Kirill Sokolovsky

Highly motivated young researcher with experience in multiwavelength investigation of variable and transient events with space (*Swift*, *Fermi*, *RadioAstron*) and ground-based telescopes. Developer of free software for optical variability detection[I] and lightcurve analysis[II]. Comfortable working with a team: large (*Fermi*/LAT and *RadioAstron* AGN collaborations) and small (the Michigan State novae team, NMW[III] nova patrol).

Personal information

Born: October 1, 1985 in Moscow
Citizenship: Russia
Marital Status: married
Children: one child, born October 9, 2016

Contact information

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Technical skills

- Data experience with *Hubble*, *CoRoT*, *INTEGRAL*/OMC, ground-based optical telescopes (photometry and long-slit spectroscopy); *Swift* (X-ray spectroscopy and UV photometry); *RadioAstron*, European VLBI network, VLBA (VLBI imaging and non-imaging analysis)
- Observing proposal PI: GranTeCan, *RadioAstron*, Aristarchos 2.3 m, *Swift* (ToO), *XMM-Newton* (ToO)
- Observing experience with the Effelsberg 100 m radio telescope (support of mm-VLBI); SOAR 4.1 m, Aristarchos 2.3 m + smaller telescopes (optical photometry, astrometry of minor planets)
- `Linux` programming in `C`, `BASH`, `Python` (including CGI for web apps, `scikit-learn`)
- Familiar with `GSL`, `PGPLOT`, `CFITSIO`, `NOVAS` libraries, `APLpy`, `WCSTools`, `CDSclient`
- Routinely use `SExtractor`, `SWarp`, `Astrometry.net` code, `VARTOOLS`, `AstroImageJ`, `XSPEC` and *Swift* `HEASoft` tools, `Difmap`, `AIPS`, `GNU Octave`
- User-level knowledge of `FreeBSD`, `Mac`, `Windows`

Education and Employment

2018 – Postdoctoral researcher at the Michigan State University, USA
2015 – 2018 Postdoctoral researcher at the National Observatory of Athens, Greece

[I] http://scan.sai.msu.ru/vast/
[II] http://scan.sai.msu.ru/lk/
[III] http://scan.sai.msu.ru/nmw/

- Developed the variable sources detection algorithm for the ESA project *Hubble* Catalog of Variables.
- Co-developed the novel machine learning-based approach to variability detection[IV].
- *Swift* follow-up of nuclear transients detected by Gaia and OGLE in search for TDEs (in collaboration with L. Wyrzykowski, Warsaw Obs.).

2015 – 2018 Staff researcher, on leave from the Astro Space Center, Lebedev Phys. Inst., Russia

- Planning of *RadioAstron* AGN monitoring observations (PI Y. Kovalev, ASC).

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 a pipeline that generates and distributes ground radio telescope schedules (.vex files) used for all non-imaging *RadioAstron* experiments (~ 3300 to date).
- Identified a new flaring *Fermi* source with a radio-loud narrow-line AGN GB 1310+487 lensed by a foreground star-forming galaxy. Proposed a novel explanation of the object's γ-ray spectrum evolution as an interplay between SSC and IC SED peaks[IV].
- Developed the transient detection pipeline and image archive software for the NMW[III] survey of bright optical transients. Co-discovered Nova Sgr 2012 No. 1=V5589 Sgr.

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

- Developed the "Variability Search Toolkit"[I, IV] software and applied it for variable stars discovery using digitized photographic plates.
- Developed a web-based lightcurve analysis service[II] used by observers in Belgium, Brazil, France, Germany, Greece, Poland, Russia, South Korea, Turkey, and the United States. Ural Federal University (Russia) maintains a mirror of this service[V].

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

- Ph.D. thesis "Multi-frequency study of relativistic jets in active galactic nuclei"[VI] defended at the University of Cologne (Germany); advisor: Y. Kovalev; referees: Y. Shao, A. Eckart, J. A. Zensus.
- Measured the frequency-dependent core shift in 20 AGNs using 1.4–15 GHz VLBA observations. This is one of the most comprehensive (in terms of number of sources and frequency coverage) studies of this effect to date.
- Performed regular inspection of *Fermi*/LAT data as a "Flare-Advocate" and coordinated multi-wavelength follow-up of flaring γ-ray sources (mostly blazars) with *Swift* and ground-based facilities. Results reported in a number of ATels.

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.

[IV] see Selected publications
[V] http://webefk.kourovka.ru/lk/
[VI] Electronic copy of the thesis may be found at http://kups.ub.uni-koeln.de/4135/

Most Significant Publications

[1] I. N. Pashchenko, K. V. Sokolovsky, P. Gavras 2018. **Machine learning search for variable stars.** Monthly Notices of the Royal Astronomical Society 475, 2326-2343

[2] K. V. Sokolovsky, A. A. Lebedev 2018. **VaST: A variability search toolkit.** Astronomy and Computing 22, 28-47.

[3] K. V. Sokolovsky, and 22 colleagues 2017. **Comparative performance of selected variability detection techniques in photometric time series data.** Monthly Notices of the Royal Astronomical Society 464, 274-292

[4] K. V. Sokolovsky, and 51 colleagues 2014. **Two active states of the narrow-line gamma-ray-loud AGN GB 1310+487.** Astronomy and Astrophysics 565, AA26

[5] K. Sokolovsky, S. Korotkiy, A. Lebedev 2013. **The New Milky Way: a wide-field survey of optical transients near the Galactic plane.** in proceedings of Stella Novae: Future and Past Decades, P. A. Woudt & V. A. R. M. Ribeiro (eds) 4–8 Feb. 2013, Cape Town, arXiv:1303.3268

Conference presentations (listing most recent)

- **NuSTAR, Swift and XMM-Newton spectroscopy of the brightest gamma-ray nova ASASSN-18fv** – poster at the 17th HEAD meeting, 17-21 March 2019 in Monterey, California, USA
- **Digitized photographic plate photometry with VaST software** – Large surveys with small telescopes: Past, Present, and Future (Astroplate III) 11-13 March 2019 in Bamberg, Germany
- **ASASSN-17gs – awakening of a dormant blazar by a tidal disruption event?** – The 8th OPTICON Gaia Science Alerts workshop, Dec. 6-8 2017, Warsaw, Poland
- **The Hubble Catalog of Variables** – IAUS 339: Southern Horizons in Time-Domain Astronomy, Nov. 13-17 2017, Stellenbosch, South Africa
- **Radio transients investigation with VLBI** – (arXiv:1803.02831) workshop summary at IAUS 339: Southern Horizons in Time-Domain Astronomy, Nov. 13-17 2017, Stellenbosch, South Africa

Research funding

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.