SHUO ZHANG

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3220 Biomedical and Physical Sciences Building, 567 Wilson Road, East Lansing, MI, 48824

APPOINTMENTS

Assistant Professor of Physics — **July 2023 - Present**
Michigan State University — East Lansing, MI

Assistant Professor of Physics — **January 2020 - July 2023**
Bard College — Annandale-on-Hudson, NY

NASA Hubble Fellowship - Einstein Fellow — **August 2019 - January 2020**
Boston University Institute for Astrophysical Research — Boston, MA

Postdoctoral Scholar and Heising-Simons Fellow — **September 2016 - July 2019**
Massachusetts Institute of Technology — Cambridge, MA

EDUCATION

Columbia University, Department of Physics — **New York, NY**
Ph.D. in Physics — June 2016
Thesis: "Investigating the Physics of Hard X-ray Outbursts from the Galactic Center Supermassive Black Hole Sagittarius A"*

Tsinghua University, Department of Engineering Physics — **Beijing, China**
B.S. in Engineering Physics — July 2010
Thesis: "Experimental Demonstration for Super-high Angular Resolution Imaging Principle for Coded-mask X-ray Telescopes"

AWARDS AND FELLOWSHIPS

- Einstein Medal (Event Horizon Telescope collaboration) — 2020
- 2020 Breakthrough Prize in Fundamental Physics (Event Horizon Telescope collaboration) — 2019
- NASA Hubble Fellowship Program - Einstein Fellowship — 2019
- Heising-Simons Research Fellowship — 2018
- McGill Space Institute Fellowship & McGill Astrophysics Fellowship (Declined) — 2016
- NASA Earth and Space Science Fellowship (NESSF) — 2013-2016
- NASA Group Achievement Award (NuSTAR Galactic Plane Survey team) — 2016
- NASA Group Achievement Award (NuSTAR project team) — 2015
- NASA Group Achievement Award (NuSTAR science team) — 2014
- Columbia University Faculty Fellowship — 2010-2012
- International Astronomical Union (IAU) Symposium 322 Travel Award — 2016
- National Astronomical Observatory of China Scholarship — 2009

- Tsinghua University Outstanding Scientific Research Scholarship 2008, 2009

SUCCESSFUL RESEARCH PROPOSAL AND GRANTS

Total external grants brought to host institutes as PI during 2017-2023: $928,801.00

- **PI**, *NuSTAR* GO cycle-9 "Joint NuSTAR and EHT Probe of Sgr A*: Flares, Blackhole Shadows and a New Hard X-ray Source", 100 ks, **$59,963, 2023-2026**
- **PI**, *NuSTAR* GO cycle-9 "Capture the Peak X-ray Luminosity of Galactic Center Molecular Cloud the "Bridge": Reflecting a Major Past Outburst from Sgr A*, 100 ks, **$63,294, 2023-2026**
- **PI**, *NuSTAR* GO cycle-8 "Joint NuSTAR and EHT Probe of Sgr A*: Flares, Blackhole Shadows and a New Hard X-ray Source", 100 ks, **$91,933, 2022-2025**
- **PI**, *NuSTAR* GO cycle-8 "Capture the Peak X-ray Luminosity of Galactic Center Molecular Cloud the "Bridge": Reflecting a Major Past Outburst from Sgr A*, 100 ks
- **PI**, *NuSTAR* GO Cycle-7 "Unveiling the Nature of a Unique Galactic Center X-ray Filament XMM 0.173-0.413 using NuSTAR and MeerKAT", 120 ks, **$75,687, 2021-2024**,
- **PI**, *Chandra* Cycle-22 Archive Proposal "A Study of Galactic Center X-ray Filaments using 11.7 Ms Archival Chandra Data from 1999 to 2019", **$69,100, 2021-2023**
- **PI**, *NuSTAR* GO Cycle-6 "Joint NuSTAR and EHT Probe of Sgr A*: Flares, Blackhole Shadows and a New Hard X-ray Source", 100 ks, **$69,911, 2021-2024**
- **PI**, *NuSTAR* GO Cycle-5 "Unveiling the Nature of a Galactic Center X-ray Filament G0.13-0.11: Pulsar Wind Nebula or Magnetic Structure?", 100 ks, **$69,909, 2020-2022**
- **PI**, *XMM-Newton* AO Cycle-16 #80241, "Probing Galactic Center MeV-GeV Cosmic-ray Population with Sgr B2 Fe Kα Line Emission", 100 ks, **$56,633, 2018-2021**
- **PI**, *Chandra* Cycle-20 Archive Proposal #20620472, "A Systematic Analysis on M31* X-ray Variability with 3 Ms of Chandra Data from 1999 to 2016", **$55,000, 2019-2020**
- **Science PI**, NASA Hubble Fellowship Program - Einstein Fellowship, "Supermassive Black Holes and Exotic Physics in Local Galaxies", **$317,371, 2019-2022**
- **Science PI**, *Chandra* GTO Cycle-19 #19610778, "Probing MeV-GeV Electrons in the X-ray Regime Using Molecular Cloud Bania's Clump 2", 100 ks
- **PI**, *NuSTAR* GO Cycle-1 #01302, "Investigating Mysterious Hard X-ray source in the SNR-MC Interaction Region of IC 443 with NuSTAR", 100 ks
- **Co-I**, *NuSTAR* GO Cycle-7, "Joint NuSTAR/Event Horizon Telescope Observations of Supermassive Black Hole System", PI: M. Nowak, 2021
- **Co-I**, *NuSTAR* GO Cycle-7, "Broad-band X-ray survey of a Galactic Pevatron accelerator associated with the microquasar SS433", PI: K. Mori, 2021
- **Co-I**, *NuSTAR* GO Cycle-6, "X-ray Jets & BH Shadows: NuSTAR, EHT, and Chandra on M87", PI: J. Neilsen, 2020

- **Co-I**, *NuSTAR* GO Cycle-4, "Optimizing Sensitivity to Sterile Neutrino Dark Matter in the Galactic Center", 100 ks, 72,000, PI: K. Perez, 2019-2020
- **Co-I**, *XMM-Newton* GO, cycle-16 #080269, "XMM Observation of Ten Hard X-ray source discovered in the Galactic Center", PI: K. Mori
- **FI**, NASA Earth and Space Science Fellowship, Grant "NNX13AM31","Investigating Hard X-ray Outbursts from the Galactic center Supermassive Black Hole Sgr A*", **$90,000**, 2013-2016
- Columbia University Faculty Fellowship, **$150,000**, 2010-2012

SCIENTIFIC COLLABORATIONS

- Member of the AXIS Telescope SNR and Compact Object Science Working Group 2022-present
- Associate Member of the LHAASO Observatory Collaboration 2021-present
- Member of the Event Horizon Telescope (EHT) Collaboration 2020-present
- Member of the Event Horizon Telescope (EHT) Multi-wavelength Science Working Group 2018-present
- Member of *eXTP* Space Telescope Observatory Science Working Group 2017-present
- Member of *Chandra*/ACIS Instrument Team 2016-present
- Member of Sgr A* X-ray Visionary Observation Campaign Team 2013-2016
- Member of *NuSTAR* Space Telescope Science Team 2012-present
- Member of *NuSTAR* Space Telescope X-ray Transient Monitoring Team 2012-2014
- member of *NuSTAR* Space Telescope Ground Calibration Team 2011-2012

COLLOQUIA, SEMINARS AND CONFERENCE ORAL PRESENTATIONS

1. **Colloquium**, George Washington University Department of Physics and Astronomy, April 2023
2. **Invited Talk**, 20th AAS HEAD Meeting special session "The Event Horizon Telescope in Light of High-Energy Emission", March 2023
3. **Colloquium**, University of Rochester Department of Physics and Astronomy, March 2023
4. **Colloquium**, Michigan State University Department of Physics and Astronomy, March 2023
5. **Colloquium**, Southern Methodist University Department of Physics, Feb. 2023
6. **Colloquium**, University of Texas Dallas Department of Physics, Feb. 2023
7. **Talk**, "Ten years of High-energy Universe in Focus" Conference, Cagliari, Italy, June 2022
8. **Colloquium**, Florida Institute of Technology Department of Physics, March 2022
9. **Colloquium**, University of Delaware Department of Physics and Astronomy, Feb. 2022
10. **Colloquium**, George Mason University Department of Physics and Astronomy, Jan. 2022
11. **Invited Talk**, #239th AAS press conference, Jan. 2022

12. **Invited Talk**, #239th AAS conference SOFIA Special Session: "the extreme ISM in the inner 200 pc of the Galaxy", Jan. 2022
13. **Colloquium**, LHAASO Collaboration Colloquium Series, virtual, Nov. 2021
14. **Colloquium**, University of Michigan, Extreme Astrophysics, virtual, February 2021
15. **Invited Talk**, #236th AAS Press Release "Galactic Center: To & Fro", virtual, June 2020
16. Talk, #236th AAS Conference, virtual, June 2020
17. Talk, #235th AAS Conference, Honolulu, Hawaii, Jan. 2020
18. Talk, "20 Years Science of Chandra" meeting, Boston, MA, October 2019
19. **Invited Talk**, 2019 Hubble Fellowship Symposium, DC, October 2019
20. **Colloquium**, Tsung-Dao Lee Institute, Shanghai, China, June 2019
21. Talk, the 29th New England Regional Quasar and AGN Meeting, Cambridge, MA, May 2019
22. **Colloquium**, Brandeis University Department of Physics, Waltham, MA, April 2019
23. Talk, 17th AAS HEAD meeting, Monterey Bay, CA, March 2019
24. **Colloquium**, Fordham University Department of Physics, New York, NY, Jan. 2019
25. **Colloquium**, Tsinghua University Center for Astrophysics, Beijing, China, Jan. 2019
26. Talk, #233rd AAS Conference, Seattle, WA, Jan. 2019
27. **Colloquium**, Bard College Physics Program, Annandale-on-Hudson, NY, Nov. 2018
28. **Colloquium**, Texas A&M University - Commerce, Commerce, TX, Nov. 2018
29. **Colloquium**, Drexel University Department of Physics, Philadelphia, PA, Nov. 2018
30. **Invited Talk**, "Future for Future" Vision for the Next Decades in Astrophysics with Gravitational Waves and Other Cosmic Messengers Workshop, New York, NY, Nov. 2018
31. **Invited Talk**, Columbia University High-energy Astrophysics Meeting, New York, NY, Nov. 2018
32. **Colloquium**, Northeastern University Department of Physics, Boston, MA, Oct. 2018
33. **Colloquium**, Black Hole Initiative at Harvard University, Cambridge, MA, Sep. 2018
34. Talk, 42nd COSPAR Scientific Assembly, Pasadena, CA, July 2018
35. Talk, The 28th New England Regional Quasar and AGN Meeting, New Haven, CT, May 2018
36. **Invited Talk**, Harvard CfA Quasar tea talk, Cambridge, MA, May 2018
37. **Invited Talk**, Xiamen University Astronomy Research Forum, Xiamen, Fujian, China, April 2018
38. Talk, 16th AAS HEAD meeting, Sun Valley, ID, Aug. 2017
39. Talk, Chandra annual meeting "From Chandra to Lynx", Cambridge, MA, Aug. 2017
40. **Invited Talk**, 1st Nanjing University Astronomy Research Forum, Nanjing, China, June 2017

41. **Seminar**, Purple Mountain Observatory, CAS, Nanjing, China, June 2017
42. **Invited Talk**, Harvard CfA High-energy Astrophysics group meeting, Cambridge, MA, April 2017
43. **Colloquium**, Tsinghua University Center for Astrophysics, Beijing, China, March 2017
44. Talk, eXTP science meeting "High-throughput X-ray astronomy in eXTP Era", Rome, Italy, Feb. 2017
45. Thesis Talk, #227th AAS Conference, Kissimmee, FL, Jan. 2016
46. **Invited Talk**, Northwestern University CIERA theory group meeting, Evanston, IL, Nov. 2015
47. **Invited Talk**, UCLA Astrophysics Journal Club, Los Angeles, CA, Nov. 2015
48. **Invited Talk**, Caltech Tea Talk, Pasadena, CA, Nov. 2015
49. Talk, Harvard CfA High-energy astrophysics group meeting, Cambridge, MA, Oct. 2015
50. Talk, IAU XXIX General Assembly, Honolulu, HI, Aug. 2015
51. Talk, Peking University Kavli Institute lunch meeting, Beijing, China, March 2015
52. **Colloquium**, Tsinghua University Center for Astrophysics, Beijing, China, March 2015
53. **Seminar**, Institute of High Energy Physics, CAS, Beijing, China, March 2015
54. **Seminar**, Shanghai Astronomical Observatory, CAS, Shanghai, China, March 2015
55. **Colloquium**, Tongji University Department of Physics, Shanghai, China, March 2015
56. Talk, #225th AAS Conference, Seattle, WA, Jan. 2015
57. **Colloquium**, National Astronomical Observatory of China, CAS, Beijing, Dec. 2012

ADVISEES' SCIENTIFIC PRESENTATION

*Student authors I supervised.

1. Talk, Rose Xu*, **Shuo Zhang**, the 241st AAS Press Release Conference, Seattle, WA, Jan. 2023
2. Talk, Rose Xu*, **Shuo Zhang**, "Discovery of Seven Hard X-ray Flares from the Galactic Center Supermassive Black Hole " ", the 241st AAS meeting, Seattle, WA, Jan. 2023
3. Talk, Field Rogers*, **Shuo Zhang**, Kerstin Perez, & Afura Taylor*, "New Constraints on Cosmic Particle Populations at the Galactic Center using X-ray Observations of the Molecular Cloud Sagittarius B2", 37th International Cosmic Ray Conference (ICRC 2021), Berlin, Germany, July 2021
4. Poster, Nathalie Jones* & **Shuo Zhang**, "Continuing Brightening of a Sgr A Complex Molecular Cloud: Revealing More Details about Past Sgr A* Activities", the 238th AAS meeting, June 2021
5. Poster, Yanpei Deng*, Grace Sanger-Johnson*, Nathalie Jones*, & **Shuo Zhang**, "NuSTAR 2020 Observation of Galactic Center Non-thermal X-ray Filament G0.13-0.11", the 238th AAS meeting, June 2021
6. Talk, Yanpei Deng*, Grace Sanger-Johnson*, Nathalie Jones*, & **Shuo Zhang**, "NuSTAR Observations of a Galactic Center Non-thermal X-ray Filament", Columbia High-energy Astrophysics Summer Meeting, July 2020

SELECTED PUBLICATIONS

Counts: **40** papers published in major peer-reviewed journals; **1** manuscripts in prep.

Total citation: **5750** (Google Scholar), h-index: **22**

Google Scholar webpage: https://scholar.google.com/citations?hl=en&user=e6GTxdEAAAAJ&view_op=list_works

For papers with more than 10 authors, I list the total number of authors and my rank.

Student authors I supervised; Bard Student authors I supervised.*

1. **Zhang, S.**, Jones, N.*, et al. "Twenty Years of X-ray Brightening of the Galactic Center Molecular Cloud "Bridge": Reflecting a Major Outburst of Sgr A*", in prep.

2. Safi-Harb, S., Mac Intyre, B., **Zhang, S.** (3 out of 15), et al. *XMM-Newton and NuSTAR Observations of W50 Powered by the Galactic Microquasar SS 433*, the Astrophysical Journal, 935(2), 163 (2022)

3. Rogers, F.*, **Zhang, S.**, Perez, K., Clavel, M., & Taylor, A.*, *New Constraints on Cosmic Particle Populations at the Galactic Center using X-ray observations of the Molecular cloud Sgr B2*, the Astrophysical Journal, 934(1), 19 (2022)

4. Event Horizon Telescope Collaboration, including **Zhang, S.**, *First Sgr A* Event Horizon Telescope Results. I. The Shadow of the Supermassive Black Hole in the Center of the Milky Way*, Astrophysical Journal Letters, 930(2), L12 (2022)

5. Event Horizon Telescope Collaboration, including **Zhang, S.**, *First Sgr A* Event Horizon Telescope Results. II. EHT and Multi-wavelength Observations, Data Processing and Calibration*, Astrophysical Journal Letters, 930(2), L13 (2022)

6. Event Horizon Telescope Collaboration, including **Zhang, S.**, *First Sgr A* Event Horizon Telescope Results. III.*, Astrophysical Journal Letters, 930(2), L14 (2022)

7. Event Horizon Telescope Collaboration, including **Zhang, S.**, *First Sgr A* Event Horizon Telescope Results. IV. Variability, Morphology and Black Hole Mass*, Astrophysical Journal Letters, 930(2), L15 (2022)

8. Event Horizon Telescope Collaboration, including **Zhang, S.**, *First Sgr A* Event Horizon Telescope Results. V. Testing Physical Models of the Galactic Center Black Hole*, Astrophysical Journal Letters, 930(2), L16 (2022)

9. Event Horizon Telescope Collaboration, including **Zhang, S.**, *First Sgr A* Event Horizon Telescope Results. VI. Testing the Black Hole Metric*, Astrophysical Journal Letters, 930(2), L17 (2022)

10. Event Horizon telescope Collaboration, Wielgus, M., et al., including **Zhang, S.**, *Millimeter light curves of Sagittarius A* observed during the 2017 Event Horizon Telescope campaign*, Astrophysical Journal Letters, 930(2), L19 (2022)

11. Event Horizon Telescope Collaboration, Georgiev, B., et al, including **Zhang, S.**, *A universal power law prescription for variability from synthetic images of black hole accretion flows*, Astrophysical Journal Letters, 930(2), L20 (2022)

12. Event Horizon Telescope Collaboration, Broderick, A., et al., including **Zhang, S.**, *Characterizing and Mitigating Intraday Variability: Reconstructing source structure in accreting black holes with mm-VLBI*,

Astrophysical Journal Letters, 930(2), L21 (2022)

13. Event Horizon Telescope Collaboration, Issaoun, S., et al., including **Zhang, S.**, *Resolving the inner parsec of the blazar J1924–2914 with the Event Horizon Telescope*, the Astrophysical Journal, 934(2), 145 (2022)

14. Boyce, H., Haggard, D., Witzel, S., et al., including **Zhang, S.** (17 out of 17), *Multi-wavelength Variability of Sagittarius A* in July 2019*, the Astrophysical Journal, 931(1), 7 (2022)

15. GRAVITY Collaboration, including **Zhang, S.** (alphabetical), *Constraining particle acceleration in Sgr A* with simultaneous GRAVITY, Spitzer, NuSTAR and Chandra observations*, A&A, 654, A22 (2021)

16. **Zhang, S.**, Zhu, Z.*, Li, H., Pasham, D., Li, Z., Clavel, M., Baganoff, F. K., Perez, K., Mori, K., Hailey, C. J., *NuSTAR and Chandra Observation of the Galactic Center Non-thermal X-ray Filament G0.13-0.11: a Pulsar Wind Nebula Driven Magnetic Filament*, the Astrophysical Journal, 893, 3 (2020)

17. Cooper, A. J., Gaggero, D., Markoff, S., **Zhang, S.**, *High-energy Cosmic Ray Production in X-ray Binary Jets*, Mon. Not. R. Astro. So., 493, 3212-3222 (2020)

18. Kim, J., Krichbaum, T. P., Broderick, A. E., et al., Event Horizon Telescope Collaboration, including **Zhang, S.**, *Event Horizon Telescope Imaging of the Archetypal Blazar 3C 279 at an Extreme 20 Microarcsecond Resolution*, A&A, 640, A69 (2020)

19. The Event Horizon Telescope Collaboration, including **Zhang, S.**, *First M87 Event Horizon Telescope Result.V. Physical Origin of the Asymmetric Ring*, AstroPhysical Journal Letters, 875, L5 (2019)

20. The Event Horizon Telescope Collaboration, including **Zhang, S.**, *First M87 Event Horizon Telescope Results.I. The Shadow of the Supermassive Black Hole*, AstroPhysical Journal Letters, 875, L1 (2019)

21. Kuznetsova, E., Krivonos, R., Clavel, M., Lutovinov, A., Chernyshov, D., Hong, J., Mori, K., Ponti, G., Tomsick, J., **Zhang, S.**, *Investigating the Origin of the Faint Non-thermal Emission of the Arches Cluster Using the 2015-2016 NuSTAR and XMM-Newton X-ray Observations"*, Mon. Not. R. Astro. So., 484(2), 1627-2636 (2019)

22. Zhu, Z., Li, Z., Morris, M., **Zhang, S.** & Liu, S.,*A Deep Chandra View of the Parsec-Scale Jet Candidate from the Galactic Center Black Hole*, AstroPhysical Journal, 875, 44 (2019)

23. **Zhang, S.**, Tang, X., Zhang, X., et al. (1 out of 13), *NuSTAR Detection of a Hard X-ray Source in the Supernova Remnant - Molecular Cloud Interaction Site of IC 443*, AstroPhysical Journal, 859, 141 (2018)

24. in't Zand, J. M., Bozzo, E., Qu, J. L.., et al., including **Zhang, S.** (182 out of 184, alphabetical after key authors), eXTP White Paper *Observatory Science with eXTP*, Science China Physics, Chemistry & Mechanics, 62(2), 029506 (2018)

25. Mori, K., Gotthelf, E. V., Hailey, C. J. et al., including **Zhang, S.** (8 out of 16), *NuSTAR Hard X-ray Observation of the Gamma-ray Binary Candidate HESS J1832-093*, AstroPhysical Journal, 848, 80 (2017)

26. **Zhang, S.**, Baganoff, F. K., Ponti, G., et al. (1 out of 20), *Sagittarius A* High Energy X-ray Flare Properties during NuSTAR Monitoring of the Galactic Center from 2012 to 2015*, AstroPhysical Journal, 843, 96 (2017)

27. Ponti, G., George, E., Scaringi, S., **Zhang. S.**, et al. (4 out of 24), *A Powerful Flare from Sgr A⋆ Confirms the Synchrotron Nature of the Emission*, Mon. Not. R. Astro. So., 468, 2447 (2017)

28. Hailey, C. J., Mori, K., Perez, K., et al., including **Zhang, S.** (16 out of 17, alphabetical after first six authors), *Evidence for Intermediate Polars as the Origin of the Galactic Center Hard X-ray Emission*, AstroPhysical Journal, 826, 160 (2016)

29. Hong, J., Mori, K., Hailey, C. J., Nynka, M., **Zhang, S.**, et al. (5 out of 44), *NuSTAR Hard X-ray Survey of the Galactic Center Region II: X-ray Point Sources*, AstroPhysical Journal, 825, 132 (2016)

30. Lotti, S., Natalucci, L., Mori, K., et al., including **Zhang, S.** (15 out of 16, alphabetical after first three authors), *NuSTAR and XMM-Newton Observations of 1E1743.1-2843: Indications of a Neutron Star LMXB Nature of the Compact Object*, AstroPhysical Journal, 822, 57 (2016)

31. **Zhang, S.**, Hailey, C. J., Mori, K., et al. (1 out of 18), *Hard X-ray Morphological and Spectral Studies of the Galactic Center Molecular Cloud Sgr B2: Constraining Past Sgr A⋆ Flaring Activity'*, AstroPhysical Journal, 815, 132 (2015)

32. Mori, K., Hailey, C. J., Krivonos, et al., including **Zhang, S.** (9 out of 38), *NuSTAR Hard X-ray Survey of the Galactic Center Region I: Hard X-ray Morphology and Spectroscopy of the Diffuse Emission*, Astrophysical Journal, 814, 94 (2015)

33. Li, Y. P., Yuan, F., Yuan, Q., Wang, D. Q., Chen, P. F., Neilsen, J., Fang, T. T., **Zhang, S.** & Dexter, J., *Statistics of X-ray Flares of Sgr A⋆: Evidence for Solar like Self-organized Criticality Phenomena*, AstroPhysical Journal, 810, 1 (2015)

34. Ponti, G., De Marco, B., Morris, M. R., et al., including **Zhang, S.** (8 out of 15), *Fifteen Years of XMM-Newton and Chandra Monitoring of Sgr A⋆: Evidence for a Recent Increase in the Bright Flaring Rate*, Mon. Not. R. Astro. So., 454, 1525 (2015)

35. Feng, H., Ho, L. C., Kaaret, P., Tao, L., Yamaoka, K., **Zhang, S.** & Grise, F., *A Luminous X-ray Flare from The Nucleus of The Dormant Bulgeless Spiral Galaxy NGC 247*, AstroPhysical Journal, 807, 185 (2015)

36. Perez, K., Hailey, C. J., Bauer, F. E., et al., including **Zhang, S.** (20 out of 22, alphabetical after first five authors), *Extended Hard X-ray Emission in the Inner Few Parsecs of the Galaxy*, Nature, 520, 646 (2015)

37. Nynka, M., Hailey, C. J., **Zhang, S.**, et al. (3 out of 16), *G359.97−0.038: A Hard X-Ray Filament Associated with a Supernova Shell-Molecular Cloud Interaction*, AstroPhysical Journal , 800, 119 (2015)

38. Barriere, N. M., Tomsick, J. A., Baganoff, F. K., et al., including **Zhang, S.** (15 out of 16, alphabetical after first two authors), *NuSTAR Detection of High-energy X-ray Emission and Rapid Variability from Sagittarius A⋆ Flares*, AstroPhysical Journal, 786, 46(2014)

39. **Zhang, S.**, Hailey, C. J., Baganoff, F. K., et al. (1 out of 14), *High-energy X-Ray Detection of G359.89-0.08 (Sgr A-E): Magnetic Flux Tube Emission Powered by Cosmic Rays?*, AstroPhysical Journal, 784, 6 (2014)

40. Nynka, M., Hailey, C. J., Mori, K., et al., including **Zhang, S.** (14 out of 15, alphabetical after first

three authors), *High-energy X-rays from J174545.5−285829, the Cannonball: A Candidate Pulsar Wind Nebula Associated with Sgr A East*, AstroPhysical Journal, 778, 31, (2013)

41. Mori, K., Gotthelf, E. V., **Zhang, S.**, et al. (3 out of 23), *NuSTAR Discovery of a 3.76-second Transient Magnetar Near Sagittarius A⋆*, AstroPhysical Journal Letters, 770, 23 (2013)

CONFERENCE PAPER AND ATEL REPORTS

*Student authors I supervised.

1. Rogers, F.*, **Zhang, S.**, Perez, K., Clavel, M., Taylor, A.*, *New Constraints on Cosmic Particle Populations at the Galactic Center using X-ray Observations of the Molecular Cloud Sagittarius B2*, 37th International Cosmic Ray Conference, DOI: 10.22323/1.395.0288 (2021)
2. Li, Y. P., Yuan, Q., Wang, Q. D., Chen, P. F., Neilsen, J., Fang, T. T., **Zhang, S.**, & Dexter, J, *Statistical and Theoretical Studies of Flares from Sagittarius A⋆*, Proc. of IAU 11(S322):31-38 (2016)
3. Mori, K., Gotthelf, E. V., Barriere, N. M., Hailey, C. J., Harrison, F. A., Kaspi, V. M., Tomsick, J. A., **Zhang, S.**, *NuSTAR Discovert of a 3.76 second pulsar in the Sgr A⋆ region*, Astronomer's Telegram, 5020 (2013)
4. Gotthelf, E. V., Mori, K., Halpern, J., et al., including **Zhang, S.** (12 out of 12), *Spin-down Measurement of PSR J1745-2900: A New Magnetar*, Astronomer's Telegram, 5046 (2013)
5. Brejnholt, N. F., Christensen, F. E., Jakobsen, A. C., et al., including **Zhang, S.** (10 out of 15, *NuSTAR Ground Calibration: the Rainwater Memorial Calibration Facility (RaMCaF)"* Proc. of SPIE, 8147, 01 (2011)

TEACHING

PHY 221: Basic principles of Mechanics	Michigan State	2023F
PHYS 250: Astrophysics	Bard College	2022F
PHYS 126B: Astronomy	Bard College	2022F
PHYS 142: Introduction to Physics II (E&M)	Bard College	2021S
PHYS 141: Introduction to Physics I (Mechanics)	Bard College	2020 S, F
G6011: Astrophysics I	Columbia University	2013, 2016
W4023: Thermal & Statistical Physics	Columbia University	2014
W1201/1202: General Physics I & II	Columbia University	2012
W1493: Intro to Experimental Physics Lab	Columbia University	2012
W1291: General Physics Lab	Columbia University	2010-2012

STUDENT MENTORING

- **PhD students**: Field Rogers (MIT Physics′22), 2020-2022
- **MA students**: Zhenlin Zhu (visiting graduate student at MIT), 2017-2018
- **Post-bachelar researcher**: Grace Sanger-Johnson (Bard′23), 2023-2024; Nathalie Jones (Bard′21), 2021-2022

- **Undergrad students**: Lauren Mendoza (Bard′26), Vera Topcik (Bard′25), Anna Connelly (Bard′25), Chloe Dufeu (Bard′25), Jade Dinkins (Bard′24, 2020), Grace Sanger-Johnson (Bard′23, 2020-2021), Rose Xu (Bard′23, 2021-2023), Sasha Fraser (Bard′24, 2021), Yanpei Deng (Bard′21, 2020-2021), Afura Taylor (MIT Physics′21, 2018-2019), Jonathon Brown (MIT Physics′20, 2018-2019), Ivy Li (MIT Physics′20, 2017-2019), Evan Tey (MIT Physics′19, 2017-2018), Allen Cheng (MIT Physics′19, 2017), Ben Hord (Columbia CC′17, 2015-2016), Armani Garvin (Columbia CC′19, 2015-2016), Alicia Canipe (Columbia GS′16, 2014-2015), Meera Desai (Barnard′18, 2014-2015)

PROFESSIONAL SERVICES

- Referee for *Nature, PRL, ApJ, MNRAS* since 2015
- Member, AAS Annie Jump Cannon Prize Committee (2022-2025)
- Member, AAS Doxsey Travel Prize Committee (2022-2025)
- Board of Directors for Astronomical Society of New York State (ASNY) (2021-2023)
- NSF reviewer (2021)
- Panel reviewer for *Hubble* Cycle-28, -31 Guest Observation Time Allocation Committee (2020, 2023)
- Panel reviewer for Future Investigators in NASA Earth and Space Science and Technology Program (2020)
- Panel reviewer for *NuSTAR* Cycle-5 Guest Observation Time Allocation Committee (2019)
- Panel reviewer for *Chandra* Cycle-21 Guest Observation Time Allocation Committee (2019)
- Panel reviewer for *Swift* Cycle-14 Guest Observation Time Allocation Committee (2017)
- Panel reviewer for NASA Astrophysics Data Analysis Program (ADAP 2017)
- Chair for #235th AAS Conference oral presentation session: Milky Way & Galactic Center (2020)
- Organizer for Galactic Nuclear Regions of Nearby Galaxies Workshop, Shanghai, China (2019)
- Organizer for MIT IAP Astrophysics Activities (2018)
- Organizer and lecturer for "X-ray Astronomy Summer Bootcamp 2020" (June 2020)
- Judge for AAS Chambliss Undergraduate Award (2015)
- Member for Bard Physics faculty search committee (2021)
- Member for Bad President's Commission on Racial Equity and Justice (2020)
- Co-organizer for weekly Physics Colloquia at Bard College (2020-2022)

PRESS AND PUBLIC OUTREACH

- GAIA STEM Lecture Series: "A Brief History of Our Monster Black Hole" (August 2023)
- #241 AAS Press Release "Discovery of Seven Hard X-ray Flares from the Galactic Center Supermassive Black Hole Sgr A*(Jan. 2023)
- #239 AAS Press Release "Galactic Center Molecular Clouds: Storytellers of Past Activity of Galactic Center Supermassive Black Hole" (Jan. 2022)

- Lecturer for Bard Lifelong Learning Institute (October 2021)
- Chandra Space Telescope Blog "The Origins of Particle Ribbons in the Center of our Galaxy" (2020)
- #236 American Astronomical Society Press Release "Galactic Center: To & Fro: Revealing the Powerful Particle Accelerator in the Galactic Center" (June 2020)
- Bard College News "Bard Physics Professor Shuo Zhang Discusses Her Research on Galactic Center Filaments at American Astronomical Society Press Conference" (June 2020)
- MIT News "Breakthrough Prize in Fundamental Physics awarded to Event Horizon Telescope Collaboration for black hole observation" (2019)
- NASA Hubble Telescope Site Press Release "NASA Awards 2019 Postdoctoral Fellowships" (2019)
- Speaker for Boston Astronomy on Tap (2019)
- Speaker for MIT public lectures of Astrophysics Activities (2018)
- Speaker for Columbia University Public lecture & Stargazing: "Our Monster Blackhole" (2015)
- High-energy Astrophysics Picture of the Week, "Monster Stirring" (2012)
- Astronomy Picture of the Day on 2012 November 2, "The Black Hole in the Milky Way Center" (2012)
- Founder and executive editor-in-chief of Tsinghua Student Research Journal (2008-2010)