# Saiyang Zhang

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## Education

2020 - present **University of Texas at Austin, TX**
Ph.D. candidate in Physics
Cumulative GPA: 3.83.

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–current **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 (AMS)**
2015-2019 **American Mathematical Society (APS)**

## Presentation

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|---|---|
| December 2023 | **Texas Symposium on Relativistic Astrophysics, 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* |
| October 2016 | **New York Six Upstate Undergraduate Research Conference** |
| | Wesleyan University, Middletown, CT |
| | Title: *The Multi-Decade Optical Light Curve and Microvariability of Blazar OJ 287* |

## Teaching

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|---|---|
| **UT Austin** | **Department of Physics** |
| 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* |
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| **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

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| **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

2023 **Zhang, S.**, Liu, B., & Bromm, V. (2023). *Distinguishing the impact and signature of black holes from different origins in early cosmic history*, Submitted to Monthly Notices of the Royal Astronomical Society, [arXiv:2310.01763].

**Zhang, S.**, Ilie, C., & Freese, K. *Detectability of Supermassive Dark Stars with the Roman Space Telescope*, Submitted to ApJ, [arXiv:2306.11606]

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).