# **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**

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

#### **Research Engineer in THz Spectroscopy and Imaging**

- 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 lowabsorption materials.
- Streamlined refractive index profile reconstruction from THz-TDS data by offloading calculations to a GPU and utilizing backpropagation-based optimization algorithms.
- Implemented a low-cost operation and high spectral quality broadband THz-TDS setup by suppressing atmospheric absorption with silica gel-based dehumidification.
- 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.
- Led the SAPHIRE project, developing non-destructive *in-situ* solutions to control pill coating thickness and humidity.
- Led the development of THz-TDS-based methods for polymer wastes sorting.

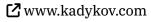
# Laboratoire National de Métrologie et d'Essais (LNE)

French National Laboratory of Metrology and Testing

**♀** Trappes France

**♀** Mons Belgium

☐ Jul. 2021 Aug. 2024





### Research Engineer in Quantum Hall Effect Metrology

• Led low-noise cryogenic quantum Hall measurements on graphene, exploring its potential as a resistance standard.

Sep. 2018 Sep. 2020

- Designed a flexible Python software package using PyMeasure, optimizing scientific equipment orchestration.
- Participated in the nanofabrication of hBN-encapsulated graphene samples, advancing quantum Hall research.
- Improved performance of a helium gas recuperation system.

## **Institute for Physics of Microstructures (IPM RAS)**

State-owned research institute specializing in solid state physics.

### ♥ Nizhny Novgorod Russia

# Research Engineer in Photonics of Narrow-Gap Semiconductors

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

# **□** May 2017 Sep. 2018

## Laboratoire Charles Coulomb (L2C) & IPM RAS

I2S Doctorlal School at the University of Montpellier

## **♥** Montpellier, France Nizhny Novgorod, Russia

### Ph.D. in Physics

Thesis: Physical properties of HgCdTe-based heterostructures: towards terahertz emission and detection

**⊟** Sep. 2014

Dec. 2017

- 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.

### **Technical skills**

- **Programming & data analysis**: Python, Jupyter, NumPy, Pandas, Xarray, SciPy, PyTest, PyTorch, scikit-learn, MATLAB
- Data visualization: Matplotlib, hvPlot, Plotly, Bokeh, Panel, OriginPro
- Measurement & automation: PyMeasure, Bluesky, yaq, LabVIEW
- Data management & integration: Intake, SQL
- Document preparation: Quarto, Typst, Pandoc, LaTeX
- Other tools: VSCode, Git, Linux, Docker, CI/CD, Zotero, GitHub, GitLab, TDD

# Languages

• French (upper-intermediate)

• Russian (native)