



Dr. Julian Geiger

Curriculum Vitae

General Information

Birth Date: 30th November 1994. Location: 90471 Nuremberg
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Education

- 02/24–01/26 **Postdoctoral Researcher / Research Software Engineer** Paul-Scherrer Institute (PSI), Materials Software and Data Group of Dr. Giovanni Pizzi, Switzerland
- 02/23–05/23 **Research internship** EPFL, Nicola Marzari research group, Switzerland
- 10/19–10/23 **Chemistry PhD** Institute of Chemical Research of Catalonia (ICIQ), Núria López research group, Spain
- 06/18–12/18 **Master Thesis** BASF, Ansgar Schäfer research group (ROM/CQ), Germany, Grade: 1.0
- 10/17–03/18 **Erasmus semester** University of Cambridge, Michiel Sprik research group, UK
- 10/16–12/18 **Chemistry M.Sc.** Friedrich-Alexander-University Erlangen-Nuremberg (FAU), Germany, Grade: 1.0
- 04/16–07/16 **Bachelor thesis** FAU, Andreas Görling research group, Germany, Grade: 1.0
- 10/13–10/16 **Chemistry B.Sc.** FAU, Germany, Grade: 1.2
- 08/05–07/13 **A-levels** Adam-Kraft-Gymnasium Schwabach, Germany, Grade: 1.4

Work as a Research Software Engineer

- aiida-core** ⓘ Contributor to and maintainer of the AiiDA workflow manager (large-scale project with >200k lines of Python code)
 - ▷ Collaborative work in an intermediate-sized team (≈ 15 currently active members) on open-source, version-controlled software (using `git` and GitHub)
 - ▷ General feature additions, usability improvements, bug fixes, and maintenance
 - ▷ Focus on AiiDA's Object-Relational Mapper (ORM) implementation and data storage modules
 - ▷ Implementation of a feature to extract data from AiiDA's SQL database (PostgreSQL / SQLite) and machine-readable `disk-objectstore` into human-readable directory trees ([9k lines contribution](#))
 - ▷ Familiarity with continuous integration (CI) tools such as pre-commit and GitHub Actions
 - ▷ Experience with the full code quality infrastructure in place in AiiDA core: testing (pytest), linting (ruff), and static type checking (mypy)
- aiida-workgraph** ⓘ Contributor to the AiiDA WorkGraph package to simplify dynamic workflow construction with AiiDA
 - ▷ General API discussions, implementation of new features, documentation updates
 - ▷ Integration of the CI pipeline used in AiiDA core into the AiiDA WorkGraph package
- sirocco** ⓘ AiiDA-based Python workflow tool for weather & climate simulations
 - ▷ Declarative, YAML-based workflow specification
 - ▷ `pydantic` models for parsing and validation of workflow files
 - ▷ `hatch` for Python project management
- renku** ⓘ Integration of AiiDA and the `renkulab.io` platform for the exploration of AiiDA archives hosted on Materials **integration** ⓘ Cloud Archive ([MCA](#)) using a containerized deployment
- basf/ precomplex** ⓘ Python and FORTRAN code for obtaining suitable input structures for automated transition-state searches for reaction path optimization algorithms (code in daily use in an industrial setting since 2018)

- Honorable mentions
- ▷ Administrator of the group's High Performance Computing (HPC) cluster (10 nodes) using YAML configuration files to configure user accounts, SLURM, and a BeeGFS shared file system
 - ▷ Supervision of Master student's semester project on optimizations to AiiDA's ORM layer and database interactions
 - ▷ Responsible person for the AiiDA [LinkedIn](#) page and the publication of a [blog post](#) series
 - ▷ Organization of regular AiiDA coding days and brainstorm meetings for team organization and planning
 - ▷ Experience with various Quantum Chemistry simulation codes: VASP, Quantum ESPRESSO, CP2K, and Turbomole on HPC systems
 - ▷ English proficiency (C2 level) and basic Spanish communication skills

- Geeky stuff I like
- ▷ Currently learning the `rust` programming language
 - ▷ Currently learning [Apache Airflow](#) in a team effort to replace AiiDA's internal engine by an industrial, general-purpose workflow manager
 - ▷ Author of the AiiDA plugin for the `fish` shell ([plugin-aiida](#) 
 - ▷ AstroNvim as IDE (with plugins, of course)
 - ▷ `fish` shell with `tmux` as terminal environment
 - ▷ Keyboard-driven `qutebrowser`

Scholarships

- 08/16–10/16 **DAAD RISE** 6-week chemistry internship at the Texas-Tech-University (Lubbock, USA)
2015–2018 **Deutschlandstipendium** funded by the German government and the Leonhard Kurz Stiftung & Co. KG

Conferences

- 13–14/08/2024 Hands-on [workshop](#) and [panel discussion](#) on FAIR Workflows in Materials Science (Purdue University, USA)
03–07/07/2023 IUVSTA-ZCAM: Metal-oxide ultrathin films and nanostructures: Experiment meets theory (Zaragoza, Spain): Poster contribution
22–25/08/2022 Psi-k conference (Lausanne, Switzerland): Poster contribution

Tutorials

- 13/08/2024 Hands-on session on AiiDA as part of the FAIR Workflows workshop ([part 1](#) and [part 2](#))
25/04/2024 Tutorial on shell configuration 
29/06/2022 Introduction to VS Code 
21/04/2021 Introduction to interactive visualization of scientific data with Plotly 

Scientific Publications

- 2025 Janssen, J., George, J., **Geiger, J.** et al. A Python workflow definition for computational materials design. *arXiv preprint arXiv:2505.20366*
- 2024 Minotaki, M., **Geiger, J.** et al., A generalized model for estimating adsorption energies of single atoms on doped carbon materials *J. Mater. Chem. A.* **18**, 2211260 (2024).
- 2023 Yang, Q., Surin, I., **Geiger, J.** et al. Lattice-Stabilized Chromium Atoms on Ceria for N₂O Synthesis. *ACS Catal.* **13**, 15977–15990 (2023).
- 2023 Surin, I., **Geiger, J.** et al., Low-Valent Manganese Atoms Stabilized on Ceria for Nitrous Oxide Synthesis. *Adv. Mater.* **35**, 2211260 (2023).
- 2022 **Geiger, J.**, Sabadell-Rendón, A., Daelman, N. et al. Data-driven models for ground and excited states for Single Atoms on Ceria. *npj Comput. Mater.* **8**, 171 (2022).
- 2022 **Geiger, J.** & López, N. Coupling Metal and Support Redox Terms in Single-Atom Catalysts. *J. Phys. Chem. C* **126**, 13698–13704 (2022).
- 2022 **Geiger, J.**, Settels, V., Deglmann, P. et al. Automated input structure generation for single-ended reaction path optimizations. *J. Comput. Chem.* **43**, 1662–1674 (2022).
- 2022 Wan, W., **Geiger, J.** et al. Highly Stable and Reactive Platinum Single Atoms on Oxygen Plasma-Functionalized CeO₂ Surfaces: Nanostructuring and Peroxo Effects. *Angew. Chem. Int. Ed.* **61**, e202112640 (2022).
- 2020 **Geiger, J.**, Sprik, M., May, M. M. et al. Band positions of anatase (001) and (101) surfaces in contact with water from density functional theory. *J. Chem. Phys.* **152**, 194706 (2020).