

# Dr. Andrzej Piotr Kądzielawa

## Curriculum Vitae

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## Experience

- 2018 – **Researcher**, *IT4Innovations National Supercomputing Centre*, Ostrava, Czechia.  
Modelling for Nanotechnologies Lab; Responsibilities: Development of software for magnetic symmetry detection and assessment of the interaction scale (python3); Design of new materials including robust Cobalt alloys and permanent magnets (VASP); Utilization of HPC libraries to model strongly-correlated electron systems with disorder (C++17).
- 2020 – 2022 **Researcher & Lecturer**, *Institute of Theoretical Physics*, Kraków, Poland, See below.
- 2017 – 2020 **Researcher & Lecturer**, *Marian Smoluchowski Institute of Physics*, Kraków, Poland.  
Member of MAESTRO team (–2018); Responsibilities: Development of high-performance low-level quantum-chemical libraries (C++17); Expansion and administration of the new computational cluster (to ~12 TFLOPS DP); Teaching (cf. Teaching section); Organization of *Spin to Cooper Pairs* conference; Research (cf. [andrzejkadzielawa.github.io](https://github.com/andrzejkadzielawa));
- 2015 – 2017 **Research assistant**, *Marian Smoluchowski Institute of Physics*, Kraków, Poland.  
Member of MAESTRO team; Responsibilities: Development of high-performance low-level libraries for realistic crystalline systems (C++11, python2.7); Acquisition and administration of the new computational cluster (~8 TFLOPS DP) for Institute of Physics; Organization of *Spin to Cooper Pairs* conference; Research (cf. [andrzejkadzielawa.github.io](https://github.com/andrzejkadzielawa));

## Education

- 2011 – 2015 **PhD in Physics**, *Jagiellonian University*, Kraków, Poland, *summa cum laude*.  
*First-Principle Approach to Electronic States and Metal - Insulator Transition in Selected Correlated Model Systems*
- 2006 – 2011 **MSc in Physics**, *Jagiellonian University*, Kraków, Poland, Uniform interdisciplinary program with 2-years-long thesis research; physics, mathematics, computer science, and biology; final grade **5.0**.  
*Evolution of a massless test scalar field on Boson Star space-time*
- 2010 **Graduate Level**, *Niels Bohr Institute*, Copenhagen, Denmark.  
Courses in Quantum Field Theory, Topology, Differential Geometry, and Quantum Optics

## Research and Scientific Activities

### Publications

- 2015 – **4 software packages**, *Open Source*, vide [bitbucket.org/azja/qmt](https://bitbucket.org/azja/qmt) & [github.com/Mellechowicz](https://github.com/Mellechowicz).
- 2013 – **19 papers**, in *peer-reviewed journals*, (cf., [orcid.org/0000-0003-0093-1967](https://orcid.org/0000-0003-0093-1967) for details).  
Mater. Lett., Corros. Sci., Phys. Rev. B, Scientific Reports, Comput. Phys. Commun., New J. Phys.
- Topics *W-Cr alloys, quantum chemistry, ab-initio calculations, high-performance computing, metallization hydrogen*
- 2019 – **9 computational grants**, (cf., [andrzejkadzielawa.github.io/computational](https://github.com/andrzejkadzielawa/computational) for details).  
including one three-year project: OPEN-18-33: *Tailoring thermal stability of W-Cr based alloys for fusion applications*

### Conferences, Schools and Seminars

- 2012 – **21 oral and 13 poster presentations**, (cf., [andrzejkadzielawa.github.io/projects](https://github.com/andrzejkadzielawa/projects) for details).

### Project participation

- 2020 – **GAČR**, *Tailoring thermal stability of W-Cr based alloys for fusion applications*, Principal Investigator.
- 2018 – 2022 **IT4Innovations National Supercomputing Center**, *Path to Exascale*, Researcher.
- 2015 – 2018 **Project MAESTRO (NCN)**, *Fundamental Properties of Strongly Correlated Systems: Unconventional Superconductivity, Quantum Critical Behavior, and Complex Electronic Structure*, Researcher.
- 2012 – 2015 **Project TEAM (FNP)**, *Correlations and coherence in quantum materials and structures - unique properties on macro and nano scales*, doctoral scholarship.

## Miscellaneous

- 2020 – **Union of Czech Mathematicians and Physicists**, regular member.  
 2019 – **Polish Physical Society**, regular member.  
 2010 **Erasmus student exchange**, Niels Bohr Institute, University of Copenhagen, Danmark.

## Teaching

- 2013 – 2018 **teacher**, Jagiellonian University, Kraków.  
 3D Geometry for Video Games Programming, Basics of Computer Programming: C with Elements of C++, Advanced Object Programming Techniques in C++, Robotics Laboratory, and Programming of Real-Time Physics for game developers  
 2011 – 2015 **doctoral student / teaching assistant**, *Faculty of Physics*, Jagiellonian University, Kraków.  
 Courses included: Physics 101, Physics Laboratory, and Programming of Real-Time Physics

## Skills

		<b>Libraries</b>				
		GNU Scientific Library	OpenMP	OpenMPI	LAPACK++	
		CBLAS	qmt	SPGlib	CUBA	
		OpenGL	GLU(T)	Armadillo	CUDA	
		<b>Compilers</b>				
C-family	C	GCC	Clang	llvm	Intel C++ Compiler	
	C++11					
	C++17					
		<b>IDEs</b>				
		personalized vim	Microsoft Visual Studio	kDevelop	Eclipse	
		<b>Other</b>				
		Intel Parallel Studio XE	Valgrind	accelerator offloading	generic programming	
		<b>Modules</b>				
Python	v3	NumPy	SciPy	Matplotlib	Mayavi 2	
	v2.7	JorG	SPGlib	Sympy	TensorFlow	
Science	Physics	Quantum Mechanics	Statistical Physics	Condensed Matter	Classical Physics	
		Phase Transitions	ab-initio	Thermodynamics	Monte Carlo Methods	
		Math	Statistics	Geometry	Linear Algebra	Topology
		<b>Fortran</b>				
other		v95	v2008	VASP	LAPACK	
			<b>Other</b>			
		RegEx's	Agile (XP)	PBS Professional	git	
		Wolfram Mathematica	office-suite	L <sup>A</sup> T <sub>E</sub> X	Gnuplot	
	Godot 3.0	GoLang	Bash	awk		

## Administrative tasks

- 2016 – 2019 **administration of Computational Cluster EDABI**, Jagiellonian University, Kraków, Poland.  
 acquisition (2016) and expansion (2018); performance of ~ 12 TFLOPS DP

## Languages

CEFR levels	<b>Polish (native)</b>	<b>English (C2)</b>	<b>Spanish (B1)</b>	<b>German (B1)</b>
		<b>Czech (A2)</b>	<b>Danish (A1)</b>	<b>Russian (A1)</b>

## Interests

- professional
- electronic correlations
  - stochastic algorithms
  - computational physics
  - low-level computing
- other
- traveling and hiking
  - scuba-diving
  - tea
  - gaming

## Licenses

driving licence	<b>A, B</b>	motorcycles and cars
diving licence	<b>Advanced Open Water Diver, Ice Diver</b>	PADI
UAS pilot licence	<b>A1/A3 POL-RP-5dfa88ca456f</b>	EASA
licence	<b>counsellor</b>	day care