Saiyang Zhang

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Education

2020 - present **University of Texas at Austin, TX**
Ph.D. candidate in Physics
Cumulative GPA: 3.84.

2015 - 2019 **Colgate University, NY**
B.A., Astronomy/Physics with honors, 2019.
B.A., Applied Mathematics, 2019.
Cumulative GPA: 3.77, Major GPA: 3.86 and 3.93.

Research

2022–current **University of Texas at Austin, Advisor: Volker, Bromm**
Project: *Imprints of the Primordial Black Holes over Cosmic History*

2021–2024 **University of Texas at Austin, Advisor: Katherine, Freese**
Project: *Detection of the Dark Stars by JWST/Roman Telescopes*

2018–2020 **Colgate University, Advisor: Cosmin, Ilie**
Project: *Dark Matter Capture by Massive Objects*

2017 **Colgate University, Advisor: Enrique, Galvez**
Project: *Polarization of Gaussian Beams*

2016 **Colgate University, Advisor: Thomas, Balonek**
Project: *Optical Variability of Quasars*

Languages & Skills

Languages Chinese (native), English (advanced), Japanese(elementary)

Programming Highly Proficient: Python, C/C++, R, MATLAB, LaTeX, Mathematica
Proficient: Bash, Fortran

Associations

2016- **American Physical Society (APS)**
2015-2019 **American Mathematical Society (AMS)**

Presentation

May 2024 **First Stars VII, Flatiron Institute, NY**
Title: *How do Primordial Black Holes change the Structure Formation?*

April 2024 **Physics Seminar (Invited), Colgate University, Hamilton, NY**
Title: *My Journey through Dark Matter and Early Universe*

December 2023 **Texas Symposium on Relativistic Astrophysics**
Tsung-Dao Li Institute, SJTU, Shanghai, China
Title: *Imprints of the Primordial Black Holes over Cosmic History*

April 2022 **APS April Meeting, New York City, NY**
Title: *Detection of Super Massive Dark Stars by the Roman Space Telescope*

June 2019 **Symposium in Honor of the Legacy of Vera Rubin**
Georgetown University, Washington DC
Title: *Multi-scatter Capture of Superheavy Dark Matter by Pop.III Stars*

March 2019 **Rochester Symposium for Physics Students: SPS Regional Meeting**
University of Rochester, Rochester, NY
Title: *Multi-scatter Capture of Superheavy Dark Matter by the First Stars*

2018 **The International Society for Optics and Photonics(SPIE): SPIE OPTO**
San Francisco, CA
Title: *Multitwist Mobius polarization in crossed complex light beams*

October 2016 **Keck Northeast Astronomy Consortium**
Wesleyan University, Middletown, CT
Title: *The Multi-Decade Optical Light Curve and Microvariability of Blazar OJ 287*

Teaching

UT Austin **Department of Physics**
Spring 2024 Grading Assistant, *PHY 362K Quantum Mechanics II: Atoms/Molecules*
Fall 2023 Grading Assistant, *PHY 373 Quantum Mechanics I: Foundations*
2020-2023 Lab TA, *PHY 105N, PHY 102N Labs for Physics II*
Spring 2022 Grading Assistant, *PHY 352L Classical Electrodynamics II*

Colgate Univ **Department of Mathematics**
Spring 2019 Math Tutor, *MATH 311 Partial Differential Equation*

Department of Physics and Astronomy
Fall 2018 Physics Tutor, *ASTR 210 Intermediate Astronomy and Astrophysics*
Fall 2016 Physics Tutor, *PHYS 131 Atoms and Waves*

Awards & Fellowship

Univ of Texas Austin	**Robert S. Davis and Lyell P. Davis Scholarship Fund**
2024	For student participating in professional development activities
Colgate Univ	**Joseph C. Amato & Anthony F. Aveni Award**
2019	For showing excellence in scientific research
	Dean's Award with Excellence
2016-2019	For Academic Excellence
	Edwin Foster Kingsbury Prize
2016	For distinguished academic achievement
	Sisson Mathematics Prizes
2016	For distinguished academic achievement
APS	**APS DAP Student/Postdoc Travel Grant**
2022	For presenters who need reimbursement of travel costs

Selected Publications

2024 **Zhang, S.**, Bromm, V., & Liu. B. *How do Primordial Black Holes change the Halo Mass Function and Structure*, submitted to The Astrophysical Journal., [arXiv:2405.11381].

2024 **Zhang, S.**, Ilie, C., & Freese, K. *Detectability of Supermassive Dark Stars with the Roman Space Telescope*, The Astrophysical Journal 965.2 (2024): 121, [arXiv:2306.11606].

2023 **Zhang, S.**, Liu, B., & Bromm, V. 2023. *Distinguishing the impact and signature of black holes from different origins in early cosmic history*, MNRAS, 528, 180., [arXiv: 2310.01763].

2022 Liu, B., **Zhang, S.**, & Bromm, V. 2022, *Effects of stellar-mass primordial black holes on first star formation*, MNRAS, 514, 2376., [arXiv:2204.06330]

2021 Ilie, C., Levy, C., Pilawa, J., & **Zhang, S.** *Constraining dark matter properties with the first generation of stars*, Phys. Rev. D, 104,123031., [arXiv: 2009.11474]

2020 Ilie, C., Pilawa, J., & **Zhang, S.** *Comment on "Multiscatter stellar capture of dark matter"*, Phys. Rev. D, 102, 048301. [arXiv:2005.05946]

2019 Ilie, Cosmin, and **Saiyang Zhang**. *Multiscatter capture of superheavy dark matter by Pop III stars*, Journal of Cosmology and Astroparticle Physics 2019. 12 (2019): 051, [arXiv:1908.02700].

Weaver, Zachary R., ..., **Saiyang Zhang**, ..., et al. *The 2016 June Optical and Gamma-Ray Outburst and Optical Microvariability of the Blazar 3C 454.3*, The Astrophysical Journal 875.1 (2019): 15, [arXiv:1903.04587].

2017 Galvez, Enrique J., Ishir Dutta, and **Saiyang Zhang**. *Möbius Polarization of Non-Collinear Poincare Superpositions*, Latin America Optics and Photonics Conference. Optical Society of America, 2018.

2016 Balonek, Thomas J., ..., **Saiyang Zhang**, ..., et al. *The Optical Variability of the Blazar 3C 454.3 over Three Decades from the Colgate University Foggy Bottom Observatory*, American Astronomical Society Meeting Abstracts# 229. Vol. 229. 2017.

Balonek, Thomas J., **Saiyang Zhang**, et al. *Blazar CTA 102 Reaches Historic Optical Maximum During Current Extended Period of Activity*, The Astronomer's Telegram 9732 (2016).

Chapman, Katie J., ..., **Saiyang Zhang**, ... et al. *A Spectacular, Unprecedented Optical Flare in the Blazar CTA 102*, The Astronomer's Telegram 9756 (2016).