



Nikodem Sokołowski

EDUCATION AND TRAINING

PhD

Université Toulouse III - Paul Sabatier, Laboratoire National des Champs Magnétiques Intenses, CNRS [07/2021 – 09/2024]

City: Toulouse | Country: France | Website: <https://www.univ-tlse3.fr/home> | Field(s) of study: Physics of Matter
| Level in EQF: EQF level 8 | Thesis: Hybrid excitons in MoSe₂/MoS₂ van der Waals heterostructure

Master

Wrocław University of Science and Technology [10/2020 – 06/2021]

City: Wrocław | Country: Poland | Website: <https://pwr.edu.pl/en/> | Field(s) of study: Technical Physics, Specialization in Nanoengineering | Final grade: Cum Laude | Level in EQF: EQF level 7 | Thesis: Optical properties of 2D perovskite [Methylhydrazinium]PbI₄

Bachelor of Engineering

Wrocław University of Science and Technology [10/2016 – 07/2020]

City: Wrocław | Country: Poland | Website: <https://pwr.edu.pl/en/> | Field(s) of study: Technical Physics, Specialization in Nanoengineering | Final grade: Cum laude | Level in EQF: EQF level 6 | Thesis: Optical properties of novel semiconductor alloys (B, III)-V

TECHNICAL SKILLS

Optical Measurements

- (micro)Optical setup assembling and aligning, cryogenic temperature, CW/ultrafast laser
- (micro)Optical measurements: photoluminescence (PL), reflectance, raman, one and two-photon PL excitation, second harmonic generation, time-resolved PL (streak camera and APD), photoreflectance, polarization-resolved measurements
- Applying magnetic field (pulsed up to 67T, static up to 16T) and electrical field, applying hydrostatic pressure

Nanometrology

- Optical Microscope, Atomic force microscope (AFM), Scanning electron microscopy (SEM) integrated with focused ion beam (FIB)

Devices Fabrication

- Fabrication of double-gated devices based on 2D materials
- Clean-room: fabrication of electrical contacts and gates by electron-beam lithography and metal evaporation.
- Wire bonding, Glovebox, Fume hood, resist spin-coating.
- 2D materials and heterostructures fabrications: Exfoliation, deterministic transfer

Calculations

- Density Functional Theory (DFT) calculations: Band structure, Bloch states, electron density. Atomix relaxation. Calculations for a twisted WS₂ homobilayer

Computer Skills

- Programming: Python, C, C++, Matlab, LabView
- Data Analysis: OriginLab
- Writing: LaTeX
- Graphics, design, animation: Autocad, Inkscape, Blender, DaVinci Resolved

PUBLICATIONS

[2024]

[Two-Dimensional Lead Iodide Perovskites with Extremely Reduced Dielectric Confinement: Embedded Self-Erasing SecondHarmonic Generation Switching, Thermochromism, and Photoluminescence](#)

Mączka, Mirosław, et al. "Two-Dimensional Lead Iodide Perovskites with Extremely Reduced Dielectric Confinement: Embedded Self-Erasing Second-Harmonic Generation Switching, Thermochromism, and Photoluminescence." Chemistry of Materials 36.21 (2024)

[2023]

[Twist-angle dependent dehybridization of momentum-indirect excitons in MoSe₂/MoS₂ heterostructures](#)

Sokolowski, Nikodem, et al. "Twist-angle dependent dehybridization of momentum-indirect excitons in MoSe₂/MoS₂ heterostructures." 2D Materials 10.3 (2023): 034003.

Link: <https://www.youtube.com/watch?v=qFsLoxshre8>

[2023]

[Approaching the Intrinsic Properties of Moiré Structures Using Atomic Force Microscopy Ironing](#)

Palai, Swaroop Kumar, et al. "Approaching the intrinsic properties of moiré structures using atomic force microscopy ironing." Nano Letters 23.11 (2023): 4749-4755.

[2021]
Photoreflectance studies of temperature and hydrostatic pressure dependencies of direct optical transitions in BGaAs alloys grown on GaP

Kopaczek, J., et al. "Photoreflectance studies of temperature and hydrostatic pressure dependencies of direct optical transitions in BGaAs alloys grown on GaP." Journal of Physics D: Applied Physics 55.1 (2021): 015107.

PROJECTS

[07/2021 – 07/2024]
ITN project 2Exciting 'Developing optoelectronics in two-dimensional semiconductors'
Link: <https://itn-2exciting.chm.tu-dresden.de>

INTERSHIPS

[09/2023 – 11/2023]
Technische Universität Dresden (TUD), Theoretical Chemistry

DFT calculation, Atomic relaxation of TMDs bilayers

[07/2023 – 09/2023]
Nanores (Company)

Scanning Electron Microscopy integrated with Focus Ion Beam, Femtosecond laser ablation

[09/2022 – 12/2022]
École Polytechnique Fédérale de Lausanne (EPFL), Laboratory of Nanoscale Electronics and Structures (LANES)

Double-gated heterostructures devices fabrication

[07/2019 – 08/2019]
Polish Center for Technology Development (PORT), Laboratory of Printed Electronics and Solar Cells.

Inkjet printer, solar cell fabrication and characterization

CONFERENCES AND SEMINARS

[25/09/2023 – 29/09/2023] Prague
Flatlands beyond Graphene 2023 (Oral)

[28/09/2022 – 30/09/2022] Lanzarote
Flatlands beyond Graphene 2022 (Poster)

HONOURS AND AWARDS

Wrocław University of Science and Technology
Rector's scholarship for the best students. Years: 2017-2021

[2020] Wrocław University of Science and Technology
Scholarship from the University's own fund for students
The prize includes both science-related activities and extra activities for students.

[2021] Santander
Santander Scholarship Universidades

The prize includes both science-related activities and extra activities for students.

EXTRACURRICULAR

[2020 – 2021]

President of a scientific club of nanoengineering „Nanoin“

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[2020 – 2021]

Member of the Student Government of the Faculty of Fundamental Problems of Technology

[2021]

Main organizer of Faculty integration-scientific physics conference (WINKO) 2021

[2020]

Organizer of the student scientific conference: Physico - Optical conference 'Foka' 2020

LANGUAGE SKILLS

Mother tongue(s): Polish

Other language(s):

English

LISTENING C1 READING C1 WRITING C1

SPOKEN PRODUCTION C1 SPOKEN INTERACTION C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user