



Aleksandr Kurenkov

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Date of birth: 29.04.1991

Nationality: Russian

Residence permit: B

Languages: English, Russian, Japanese (basic)

SUMMARY

Over 7 years of experience leading international R&D teams and delivering patented innovations in nanotechnology, spintronics, imaging and neuromorphic computing. Proven ability to manage complex, high-impact projects from concept to real-world solution, even in the face of uncertainty. Track record of securing and managing over EUR 1m of funds.

PROFESSIONAL EXPERIENCE

ETH Zürich and Paul Scherrer Institute (Switzerland) – Scientist 09/2020 – Now

- Managed a collaboration of ETH with IBM Zürich and 3 universities to successfully accomplish a [EUR 3m Horizon Europe project](#) and exceed its objectives
- Reported all deliverables on time despite pandemic restrictions and a long critical equipment failure
- Developed a 10 nm nano-fabrication process and a Python-automated high-frequency characterization setup to create a TRL-6 [neuromorphic chip prototype](#) used in the final report
- Coordinated a team of 8 engineers, scientists, and technicians leading to two key discoveries: a [new strong coupling between magnetic bits](#) and a novel switching mechanism in ferrimagnets
- Used these new phenomena for brain-like computing, currently being documented in 4 publications

Center for Science and Innovation in Spintronics (Japan) – Researcher 10/2014 – 08/2020

- Led a Japan-Switzerland-UK collaboration through 20 days of round-the-clock synchrotron experiments worth EUR 0.5m, which imaged the mechanism of antiferromagnetic switching relevant for current HDD and prospective MRAM recording, and resulted in 3 high-impact publications ([1,2,3](#))
- Co-wrote and secured [4 grants worth EUR 0.54m](#), including 2 as a principal investigator
- Innovatively harnessed newly discovered physics in thin magnetic films to build [the first compatible artificial synapse and neuron](#), solving a central challenge in brain-like computing hardware
- Used Class-1 300 mm wafer semiconductor cleanroom to enable a [breakthrough discovery in spintronics](#) with over 1000 citations and [patents in the US](#) and [Japan](#)

Moscow State University (Russia) – Junior Researcher 09/2011 – 09/2014

- Used sputtering and lithography techniques to [produce and model magnetoresistive sensors](#) and achieve the highest signal in class at the time
- Secured a competitive start-up grant of EUR 13k (UMNIK) by constructing and [patenting](#) a high-precision positioning device prototype using the developed sensors and presenting the business plan

EDUCATION

PhD in Electronic Engineering, Tohoku University, Japan 10/2014 – 03/2018

Funded by the Japanese government scholarship. University ranking #1 in Japan.

Specialist of Science in Physics, Moscow State University, Russia 09/2008 – 12/2013

Equivalent to a Master's (5.5 years). Graduated in the top 3% of the year.

Project Management course, Paul Scherrer Institute 09/2023

Agile Research course, ETH Zürich 11/2023

SKILLS

Excellent communication, both written and verbal. Each of my 4 grant and 7 research proposals has been awarded. I have given talks and reports ranging from 3 to 90 minutes and enjoy making them clear and engaging.

Project management and leadership of international and professionally diverse teams on projects lasting from 1 week to 4 years. I prioritize valuing every perspective for efficient and quick problem-solving.

Data analysis and simulation, including large (1-2 Tb) and noisy datasets, and using tools like Python, Mathematica, MATLAB, COMSOL, OriginLab, and LabView.

Rapid prototyping, including 3D printing, microcontrollers, PCB and CAD design.

Extensive nanofabrication and clean room experience gained from working in 4 cleanrooms worldwide, including optical, laser and electron-beam lithography, deposition and etching methods.

Material and device characterization techniques, including optical (MOKE, Microscopy) and electrical measurements (high-frequency, low-noise, low/high temperature), microscopy (SEM, AFM, MFM), X-ray (XRD, XMCD/XMLD PEEM, STXM), ion spectroscopy (RBS, SIMS), magnetometry (VSM, SQUID).

SELECTED PUBLICATIONS AND TALKS

- Invited talk at Magnetism and Magnetic Materials Conference, US** 2020
The most prestigious general conference in the field of magnetism
- Invited talk at Harvard/Tohoku Workshop, US** 2020
Discussion on quantum materials, spintronics and computing
- Invited talk at SpinEngine Workshop, Norway** 2024
Discussion on the future of computing hardware between academia and industry
- Publication in Advanced Materials** (Impact factor 29.4) 2019
Work on brain-like hardware that received a [journal cover](#) and [178 citations](#)
- Publication in Nature Materials** (Impact factor 41.2) 2016
Work on fundamental magnetism with the outstanding [1100 citations](#)
- Perspective in Journal of Applied Physics** 2020
A review of and perspective on antiferromagnetic spintronics for neuromorphic computing

PROFESSIONAL SERVICE

- Swiss Physical Society Annual Meeting** 2023
[Organizer](#) of the 'Spintronics and Magnetism at the Nanoscale' session
- ETH-EPFL Summer School on Spintronics and Neuromorphic Computing** 2022
[Lecturer](#) and panelist
- Around-the-Clock Around-the-Globe IEEE Magnetics Conference** 2020, 2021
Member of the [Organizing committee](#) in 2020 and [Advisory board](#) in 2021
24-hour virtual conference with speakers from all over the world organized in response to the pandemic

HOBBIES

Computational and [artistic photography](#), Trail running, Road cycling, Cycling physics simulations