Sabina Sagynbayeva

Curriculum Vitae

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RESEARCH INTERESTS

I am an astrophysicist, who primarily works on the past, present, and future of exoplanets – I study planetary dynamics and planet formation to understand the architecture of exoplanets. In the meantime, I also work on stars that host those exoplanets and stellar characterization by studying their surface activity using the time-series data from *Kepler* and *TESS* telescopes. I am broadly interested in general analytical techniques, astro-statistics, and numerical simulations.

EDUCATION

2021 - PRESENT **PhD:** Physics (Astrophysics)
Stony Brook University, Stony Brook, NY

2021 - 2023 **MA:** Physics (Astrophysics)
Stony Brook University, Stony Brook, NY

2016 – 2020 **Bachelor of Science:** Physics
Minor: Mathematics, Literature
Nazarbayev University, Astana, Kazakhstan

RESEARCH POSITIONS

JAN 2025 – JUN 2025 (FT)

Kavli Institute for Theoretical Physics

Advisors: Dr. Lars Bildsten, Dr. Omer Blaes
Guest Researcher and KITP Grad Fellow

CURRENT, FROM FEB 2021 (FT)

Stony Brook University and Flatiron Institute

Advisors: Dr. Phil Armitage, Dr. Will Farr
Research Project Assistant and Guest Researcher at CCA

JUN 2020 – AUG 2020 (FT)

Nazarbayev University

Advisor: Dr. Daniele Malafarina
Research Assistant

MAY 2019 – AUG 2019 (FT)

University of Cambridge

Advisors: Dr. Roman Rafikov, Dr. William Béthune
Research Intern

AUG 2018 – DEC 2019 (PT)

Nazarbayev University

Advisors: Dr. Ernazar Abdikamalov, Dr. Dana Alina
Research Assistant

PUBLICATIONS: 1ST/2ND AUTHOR

15. **Sabina Sagynbayeva** et al. "Occurrence Rates Based on Chemical Abumdances of K2 Planets." *In prep*.

14. **Sabina Sagynbayeva** et al. "Rotation Periods for Stars in Open Cluster NGC 6819 From Kepler Light Curves." *In prep*.

13. **Sabina Sagynbayeva** et al. "Polka-dotted Stars II: Starspost and Obliquities of HAT-P-11, Kepler-17, Kepler-45, Kepler-63." *In prep*.

12. **Sabina Sagynbayeva** et al. "Polka-dotted Stars: a Hierarchical Model for Mapping Stellar Surfaces Using Occultation Light Curves." *ApJ* (2025).

11. **Sabina Sagynbayeva** et al. "Requirements for Joint Orbital Characterization of Cold Giants and Habitable Worlds with Habitable Worlds Observatory." *AJ* (2025).

10. **Sabina Sagynbayeva** et al. "Circumplanetary Disks are Rare around Planets at Large Orbital Radii: A Parameter Survey of Flow Morphology around Giant Planets." *ApJ* (2025).

9. Daniele Malafarina, **Sabina Sagynbayeva**. "What a difference a quadrupole makes?" *General Relativity and Gravitation* (2021).

PUBLICATIONS: NTH AUTHOR

8. Elisabeth Newton et al. [including **S. Sagynbayeva**]. "The role of stellar multiplicity in the prevalence of small, cool planets" *In prep* (2025).

7. Thayne Currie et al. [including **S. Sagynbayeva**]. "SCExAO/CHARIS and Gaia Direct Imaging and Astrometric Discovery of a Superjovian Planet 3-4 λ/D from the Accelerating Star HIP 54515" *In review* (2025).

6. Courtney Dressing et al. [including **S. Sagynbayeva**]. "Scientific Discovery Space for the Habitable Worlds Observatory." *In review* (2025).

5. Sarah Blunt et al. [including **S. Sagynbayeva**]. "A Statistical Method for Constraining the Capability of the Habitable Worlds Observatory to Understand Ozone Onset Time in Earth Analogs." *JATIS* (2025).

4. Rachel B. Fernandes et al. [including **S. Sagynbayeva**]. "Signatures of Atmospheric Mass Loss and Planet Migration in the Time Evolution of Short-Period Transiting Exoplanets." *The Astronomical Journal* (2025).

3. Briley Lewis et al. [including **S. Sagynbayeva**]. "Exploring the Effects of Astrobites Lesson Plans on Undergraduate Astronomy Students." *Physical Review Physics Education Research* (2025).

2. Thayne Currie et al. [including **S. Sagynbayeva**]. "Direct Imaging and Astrometric Discovery of a Superjovian Planet Orbiting an Accelerating Star." *Science* (2023).

1. D. Alina et al. [including **S. Sagynbayeva**]. "Large-scale magnetic field in the Monoceros OB-1 East molecular cloud." *Astronomy & Astrophysics* (2020).

AWARDS, GRANTS, & FELLOWSHIPS

2024-2025

KITP Graduate Fellowship

I was selected for the opportunity for advanced physics doctoral students to spend a minimum period of 5 months at the Kavli Institute for Theoretical Physics.

2024

Peter Kahn Prize

An award for "outstanding research" for which I was nominated by my academic advisor.

2023

The Other Worlds Laboratory Exoplanet Summer Program

I was selected for the program that allows to visit UC Santa Cruz for three weeks to work on a project with an UCSC faculty.

2023 – 2024

Frontera Computational Science Fellowship

1-year fellowship for graduate students with an opportunity to compute on Frontera.

2022 – 2024

LSSTC Data Science Fellowship Program

I was selected for the program that consists of six week-long sessions on data science.

2020

Young Researchers Alliance FRIP program

The stipend awarded to students for research projects. Stipend: $1,000

2019

Yessenov Foundation Scholarship

Awarded to ten best students from Kazakhstan for a research internship in the US and European universities and laboratories. Funding: $7,500

SELECTED INVITED (16) & CONFERENCE TALKS

Exoplanet seminar, Space Telescope Science Institute	Dec 2025
Carnegie EPL Astronomy Seminar, Carnegie Institution for Science	Oct 2025
Stars & Planets workshop, MIT	Aug 2025
Exoplanets group meeting, Princeton University	Jun 2025
Exoplanets group meeting, Queen Mary University, London, UK	Jun 2025
Dynamix Conference, Cambridge, UK	Jun 2025
56th DDA meeting, Atlanta, Georgia	May 2025
Planet Formation and Migration near the Inner Edge of Disks, KITP Program	Apr 2025
A&A Journal Club Talk, University of California San Diego	Apr 2025
AstroLunch seminar talk, University of California Santa Barbara	Mar 2025
PLUNCH seminar talk, University of California Santa Cruz	Mar 2025

KITP Local's Lunch, KITP — Feb 2025

Planet Formation group meeting, Flatiron Institute (CCA) — Feb 2025

MAPL Lab Group Meeting, University of California Santa Barbara — Feb 2025

Planet Formation group meeting, Flatiron Institute (CCA) — Oct 2024

Frontera Talk, Texas Advanced Computing Center — May 2024

New York Area Exoplanets Meeting (NYAEM) 2024 — May 2024

Lunch Talk, Columbia University — Feb 2024

Bay Area Exoplanet Meeting 44, University of California Santa Cruz — Jul 2023

University of California Santa Barbara — Jul 2023

OWL talk, University of California Santa Cruz — Jul 2023

StanCon 2023, Washington University in St. Louis — Jun 2023

Athena++ workshop, Flatiron Institute (CCA) — May 2023

Gravitational Waves group meeting, Flatiron Institute (CCA) — Oct 2022

Seminar, University of Kansas — May 2022

TEACHING APPOINTMENTS

MAY 2023 – JUL 2023

Teaching Assistant
Course: Classical Physics Lab
Department of Physics & Astronomy, Stony Brook University

MAR 2022 – APR 2022

Group Project Leader
Women in Science and Engineering program
Stony Brook University

AUG 2021 – DEC 2021

Teaching Assistant
Course: Introduction to Planetary Sciences
Department of Physics & Astronomy, Stony Brook University

JAN 2017 – JAN 2019

Tutor of Mathematics
Courses: Calculus I,II,III, Linear Algebra, Ordinary Differential Equations, Real Analysis
Department of Mathematics, Nazarbayev University

ACADEMIC LEADERSHIP AND SERVICE

MAY 2024 –

Steering Committee Member
NASA HWO Demographics and Architectures Sub-WG

OCT 2023

Executive Secretary
NASA Astrophysics Theory Program (ATP)

SEP 2021 – MAY 2023

Senator for the Department of Physics & Astronomy, Member of the Graduate DEI Committee
Graduate Student Organization, Stony Brook University

JUN 2021 – JUN 2022

Underclass person-at-large & Director of External Affairs
Physics Graduate Student Association, Department of Physics & Astronomy, Stony Brook University

SEP 2017 – MAY 2020

Physics Department Representative
Student Council of Nazarbayev University

SELECTED OUTREACH : WATCHABLE TALK

MAR 2023

Outreach talk: The formation of gas giants
iTelescope Webinar Series

AUG 2022

Outreach talk: Oceans in the Solar System
Astronomy on Tap, New York City

APR 2021

Outreach talk: How do planets form?
Astronomy on Tap, Baton Rouge

JAN 2021 – JAN 2023

Writer for Astrobites.org

A website where graduate students publish daily summaries of recent papers on astro-ph.
I also chaired the Advertising and Undergraduate Committees.

APR 2018 – MAY 2020

President of the Women in Physics Club

Nazarbayev University

OCT 2017 – SEP 2020

Organizer at the "Education for all" center

An organization that helps children with mental and physical disabilities.
I organized the first three inclusive musical theatre performances in Kazakhstan

COMPUTATIONAL SKILLS

PROGRAMMING / MARKUP LANGUAGES	Python, Julia, C/C++, IDL, HTML, JavaScript, Mathematica, LaTeX
STATISTICAL SKILLS	Hierarchical Bayesian Models, Gaussian Processes, MCMC sampling
HYDRO CODES	Athena++, PLUTO
N-BODY CODES	REBOUND
FRAMEWORKS / TOOLS	git, GitHub, ds9, Slurm
SUPERCOMPUTING CLUSTERS	*seawulf* at SBU, *Frontera* at the Texas Advanced Computing Center, *rusty* at Flatiron Institute