Max Rakitin

Bio

Personal details

Name: Max Rakitin (a.k.a. Maksim S. Rakitin)

Summary: I am a group leader of the Data Acquisition and Detectors group of the Data Science and Systems Integration Division of NSLS-II, BNL.

News: "Computer, Is My Experiment Finished?" (September 16, 2022)
https://www.bnl.gov/newsroom/news.php?a=220832

"Seeing the Forest Through the Trees: Brookhaven Lab Scientists Develop New Computational Approach to Reduce Noise in X-ray Data." (April 18, 2022)
https://www.bnl.gov/newsroom/news.php?a=219533

Links: ○ BNL • SBU • SUSU
○ ⬤ @mrakitin • in @mrakitin • 🎓 Google Scholar • R² ResearchGate
○ iD ORCID: 0000-0003-3685-852X

Education and training

2008.10–2012.09 **Ph.D. in Condensed Matter Physics (defended on September 19, 2012)**
South Ural State University (National Research University), Chelyabinsk, Russia

2006.09–2008.06 **M.S. in Applied Mathematics and Physics (June 13, 2008)**
South Ural State University (SUSU), Chelyabinsk, Russia

2002.09–2006.06 **B.S. in Applied Mathematics and Physics (June 20, 2006), summa cum laude**
South Ural State University (SUSU), Chelyabinsk, Russia

Research and professional expertise

2017.11–present **Associate Computational Scientist**, *DAMA group, NSLS-II, Brookhaven National Laboratory*, Upton, NY (https://www.bnl.gov)

2015.12–2017.10 **Research Associate (Postdoc)**, *NSLS-II, Brookhaven National Laboratory*, Upton, NY (https://www.bnl.gov)

2013.10–2015.12 **Postdoctoral Associate (Postdoc)**, *Department of Geosciences, Stony Brook University*, Stony Brook, NY (https://stonybrook.edu, https://uspex-team.org/en)

2007.06–2013.10 **QA Engineer, QA Team Leader**, *Applied Technologies Ltd.*, Chelyabinsk, Russia (https://www.appliedtech.ru/en/), a partner of Rocket Software Inc., USA (https://www.rocketsoftware.com)

Software projects

○ **Bluesky** — a library for experiment control and collection of scientific data and metadata, https://blueskyproject.io/bluesky.

○ **Ophyd** — a device abstraction library, https://blueskyproject.io/ophyd.

○ **Databroker** — a simple, user-friendly interface for retrieving stored data and metadata from multiple sources, https://blueskyproject.io/databroker.

- **Synchrotron Radiation Workshop (SRW)** — computer code for X-ray source and optics simulations, https://github.com/mrakitin/SRW.
- **Sirepo** — a cloud-based framework for SRW, https://github.com/radiasoft/sirepo.
- **Databroker extractor** — image processing and data visualization, https://github.com/mrakitin/databroker-extractor.
- **CRL simulator** — a code for simulation of a transfocator (compound refractive lenses (CRL) for X-ray focusing), https://github.com/mrakitin/bnlcrl.
- **USPEX** — a code for evolutionary crystal structure prediction, https://uspex-team.org/en.
- **USPEX online utilities** — a set of pre- and post-processing tools for crystal structure simulations, https://uspex-team.org/en/uspex/tools.
- **USPEX manual** — https://uspex-team.org/en/uspex/documentation.
- Utilities for DFT simulations
- IBM Mainframe software projects

Publications

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58. A. Tayal, D. S. Coburn, D. Abel, M. Rakitin, O. Ivashkevych, J. Wlodek, D. Wierzbicki, W. Xu, E. Nazaretski, E. Stavitski, and D. Leshchev, "5-Analyzer Johann Spectrometer for Hard X-ray Photon-in-Photon-out Spectroscopy at the Inner Shell Spectroscopy Beamline at NSLS-II: Design, Alignment, and Data Acquisition," *Journal of Synchrotron Radiation (Accepted Manuscript)*, 2024. https://submission.iucr.org/status?Qname=Rakitin&Qcnor=ok5123&Submit+query=Submit+Query

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56. H. Goel, O. Chubar, R. Li, L. Wiegart, M. Rakitin, and A. Fluerasu, "Efficient end-to-end simulation of time-dependent coherent X-ray scattering experiments," *Journal of Synchrotron Radiation*, vol. 31, no. 3, pp. 517–526, May 2024. https://doi.org/10.1107/S1600577524001267

55. N. M. Cook, A. M. Barbour, E. G. Carlin, J. A. Einstein-Curtis, R. Nagler, R. O'Rourke, M. Rakitin, L. Wiegart, and H. Wijesinghe, "Integrating Online Analysis with Experiments to Improve X-Ray Light Source Operations," in *Proc. 19th Int. Conf. Accel. Large Exp. Phys. Control Syst. (ICALEPCS'23)*, ser. International Conference on Accelerator and Large Experimental Physics Control Systems, no. 19. JACoW Publishing, Geneva, Switzerland, 02 2024, paper TUSDSC02, pp. 921–924. https://jacow.org/icalepcs2023/papers/tusdsc02.pdf

54. J. A. Einstein-Curtis, D. T. Abell, Y. Du, A. Giles, M. V. Keilman, J. Lynch, P. Moeller, T. Morris, B. Nash, I. V. Pogorelov, M. Rakitin, and A. L. Walter, "Online Models for X-ray Beamlines Using Sirepo-Bluesky," in *Proc. 19th Int. Conf. Accel. Large Exp. Phys. Control Syst. (ICALEPCS'23)*, ser. International Conference on Accelerator and Large Experimental Physics Control Systems, no. 19. JACoW Publishing, Geneva, Switzerland, 02 2024, paper MO3BCO05, pp. 165–170. https://jacow.org/icalepcs2023/papers/mo3bco05.pdf

53. P. M. Maffettone, D. B. Allan, A. Barbour, T. A. Caswell, D. Gavrilov, M. D. Handwell, T. Morris, D. Olds, M. Rakitin, S. I. Campbell, and B. Ravel, Book *"Methods and Applications of Autonomous Experimentation"*. *Chapter 8: "Artificial Intelligence Driven Experiments at User Facilities"*, 1st ed. Chapman & Hall/CRC Computational Science, 2023, ch. Chapter 8. https://doi.org/10.1201/9781003359593

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