# Curriculum Vitae


| | |
|---|---|
| Name: | Dr. Felix Sébastien Bourier |
| Nationality: | German |
| E-Mail: | script@bourier.biz |
| Linkedin: | Felix Bourier |
| Website & Portfolio: | www.bourier.biz |


PhD-level Data Scientist, Physical Chemist, and ML Engineer with 8+ years in data-driven research and industrial software development. Builds production-grade software for complex physical data analysis, including high-throughput ETL pipelines, system benchmarking, and statistical profiling. Bridges physics-driven problem domains with scalable software engineering and live interactive web projects simulating emergent physical/chemical behavior and multi-agent AI.

## Professional Experience

**December 2022 - Present**: Scientist & Software Developer for
EUV Layer Metrology
Carl Zeiss SMT GmbH, Oberkochen
Initially as a Consultant: MCA Engineering GmbH, Munich

- Developed **high-precision benchmarking protocols** for EUV mirror classification and optimized metrology techniques, improving measurement precision and measurement speed via **statistical profiling and systematic bottleneck analysis**.
- Developed **end-to-end ETL pipelines** to standardize data flows from complex measurement systems, automating measurement processes and data transformation with enforced **data quality controls**.
- Developed autoencoders for anomaly detection in EUV reflectivity measurements using Keras.
- Established **modular software architectures and CI/CD workflows (Azure DevOps)**, introducing **Azure Git, coding guidelines, and unit testing** to improve **code quality, reliability, and performance**, while conducting **ISO 27001–aligned risk assessments** to ensure **information security**.
- Leveraged **Palantir Impact** for data visualization, achieving a throughput increase; additionally developed decision dashboards in **Kibana/ElasticSearch** enabling **faster error diagnosis and decision-making** across development, engineering, and management.
- Served as an **interdisciplinary interface** between engineers, physicists, and computer scientists, providing **technical leadership** for an agile expert team of four and applying **Scrum and Kanban** practices.
- **Represented ZEISS at national career events** as a brand ambassador, providing insights into the application process, career paths, and challenges of the semiconductor industry to young professionals.

**April 2017 - November 2022:** Research Assistant
University of Hamburg
CUI: Advanced Imaging of Matter,
Federal Cluster of Excellence

- Implemented atomistic **models and simulations in Python 3** to describe opto-electronic properties of semiconductor Quantum Dots.
- Utilized **HPC clusters** for demanding **DFT calculations**.
- **Kinetic simulations in MATLAB** to study the formation of metallic nanoparticles.
- Performed laser microscopy on individual semiconductor nanoparticles for time-resolved characterization of optical properties.
- **Synthesis** of semiconductor Quantum Dots and metallic nanoparticles of different morphologies.
- Trained a **CUDA-accelerated RNN** for sequence generation (text & MIDI music).
- Applied and optimized **generative AI models (Disco Diffusion & Stable Diffusion)** for image synthesis during early development stages by optimizing **CLIP scheduling**.
- Teaching in **Thermodynamics** and supervision of Bachelor's and Master's theses with a focus on **DFT-calculations** and **MD-simulations**.

## Education

| | |
|---|---|
| Doctorate: | Physical Chemistry, 2023, Magna Cum Laude |
| Master: | Physical Chemistry, 2017, Very Good |
| References: | Prof. Dr. Alf Mews & Prof. Dr. Gabriel Bester |

## Featured Personal Projects

- **Chemical Chaos Engine** – Real-time, browser-based particle chemistry and physics sandbox simulating emergent behavior of matter by bridging rigid-body physics, fluid dynamics, and heuristic organic chemistry. Features a spatial hash grid for performant interactions of hundreds of particles and also featuring interactive HUD controls and benchmarking. Live demo: https://bourier.biz.
- **LLM Agent Orchestrator** – Modular multi-agent AI system for autonomous software development, supporting multiple LLM providers, self-healing agents, and role-based orchestration. Generates a versioned virtual file system for code. Web-deployed and fully interactive. Live demo: LLM Orchestrator.

## Technical Skills

### Programming Languages

| | | | |
|---|---|---|---|
| Python 3 | Expert | MATLAB | Expert |
| SQL | Advanced | Lua | Advanced |
| Javascript | Advanced | Bash | Advanced |

### AI/ML Frameworks

| | | | |
|---|---|---|---|
| Keras | Advanced | Tensorflow | Advanced |
| Scikit-learn | Advanced | Pytorch | Advanced |

**Data Analysis & Big Data**

| | | | |
|---|---|---|---|
| Pyspark | Expert | GUI Development | Expert |
| Palantir Impact | Advanced | ElasticSearch | Advanced |

**Cloud & MLOps**

| | | | |
|---|---|---|---|
| AWS | Advanced | Azure DevOps | Advanced |
| Jira | Advanced | Docker | Advanced |
| CI/CD Pipelines | Advanced | Terraform | Advanced |

**Further Tools & Methods**

| | | | |
|---|---|---|---|
| Agile Methods | Expert | Git | Expert |
| Prompt Engineering | Advanced | Generative AI | Advanced |
| Disco Diffusion | Advanced | System Communication | Advanced |

## Languages

| | | | |
|---|---|---|---|
| German - | Native Language | English - | Business Fluent |

## Publications

- F. S. Bourier, Dissertation, 2023, Staats- und Universitätsbibliothek Hamburg, https://ediss.sub.uni-hamburg.de/handle/ediss/10241
- S.-H. Lohmann, P. Harder, F. Bourier, C. Strelow, A. Mews and T. Kipp, *Influence of Interface-Driven Strain on the Spectral Diffusion Properties of Core/Shell CdSe/CdS Dot/Rod Nanoparticles*, Journal of Physical Chemistry C, 2019, 123(8), 5099-5109, https://doi.org/10.1021/acs.jpcc.8b12253
  Responsible for atomistic models and band gap simulations.

## Volunteer Activities

- **Since 2025: Founding member** of the non-profit association Förderverein Spielstadt Mini-München e.V.
- **Since 2023: Contributor & Co-Teamlead** of the team Science & Education of the Young Chemist Forum (JCF), GDCh Frankfurt:
  - Development of a chemistry escape room game (ChemEscape) **(2000 kits shipped)**
  - Preparation of workshops and talks about the usage of AI in Science
- **2018 - 2021: Elected representative of the doctoral students** and voting member of the board of directors at the federal cluster of excellence CUI: Advanced Imaging of Matter.
- **Since 2003:** Organization and supervision of scientific workshops for children, adolescents & teenagers **(reached thousands of participants)**. Cooperations with various projects and renowned institutions like Deutsches Museum München.

Hamburg, 18. January, 2026 Felix Bourier