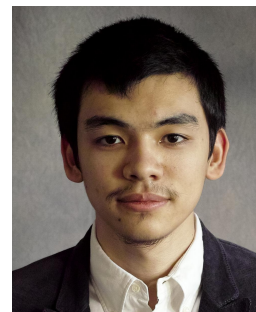


Sasha (Alexander A.) Kaurov, Ph.D

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Interdisciplinary researcher with 10+ years of experience in astronomy, astrophysics and cosmology, and 2+ years in sociology. Interested in meaningful incorporation of novel technology into education and science outreach.

20+ published research papers ([Google scholar](https://scholar.google.com/citations?user=Kaurov)).



PROFESSIONAL EXPERIENCE

Harvard University

Research Associate, History of Science

Boston, MA

March 2022 — Present

Dean's Competitive Fund for Promising Scholarship, PI Naomi Oreskes

- Working paper: Evaluating the discussion of climate change by religious leaders in the USA by collecting and analyzing publicly available sermons recordings from thousands of churches.
- Led the project "Trends in American scientists' political donations and implications for trust in science" in collaboration with V. Cologna, C. Tyson, and N. Oreskes, published in Nature's [Humanities and Social Sciences Communications 9, 368 \(2022\)](#)

Columbia University

Summer lecturer

New York, NY

July 2022 — August 2022

- Led a 30-hour course on "The Origins of the Universe" for 20 high school students.

Blue Marble Space Institute of Science

Research Associate

Seattle, WA

November 2021 — Present

Notable project:

- "Simulations of ^{60}Fe entrained in ejecta from a near-Earth supernova: Effects of observer motion"
E. Chaikin, A. Kaurov, B. D. Fields, C. A. Correa [MNRAS, Volume 512, Issue 1, Pages 712–727 \(2022\)](#)

The Institute for Advanced Study

Visitor, Interdisciplinary Program

Princeton, NJ

September 2016 — July 2021

Postdoctoral member, School of Natural Sciences

September 2021 — Present

Selected projects:

- "Highly Magnified Stars in Lensing Clusters: New Evidence in a Galaxy Lensed by MACS J0416.1-2403"
A. Kaurov, L. Dai, T. Venumadhav, J. Miralda-Escudé, B. Frye, [The Astrophysical Journal 880 \(1\), 58 \(2019\)](#)
- "Implication of the Shape of the EDGES Signal for the 21 cm Power Spectrum" A. Kaurov, T. Venumadhav, L. Dai, M. Zaldarriaga [The Astrophysical Journal Letters, Volume 864, Issue 1, article id. L15, 5 pp. \(2018\)](#)

Fermilab

Research Assistant, Astrophysics group

Batavia, IL

September 2012 — July 2013

- "Cosmic Reionization On Computers II. Reionization History and Its Back Reaction on Early Galaxies"
N. Gnedin, A. Kaurov [The Astrophysical Journal, Volume 793, Number 1 \(2014\)](#)

The University of Chicago

Research assistant

Chicago, IL

September 2013 — July 2016

Teaching assistant

September 2011 — July 2012

EDUCATION

The University of Chicago

Ph.D. in Astronomy and Astrophysics — scientific advisor Nickolay Gnedin

Chicago, IL

June 2016

The Saint-Petersburg's Polytechnic University

B.Sc. in Nuclear Astrophysics

Saint-Petersburg, Russia

June 2011

COMMUNITY SERVICE / NON-PROFIT

Earthlings Hub (earthlingshub.org)

March 2022 — Present

co-Founder

Founded in March 2022, Earthlings Hub addresses the educational needs of families and orphanages displaced by the war in Ukraine. More than a hundred scientists, teachers, and psychologists collaborate to offer students a balancing and enriching inquiry-based educational program going beyond the standard school curriculum and incorporating exposure to scientific research. Earthlings Hub is administered by US-based international 501(c)(3) non-profit Blue Marble Space.

The Science Mentors (thesciencementors.com)

2020 — Present

co-Founder

Co-developed scientific programming and built infrastructure to individually match 300+ mentee-mentor pairs of early career scientists from Eastern Europe.

Miscellaneous:

- The National Aeronautics and Space Administration (NASA) grant review panelist.
- Referee for Monthly Notices of the Royal Astronomical Society.

SCIENCE OUTREACH AND TECHNOLOGY

OmniScope (omniscopescope.org)

June 2020 — Present

Founder

Utilizing new technologies, such as artificial intelligence and virtual worlds, to educate and communicate about science in the most meaningful and transformative ways. Selected projects:

- Science communication in the shared virtual worlds. Established collaborations and produced immersive virtual reality shows with the Japanese Space Exploration Agency, the Earth Life Science Institute (ELSI, Tokyo Institute of Technology) and Nautilus magazine. Performed talent search, acquisition and directed these projects. — omniscopescope.org/virtual-worlds
- Online immersive theater show En Route. Co-produced a 2D web-based sci-fi show with leading online immersive theater specialists. Role: science consultant and technology development. — EnRoute.space

MENTORSHIP AND LEADERSHIP

Academic:

- Served as the primary scientific advisor of five undergraduate students, who later received M.Sc. fellowships in Germany and Switzerland and later pursued Ph.D. programs.
- Mentored graduate student from Princeton University.
- Mentored undergraduate interns from Harvard University.

Outside of academia:

- Established the processes in the non-profit organizations with 100+ members.

REFERENCES

Academic:

- **Naomi Oreskes**, professor of the History of Science and Affiliated Professor of Earth and Planetary Sciences at Harvard University oreskes@fas.harvard.edu
- **Matias Zaldarriaga**, professor at the Institute for Advanced Study matiasz@ias.edu

Teaching, education and outreach:

- **Julia Turchaninova**, professor at North Houston Early College, former vice-dean of the Russian's Academy for Educators' In-Service Training yturchan@gmail.com
- **Piet Hut**, professor of Interdisciplinary Studies at the Institute for Advanced Study pjet@ias.edu

FULL LIST OF PROJECTS AND PUBLICATIONS

Computational sociology:

- Trends in American scientists' political donations and implications for trust in science [1]
- Commute accessibility of planetariums in the United States [2]

Astronomy, astrophysics and cosmology:

- Adapting techniques inspired by machine learning methods for mapping and detection of extragalactic hydrogen [3,4]
- Numerical modeling for statistical description of photon-hydrogen scattering in turbulent media [5]
- Time-series image analysis for capturing rear gravitational lensing events [6–8]
- Statistical properties of spatial distribution of dust particles in hydrodynamical simulations of dust-gas mixtures [9]
- Simulation of supernova ejecta of heavy ^{60}Fe isotope found on Earth [10]
- Statistical properties of the Large Scale Structure of the universe derived from the basic principles [11]
- Spatial statistical properties of early universe as an evidence of early heating of the universe and its physical origin [12,13]
- Statistical anomalies of merging galaxies observed by the Hubble Space Telescope [14]
- Numerical and analytical modeling and the statistical description of the early universe [15–20]
- Numerical modeling of neutron stars [21–23]
- Numerical modeling of dark matter annihilation and its effect on the universe [24,25]

1. Kaurov AA, Cologna V, Tyson C, Oreskes N. Trends in American scientists' political donations and implications for trust in science. *Humanit Soc Sci Commun*. 2022;9: 368. doi:10.1057/s41599-022-01382-3
2. Kaurov AA, Bazhenov V, SubbaRao M. Planetarium commute accessibility in the United States of America. *Authorea Preprints*. 2021.
3. Greig B, Ting YS, Kaurov AA. Exploring the cosmic 21-cm signal from the epoch of reionization using the wavelet scattering transform. *Mon Not R Astron Soc*. 2022. Available: <https://academic.oup.com/mnras/article-abstract/513/2/1719/6565815>
4. Greig B, Ting Y-S, Kaurov AA. Detecting the non-Gaussianity of the 21-cm signal during reionisation with the Wavelet Scattering Transform. *arXiv [astro-ph.CO]*. 2022. Available: <http://arxiv.org/abs/2207.09082>
5. Munirov VR, Kaurov AA. Influence of turbulence on Lyman-alpha scattering. *arXiv [astro-ph.GA]*. 2022. Available: <http://arxiv.org/abs/2208.13103>
6. Dai L, Venumadhav T, Kaurov AA, Miralda-Escude J. Probing Dark Matter Subhalos in Galaxy Clusters Using Highly Magnified Stars. *The Astrophysical Journal*. 2018. p. 24. doi:10.3847/1538-4357/aae478
7. Kaurov AA, Dai L, Venumadhav T, Miralda-Escudé J, Frye B. Highly Magnified Stars in Lensing Clusters: New Evidence in a Galaxy Lensed by MACS J0416.1-2403. *The Astrophysical Journal*. 2019. p. 58. doi:10.3847/1538-4357/ab2888
8. Dai L, Kaurov AA, Sharon K, Florian M. Asymmetric surface brightness structure of caustic crossing arc in SDSS J1226+ 2152: a case for dark matter substructure. *Mon Not R Astron Soc*. 2020. Available: <https://academic.oup.com/mnras/article-abstract/495/3/3192/5837590>
9. Steinwandel UP, Kaurov AA, Hopkins PF, Squire J. On the optical properties of resonant drag instabilities: variability of asymptotic giant branch and R Coronae Borealis stars. *Mon Not R Astron Soc*. 2022;515: 4797–4809. doi:10.1093/mnras/stac2035

10. Chaikin E, Kaurov AA, Fields BD. Simulations of ^{60}Fe entrained in ejecta from a near-Earth supernova: effects of observer motion. *Mon Not R Astron Soc.* 2022. Available: <https://academic.oup.com/mnras/article-abstract/512/1/712/6524879>
11. Ivanov MM, Kaurov AA. Non-perturbative probability distribution function for cosmological counts in cells. *J Cosmol.* 2019. Available: <https://iopscience.iop.org/article/10.1088/1475-7516/2019/03/009/meta>
12. Venumadhav T, Dai L, Kaurov A, Zaldarriaga M. Heating of the intergalactic medium by the cosmic microwave background during cosmic dawn. *Phys Rev D Part Fields.* 2018. Available: <https://journals.aps.org/prd/abstract/10.1103/PhysRevD.98.103513>
13. Kaurov AA, Venumadhav T, Dai L. Implication of the Shape of the EDGES Signal for the 21 cm Power Spectrum. *Astrophys J.* 2018. Available: <https://iopscience.iop.org/article/10.3847/2041-8213/aada4c/meta>
14. Chaikin EA, Tyulneva NV, Kaurov AA. Observing galaxy mergers at the epoch of reionization. *Astrophys J.* 2018. Available: <https://iopscience.iop.org/article/10.3847/1538-4357/aaa196/meta>
15. Kaurov AA. On improving analytical models of cosmic reionization for matching numerical simulation. *Astrophys J.* 2016. Available: <https://iopscience.iop.org/article/10.3847/0004-637X/831/2/198/meta>
16. Kaurov AA, Gnedin NY. Cosmic Reionization On Computers. Mean and fluctuating redshifted 21 cm signal. *Astrophys J.* 2016. Available: <https://iopscience.iop.org/article/10.3847/0004-637X/824/2/114/meta>
17. Kaurov AA, Gnedin NY. Cosmic reionization on computers. III. The clumping factor. *Astrophys J.* 2015. Available: <https://iopscience.iop.org/article/10.1088/0004-637X/810/2/154/meta>
18. Gnedin NY, Kaurov AA. Cosmic reionization on computers. ii. reionization history and its back-reaction on early galaxies. *Astrophys J.* 2014. Available: <https://iopscience.iop.org/article/10.1088/0004-637X/793/1/30/meta>
19. Kaurov AA, Gnedin NY. Recombination clumping factor during cosmic reionization. *Astrophys J.* 2014. Available: <https://iopscience.iop.org/article/10.1088/0004-637X/787/2/146/meta>
20. Kaurov AA, Gnedin NY. Effect of halo bias and Lyman Limit Systems on the history of cosmic reionization. *Astrophys J.* 2013. Available: <https://iopscience.iop.org/article/10.1088/0004-637X/771/1/35/meta>
21. Chaikin EA, Kaurov AA, Kaminker AD. Neutron stars with variable internal heaters. *EPL (Europhysics).* 2017. Available: <https://iopscience.iop.org/article/10.1209/0295-5075/117/29001/meta>
22. Popov SB, Kaurov AA, Kaminker AD. Central compact objects in Kes 79 and RCW 103 as “hidden” magnetars with crustal activity. *Publications of the.* 2015. Available: <https://www.cambridge.org/core/journals/publications-of-the-astronomical-society-of-australia/article/central-compact-objects-in-kes-79-and-rcw-103-as-hidden-magnetars-with-crustal-activity/5668F1C9E84D73BDF994F3AE58DB2FCC>
23. Kaminker AD, Kaurov AA, Potekhin AY. Thermal emission of neutron stars with internal heaters. *Mon Not R Astron Soc.* 2014. Available: <https://academic.oup.com/mnras/article-abstract/442/4/3484/1357581>
24. Kaurov AA, Hooper D, Gnedin NY. The effects of Dark Matter annihilation on cosmic reionization. *Astrophys J.* 2016. Available: <https://iopscience.iop.org/article/10.3847/1538-4357/833/2/162/meta>
25. Kaurov AA. Energy Dissipation of Energetic Electrons in the Inhomogeneous Intergalactic Medium during the Epoch of Reionization. *Astrophys J.* 2016. Available: <https://iopscience.iop.org/article/10.3847/0004-637X/824/2/97/meta>