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ABOUT ME

Postdoctoral researcher exploring nonlinear effects in optical fibers

EDUCATION AND TRAINING

PhD

University Bourgogne Franche-Comté [10/2021 – 11/2024]

City: Dijon | Country: France | Field(s) of study: Physics

PhD

Wrocław University of Science and Technology [10/2020 – 11/2024]

City: Wrocław | Country: Poland | Field(s) of study: Physical Sciences

magister inżynier (Master of Science)

Wrocław University of Science and Technology [02/2019 – 07/2020]

City: Wrocław | Country: Poland | Field(s) of study: Optics | Final grade: celujący (excellent) | Thesis: Numerical investigations of properties of twisted optical fibers

inżynier (Bachelor of Engineering)

Wrocław University of Science and Technology [10/2015 – 02/2019]

City: Wrocław | Country: Poland | Field(s) of study: Biomedical engineering | Final grade: celujący (excellent) | Thesis: Light sources using nonlinear frequency conversion for biomedical applications

WORK EXPERIENCE

 **Dipartimento di INGEGNERIA DELL'INFORMAZIONE, ELETTRONICA E TELECOMUNICAZIONI, Sapienza Università** – Rome, Italy

City: Rome | Country: Italy

Postdoctoral researcher

[15/01/2025 – 14/01/2026]

Experimental investigation of nonlinear effects in few- and multimode optical fibers; development of multimode fiber laser cavity.

 **Laboratoire Interdisciplinaire Carnot de Bourgogne, University Bourgogne Franche-Comté** – Dijon, France

City: Dijon | Country: France

Research visit

[06/10/2024 – 17/10/2024]

Experimental characterization of intermodal frequency conversion into UV in a graded-index fiber. Research mobility supported

by the French-Polish Polonium Hubert Curien Partnership *Far-detuned frequency conversion in multimode fibers* funded by the French Ministry for Europe and Foreign Affairs, French Ministry for Higher Education and Research, and Polish National Agency for Academic Exchange.

 **Fiber Optics Group, Wrocław University of Science and Technology** – Wrocław, Poland

City: Wrocław | Country: Poland

Work in research project

[09/2021 – 03/2024]

Study of nonlinear effects in specially designed optical fibers (Polish National Science Center project Sonata Bis "Nonlinear phenomena in multimode optical fibers - multimode solitons and frequency conversion", principal investigator: Karol Tarnowski).

 **Laboratoire Interdisciplinaire Carnot de Bourgogne, University Bourgogne Franche-Comté** – Dijon, France

City: Dijon | Country: France

Research visit

[04/09/2023 – 06/10/2023]

Experimental study of helical wavepackets emission during nonlinear propagation of femtosecond pulses in multimode fibers. Research visit funded by the project "STER - Internationalization of doctoral schools" by the National Agency for Academic Exchange.

 **Laboratoire Interdisciplinaire Carnot de Bourgogne, University Bourgogne Franche-Comté** – Dijon, France

City: Dijon | Country: France

Research visit

[11/10/2021 – 22/10/2021]

Experimental characterization of conical emission in bulk media and multimode fiber. Research mobility supported by the French-Polish Polonium Hubert Curien Partnership *Nonlinear light propagation in multimode fibers* funded by the French Ministry for Europe and Foreign Affairs, French Ministry for Higher Education and Research, and Polish National Agency for Academic Exchange.

 **Laboratoire Interdisciplinaire Carnot de Bourgogne, University Bourgogne Franche-Comté** – Dijon, France

City: Dijon | Country: France

Research visit

[25/04/2021 – 10/07/2021]

Observation and experimental characterization of discrete conical emission in multimode optical fibers. Research mobility supported by Erasmus+ and French-Polish Polonium Hubert Curien Partnership *Nonlinear light propagation in multimode fibers* funded by the French Ministry for Europe and Foreign Affairs, French Ministry for Higher Education and Research, and Polish National Agency for Academic Exchange.

 **Fiber Optics Group, Wrocław University of Science and Technology** – Wrocław, Poland

City: Wrocław | Country: Poland

Work in research project

[09/2018 – 09/2020]

Measurement of linear and non-linear parameters of specially designed microstructured optical fibers (Polish National Centre for Research and Development project "Dispersion-engineered fiber modules for tunable laser sources", principal investigator: Tadeusz Martynkien).

 **Laboratoire Interdisciplinaire Carnot de Bourgogne, University Bourgogne Franche-Comté** – Dijon, France

City: Dijon | Country: France

Research internship

[27/08/2019 – 27/10/2019]

Experimental development of multi-species gas detection devices for environmental applications. In particular mid-infrared high-repetition-rate absorption spectroscopy with fiber-based supercontinuum light source.

LANGUAGE SKILLS

Mother tongue(s): Polish

Other language(s):

English

LISTENING C2 **READING** C2 **WRITING** C2
SPOKEN PRODUCTION C2 **SPOKEN INTERACTION** C2

French

LISTENING B1 **READING** B1 **WRITING** A2
SPOKEN PRODUCTION A2 **SPOKEN INTERACTION** A2

Spanish

LISTENING B1 **READING** B1 **WRITING** A2
SPOKEN PRODUCTION A2 **SPOKEN INTERACTION** A2

German

LISTENING A1 **READING** A2 **WRITING** A1
SPOKEN PRODUCTION A1 **SPOKEN INTERACTION** A1

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

CONFERENCES AND SEMINARS

[04/08/2025 – 07/08/2025] Waikiki, USA

Optica Nonlinear Optics Topical Meeting Invited *Spatial beam freezing in a few-mode optical fiber*

[23/06/2025 – 27/06/2025] Munich, Germany

CLEO EU *Spatial beam cleaning in Ytterbium spatiotemporal mode-locked fiber laser*

[05/05/2025 – 09/05/2025] Long Beach, USA

CLEO *Fundamental mode instability in few mode optical fiber*

[05/05/2025 – 09/05/2025] Long Beach, USA

CLEO *Controlling light by light through intermodal interactions in multimode fibers,*

[12/03/2025 – 14/03/2025] Southampton, UK

Multimode Optics: from Optical Fibres to Nanophotonics Invited *Spatio-temporal wavepackets in multimode step-index fibers: spontaneous emergence during nonlinear propagation of ultrashort pulses*

[02/09/2024 – 06/09/2024] Strbske Pleso

Slovak-Czech-Polish Optical Conference *Towards spontaneous helicon wavepacket generation in multimode optical fibers*

[11/09/2023 – 15/09/2023] Dijon, France

European Optical Society Annual Meeting *Experimental observation of discretized conical wave in a multimode fiber*

[11/09/2023 – 15/09/2023] Dijon, France

European Optical Society Annual Meeting *Mid-IR generation beyond 3500 nm in a graded-index silica fiber*

[17/07/2023 – 19/07/2023] Giardini Naxos, Italy

Multimode Nonlinear Photonics IEEE SUM (Invited) *Far-detuned frequency conversion beyond 3500 nm in a few-mode graded-index silica fiber*

[04/07/2023 – 07/07/2023] Toruń, Poland

Polish Optical Conference *Daleka konwersja częstotliwości w kilkumodowym światłowodzie gradientowym*

[05/09/2022 – 09/09/2022] Wojanów, Poland

Polish-Slovak-Czech Optical Conference *Observation of soliton trapping in microstructured optical fibers with different group birefringence*

[03/04/2022 – 07/04/2022] Strasbourg, France

SPIE Photonics Europe *Discretized X-Wave in a Multimode Optical Fiber*

[01/11/2021 – 04/11/2021] online

Frontiers in Optics Poster *Discretized X-Wave in a Multimode Optical Fiber*

[09/08/2021 – 13/08/2021] online

OSA Nonlinear Optics Topical Meeting *Polarization conversion of solitons propagating in birefringent microstructured optical fibers*

PUBLICATIONS

Orbital chirality of light in few-mode step-index optical fibers

K. Stefańska, E. Hertz, K. Tarnowski, B. Kibler, P. BÉjot, APL Photonics 10, 040804 (2025)

High-gain far-detuned nonlinear frequency conversion in optical fibers: intramodal vs. intermodal processes

K. Stefańska, P. BÉjot, J. Fatome, G. Millot, K. Tarnowski, B. Kibler, Sci Rep 14, 15872 (2024)

Experimental Observation of the Spontaneous Emission of a Space-Time Wavepacket in a Multimode Optical Fiber

K. Stefańska, P. BÉjot, K. Tarnowski, and B. Kibler, ACS Photonics 10 (3), 727-732 (2023)

Soliton trapping and orthogonal Raman scattering in a birefringent photonic crystal fiber

K. Stefańska et al., Opt. Lett. 47, 4183-4186 (2022)

All-normal dispersion supercontinuum vs frequency-shifted solitons pumped at 1560 nm as seed sources for thulium-doped fiber amplifiers

O. Szewczyk, K. Tarnowski, A. Głuszek, D. Szulc, K. Stefańska et al., Opt. Express 29, 18122 (2021)

The influence of germanium concentration in the fiber core on temperature sensitivity in Rayleigh scattering-based OFDR

B. Szczupak, J. Olszewski, M. Madry, P. Pala, K. Stefańska et al., IEEE Sens. J., 21, 20036 (2021)

Temporal fine structure of all-normal dispersion fiber supercontinuum pulses caused by non-ideal pump pulse shapes

A. Rampur, et al., Opt. Express 28, 16579-16593 (2020)

VOLUNTEERING

Organizing international student conference OPTO 2021

Link: <https://www.opto2024.cz/opto-history/>

[2018 – Current] Wrocław University of Science and Technology

Active participation in SPIE & Optica Student Chapters

- President (2020-21; 22-23), Vice-President (2021-22), Secretary (2023-24) of SPIE Student Chapter;
- Runner-up for the SPIE Presidential Award for Outstanding Student Chapter for the chapter's activities and accomplishments in 2021;
- Organization of workshops for school and university students and general audiences: Dolnośląski Festiwal Nauki, Międzynarodowy Dzień Światła, Piknik z Wolfke.

Episode "Optical Fibers" in the outreach series POLILAB

Link: <https://www.youtube.com/watch?v=9fznsDFT7Mw>

HONOURS AND AWARDS

[2024] Santander Open Academy

Santander Award 10 awardees selected from students & PhD students of Wrocław University of Science and Technology

[2023] IEEE Photonics Young Professionals

Grant for attending international IEEE Photonics Society Summer Topicals Meeting Series 2023 As one of six awardees, I had travel and participation expenses covered by the grant (Giardini Naxos, Italy, 07.2023).

[2023] Optica Foundation

Zuegel Family Scholarship allowed participation in the Siegman International School on Lasers 2023. As one of 10 awardees, I had travel and participation expenses covered by the scholarship (Dublin, Ireland, 06.2023).

[2022] Wrocław University of Science and Technology

InterDocSchool Scholarship awarded for the academic year 2022-2023 to eight PhD students of Wrocław University of Science and Technology for pursuing their doctorates in international collaboration.

[2022] Wrocław University of Science and Technology

Dean's Award for 6 PhD students in the Faculty of Fundamental Problems of Technology for their achievements in the academic year 2021/2022.

[2022] Optica Foundation

Grant for attending Student Leadership and Frontiers in Optics 2022 As one of 100 participants, I had travel and participation expenses covered by the grant (Rochester, USA, 10.2022).

[2022] Optica Foundation

Zuegel Family Scholarship allowed participation in the Siegman International School on Lasers 2022. As one of 10 awardees, I had travel and participation expenses covered by the scholarship (Chęciny, Poland, 06.2022).

[2021] SPIE

SPIE Optics and Photonics Education Scholarship awarded by the international organization SPIE. 78 students from all levels of education have been selected worldwide based on their potential for significant contributions to optics and photonics.

[2020] Wrocław University of Science and Technology

Best Master Graduate 3rd place in the competition for the Best Master Graduate at the Faculty of Fundamental Problems of Technology, Wrocław University of Science and Technology

[2019] Wrocław University of Science and Technology

Best Bachelor Graduate 7th place in the competition for the Best Bachelor Graduate at the Faculty of Fundamental Problems of Technology, Wrocław University of Science and Technology

ATTENDED WORKSHOPS AND SCHOOLS

[14/05/2024 – 15/05/2024]

Multimode-Multichannel Guided Photonics Workshop (Villeneuve-d'Ascq, France)

Poster *High-gain far-detuned FWM in graded-index fiber,*

Poster *Discretized conical wave and helicon wavepackets in multimode fibers*

[23/10/2023 – 27/10/2023]

School on Nonlinear Optics in Fibers and Integrated Optics (Cargese, France)

Poster *Space-time wavepackets in optical fibers: discretized conical emission in a multimode fiber*

[18/06/2023 – 24/06/2023]

Siegman International School on Lasers (Dublin, Ireland)

Poster *Soliton Trapping in Birefringent Photonic Crystal Fibers*

[10/2022]

Student Leadership Conference (Rochester, USA)

Presentation *Discretized conical wave in a multimode optical fiber*

[22/08/2022 – 25/08/2022]

Multimode Photonics Workshop (Rome, Italy)

Poster *Discretized Conical Wave in a Multimode Optical Fiber*

[25/06/2022 – 02/07/2022]

Siegman International School on Lasers (Checiny, Poland)

[29/06/2020 – 03/07/2020]

Workshop New Frontiers in Photonics (online / Gdańsk, Poland)

DATI PERSONALI

Dati personali

Autorizzo il trattamento dei miei dati personali ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali".