



ACADEMIC TEACHER PROFESSIONAL EXPERIENCE

DOCTORAL SCHOOL OF WROCLAW UNIVERSITY OF SCIENCE AND TECHNOLOGY

1. Basic information

Name, surname:	Grzegorz Sęk
Grade / Title:	Professor
Scientific discipline	nauki fizyczne / physical sciences
Faculty:	W11 Wydział Podstawowych Problemów Techniki / Faculty of Fundamental Problems of Technology
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2. Publication record

Up to 10 most important papers published over the period of previous 10 years.

No.	Description (authors, publication title, journal / conference, DOI)	Publication year
1.	J. Serafińczuk, W. Rudno-Rudziński, M. Gawęłczyk, P. Podemski, K. Parzyszek, A. Piejko, V. Sichkovskiy, J.P. Reithmaier, G. Sęk High-resolution X-ray diffraction to probe quantum dot asymmetry Measurement 221, 113451 https://doi.org/10.1016/j.measurement.2023.113451	2023
2.	T. Gao, L. Rickert, F. Urban, J. Große, N. Srocka, S. Rodt, A. Musiał, K. Żołnacz, P. Mergo, K. Dybka, W. Urbańczyk, G. Sęk, S. Burger, S. Reitzenstein, T. Heindel A quantum key distribution testbed using a plug&play telecom-wavelength single photon source Applied Physics Reviews 9, 011412 https://doi.org/10.1063/5.0070966	2022
3.	P. Podemski, M. Gawęłczyk, P. Wyborski, H. Salamon, M. Burakowski, A. Musiał, J. P. Reithmaier, M. Benyoucef, G. Sęk Spin memory effect in charged single telecom quantum dots Optics Express 29, 34024 https://doi.org/10.1364/OE.438708	2021
4.	A. Musiał, K. Żołnacz, N. Srocka, O. Kravets, J. Große, J. Olszewski, K. Poturaj, G. Wójcik, P. Mergo, K. Dybka, M. Dyrkacz, M. Dłubek, K. Lauritsen, A. Bülter, P.-I. Schneider, L. Zschiedrich, S. Burger, S. Rodt, W. Urbańczyk, G. Sęk, S. Reitzenstein Plug&Play Fiber-Coupled 73 kHz Single-Photon Source Operating in the Telecom O-Band Advanced Quantum Technologies 3, 2000018 https://doi.org/10.1002/qute.202000018	2020
5.	M. Gawęłczyk, P. Wyborski, P. Podemski, J. P. Reithmaier, S. Höfling, and G. Sęk Excited states of neutral and charged excitons in single strongly asymmetric InP-based nanostructures emitting in the telecom C band	2019



	Physical Review B 100, 241304(R) https://doi.org/10.1103/PhysRevB.100.241304	
6.	P. Mrowiński, M. Emmerling, C. Schneider, J. P. Reithmaier, J. Misiewicz, S. Höfling, and G. Sęk Photonic engineering of highly linearly polarized quantum dot emission at telecommunication wavelengths Physical Review B 97, 165427 https://doi.org/10.1103/PhysRevB.97.165427	2018
7.	M. Gawełczyk, M. Syperek, A. Maryński, P. Mrowiński, Ł. Dusanowski, K. Gawarecki, J. Misiewicz, A. Somers, J. P. Reithmaier, S. Höfling, G. Sęk Exciton lifetime and emission polarization dispersion in strongly in-plane asymmetric nanostructures Physical Review B 96, 245425 (Editors' Pick) https://doi.org/10.1103/PhysRevB.96.245425	2017
8.	Ł. Dusanowski, P. Holewa, A. Maryński, A. Musiał, T. Heuser, N. Srocka, D. Quandt, A. Strittmatter, S. Rodt, J. Misiewicz, S. Reitzenstein, G. Sęk Triggered high-purity telecom-wavelength single-photon generation from p-shell-driven InGaAs/GaAs quantum dot Optics Express 25, 31122 https://doi.org/10.1364/OE.25.031122	2017
9.	M. Pieczarka, M. Syperek, Ł. Dusanowski, J. Misiewicz, F. Langer, A. Forchel, M. Kamp, C. Schneider, S. Höfling, A. Kavokin, G. Sęk Ghost Branch Photoluminescence From a Polariton Fluid Under Nonresonant Excitation Physical Review Letters 115, 186401 https://doi.org/10.1103/PhysRevLett.115.186401	2015
10.	Ł. Dusanowski, M. Syperek, P. Mrowiński, W. Rudno-Rudziński, J. Misiewicz, A. Somers, S. Höfling, M. Kamp, J. P. Reithmaier, G. Sęk Single photon emission at 1.55 μm from charged and neutral exciton confined in a single quantum dash Applied Physics Letters 105, 021909 https://doi.org/10.1063/1.4890603	2014

3. Projects and grants

List of the most important 5 projects/grants with basic description including: title, source(s) of funding, name of the call, role in the project (e.g., principal investigator).

1.	Role in the project (e.g., principal investigator, work package leader, etc.)	Principal Investigator
	Project title	In-line cascade laser spectrometer for process control
	Sources of funding	European Commission Horizon 2020
	Name of the call	H2020-SPIRE-2014
	Implementation period	2015-2018
2.	Role in the project (e.g., principal investigator, work package leader, etc.)	Leader of the Polish consortium
	Project title	FI-SEQUR - Fibre-coupled semiconductor single-photon source for secure quantum communication in the 1.3 μm range
	Sources of funding	The National Centre for Research and Development



	Name of the call	Poland-Berlin Photonics Programme
	Implementation period	2016-2019
3.	Role in the project (e.g., principal investigator, work package leader, etc.)	Principal Investigator
	Project title	Optical, structural and electronic properties of III-V quantum dots on silicon
	Sources of funding	National Science Centre of Poland
	Name of the call	OPUS
	Implementation period	2020-2024
4.	Role in the project (e.g., principal investigator, work package leader, etc.)	Principal Investigator
	Project title	Cost-efficient gas sensing system based on wavelength tunable quantum-dot VCSEL arrays with nanogratings
	Sources of funding	The National Centre for Research and Development
	Name of the call	Poland-Brandenburg Photonics Programme
	Implementation period	2022-2025
5.	Role in the project (e.g., principal investigator, work package leader, etc.)	Principal Investigator
	Project title	Investigation of fundamental physical properties of coupled quantum well – quantum dot systems emitting in the near infrared range of 1.3 - 1.55 micrometer
	Sources of funding	National Science Centre of Poland
	Name of the call	HARMONIA
	Implementation period	2014-2017

4. International experience

Brief description of international cooperation and experience (e.g., research stays, cooperation with foreign entities, coordination or participation in international projects or programmes, keynote speeches and presentations delivered at renowned international conferences, visiting professor stays, invited lectures).

No.	Description	Year(s)
1.	Post-doc position in the Applied Physics Department, University of Würzburg	2003-2004
2.	Project of the HARMONIA call of National Science Centre of Poland for international collaboration (University of Kassel, Germany, Technion, Israel): "Investigation of fundamental physical properties of coupled quantum well – quantum dot systems emitting in the near infrared range of 1.3 - 1.55 micrometer"	2014-2017
3.	EU Project of Horizon 2020 Programme: "iCspec - In-line cascade laser spectrometer for process control" (PI at WUST)	2015-2018
4.	Project of bilateral programme in the field of photonics of the Polish NCBR and Investitionsbank in Berlin: "FI-SEQUR - Fibre-coupled semiconductor single-photon source for secure quantum communication in the 1.3 μm range" (Leader of the Polish Consortium)	2016-2019
5.	International Academic Partnerships projects with TU Berlin and University of Würzburg, Polish National Agency for Academic Exchange	2018-2020



6.	Project of the OPUS call of National Science Centre of Poland for international collaboration (University of Kassel, Germany): "Optical, structural and electronic properties of III-V quantum dots on silicon"	2020-2024
7.	Project of the bilateral Poland-Brandenburg programme in the field of photonics of the Polish NCBR and Investitionsbank in Berlin: "QD-SENSE - Cost-efficient gas sensing system based on wavelength tunable quantum-dot VCSEL arrays with nanogratings" (PI at WUST)	2022-2025
8.	Invited talk during Photonics West Conference, Session Quantum Sensing and Nanophotonic Devices, San Francisco, USA: "Recent advances in GaSb-based structures for mid-infrared emitting lasers: spectroscopic study"	2013
9.	Invited talk during Second Asian School-Conference on Physics and Technology of Nanostructured Materials - ASCO-NANOMAT, Vladivostok, Russia: "Optical properties of quantum dashes"	2013
10.	Invited talk during International Conference and Exhibition on Lasers, Optics and Photonics, San Antonio, USA: "Optical properties of type II QWs for interband cascade lasers"	2013
11.	Invited talk during International School on Nanophotonics and Photovoltaics, Tbilisi, Georgia: "Semiconductor quantum dashes on InP: peculiar optical properties and potential for nanophotonic applications at the telecommunication wavelengths"	2014
12.	Invited talk during International Conference on Metamaterials and Nanophysics, Varadero, Cuba: "Optical properties of semiconductor nanostructures on InP with respect to photonic applications at the telecommunication wavelengths"	2015
13.	Invited talk during Conference on Advances in Quantum Materials, Quantum Physics and Nanophotonics, 25th anniversary of the "Technische Physik" Department at University of Würzburg, Würzburg, Germany: "Quantum dashes - exotic nanostructures with interesting optical properties and application prospects"	2015
14.	Invited talk during International Conference on Transparent Optical Networks - ICTON, Bucharest, Romania: "Recent developments in quantum dot-based single-photon sources at telecom wavelengths"	2018
15.	Invited talk during conference PROMIS - Photonics by the Lake Conference, Windermere, UK	2018
16.	Invited talk during SPIE Optics & Photonics Conference, San Diego, USA: "Optimization of the active region of interband cascade lasers emitting in the MIR"	2018
17.	Invited talk during EPIC World Industrial Quantum Photonics at ICFO Summit, Barcelona, Spain: "Recent developments in quantum-dot-based single photon sources in the telecommunication range"	2019
18.	Invited talk during 4Photon School, Würzburg, Germany: "Telecommunication wavelength quantum dashes and dots"	2019
19.	Invited talk during EQUPEP - International Workshop on Engineering of Quantum Emitter Properties, Berlin, Germany: "Recent developments in quantum-dot-based single photon sources in the telecommunication range - Compact and stand-alone device at the O-band"	2019
20.	Invited talk during Interdisciplinary Nanostructure Science and Technology, Kassel, Germany: "Recent results on epitaxial quantum dots as efficient single photon emitters at the telecommunication wavelengths"	2022



21.	Invited talk during International Workshop on Advances in Photonics in Semiconductor Quantum Systems, Würzburg, Germany: "Towards practical QD-based single photon sources in the telecom range"	2022
22.	Invited talk during International Conference on Transparent Optical Networks - ICTON, Bucharest, Romania: "Towards practical QD-based single photon sources in the telecom range"	2023
23.	Invited talk during iNOW – International Nano-Optoelectronics Workshop, Würzburg, Germany: "Towards practical QD-based single photon sources in the telecom range"	2023

5. Experience in teaching doctoral students

Brief description of experience in teaching doctoral students (e.g., courses in doctoral schools and PhD studies, summer/winter schools for doctoral students, tutorials, trainings, etc.).

No.	Description	Year(s)
1.	Lecture on "Physics of modern materials" for PhD students of Mechanical Engineering Faculty	2014/2015
2.	Interdisciplinary Seminar for PhD students of the InderDok Programme	2020/2021
3.		

6. List of supervised doctoral students

List of all supervised doctoral students that defended the PhD including: name of the student, dissertation title, year of awarding PhD.

No.	Name, surname	Dissertation title	Year of awarding PhD
1.	Filip Janiak	Optical properties of type II structures on GaSb substrates emitting in the mid infrared range	2014
2.	Łukasz Dusanowski	Carrier dynamics, photon emission statistics and phonon decoherence in single quantum dashes emitting in the near infrared	2016
3.	Paweł Mrowiński	Optical properties of single InAs epitaxial nanostructures with respect to applications in nanophotonics	2016
4.	Maciej Pieczarka	Investigations of exciton polariton condensates in semiconductor microcavities with a built-in disorder	2017
5.	Mateusz Dyksik	Fourier spectroscopy of interband cascade laser structures	2018
6.	Michał Kozub	Investigation into properties of thin indium arsenide films with respect to the emission of terahertz radiation	2018

7. Prizes and awards

The most important national and international prizes and awards related to research, development and teaching activities.

No.	Description	Year
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1.	Wojciech Rubinowicz Award of the Polish Physical Society for „Pioneering works on optical and excitonic properties of novel epitaxial nanostructures emitting in the near infrared"	2017
2.	Award of Polish Prime Minister for the PhD dissertation	2002
3.	Scholarships of the Foundation for Polish Science for young scientists	2001 and 2002

8. Other significant achievements

Information on other significant achievements related to research, development and teaching activities.

World-wide pioneering research in the solid state quantum electrodynamics realized in a semiconductor system. First experimental observation of strong coupling between a single exciton (electron-hole pair) confined in a semiconductor quantum dot and a single photon confined in an optical microcavity - summarized in a paper in Nature in 2004 (<https://doi.org/10.1038/nature02969>), cited more than 1600 times (without self-citations).