



ACADEMIC TEACHER PROFESSIONAL EXPERIENCE

DOCTORAL SCHOOL OF WROCLAW UNIVERSITY OF SCIENCE AND TECHNOLOGY

1. Basic information

Name, surname:	Paweł Scharoch
Grade / Title:	Dr hab.
Scientific discipline	nauki fizyczne / physical sciences
Faculty:	W11 Wydział Podstawowych Problemów Techniki / Faculty of Fundamental Problems of Technology
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Link to home page and/or research profiles (Google Scholar, ResearchGate, etc.)	

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.	Jakub Ziembicki, Paweł Scharoch, Maciej P. Polak, Michał Wiśniewski, and Robert Kudrawiec <i>Electronic and structural properties of group IV materials and their polytypes</i> J. Appl. Phys., 139, 15 (2024)	2024
2.	Jakub Ziembicki, <u>Paweł Scharoch</u> , Maciej P. Polak, Michał Wiśniewski, Robert Kudrawiec: <i>Band parameters of group III-V semiconductors in wurtzite structure</i> Journal of Applied Physics. 2022, vol. 132, nr 22, art. 225701, s. 1-11	2022
3.	Maciej P. Polak, <u>Paweł Scharoch</u> , Robert Kudrawiec: <i>The electronic band structure of Ge_{1-x}Sn_x in the full composition range: indirect, direct, and inverted gaps regimes, band offsets, and the Burstein-Moss effect</i> Journal of Physics D-Applied Physics. 2017, vol. 50, nr 19, art. 195103, s. 1-12	2017
4.	P. Polak, <u>Paweł Scharoch</u> , Robert Kudrawiec: <i>The effect of isovalent doping on the electronic band structure of group IV</i> Journal of Physics D-Applied Physics. 2021, vol. 54, nr 8, art. 085102, s. 1-9	2021
5.	Norbert Janik, <u>Paweł Scharoch</u> , Robert Kudrawiec: <i>Towards band gap engineering via biaxial and axial strain in group IV crystals</i> Computational Materials Science. 2020, vol. 181, art. 109729, s. 1-18	2020
6.	<u>Paweł Scharoch</u> , Norbert Janik, Michał Wiśniewski, Herbert S. Mączko, Marta Gładysiewicz, Maciej P. Polak, Robert Kudrawiec: <i>Electronic band structure of semiconductor alloys: from ab initio to k-p via computational alchemy, on example of Ge_{1-x}Sn_x alloy</i> Computational Materials Science. 2021, vol. 187, art. 110052, s. 1-8	2021



7.	Krzysztof Gawarecki, <u>Paweł Scharoch</u> , Michał Wiśniewski, Jakub Ziembicki, Herbert S. Mączko, Marta Gładysiewicz, Robert Kudrawiec: <i>Invariant expansion of the 30-band k-p model and its parameters for III-V compounds</i> Physical Review. B. 2022, vol. 105, nr 4, art. 045202, s. 1-16	2022
8.	Filip Dybała, Maciej P. Polak, Jan K. Kopaczek, <u>Paweł Scharoch</u> , K. Wu, Sefaattin Tongay, Robert Kudrawiec: <i>Pressure coefficients for direct optical transitions in MoS₂, MoSe₂, WS₂, and WSe₂ crystals and semiconductor to metal transitions</i> Scientific Reports. 2016, vol. 6, art. 26663, s. 1-12	2016
9.	Maciej P. Polak, <u>Paweł Scharoch</u> , Robert Kudrawiec, Jan K. Kopaczek, Maciej J. Winiarski, Wojciech M. Linhart, M. K. Rajpalke, Kin Man. Yu, T. S. Jones, M. J. Ashwin, Tim D. Veal: <i>Theoretical and experimental studies of electronic band structure for GaSb_{1-x}Bi_x in the dilute Bi regime</i> Journal of Physics D-Applied Physics. 2014, vol. 47, nr 35, art. 355107, s. 1-7	2014
10.	Maciej P. Polak, <u>Paweł Scharoch</u> , Robert Kudrawiec: <i>First-principles calculations of bismuth induced changes in the band structure of dilute Ga-V-Bi and In-V-Bi alloys: chemical trends versus experimental data</i> Semiconductor Science and Technology. 2015, vol. 30, nr 9, art. 094001, s. 1-9	2015

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.)	project manager
	Project title	Materials based on Ge-IV alloys for modern optoelectronic devices integrated with Si
	Sources of funding	NCN OPUS11, 2016/21/B/ST7/01267, 2017-2021
	Name of the call	
	Implementation period	2017-2021
2.	Role in the project (e.g., principal investigator, work package leader, etc.)	principal investigator
	Project title	high pressure sensors
	Sources of funding	NCBIR, no POIR.04.01.04-00-0034/20
	Name of the call	
	Implementation period	2019-2023
3.	Role in the project (e.g., principal investigator, work package leader, etc.)	associate editor
	Project title	excitonic g-factors engineering in van der Waals structures
	Sources of funding	NCN 2021/41/N/ST3/04516
	Name of the call	
	Implementation period	



4.	Role in the project (e.g., principal investigator, work package leader, etc.)	coworker
	Project title	quantum interaction induced phase diagram of heavily doped transition metal dichalcogenides
	Sources of funding	2016/23/G/ST3/04112 (BETHOWEN)
	Name of the call	
	Implementation period	
5.	Role in the project (e.g., principal investigator, work package leader, etc.)	associate editor
	Project title	First principles calculations of band structure, structural and optical properties, for highly mismatched mixed semiconductor compounds
	Sources of funding	DI2013 006143
	Name of the call	Diamond gant
	Implementation period	

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.	University of Durham, United Kingdom – postdoctoral internship in Semiconductor Theory Group	1987-1988
2.	Fritz-Haber Institute, Theory Department, Berlin – research internship	<u>Oct. 2001 to Jan. 2002</u>
3.		

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.	No experience	
2.		
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.	Tomasz Woźniak	<i>Ab initio studies of the effect of physical and configurational factors on the optical response characteristics of low-dimensional atomic systems</i>	2021



2.	Jakub Ziebicki	<i>Ab initio study of semiconductor crystals in wurtzite and zinc blende structures, for optoelectronic applications</i>	2024
3.			

7. Prizes and awards

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

No.	Description	Year
1.	Medal of the National Education Commission	2023
2.	Silver Medal for Long Service	2018
3.	Golden Badge of the Wrocław University of Science and Technology	2008

8. Other significant achievements

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

Development and publishing a handbook on computational methods in physics, in Polish and in English:

Paweł Scharoch, Radosław Szymon, Maciej P. Polak
A first guide to computational modelling in physics
software developed by Katarzyna Hołodnik-Malecka.
Cambridge University Press, 2024

Paweł Scharoch, Radosław Szymon, Maciej P. Polak
Wstęp do modelowania komputerowego w fizyce
programy komputerowe: Katarzyna Hołodnik-Malecka
Warszawa, Wydawnictwo Naukowe PWN, 2023

Development of the new field of study in the Faculty of Fundamental Problems of Technology: *Advanced Materials*. The program has been accepted by Faculty Council, university Material Science Discipline Council and Students Council. It still requires the acceptance of the Council for the Quality of Education and University Senate – the procedure is in course. Estimated date of commencement of studies is October 2025

Development of a specialistic course *First Principles calculations based on Density Functional Theory*. Participation in writing two parts of the handbook for this course, within Integrated Program of Development of Wrocław University of Science and Technology (published online):

M. Polak, T. Woźniak, P. Scharoch „*Zastosowania metod ab initio - podstawy teoretyczne*”, 2020, PWr
T. Woźniak, M. Polak, P. Scharoch „*First oprinciples calculations – project*”, 2020, PWr

Development and conduction of interdepartmental course of general physics in English: 3-term (1999 – 2004), 2-term (2007 – 2009)