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 – **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 comptutational cluster (to ~ 12 `TFLOPS DP`); Teaching (cf. Teaching section); Organization of *Spin to Cooper Pairs* conference; Research (cf. andrzejkadzielawa.github.io);

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);

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

Conferences, Schools and Seminars

2012 – **20 oral and 11 poster presentations**, (cf. `andrzejkadzielawa.github.io/projects` for details).

Publications

2015 – **4 software packages**, *Open Source*, vide bitbucket.org/azja/qmt & github.com/Mellechowicz.

2013 – **14 papers**, *in peer-reviewed journals*, (cf. `andrzejkadzielawa.github.io/articles` for details).
Phys. Rev. B, Scientific Reports, Comput. Phys. Commun., New J. Phys., Acta Phys. Pol. A, Eur. Phys. J. B

Topics *ab-initio calculations, high-performance computing, multilevel parallelism, metallization hydrogen*

Project participation

2020 – **GAČR**, *Tailoring thermal stability of W-Cr based alloys for fusion applications*, Principal Investigator.

2018 – **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

C-family `C` `C++11` `C++17`

Python `v3` `v2.7`

Science `Physics` `Math`

other

Libraries			
GNU Scientific Library	*OpenMP*	*OpenMPI*	*LAPACK++*
CBLAS	*qmt*	*SPGlib*	*CUBA*
OpenGL	*GLU(T)*	*Armadillo*	*CUDA*
Compilers			
GCC	*Clang*	*llvm*	*Intel C++ Compiler*
IDEs			
personalized vim	*Microsoft Visual Studio*	*kDevelop*	*Eclipse*
Other			
Intel Parallel Studio XE	*Valgrind*	*accelerator offloading*	*generic programming*
Modules			
NumPy	*SciPy*	*Matplotlib*	*Mayavi 2*
JorG	*SPGlib*	*Sympy*	*TensorFlow*
Quantum Mechanics	*Statistical Physics*	*Condensed Matter*	*Classical Physics*
Phase Transitions	*ab-initio*	*Thermodynamics*	*Monte Carlo Methods*
Statistics	*Geometry*	*Linear Algebra*	*Topology*
Fortran			
v95	*v2008*	*VASP*	*LAPACK*
Other			
RegEx's	*Agile (XP)*	*PBS Professional*	*git*
Wolfram Mathematica	*office-suite*	*LaTeX*	*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

Polish (native)	**English (C2)**	**Spanish (B1)**	**German (B1)**
	Czech (A2)	**Danish (A1)**	**Russian (A1)**

Interests

professional
- electronic correlations
- stochastic algorithms
- computational physics
- low-level computing

other
- traveling and hiking
- scuba-diving
- tea
- gaming

Licenses

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