

Hayk Hakobyan

PHD CANDIDATE · PRINCETON UNIVERSITY

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Research interests

Pulsar magnetospheres: particle acceleration in the magnetospheric current sheet, high energy radiation, pair production in the outer magnetosphere.

Black-hole accretion disk coronae: hard state of X-ray binaries, generation, evolution and reconnection of magnetic loops in disk coronae.

Magnetic reconnection: acceleration mechanisms, effects of QED phenomena (radiation, pair production, Compton scattering) on reconnection dynamics, emission signatures of reconnecting systems.

Skills

Programming C/C++, Fortran, python, CUDA

Visualization matplotlib (python), mayavi (python), d3js (javascript)

Plasma simulations particle-in-cell (**Tristan-MP**, **Tristan-MP v2***), force-free (**Tristan-ff***, **CoffeeGPU**), MHD/hybrid (**Athena++**, **Pegasus**)

[*] marks codes I developed

Education

Princeton University

PH.D. IN ASTROPHYSICS (5TH YEAR, ADVISOR: ANATOLY SPITKOVSKY)

Princeton NJ, USA

2016 - present

Princeton University

M.A. IN ASTROPHYSICS

Princeton NJ, USA

2016 - 2018

Moscow Institute of Physics and Technology, Lebedev Physical Institute

M.S. IN THEORETICAL PHYSICS (ADVISOR: VASILY BESKIN)

Moscow, Russia

2014 - 2016

Moscow Institute of Physics and Technology

B.S. IN PHYSICS (WITH HONORS, ADVISOR: VASILY BESKIN)

Dolgoprudnyy, Russia

2010 - 2014

Publications

Secondary energization in compressing plasmoids during magnetic reconnection

Hakobyan, H., PETROPOULOU, M., SPITKOVSKY, A., SIRONI, L.

Submitted to ApJ (arXiv:2006.12530)

2020

Effects of synchrotron cooling and pair production on collisionless relativistic reconnection

Hakobyan, H., PHILIPPOV, A., SPITKOVSKY, A.

ApJ 877, 53

2019

On the mean profiles of radio pulsars - II. Reconstruction of complex pulsar light curves and other new propagation effects

Hakobyan, H., BESKIN, V., PHILIPPOV, A.

MNRAS 469, 2704

2017

On the light-curve anomalies of radio pulsars.

Hakobyan, H., PHILIPPOV, A., BESKIN, V., GALISHNIKOVA, A., NOVOSELOV, E., RASHKOVETSKYI, M.

JPCS 012018

Sep. 2015 - May 2016

The shapes of pulsar radio pulses in the plane of the sky

Hakobyan, H., BESKIN, V.

Astronomy Reports 58, 889

2014

Constraining new fundamental physics with multiwavelength astrometry

EGOROV, P., GUZININ, M., Hakobyan, H., TROITSKY, S.

MNRAS 437, L90

2014

Talks and posters

Remote Thunch seminar

PRINCETON UNIVERSITY

Princeton, USA

Apr. 2020

DPP 2019 (poster)

AMERICAN PHYSICAL SOCIETY

Ft. Lauderdale FL, USA

Nov. 2019

Multiscale Phenomena in Plasma Astrophysics workshop

KAVLI INSTITUTE FOR THEORETICAL PHYSICS

Santa Barbara CA, USA

Oct. 2019

Magnetospheres of Neutron Stars and Black Holes (invited talk)

NASA GODDARD SPACE FLIGHT CENTER

Greenbelt MD, USA

Jun. 2019

Thunch seminar

PRINCETON UNIVERSITY

Princeton NJ, USA

Nov. 2018

Eighth International Fermi Symposium (poster)

NASA

Baltimore MD, USA

Oct. 2018

Workshop on Relativistic Plasma Astrophysics (poster)

PURDUE UNIVERSITY

West Lafayette IN, USA

May 2018

Talks and posters at various international conferences in Russia

HIGH ENERGY ASTROPHYSICS (2013, 2014, 2015), INTERGALACTIC RADIOWAVE ASTRONOMY CONFERENCE (2014, 2015), NEUTRON STARS INTERNATIONAL CONFERENCE (2014)

Russia

2014 - 2015

Teaching and mentorship

Co-advisor

FOR EMMANUEL ANEKE (SIMONS-NSBP SCHOLARS PROGRAM), CO-ADVISED WITH ALEXANDER PHILIPPOV AND BART RIPPERDA

Remote

Jul. 2020 - Aug. 2020

Co-advisor

FOR ALISA GALISHNIKOVA (UNDERGRADUATE IN MIPT, NOW GRADUATE STUDENT AT PRINCETON), CO-ADVISED WITH VASILY BESKIN AND ALEXANDER PHILIPPOV

Remote

Sep. 2018 - May 2019

Teaching assistant

AST 203 COURSE AT PRINCETON UNIVERSITY

Princeton NJ, USA

Feb. 2018 - May 2018

Computer science teacher

INTEGRATION XXI (INTERNATIONAL BACCALAUREATE)

Moscow, Russia

Sep. 2015 - May 2016

Community engagement

2017-2018 **Organizer**, Thunch seminar in the Astrophysics Dept of Princeton

Princeton NJ, USA

2018+ **Referee**, for ApJ, MNRAS and JPP

Remote

2020+ **Member**, international team of experts of the Science Committee of Armenia

Remote

2014-2016 **Science reporter**, various pop-science and non-scientific magazines

Russia

2013-2015 **Organizer**, undergraduate physics seminar in the Moscow Institute of Physics and Technology

Russia