

Nazar Budaiev

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Education

Ph.D. in Astronomy, University of Florida Expected 2025
M.S. in Astronomy, University of Florida August 2022
B.A. in Astronomy and Physics, Boston University May 2020

Research Experience

Graduate Student, University of Florida Fall 2020 - present
- Catalog water masers in a massive star forming cloud Sagittarius B2. Describe the 3D kinematics of the cloud.
- Complete quality assessment of incoming data and analyse spatial distribution of prestellar cores in ACES – a large ALMA survey covering the Central Molecular Zone (CMZ); an international collaboration of over 90 people.
- Cataloged 410 protostellar cores in a star forming cloud Sagittarius B2 using ~500 AU resolution ALMA data. Discovered that all observed sources are optically thick, rotationally supported Stage 0/I Young Stellar Objects. Derived source masses and obtained the Core Mass Function and Star Formation Rate. [Paper](#) accepted September 2023.

Research Assistant, BU Astronomy Department Fall 2018 - Summer 2020
- Developed IDL code to analyze performance of new VEGAS receiver on Green Bank Telescope when measuring high energy level transitions.
- Examined and tested IDL code for modeling HI clouds in Milky Way interstellar medium.

Summer Student, Green Bank Observatory Summer 2019
- Crafted a 6 GHz continuum map of inner Galactic Plane with IDL and Python using data from the GBT Diffuse Ionized Gas Survey (GDIGS).

Teaching Experience

Graduate student instructor, Astronomy Laboratory, UF Fall 2020 - Spring 2021
- Taught an undergraduate non-major laboratory course. Recorded videos of labs to facilitate remote learning. Redesigned several outdated experiments.

Teaching Assistant, Stellar and Galactic Astrophysics, BU Spring 2020
- Assisted students in an IDL programming heavy course.

Teaching Assistant, Project Accelerate, BU Fall 2018 - Spring 2020

- Lead lab section of Advanced Placement physics course for underserved students. Developed and organized review sheets for each module of the course as a personal project.

Camp Mentor, Physics Inspiring the Next Generation, GBO Summer 2019
 - Mentored 9th graders from underrepresented groups that worked on a research project for 2 weeks.

Learning Assistant, General Physics I, BU Fall 2017 - Spring 2018
 - Facilitated students in various activities to succeed in introductory physics courses.

Awards

Certificate of Outstanding Merit, for exemplary academic achievements, a wide range of accomplishments, and contributions to UF and the community among international students. Fall 2023

Astro Department Award for Distinguished Service & Citizenship, for outreach work on improving astronomy education in Ukraine and writing webinars for astronomy enthusiasts. Fall 2022

Student Observing Support (SOS) ALMA Cycle 8, \$34,955 Fall 2021

Undergraduate Research Award, for the work studying the physical properties and global distribution of diffuse ionized gas in the interstellar medium of the Milky Way Galaxy. May 2020

Dean's List 2017, Fall 2018

Outreach

Webinar Writer, Website Editor, AstroSandbox Summer 2020 - present
 - Compose study materials for Ukrainian students interested in astronomy. Promote and improve the level of astronomy education in Ukraine. Maintain English version of the website.
 - Wrote and delivered four webinars: [Python in astronomy](#), [Astronomical image processing](#), [Multiwavelength astronomy](#), [Radio astronomy](#).

Co-organizer and Judge, Astronomy Battles August 2020 - 2023
 - Served as a judge in the annual astrophysics [team competition](#) with 50 participants from 15 regions of Ukraine. Wrote several national-level difficulty problems for the competition.

Mentoring committee, UF Astronomy Department Fall 2021 - Spring 2023
 - Serve as a graduate student representative. Share anonymized students' mentoring needs with the committee. Gather students' opinions on proposed changes.

Pen Pal, Letters to a Pre-Scientist Fall 2021 - Spring 2021
 - Correspond with a high-school student via physical mail throughout a year.

Mentor, Ukraine Global Scholars Spring 2020 - Spring 2022
 - Assist promising Ukrainian students to get into the world's best universities.
 - Mentored two high-school students through weekly meetings. Both students were accepted to several of the top 20 US boarding schools.

Visiting astronomer, Littlewood Elementary September 2021

Conferences and Workshops

Surveying the Milky Way , Pasadena, CA	October 2023
19th Synthesis Imaging Workshop , Charlottesville, VA	June 2023
Protostars and Planets VII , Kyoto, Japan	April 2023
From Stars to Galaxies II , Gothenburg, Sweden	June 2022
Seeing the Future , Portsmouth, NH	April 2022
Star Formation School , Granada, Spain	November 2021
GBT Remote Observer Certification , Green Bank Obs., WV	September 2021
Single Dish School , Green Bank Obs., WV	September 2021
ISM 2021 , Beirut, Lebanon (virtual)	April 2021

Publications

Papers

1. **N. Budaiev**, A. Ginsburg, D. Jeff, C. Goddi, F. Meng, Á. Sánchez-Monge, P. Schilke, A. Schmiedeke, and T. Yoo *Protostellar cores in Sagittarius B2 N and M*, September 2023, [arXiv:2309.14407](#).
2. D. Jeff, A. Ginsburg, A. Bulatek, **N. Budaiev**, Á. Sánchez-Monge, M. Bonfand, C. Battersby, F. Meng, P. Schilke, and A. Schmiedeke. *Thermal Properties of the Hot Core Population in Sagittarius B2 Deep South*, 2023, *subm.*
3. Y. T. Yan, C. Henkel, K. M. Menten, Y. Gong, H. Nguyen, J. Ott, A. Ginsburg, T. L. Wilson, A. Brunthaler, A. Belloche, J. S. Zhang, **N. Budaiev**, and D. Jeff, *Discovery of non-metastable ammonia masers in Sagittarius B2*, October 2022, [2022A&A...666L..15Y](#).
4. F. Meng, Á. Sánchez-Monge, P. Schilke, A. Ginsburg, C. DePree, **N. Budaiev**, D. Jeff, A. Schmiedeke, A. Schwörer, V. S. Veena, and Th. Möller, *The physical and chemical structure of Sagittarius B2 VI. UCHii regions in Sgr B2*, August 2022, [2022arXiv220807796M](#).

Talks and Posters

“Protostellar cores in Sagittarius B2 N and M,” [Contributed talk](#). Surveying the Milky Way: The Universe in Our Own Backyard, Pasadena, CA, October 2023

“A 500 AU resolution census of protostellar cores in the giant molecular cloud Sagittarius B2,” [Poster](#). PPVII, Kyoto, Japan, April 2023

“A 500 AU resolution census of pre- and protostellar cores in the giant molecular cloud Sagittarius B2,” [Poster](#). From Stars to Galaxies II, Gothenburg, Sweden, June 2022

“A 500 AU resolution census of pre- and protostellar cores in the giant molecular cloud Sagittarius B2,” [Poster](#). Seeing the Future, Portsmouth, NH, April 2022.

“A 6 GHz Continuum Map of the Inner Galactic Plane with the Green Bank Telescope,” [Poster](#). AAS 235th Meeting, Hawaii, January 2020.

"A 6 GHz Continuum Map of the Inner Galactic Plane with the Green Bank Telescope,"
Talk. Astronomy Undergraduate Research Symposium, Boston University, October 2019.

"Simulation Proposal for Fluids Lab." Poster. Learning Assistant Poster Session, Boston University, December 2017.

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