Chenyi Luo, Dr.-Ing.

Postdoc Researcher
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Links: Group page | Google scholar | ResearchGate | Personal website

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Research Interests

- Porous media, Fracture mechanics, Simulation technology, Numerical methods, Stability analysis, Hydraulic fracturing, Desiccation crack,

Professional experiences

- 06.2020 to date, Postdoc researcher, ETH Zurich, Switzerland
- 11.2021 to 12.2021, Visiting scholar, EPFL, Switzerland
- 06.2019 to 05.2020, Postdoc researcher, Tongji University, China
- 08.2013 to 03.2019, Research assistant, University of Stuttgart, Germany
- 04.2012 to 09.2012, Research assistant, Hilti AG, Liechtenstein
- 09.2009 to 08.2010, Research assistant, Tongji University, China

Education

- 03.2019, Dr. -Ing., University of Stuttgart, Germany
  Supervisor: Prof. Wolfgang Ehlers
- 10.2012, Master's degree, Civil Engineering, University of Stuttgart, Germany
  GPA: 1.2/1/0, Rank 1
- 06.2009, Bachelor in Civil Engineering, Tongji University, China

Honours and awards

- 03.2019, summa cum laude, University of Stuttgart, Germany
- 04.2013, Honor Roll Student, University of Stuttgart, Germany
- 05.2012, Hilti Scholarship, Hilti AG, Liechtenstein
- 02.2012, DAAD fellowship, DAAD, Germany
- 07.2011, DAAD fellowship, DAAD, Germany

Publications

Journal publications

[1] **Chenyi Luo**, Lin Chen, Yu Huang (2021). A phase-field model based on an anisotropic degradation of elasticity tensor and a stress-driven Crack Opening Indicator. *Computer Methods in Applied Mechanics and Engineering*, 384, 113928. (SCIE JCR Q1; impact factor: 6.588)

[2] Wolfgang Ehlers, **Chenyi Luo** (2018). A phase-field approach embedded in the Theory of Porous Media for the description of dynamic hydraulic fracturing, Part II: The crack-opening indicator. *Computer Methods in Applied Mechanics and Engineering*, 341, 429-442. (SCIE JCR Q1; Impact factor: 6.588; Cited 27 times in Google Scholar as of 26.09.2022)

[3] Wolfgang Ehlers, **Chenyi Luo** (2017). A phase-field approach embedded in the Theory of Porous Media for the description of dynamic hydraulic fracturing. *Computer Methods in Applied Mechanics and Engineering*, 315, 348-368. (SCIE JCR Q1; Impact factor: 6.588; Cited 119 times in Google Scholar as of 26.09.2022)

[4] **Chenyi Luo** (2022). Fast staggered schemes for the phase-field model of brittle fracture based on the fixed-stress concept. arXiv preprint arXiv:2209.07969.

[5] **Chenyi Luo**, Lorenzo Sanvia, Laura De Lorenzis (2022). A fully coupled phase-field model for desiccation cracks. (to be submitted)

[6] **Chenyi Luo,** Lorenzo Sanvia, Laura De Lorenzis (2022). Phase-field modelling of drying-induced cracks: choice of coupling and study of homogeneous and localized damage. (to be submitted)

Dissertation

- **Chenyi Luo** (2019). A Phase-field Model Embedded in the Theory of Porous Media with Application to Hydraulic Fracturing. Dissertation, Report No. II-35, Institute of Applied Mechanics (CE), University of Stuttgart, 2019. ISBN 3-937399-35-5.

Conference papers

- Wolfgang Ehlers, **Chenyi Luo** (2018). Fracking processes in porous media extended. Proc. 6th European Conference on Computational Mechanics (ECCM) & 7th European Conference on Computational Fluid Dynamics (ECFD 7), Glasgow, UK.
- Wolfgang Ehlers, **Chenyi Luo** (2017). On fracking processes in saturated porous media. Proc. VII International Conference on Coupled Problems in Science and Engineering, International Center for Numerical Methods in Engineering (CIMNE), Rhodes Island, Greece.
- **Chenyi Luo**, Wolfgang Ehlers (2016). A three-dimensional model of hydraulic fracturing. PAMM 16 (1), 465-466.
- **Chenyi Luo**, Wolfgang Ehlers (2015). Hydraulic fracturing based on the Theory of Porous Media. PAMM 15(1), 401-402.

Presentations

- **Chenyi Luo**. A phase-field model for desiccation cracks, ISINA 2022 Symposium, Specialist lectures, TU Chemnitz, Chemnitz, Germany.
- **Chenyi Luo**. A phase-field model based on the directional strain decomposition, GAMM 2020, Young Researcher's mini-symposium, Kassel, Germany.

Funded projects

- Principle Investigator (**PI**), National Natural Science Foundation of China, Modelling crack development in slopes under rainfall infiltration using the Theory of Porous Media and phase-field method for understanding its impact on slope failure
  Grant no.: 41907226; Amount: 270,000 CNY; Duration: 2020 to 2022.
  Success rate:
- **Principle Investigator**, On the relation between the wave propagation and the crack propagation in hydraulic fracturing
  Grant no. 2020M671220; Amount: 113,1000 CNY; Duration: 2020 to 2022.

Teaching/advising experiences

- 09.2013 to 02.2017, teaching assistant, Continuum Mechanics, Institute of Applied Mechanics, University of Stuttgart, Germany
- 03.2014 to 08.2016, teaching assistant, Foundation of Coutinuum Thermodynamics for Single- and Multiphase Materials, Institute of Applied Mechanics, University of Stuttgart, Germany
- 2022, Co-supervisor, Sinan Laloui, undergraduate student, Characterisation of mechanical and fracture properties of a clayey soil as a function of the water content, ETH Zurich

Journal review activities

- International Journal of Numerical Methods in Engineering, Engineering Fracture Mechanics, International Journal of Nonlinear Mechanics, Engineering with Computers, Journal of Mechanics of Materials and Structures