Curriculum Vitae — Artur Avakyan

Personal Info

Name: Artur Avakyan
Current position: Doctoral researcher in Tuebingen University
Address: 72074, Tübingen, Baden-Württemberg, Wilhelmstr. 154
Email: artur.avakyan@astro.uni-tuebingen.de
Phone number: +49 (152) 389 554 09
ORCID: 0000-0001-7502-7951
Web: Personal website, XRBCats, : ScorpionesXone

Research Interests

Machine learning (ML) methods and big data: Use of ML methods for identification of multi-wavelength (MW) counterparts and classification of celestial objects
Accretion in close X-ray binaries (XRBs) and cataclysmic variables: Modeling of accretion process in disks and winds encountered in compact binaries including effects of outflows on compact binaries evolution and their implications on observed properties of XRB population
Observational MWL studies of X-ray sources: Analysis and interpretation of MWL observational data for individual sources and their populations

Scientific Work Experience

Institut für Astronomie und Astrophysik Tübingen **2021 — present time**
Member of the High Energy Astrophysics group, doctoral researcher

Sternberg Astronomical Institute, Moscow State University **2018 — 2021**
Member of the Department of Relativistic Astrophysics, laboratory assistant

Caucasus Mountain Observatory of the SAI MSU **Summer 2017 and 2018**
Specialist student, practice on observatory.

Education

Doctoral researcher (Doktorand) **2021—present time**
Place: Institut für Astronomie und Astrophysik Tübingen, Universität Tübingen, Germany
Topic: Galactic X-ray binaries in eROSITA survey
Advisors: Dr. Victor Doroshenko and Prof. Dr. Andrea Santangelo

Master in physics and astronomy **2015—2021**
Place: Sternberg Astronomical Institute, Moscow State University, Russian Federation
Topic: Simulation of X-ray nova outbursts taking into account outflows from accretion discs
Advisors: Dr. Galina Lipunova and Dr. Konstantin Malanchev

Observational Time

- **PI time:** XMM-Newton — 125 Ks (100 Ks requested in current AO23)
- **co-I time:** NuSTAR — 150 Ks

Honors and Grants

Grant of Russian Science Foundation **2021**
Grant №21-12-00141 on the topic: "Physics of accretion and magnetic fields of neutron stars: transients and evolution", co-I

Scholarship for the advancement of physics «BASIS» **2018 — 2021**
"The influence of the wind of the accretion disk on the evolution of Low-Mass X-ray Binaries"

The Program of development of Moscow State University **2018 — 2020**
Leading Scientific School "Physics of stars, relativistic objects and galaxies", co-I

Teaching and supervision

Courses given (Master/Bachelor students, tutoring and seminars):
"High energy astrophysics", Tuebingen University
"Astronomy & Astrophysics", Tuebingen University
"Laboratory physics practices", Moscow State University

Participation in conferences, schools and workshops

- **FRASCATI WORKSHOP 2023: Multifrequency Behaviour of High Energy Cosmic Sources - XIV (Palermo, 12 — 17 June 2023)**
  "Uncovering X-ray binary population in eROSITA using machine learning methods"
- **The 20th German eROSITA Consortium meeting (Max Planck Institute for Extraterrestrial Physics, Garching, 2 — 5 May, 2023)**
  "An update on XRB candidates identification with eROSITA"
- **ErUM-Data Hub Deep Learning School "Basic Concepts" (Landhaus Nordhelle, Meinerzhagen, 27 February — 2 March, 2023)**
- **The 19th eROSITA-DE Consortium meeting (University of Erlangen-Nuremberg, Bamberg, 2—4 November, 2022)**
  "Welcome to the machine: hunting for XRBs with random forests"
- **The International Annual Meeting of the German Astronomical Society (University of Bremen, Bremen, 12—16 September, 2022)**
  "Two new catalogs of low-mass and high-mass XRBs in the Galaxy"
- **Successes of Russian Astrophysics 2020: Theory and Experiment (Sternberg Astronomical Institute, MSU, Moscow, 18 December, 2020)**
  "Change in the orbital period of the binary system due to the wind from the accretion disk"
  "Simulation of viscous accretion disk outburst"
- **High Energy Astrophysics Today and Tomorrow HEA-2019 (Space Research Institute, RAS, Moscow, 17 — 20 December, 2019)**
  "Simulation of the evolution of the binary system 4U 1543−47 taking into account the thermal wind during the 2002 outburst"
- **High Energy Astrophysics Today and Tomorrow HEA-2018 (Space Research Institute, RAS, Moscow, 18 — 21 December, 2018)**
  "Influence of the wind of the accretion disk on the evolution of flares of low-mass X-ray binaries"
- **Successes of Russian Astrophysics 2018: Theory and Experiment (Sternberg Astronomical Institute, MSU, Moscow, 17 December, 2018)**
  "Evolution of a viscous disk of low-mass X-ray binaries"

- **The multi-messenger astronomy: gamma-ray bursts, search for electromagnetic counterparts to neutrino events and gravitational waves (Special Astrophysical Observatory, RAS, 7 – 14 October, 2018)**
  "Accretion disk wind influence on the evolution of LMXB outburst"

Service

Member of eROSITA_DE consortium (accreting compact objects and follow-up working groups)

Publications

- "XMM-Newton follow-up of two eROSITA XRB candidates"
  Avakyan A., Zainab A., Doroshenko V., Wilms J., Santangelo A., 2024 (submitted)
- "A new Be X-ray Binary eRASS J084850−420035 emerges with eROSITA and NuSTAR"
  Zainab A., **Avakyan A.**, Doroshenko V.,W., et al. 2024 (submitted)
- "The effect of thermal winds on the outbursts evolution of LMXB systems"
  Avakyan A., Lipunova, G., & Malanchev, K. 2024, MNRAS, 527, 3709
- "XRBcats: Galactic Low-Mass X-ray binary catalogue"
  Avakyan A., Neumann M., Zainab A., Doroshenko V., Wilms J., Santangelo A., 2023, A&A, 675, A199
- "XRBcats: Galactic High Mass X-ray Binary Catalogue"
  Neumann M., **Avakyan A.**, Doroshenko V., & Santangelo A., 2023, A&A, 677, A134
- "Change in the Orbital Period of a Binary System Due to an Outburst in a Windy Accretion Disk"
  Avakyan A., Lipunova G. , Malanchev K., Shakura N., 2021, Astron. Lett., 47, 377
- "Influence of accretion disk wind on the evolution of LMXB outburst"
  Avakyan A., Malanchev K., & Lipunova G., 2019, in The MultiMessenger Astronomy: Gamma-Ray Bursts, Search for Electromagnetic Counterparts to Neutrino Events and Gravitational Waves. p. 25—31
- "Modeling outbursts of viscous accretion discs"
  Lipunova, G., Malanchev, K., **Avakyan A.**, et al. 2022, in Astronomy at the Epoch of Multimessenger Studies p. 288—290

References

- Prof. Dr. Andrea Santangelo (santangelo@astro.uni-tuebingen.de, IAAT, Tübingen, Germany)
- Dr. Victor Doroshenko (doroshv@astro.uni-tuebingen.de, IAAT, Tübingen, Germany)