

# CURRICULUM VITAE



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## 1. Expertise and research interest

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- > Structural geology & volcanology
- > Physical properties of rocks & rock deformation processes
- > Geochemistry, petrology and hydrothermal alteration
- > Rock fabric quantification from mega- to nano-scale

## 2. Professional experience

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- > 04/2018 – present: *project coordinator German Scientific Earth Probing Consortium*
  - Public relations
  - Coordination of teaching courses
- > 04/2016 – present: *Post-doc in DFG project on ICDP/USDP drill core samples*
  - Hydrothermal alteration; petrology, geochemistry, C-O-isotopes, and clay mineralogy
  - Physical properties of Mt Unzen samples
  - 2D and 3D fabric analysis by SEM imaging and X-ray computed tomography (XCT)
- > 11/2015 – 03/2016: *Intern as a geotechnical engineer at DB International (Deutsche Bahn)*
  - Field and laboratory investigations for soil and rock stability reports of railways
  - Writing geotechnical reports of foundation soils
- > 06/2015 – present: *Journal of Earth Sciences – editorial board member*
  - Reviewing of submitted manuscripts
  - Preparation of review reports

- > 10/2014 – 11/2015: *Research assistant at Ludwigs-Maximilians-University (LMU)*
  - X-ray computed tomography (XCT) studies on bubble size distributions of basalts
  - Data preparation and evaluation with Avizo software
  - Methodical development of a conversion from 2D in 3D fabric quantification (porosity)
- > 08/2011 – 10/2015: *Assistant at Tectonics and Material Fabrics Section of TUM*
  - Supervision of BSc theses
  - Organization and supervision of field trips
  - Lecturer for subjects such as *Dynamic Earth, Microscopy, Basics in Rock Forming Minerals*
  - Grading of tests and mapping reports
  - Assessment of student applications
- > 05/2011 – 08/2011: *Assistant for "GSA – Fragile Earth Conference" at Ludwigs-Maximilians-University (LMU) Munich*
  - Internal communication and coordination of the organization team
  - IT-support during the conference
- > 03/2007 – 05/2007: *Intern at Landesamt für Umwelt Bayern (LfU) – section geothermal energy production and seismology*
  - On-site inspection of drilling processes
  - Drill log archiving
  - GIS digitalization of the Bavarian seismological map
- > 11/2005 – 06/2011: *Student assistant at Chair of Engineering Geology TUM*
  - Triaxial shear tests (rock testing laboratory)
  - Abrasivity tests (Cerchar & LCPC) (soil testing laboratory)
  - Assistant for the PhD thesis of Dr. Stefanie Gillhuber
  - Organization and supervision of a field trip (Boccheggiano Normal Fault - Italy)

### 3. Teaching

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- > 08/2014 – 09/2014: *Low-grade metamorphic rocks of Cornwall/UK (10-day M.Sc. field course)*
  - Organization (timeline, student correspondence and booking of accommodations)
  - Teaching of mapping and sampling techniques
  - Supervision and grading of mapping reports
- > 09/2012 – 03/2013: *Microscopy (B.Sc. lecture)*
  - Lecturing of two hours per week
  - Creating and grading the final exams
- > 08/2013 – 09/2013: *Low-grade metamorphic rocks of Sardinia/Italy Italy (12-day B.Sc. mapping course)*
  - Organization (timeline, student correspondence and booking of accommodations)
  - Teaching of mapping techniques
  - Supervision and grading of mapping reports
- > 09/2012 – 03/2013: *Dynamic Earth (B.Sc. lecture)*
  - Lecturing of four hours per week
  - Creating and grading the final exams
- > 08/2012 – 09/2012: *Low-grade metamorphic rocks of Sardinia/Italy Italy (12-day B.Sc. mapping course)*

- Organization (timeline, student correspondence and booking of accommodations)
  - Teaching of mapping techniques
  - Supervision and grading of mapping reports
- > 08/2011 – 03/2012: *Basics in Rock Forming Minerals (B.Sc. lecture)*
- Lecturing of two hours per week
  - Creating and grading the final exams
- > 08/2011 – 09/2011: *High-grade metamorphic rocks of the Ivrea Zone/Italy (12-day B.Sc. mapping course)*
- Organization (timeline, student correspondence and booking of accommodations)
  - Teaching of mapping techniques
  - Supervision and grading of mapping reports
- > 06/2011 – 06/2011: *Fluid flow in shear zones – Quartz Vein Networks of the Boccheggiano Normal Fault - Italy*
- Organization (timeline, student correspondence and booking of accommodations)
  - Teaching of mapping and field techniques

#### 4. Education

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- > 08/2016 – 09/2016: *CINEMAX II workshop (Denmark)*
- 3D modelling and imaging of material microstructure
  - Data reconstruction & AVIZO workshop
- > 08/2011 – 10/2015: *PhD studies at the Tectonics and Material Fabrics Section of the TUM*
- Collaboration with:
    - (i) Prof. Dr. Stephen Cox (Australian National University)
    - (ii) Prof. Dr. Tom Blenkinsop (Cardiff University - School of Earth and Ocean Sciences)
    - (iii) Prof. Dr. Giacomo Prosser (University of Bari)
  - Funded by the German Academic Exchange Service (DAAD) and the Leonhard-Lorenz foundation
  - Title of the PhD thesis: "*Interaction of fragmentation, quartz precipitation and material transport in brittle shear zones*"
- > 05/2013 – 06/2013: *Workshop on "Understanding hydrothermal mineralising systems: modelling and structure quantification" at University of Western Australia (UWA)*
- Prof. Alison Ord: "*Critical Mineralising Plumbing Systems - Analysis Using Wavelets*" & "*Structures in mineralising plumbing systems*"
  - Prof. Bruce Hobbs: "*The DNA of Hydrothermal Systems*"
  - Dr. Tim Dodwell: "*Multilayerd Folding*"
  - Alice Springs to Ruby Gap excursion with a focus on hydrothermal mineral precipitation in fracture zones of Proterozoic basement rocks (Arunata region)
- > 06/2011 – 07/2011: *Intensive workshop and seminar on "Leading Teams in Projects" at Technical University Munich (TUM)*
- One-on-one interviews
  - Skill assessment of team members
  - Team leader certificate
- > 09/2005 – 05/2011: *Studies in geology at the Technical University of Munich (TUM)*
- Undergraduate studies in engineering geology and hydrogeology
  - Graduate studies in economic geology & petrology

• Dipl. Geol. (equivalent to M.Sc. with honors); thesis title: "*Quantitative and Qualitative Analysis of Quartz Vein Networks of the Boccheggiano Normal Fault - Italy*"

> 09/1996 – 03/2000: *Full apprenticeship as a toolmaker*

- Computer numerical control processing (CNC) of metals and synthetics
- Manual laboring of metals and synthetics

## 5. Abstracts

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> 2017: Kruhl, J.H., **Yilmaz, T.I.**, Blenkinsop, T., Heuss, S., Seybold, L., Ord, A., Duschl, F.: *Fragmentation, dissolution-precipitation and fluid-solid flow – the structured life of hydrothermal fault zones*. Specialist Group in Tectonics and Structural Geology, The Geological Society of Australia.

> 2017: Colombier, M., Wadsworth, F., Dobson, K.J., Caceres, F., Scheu, B., Cronin, S., **Yilmaz, T.I.**, Hess, K.-U., Ruthensteiner, B., Dingwell, B.D.: *The percolation threshold in magma: Insights from laboratory measurements, micro-computed tomography and in situ synchrotron experiments*. IAVCEI 2017 annual conference, poster presentation.

> 2017: Mayer, K., Montanaro, C., Isaia, R., Gresse, M., Scheu, B., **Yilmaz, T.I.**, Vandemeulebrouck, J., Ricci, T., Dingwell, B.D.: *On the role of the subsoil on surficial degassing processes at Solfatara crater, Campi Flegrei caldera*. IAVCEI 2017 annual conference, poster presentation.

> 2017: Rott, S., Scheu, B., Mayer, K., **Yilmaz, T.I.**, Gilg, H.A., Joseph, E.P., Dingwell, B.D.: *Phreatic activity, hydrothermal alteration and related hazards at Boiling Lake and the Valley of Desolation, Dominica*. IAVCEI 2017 annual conference, poster presentation.

> 2017: Cimorelli, C., **Yilmaz, T.I.**, Colombier, M., Villanova, J., Höfer, L., Hess, K.-U., Ruthensteiner, B., Dingwell, B.D.: *Micro- and nano-CT textural analysis of an experimental volcanic fulgurite*. EGU General Assembly 2017 annual conference, poster presentation.

> 2017: Hess, K.-H., **Yilmaz, T.I.**, Gilg, H. A., Janots, E., Mayer, K., Nakada, S., Dingwell, B.D.: *Chemistry, mineralogy and alteration intensity of hydrothermal altered Mt Unzen conduit rocks (Shimabara/Japan)*. EGU General Assembly 2017 annual conference, poster presentation.

> 2017: Colombier, M., Tost, M., Cronin, S., Scheu, B., Dobson, K.J., Hess, K.-U., Ruthensteiner, B., **Yilmaz, T.I.**, Dingwell, B.D.: *Vesiculation, fragmentation and aggregation processes during the 2014-2015 eruption of Hunga Tonga-Hunga Ha'apai volcan*. EGU General Assembly 2017 annual conference, oral presentation.

> 2016: Song, W., Wadsworth, F., **Yilmaz, T.I.**, Schulz, U., Dingwell, B.D.: *Spreading dynamic of viscous volcanic ash droplets onto EB-PVD and APS thermal barrier coatings*. 40th International Conference and Expo on Advanced Ceramics and Composites, oral presentation.

> 2016: **Yilmaz, T.I.**, Mayer, K., Hess, K.-U., Janots, E., Gilg, H.A., Dingwell, B.D.: *Hydrothermal alteration of the Mt Unzen conduit*. AGU Fall Meeting 2016 annual conference, poster presentation.

> 2016: Mayer, K., Scheu, B., Montanaro, C., **Yilmaz, T.I.**, Aßbichler, D., Gilg, H.A., Dingwell, B.D.: *Phreatic activity in the Valley of Desolation, Dominica (Lesser Antilles) – constraints from field investigations and experimental volcanology*. EGU General Assembly 2016 annual conference, oral presentation.

- > 09/2015: **Yilmaz, T.I.**, Blenkinsop, T., Kruhl, J.H. (2015): *Evaluation of fragmentation processes by fractal-geometry-based quantification methods*. IAMG 2015 annual conference, oral presentation.
- > 04/2015: Mayer, K., Scheu, B., Montanaro, C., Aßbichler, D., **Yilmaz, T.I.**, Isaia, R., Dingwell, D.B. (2015): "*Hydrothermal alteration favoring phreatic eruption processes at Solfatara (Campi Flegrei)?*" EGU General Assembly, oral presentation.
- > 04/2015: **Yilmaz, T.I.**, Blenkinsop, T.G., Kruhl, J.H., Duschl, F. (2015): "*Complex fragmentation and silicification structures in fault zones: quartz crystallization and repeated fragmentation in the Rusey fault zone (Cornwall/UK)*." EGU General Assembly, poster presentation.
- > 09/2014: **Yilmaz, T.I.**, Kruhl, J.H. (2014): *Quartz mineralization during hydrothermal fluid flow and repeated fragmentation: fluidization, grain growth, deformation and recrystallization structures in the Rusey fault zone (Cornwall/UK)*." 21st General Meeting of the International Mineralogical Association, Johannesburg, South Africa, oral presentation.
- > 04/2014: **Yilmaz, T.I.**, Prosser, G., Liotta, D., Kruhl, J.H., Gilg, H.A., Ord, A. (2014): "*Quartz formation during hydrothermal fluid flow and repeated fragmentation: fluidization, grain growth and deformation structures in the Pfahl shear zone (Germany) and the Rusey fault zone (UK)*." 15th Symposium on Tectonics, Structural Geology and Geology of Crystalline Rocks (TSK), University of Potsdam, oral presentation.
- > 09/2013: **Yilmaz, T.I.**, Prosser, G., Liotta, D., Kruhl, J.H. (2013): "*Hydrothermal activity along strike-slip faults: cyclicity of movements and fluid flow*." International conference (Geofluids), Eberhard-Karls-University, Tübingen, oral presentation.
- > 05/2013: **Yilmaz, T.I.**, Prosser, G., Liotta, D., Kruhl, J.H. (2013): "*Hydrothermal activity along strike-slip faults: cyclicity of movements and fluid flow*." International conference (FUTORES), Townsville, Australia, oral presentation.
- > 12/2012: **Yilmaz, T.I.**, Prosser, G., Liotta, D., Kruhl, J.H. (2012): "*Hydrothermal quartz formation during fluctuations of brittle shear zone activity and fluid flow: grain growth and deformation structures of the Pfahl shear zone (Germany)*." AGU Fall Meeting, San Francisco, poster presentation.

## 6. Seminar and workshop presentations

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- > 01/2017: "*Devolatilization experiments of hydrothermally altered conduit samples (Mt. Unzen, Shimabara, Japan)*" Oral presentation, Volcanology, Petrology and Geofabrics Seminar, Munich Geo Center (MGC)
- > 08/2016: "*Hydrothermal alteration and 3D fabric quantification of conduit dyke samples from the USDP-4 drill core at Mt Unzen (Shimabara, Japan)*" Poster presentation, CINEMAX II – 3D modelling workshop.
- > 10/2015: "*Interaction of fragmentation, quartz precipitation and material transport in brittle shear zones*" PhD thesis defense talk, TUM.
- > 06/2014: "*Brittle deformation and fluid flow within the Rusey fault zone (Cornwall)*" Volcanology, Petrology and Geofabrics Seminar, Munich Geo Center (MGC).



- > 03/2014: "*Quartz mineralization during hydrothermal fluid flow and repeated fragmentation: fluidization, grain growth and deformation structures in brittle shear zones.*" The Internal Seminar Series, Cardiff University, invited speaker.
- > 05/2013: "*The Pfahl shear zone: quartz microstructures as witnesses of cyclic brittle deformation and fluid flow*" DAAD Greater 8 Meeting, University of Western Australia (UWA).
- > 06/2012: "*Fluid flow and silicification in brittle shear zones*" Volcanology, Petrology and Geofabrics Seminar, Munich Geo Center (MGC).
- > 03/2011: "*Quantitative and qualitative analysis of quartz vein networks at the Boccheggiano normal fault (Italy)*" Volcanology, Petrology and Geofabrics Seminar, Munich Geo Center (MGC).

## 7. Publications

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- > 2018: **Yilmaz, T.I.**, Gilg, H.A., Wallace, P., Hess, K.-U., Utley, J., Kendrick, J.E., Lavallée, Y., Wadsworth, F.B., Nakada, S., Dingwell, D.B.: *Rapid three-stage clay alteration of conduit dykes from the Mt Unzen USDP-4 drill core.* GEOLOGY, in review
- > 2018: Colombier, M., Scheu, B., Wadsworth, F.B., Cronin, S., Vasseur, J., Dobson, K.J., Hess, K.-U., Tost, M., **Yilmaz, T.I.**, Cimarelli, C., Brenna, M., Ruthensteiner, B., Dingwell, D.B.: *Vesiculation and quenching during Surtseyan eruptions at Tonga-Hunga Ha'apai volcano, Tonga.* Journal of Geophysical Research, accepted.
- > 2017: Montanaro, C., Mayer, K., Isaia, R., Gresse, M., **Yilmaz, T.I.**, Scheu, B., Vandemeulenbrouck, J., Ricci, T., Dingwell, D.B.: *Hydrothermal activity and subsoil complexity: implication for degassing processes at Solfatara crater, Campi Flegrei caldera.* Bulletin of Volcanology. DOI: 10.1007/s00445-017-1167-z.
- > 2017: Mayer, K., Scheu, **Yilmaz, T.I.**, B., Rott, S., Montanaro, C., Gilg, H.A., Joseph, E.P., Dingwell, B.D.: *Phreatic activity in the Valley of Desolation, Dominica (Lesser Antilles) - constraints from field investigations and experimental volcanology.* Bulletin of Volcanology. DOI: 10.1007/s00445-017-1166-0.
- > 2016: **Yilmaz, T.I.**, Duschl, F., Di Genova, D.: *Feathery and network-like filamentous textures as indicators for the re-crystallization of quartz from a metastable silica precursor at the Rusey Fault Zone, Cornwall, UK.* Solid Earth, 7, 1509–1519, DOI:10.5194/se-7-1509-2016.
- > 2016: Mayer, K., Scheu, B., Montanaro, C., **Yilmaz, T.I.**, Isaia, R., Abbichler, D., Dingwell, B.D.: *Influence of hydrothermal alteration on phreatic eruption processes in Solfatara (Campi Flegrei).* Journal of Volcanology and Geothermal Research, 320, 126–143, DOI:10.1016/j.jvolgeores.2016.04.020
- > 2015: **Yilmaz, T.I.**: *Interaction of fragmentation, quartz precipitation, and material flow in brittle shear zones.* PhD thesis at Technical University of Munich (TUM), DOI:10.14459/2015MD1256328.
- > 2014: **Yilmaz, T.I.**, Prosser, G., Liotta, D., Kruhl, J.H., Gilg, A.H.: *Hydrothermal quartz formation during fluid flow and repeated fragmentation: grain growth and deformation structures in the Pfahl shear zone (Germany).* Journal of Structural Geology, 68, 158–174, DOI:10.1016/j.jsg.2014.09.004.