Aleksandr KADYKOV cv@kadykov.com

Research Engineer

Proven ability to design and execute experiments, analyse and present data, develop scientific Python software. Strong background in applied and basic research in THz photonics and solid-state physics.

- Data analysis & presentation
- Experimental design & execution
- Instrumentation integration & orchestration
- Scientific Python development

Multitel ASBL

Mons
Belgium

Non-profit innovation center specializing in applied photonics, AI, etc.

Research Engineer in THz Spectroscopy and Imaging

Jul. 2021
Aug. 2024

- Developed a THz time-domain spectroscopy (THz-TDS) data pipeline with an improved signal-to-noise ratio by utilizing sensitivity profile-shaped filtering.
- Developed a computationally cheap THz-TDS data processing method for refractive index and thickness extraction in low-absorption materials.
- Streamlined refractive index profile reconstruction from THz-TDS data by offloading calculations to a GPU and utilizing backpropagation-based optimization algorithms.
- Automated laboratory workflows by implementing Python tools for measurement orchestration, data management, analysis, and result presentation.
- Ensured best software development practices by implementing unit testing, CI/CD pipelines, and documentation.

Laboratoire National de Métrologie et d'Essais (LNE)

Trappes
France

French National Laboratory of Metrology and Testing

Research Engineer in Quantum Hall Effect Metrology

Sep. 2018
Sep. 2020

- Led low-noise cryogenic quantum Hall measurements on graphene, exploring its potential as a resistance standard.
- Designed a flexible Python software package, optimizing scientific equipment orchestration.
- Participated in the nanofabrication of hBN-encapsulated graphene stacks.
- Improved performance of a helium gas recuperation system.

Aleksandr KADYKOV cv@kadykov.com

Institute for Physics of Microstructures (IPM RAS)

Nizhny Novgorod
Russia

State-owned research institute specializing in solid state physics.

Research Engineer in Photonics of Narrow-Gap Semiconductors

May 2017
Sep. 2018

- Led THz and FTIR cryogenic measurements of photoluminescence and photoconductivity.
- Achieved laser emission in HgCdTe heterostructures at a record wavelength.

Laboratoire Charles Coulomb (L2C) & IPM RAS

Montpellier, France
Nizhny Novgorod, Russia

I2S Doctorlal School at the University of Montpellier

Ph.D. in Solid State Physics

Sep. 2014
Dec. 2017

- Thesis: Physical properties of HgCdTe-based heterostructures: towards terahertz emission and detection
- Implemented a double-modulation technique, enabling the extraction of critical magnetic fields in a topological insulator.
- First to observe a temperature-driven phase transition in a topological insulator using magnetotransport.

Data analysis & presentation: Python, NumPy, Pandas, Xarray, SciPy, Matplotlib, hvPlot, Plotly, Bokeh, Panel, Intake,

Instrumentation integration & orchestration: PyMeasure, Bluesky, yaq, LabVIEW

Reporting: Quarto, Jupyter, Typst, LaTeX, RevealJS

Programming: VSCode, Git, Linux, Docker, PyTest, Pre-Commit, GitLab CI/CD, GitHub Actions, TDD, Devcontainers

- **English** (upper-intermediate)
- **French** (upper-intermediate)
- **Russian** (native)