Kirill Sokolovsky

223 Astronomy, 1002 W. Green St., Urbana, IL 61801
Phone: +1 517 3037121 E-mail: kirx@kirx.net
https://www.kirx.net/ https://github.com/kirxkirx/
ORCID 0000-0001-5991-6863

Scientific interests

- The role of shocks in the origin of multiwavelength emission from novae and blazars
- Observations of the launching site and downstream structure of AGN jets
- Identification of variable stars and time series analysis techniques
- Flickering as a common feature of accreting systems

Technical skills

- Data experience with VLA, VLBA, European VLBI network, *RadioAstron*; *NuSTAR*, *Swift*, *XMM-Newton*; *TESS*, *CoRoT*, *HST*; ground-based optical telescopes,
- Proposal PI: VLA, *NuSTAR*, *XMM-Newton*, *Swift*, *RadioAstron*, GTC 10.4 m
- Observing experience with Effelsberg 100 m radio telescope (support of mm-VLBI); optical: SOAR 4.1 m, Aristarchos 2.3 m, small telescopes
- `Linux` programming in `C`, `BASH`, `Python`
- Familiar with `SCHED`, `Difmap`, `AIPS`, `CASA`; `XSPEC`; `SExtractor`, `SWarp`, `Astrometry.net`
- Experience with MSU's High Performance Computing Cluster
- Large datasets: VLBI data correlation with `DiFX` (∼300 GB/station/experiment × 2 to 12 stations), *Hubble* Source Catalog (2 TB), NMW archive of 150 000 images (2.5 TB)

Education and Employment

2022 – present — Postdoctoral researcher at University of Illinois Urbana-Champaign, USA

- Developing a `PyZOGY`-based image subtraction pipeline for AGN photometry with *TESS*

2021 – 2022 — SOAR 4.1 m telescope operations support at Michigan State University, USA

- Developed code for tracking calibration drift of Goodman Spectrograph, including an online tool for computing focus temperature correction [I]

2018 – 2021 — Postdoctoral researcher at Michigan State University, USA

- Multiwavelength observations of Galactic novae[II] focusing on X-ray spectroscopy with *NuSTAR* and radio monitoring with the VLA
- Developed a code for periodicity search in photon arrival times[III]

[I] `https://kirxkirx.github.io/goodfoc/`
[II] see Selected publications
[III] `https://github.com/kirxkirx/patpc`

- Constructed a -based GPS+NTP server for MSU Observatory clock

2015 – 2018 Postdoctoral researcher at the National Observatory of Athens, Greece

- Developed the variability detection algorithm for the ESA's *Hubble* Catalog of Variables[IV]
- Co-investigated the novel machine learning approach to variability detection

2011 – 2015 Postdoctoral researcher, Astro Space Center, Lebedev Phys. Inst., Moscow, Russia

- Designed an automated planning tool for the *RadioAstron* Space-VLBI AGN survey
- Implemented automated generation and distribution of ground radio telescope `vex` schedules

2011 – 2015 Software engineer (part time), Sternberg Institute, Moscow State University, Russia

- Developed the `Variability Search Toolkit (VaST)`[V] and applied it for variable stars discovery using digitized photographic plates
- Designed the transient detection pipeline and image archive for the NMW[VI] nova patrol. Co-discovered Nova Sgr 2012 No. 1, Nova Cas 2020 and Nova Per 2020.
- Designed a web-based lightcurve period search tool[VII]

2008 – 2011 Ph.D. student at the Max Planck Institute for Radio Astronomy, Bonn, Germany

- Thesis *Multi-frequency study of relativistic jets in active galactic nuclei*[VIII] defended at the University of Cologne; advisor Y. Kovalev; referees: Y. Shao, A. Eckart, J. A. Zensus

2001 – 2008 Physics department, Moscow State University, Russia

- Diploma thesis *Properties of GHz-peaked spectrum sources from RATAN-600 and VLBA observations* (in Russian); advisor: Y. Kovalev

Recent papers with my essential contribution

[1] **Sokolovsky, K. V.** and 43 colleagues 2023. *The multiwavelength view of shocks in the fastest nova V1674 Her.* Monthly Notices of the Royal Astronomical Society 521, 5453-5472.

[2] **Sokolovsky, K. V.** and 18 colleagues 2022.
The first nova eruption in a novalike variable: YZ Ret as seen in X-rays and γ-rays. Monthly Notices of the Royal Astronomical Society 514, 2239-2258.

[3] **Sokolovsky, K. V.** and 15 colleagues 2022. *1RXH J082623.6−505741: A New Long-period Cataclysmic Variable with an Evolved Donor and a Low Mass-transfer Rate.*
The Astrophysical Journal 934.

[4] **Sokolovsky, K. V.** and 17 colleagues 2020. *X-ray spectroscopy of the γ-ray brightest nova V906 Car (ASASSN-18fv).* Monthly Notices of the Royal Astronomical Society 497, 2569-2585.

[5] Aydi, E., **Sokolovsky, K. V.**, Chomiuk, L. and 39 colleagues 2020. *Direct evidence for shock-powered optical emission in a nova.* Nature Astronomy 4, 776-780.

h**-index**= 28 computed over all the co-authored papers listed in NASA ADS.

[IV] `https://archive.stsci.edu/hlsp/hcv`
[V] `https://github.com/kirxkirx/vast`
[VI] `http://scan.sai.msu.ru/nmw/`
[VII] `http://scan.sai.msu.ru/lk/`
[VIII] Available at `http://kups.ub.uni-koeln.de/4135/`

Community service, teaching and outreach

- Peer reviewer for *Nature*, ApJ, AJ, A&A, MNRAS, PASP, PASJ, PASA, *European Physical Journal C*, *Solar System Research*, *Acta Astronautica*, *Fermi*/LAT collaboration (internal paper review)
- External reviewer for NASA *Fermi* GO program and Chilean CONICYT, "2022, subject-matter expert reviewer in a NASA peer review."
- Participated in the "MSU Observatory Research Program" training students in observational astronomy techniques using the MSU Observatory 24' telescope
- Re-designed an online introduction to astronomy for non-STEM majors course at Michigan State University and presented it to 30+ students in summer 2022
- Presented two live lectures (100+ students) of the introduction to astronomy course at Michigan State University temporary replacing Prof. Laura Chomiuk
- I maintain close collaboration with the community of amateur astronomers: NMW survey[IV], observations of novae[IX], AAVSO campaigns on the microlensing event Gaia16aye[X] and blazars 3C 273 and 3C 279[XI]

Research funding

2022 – 2023 *NuSTAR* GO Cycle 9 proposal 9198 *Understanding the γ-ray production in nova shocks* (PI), 72 717 USD

2022 – 2023 *Swift* Cycle 18 proposal 1821098 *In search of shocks in novae* (PI), 38 000 USD (not triggered for the lack of a suitable target)

2022 – 2023 *XMM-Newton* AO-21 proposal 90327 *Grating spectroscopy of shocked nova ejecta* (PI), 50 000 USD

2022 – 2023 *NuSTAR* GO Cycle 8 proposal 8136 *Understanding the γ-ray production mechanism in nova shocks* (PI), 92 449 USD

2020 – 2021 *NuSTAR* GO Cycle 6 proposal 6164 *Understanding the γ-ray production mechanism in nova shocks* (PI), 70 591 USD

2019 – 2020 *NuSTAR* GO Cycle 5 proposal 5138 *Understanding the γ-ray production mechanism in nova shocks* (PI), 66 591 USD (not triggered for the lack of a suitable target)

2014 – 2015 Russian Foundation for Basic Research (RFBR) grant 14-02-31789 *Multifrequency VLBI study of magnetic fields in active galactic nuclei* (PI), 800 000 RUB $\approx$ 13 000 USD

2008 – 2011 Stipend from the International Max Planck Research School (IMPRS) for Astronomy and Astrophysics at the Universities of Bonn and Cologne for Ph.D. thesis research

Last updated: July 14, 2023

[IX] http://www.astronomerstelegram.org/?read=13804
[X] https://www.aavso.org/aavso-alert-notice-552
[XI] https://www.aavso.org/aavso-alert-notice-430