. **Gülcher, A. J. P.**, Beaussier, S., and Gerya, T. (2017) On the formation of oceanic detachment faults and their influence on intra-oceanic subduction initiation: 3D thermomechanical modeling. XV International Workshop on Mantle and Lithosphere Dynamics 2018, Putten, the Netherlands

FURTHER EDUCATION AND TRAINING (SELECTED)

2019 - present

Leadership and development

- Leadership and intercultural competences, Dr. Silvie Klein-Franke
- New Space Economy, École polytechnique fédérale de Lausanne (EdX)
- Leadership and how to succeed in Scientific and Professional Careers, Dr. Sarah Shephard
- Introduction to Collegial Coaching, [SolutionSurfers](#), [International Coaching Federation](#)
- Time management, [Sandra Bajus](#), ETH Zürich
- [Learning to Teach](#), Educational Development and Technology, ETH Zürich
- Scientific writing, Dr. Thomas Armstrong, University of st. Gallen, Switzerland
- Project Management for Research, ETH Zürich
- Strategic Thinking, [Barefoot Thinking Company](#)

2020 - 2021

Scientific/computational

- Visualisation of scientific and abstract data, Computer Graphics Laboratory ETH Zürich
- Parallel Programming with MPI/OpenMPI, High-Performance Computing Center Stuttgart (HLRS)

REFERENCES

- **Dr. Suzanne Smrekar**, Scientific staff at NASA Jet Propulsion Laboratory, suzanne.e.smrekar@jpl.nasa.gov (postdoc advisor and VERITAS Principal Investigator)
- **Dr. Maxim Ballmer**, Lecturer at University College London m.ballmer@ucl.ac.uk (PhD advisor and collaborator)
- **Prof. Taras Gerya**, Professor at Swiss Federal Institute of Technology, taras.gerya@erdw.ethz.ch (former group member and collaborator)
- **Prof. Thomas Widemann**, Staff Scientist at Paris Observatory's Laboratory of Space and Instrumentation Studies and Professor at University Versailles Saint-Quentin, thomas.widemann@obspm.fr (professional service and ESA's EnVision collaborator)
- **Prof. Paul Tackley**, Professor at Swiss Federal Institute of Technology, paul.tackley@erdw.ethz.ch (PhD advisor and collaborator)
- **Prof. Gregor Golabek**, Professor at Bayerisches GeoInstitut, Bayreuth, Germany, gregor.golabek@uni-bayreuth.de (Collaborator)