

January, 2018

John H. Wise, Ph.D.
Dunn Family Associate Professor
Center for Relativistic Astrophysics
School of Physics
Georgia Institute of Technology

I. Earned Degrees

B.S.	Physics with Highest Honor	1998-2001	Georgia Institute of Technology
*	Astronomy & Astrophysics	2001-2004	Pennsylvania State University (advisors: M. Eracelous, T. Abel)
Ph.D.	Physics	2004-2007	Stanford University (advisor: T. Abel)

[* transferred after advisor moved to Stanford University]

II. Employment History

2007-2009	NASA Postdoctoral Fellow, NASA Goddard Space Flight Center (advisors: J. Centrella, J. Mather)
2009-2011	Hubble Postdoctoral Fellow, Princeton University (advisor: R. Cen)
2011-2016	Assistant Professor, School of Physics and Center for Relativistic Astrophysics, Georgia Institute of Technology [Dunn Family Professorship 2015-2016]
2016-present	Associate Professor, School of Physics and Center for Relativistic Astrophysics, Georgia Institute of Technology [Dunn Family Professorship 2016-2018]

III. Honors and Awards

2017	Supercomputing 2017 Best Scientific Visualization
2017	Hesburgh Award Teaching Fellow
2015	Eric R. Immel Award for Excellence in Teaching
2015-2018	Dunn Family Professorship
2011-2015	(6) Thank a Teacher Awards (PHYS 2122, PHYS 4347)
2013	XSEDE13 Best Visualization Award
2009-2011	Hubble Fellowship
2009-2011	Lyman Spitzer Fellowship, Princeton University
2007-2009	NASA Postdoctoral Program Fellowship, Goddard Space Flight Center
2003-2004	Pennsylvania Space Grant Fellowship
2002	Stephen Brumach Graduate Fellowship, Pennsylvania State University
2001	Braddock Fellowship, Pennsylvania State University

IV. Research, Scholarship, and Creative Activities

(bold number indicates work done at Georgia Tech)

(# indicates Wise group grad student/postdoc; @ indicates undergraduate student; first author is always the corresponding author)

Google Scholar profile at <https://scholar.google.com/citations?user=72RK2WIAAAAJ>

A. Published Books, Parts of Books, and Edited Volumes

A1. Books

No data

A2. Refereed Book Chapters

1. Wise, J. H. "Growth and Feedback from the First Black Holes", *Formation of the First Black Holes*, Ed. D. Schleicher and M. Latif. Singapore: World Scientific, 2018

A3. Other Parts of Books

No data

A4. Edited Volumes

No data

B. Refereed Publications and Submitted Articles

B1. Published and Accepted Journal Articles

1. Corlies, L., Johnston, K., Wise, J. H. 2018, “Exploring early simulated star formation in the context of ultrafaint dwarf galaxies”, *Monthly Notices of the Royal Astronomical Society*, accepted December 27, 2017
[Wise provided simulation data and technical expertise]
2. #Koh, D., Wise, J. H. 2018, “Extending semi-numeric reionization models to the first stars and galaxies”, *Monthly Notices of the Royal Astronomical Society*, 474, 3817
[Wise provided technical expertise, guided Koh, and helped revise the text.]
3. #Barrow, K. S. S., Wise J. H., #Aykutalp, A., O’Shea, B. W., Norman, M. L., Xu, H. 2018, “First light – II. Emission line extinction, population III stars, and X-ray binaries”, *Monthly Notices of the Royal Astronomical Society*, 474, 2617
[Wise provided technical expertise, guided Barrow, and helped revise the text.]
4. #Ge, Q., Wise, J. H. 2017, “On the effect of Lyman-alpha trapping during the initial collapse of massive black hole seeds”, *Monthly Notices of the Royal Astronomical Society*, 472, 2773
[Wise provided technical expertise, guided Ge, and helped revise the text.]
5. #Park, K. Wise, J. H., Bogdanovic, T. 2017, “Radiation-driven Turbulent Accretion onto Massive Black Holes”, *Astrophysical Journal*, 847, 70
[Wise provided technical expertise]
6. #Barrow, K. S. S., Wise J. H., Norman, M. L., O’Shea, B. W., Xu, H. 2017, “First light: exploring the spectra of high-redshift galaxies in the Renaissance Simulations”, *Monthly Notices of the Royal Astronomical Society*, 469, 4863
[Wise provided technical expertise, guided Barrow, and helped revise the text.]
7. Das, A., Mesinger, A., Pallottini, A., Ferrara, A., Wise, J. H. 2017, “High Mass X-ray Binaries and the Cosmic 21-cm Signal: Impact of Host Galaxy Absorption”, *Monthly Notices of the Royal Astronomical Society*, 469, 1166
8. Regan, J. A., Visbal, E., Wise, J. H., Haiman, Z., Johnsson, P. H., Bryan, G. L. 2017, “Rapid Formation of Massive Black Holes in close proximity to Embryonic Proto-Galaxies”, *Nature Astronomy*, 1, 75
9. Smith, B. D., Bryan, G. L., Glover, S. C. O., Goldbaum, N. J., Turk, M. J., Regan, J., Wise, J. H., Schive, H.-Y., Abel, T., Emerick, A., O’Shea, B. W., Anninos, P., Hummels, C. B., Khochfar, S. 2017, “Grackle: a Chemistry and Cooling Library for Astrophysics”, *Monthly Notices of the Royal Astronomical Society*, 466, 2217-2234
10. Kim, J.-H. for the AGORA Collaboration (42 authors). 2016, “The AGORA High-Resolution Galaxy Simulations Comparison Project. II: Isolated Disk Test”, *Astrophysical Journal*, 833, 202
11. Xu, H., Wise, J. H., Norman, M. L., Ahn, K., O’Shea, B. W. 2016, “Galaxy Properties and UV Escape Fractions during the Epoch of Reionization: Results from the Renaissance Simulations”, *Astrophysical Journal*, 833, 84
12. Xu H., Ahn, K., Norman, M. L., Wise, J. H., O’Shea, B. W. 2016, “X-ray Background at High Redshifts from Pop III Remnants: Results from the Renaissance Simulations”, *Astrophysical Journal Letters*, 832, L5
13. #Koh, D., Wise, J. H. 2016, “Amplification of Magnetic Fields in a Primordial HII Region and Supernova”, *Monthly Notices of the Royal Astronomical Society*, 462, 81-91
14. Regan, J. A., Johansson, P. H., Wise, J. H. 2016, “Positive or Negative? The Impact of X-ray

- Feedback on the Formation of Direct Collapse Black Hole Seeds”, *Monthly Notices of the Royal Astronomical Society*, 461, 111-125
15. Xu, H., Norman, M. L., O’Shea, B. W., Wise, J. H. 2016, “Late Pop III Star Formation during the Epoch of Reionization: Results from the Renaissance Simulations”, *Astrophysical Journal*, 823, 140
 16. Regan, J. A., Johansson, P. H., Wise, J. H. 2016, “Forming Super-Massive Black Hole Seeds under the Influence of a Nearby Anisotropic Multi-Frequency Source”, *Monthly Notices of the Royal Astronomical Society*, 459, 3377-3394
 17. #Park, K., Ricotti, M., Natarajan, P., Bogdanovic, T., Wise, J. H. 2016, “Bulge-Driven Fueling of Seed Black Holes”, *Astrophysical Journal*, 818, 184
 18. O’Shea, B. W., Wise, J. H., Xu, H., Norman, M. L. 2015, “Probing the Ultraviolet Luminosity Function of the Earliest Galaxies with the Renaissance Simulations”, *Astrophysical Journal Letters*, 807, L12
 19. Smith, B. D., Wise, J. H., O’Shea, B. W. Norman, M. L., Khochfar, S. 2015, “The First Population II Stars Formed in Externally Enriched Mini-haloes”, *Monthly Notices of the Royal Astronomical Society*, 452, 2822-2836
 20. Regan, J. A., Johansson, P. H., Wise, J. H. 2015, “The effect of dark matter resolution on the collapse of baryons in high redshift numerical simulations”, *Monthly Notices of the Royal Astronomical Society*, 449, 3766-3779
 21. #Altay, G., Wise, J. H. 2015, “Rabacus: A Python Package for Analytic Cosmological Radiative Transfer Calculations”, *Astronomy & Computing*, 10, 73
 22. Ahn, K., Xu, H., Norman, M. L., Alvarez, M. A., Wise, J. H. 2015, “Spatially Extended 21 cm Signal from Strongly Clustered UV and X-ray Sources in the Early Universe,” *Astrophysical Journal*, 802, 8
 23. Norman, M. L., Reynolds, D. R., So, G. C., Wise, J. H., 2015, “Direct Numerical Simulation of Reionization in Large Cosmological Volumes I: Numerical Methods and Tests,” *Astrophysical Journal Supplement*, 216, 16
 24. #Aykutalp, A., Wise, J. H., Spaans, M., Meijerink, R. 2014, “Songlines from Direct Collapse Black Holes: Effects of X-rays on Black Hole Growth and Stellar Populations”, *Astrophysical Journal*, 797, 139
 25. Chen, P., Wise, J. H., Norman, M. L., & Xu, H., O’Shea, B. W. 2014, “Scaling Relations for Galaxies prior to Reionization,” *Astrophysical Journal*, 795, 144
 26. Regan, J. A., Johansson, P. H., Wise, J. H. 2014, “The Direct Collapse of a Massive Black Hole Seed Under the Influence of an Anisotropic Lyman-Werner Source,” *Astrophysical Journal*, 795, 137
 27. Xu, H., Ahn, K., Wise, J. H., & Norman, M. L. 2014, “Heating the IGM by X-rays from Population III Binaries in High Redshift Galaxies”, *Astrophysical Journal*, 791, 110
 28. Wise, J. H., @Demchenko, V., @Halicek, M., Abel, T., Turk, M. J., Norman, M. L., & Smith, B. D. 2014, “The Birth of a Galaxy – III. Luminosity functions and ultraviolet radiation escape fractions,” *Monthly Notices of the Royal Astronomical Society*, 442, 2560-2579
 29. So, G. C., Norman, M. L., Reynolds, D. R., Wise, J. H. 2014, “Direct Numerical Simulations of Reionization II: Recombinations, Clumping Factors, and the Photon Budget for Reionization”, *Astrophysical Journal*, 789, 149
 30. The Enzo Collaboration: Bryan, G. L., Norman, M. L., O’Shea, B. W., Abel, T., Wise, J. H., Turk, M. J., Reynolds, D. R., Collins, D. C., Wang, P., Skillman, S. W., Smith, B. D., Harkness, R. P., Bordner, J., Kim, J., Kuhlen, M., Xu, H., Goldbaum, N., Hummels, C., Kritsuk, A. G., Tasker, E., Skory, S., Simpson, C. S., Hahn, O., Oishi, J. S., So, G., Zhao, F., Cen, R., Li, Y. 2014, “Enzo: An Adaptive Mesh Refinement Code for Astrophysics”, *Astrophysical Journal Supplement*, 211, 19
 31. Kim, J., Abel, T., Agertz, O., Bryan, G. L., Ceverino, D., Christensen, C., Conroy, C., Dekel, A., Gnedin, N. Y., Goldbaum, N. J., Guedes, J., Hahn, O., Hobbs, A., Hopkins, P. F., Hummels, C. B., Iannuzzi, F., Keres, D., Klypin, A., Kravtsov, A. V., Krumholz, M. R., Kuhlen, M., Leitner, S. N.,

- Madau, P., Mayer, L., Moody, C. E., Nagamine, K., Norman, M. L., Oñorbe, J., O'Shea, B. W., Pillepich, A., Primack, J. R., Quinn, T., Read, J. I., Robertson, B. E., Rocha, M., Rudd, D. H., Shen, S., Smith, B. D., Szalay, A. S., Teyssier, R., Thompson, R., Todoroki, K., Turk, M. J., Wadsley, J. W., Wise, J. H., Zolotov, A., 2014, “The AGORA High-Resolution Galaxy Simulations Comparison Project”, *Astrophysical Journal Supplement*, 210, 14
32. Grissom, R., Ballantyne, D. R., & Wise, J. H. 2014, “On the contribution of active galactic nuclei to reionization,” 2014, *Astronomy & Astrophysics*, 561, 90
 33. Kim, J.-H., Krumholz, M. R., Wise, J. H., Turk, M. J., Goldbaum, N. J., & Abel, T. 2013, “Dwarf Galaxies with Ionizing Radiation Feedback. II: Spatially-resolved Star Formation Relation”, *Astrophysical Journal*, 779, 8
 34. Kim, J.-H., Krumholz, M. R., Wise, J. H., Turk, M. J., Goldbaum, N. J., & Abel, T. 2013, “Dwarf Galaxies with Ionizing Radiation Feedback. I: Escape of Ionizing Photons”, *Astrophysical Journal*, 775, 109
 35. Xu, H., Wise, J. H., Norman, M. L. 2013, “Population III Stars and Remnants in High Redshift Galaxies”, *Astrophysical Journal*, 773, 83
 36. Aykutaalp, A., Wise, J. H., Meijerink, R., Spaans, M. 2013, “The Response to Metal Rich Gas to X-ray Irradiation from a Massive Black Hole at High Redshift: Proof of Concept”, *Astrophysical Journal*, 771, 50
 37. Holley-Bockelmann, K., Wise, J. H., Sinha, M. 2012, “Kickstarting Reionization with the First Black Holes: The Effects of Second-order Perturbation Theory in Pre-reionization Volumes”, *Astrophysical Journal Letters*, 761, L8-L13
 38. Wise, J. H., Abel, T., Turk, M. J., Norman, M. L., & Smith, B. D. 2012, “The Birth of a Galaxy. II. The Role of Radiation Pressure”, *Monthly Notices of the Royal Astronomical Society*, 427, 311-326
 39. Mirocha, J., Skory, S., Burns, J. O., & Wise, J. H. 2012, “Optimized Multi-Frequency Spectra for Applications in Radiative Feedback and Cosmological Reionization”, *Astrophysical Journal*, 756, 94-108
 40. Kuhlen, M., Krumholz, M. R., Madau, P., Smith, B. D., & Wise, J. H. 2012, “Dwarf Galaxy Formation with H₂-regulated Star Formation”, *Astrophysical Journal*, 749, 36-57
 41. Wise, J. H., Turk, M. J., Norman, M. L., & Abel, T. 2012, “The Birth of a Galaxy: Primordial Metal Enrichment and Population II Stellar Populations”, *Astrophysical Journal*, 745, 50-59
 42. Kim, J.-H., Wise, J. H., Alvarez, M. A., & Abel, T. 2011, “Galaxy Formation with Self-consistently Modeled Stars and Massive Black Holes. I: Feedback-regulated Star Formation and Black Hole Growth”, *Astrophysical Journal*, 738, 54-70
 43. Wise, J. H. & Abel, T. 2011, “Enzo+Moray: Radiation Hydrodynamics Adaptive Mesh Refinement Simulations with Adaptive Ray Tracing”, *Monthly Notices of the Royal Astronomical Society*, 414, 3458-3491
 44. van Meter, J. R., Wise, J. H., Miller, M. C., Reynolds, C. S., Centrella, J., Baker, J. G., Boggs, W. D., Kelly, B. J., & McWilliams, S. T. 2010, “Modeling Flows Around Merging Black Hole Binaries”, *Astrophysical Journal Letters*, 711, 89-93
 45. Alvarez, M. A., Wise, J. H., Abel, T. 2009, “Accretion onto the First Stellar Mass Black Holes,” *Astrophysical Journal Letters*, 133-137
 46. Kim, J.-H., Wise, J. H., & Abel, T. 2009, “Galaxy Mergers with Adaptive Mesh Refinement: Star Formation and Hot Gas Outflow,” *Astrophysics Journal Letters*, 694, 123-127
 47. Wise, J. H., & Cen, R. 2009, “Ionizing Photon Escape Fractions from High Redshift Dwarf Galaxies,” *Astrophysical Journal*, 693, 984-999
 48. Wise, J. H., & Abel, T. 2008, “Resolving the Formation of Protogalaxies. III. Feedback from the First Stars,” *Astrophysical Journal*, 685, 40-56
 49. Wise, J. H., & Abel, T. 2008, “How Very Massive Metal-Free Stars Start Cosmological Reionization,” *Astrophysical Journal*, 684, 1-17
 50. Wise, J. H., & Abel, T. 2008, “Resolving the Formation of Protogalaxies. II. Central Gravitational

- Collapse,” *Astrophysical Journal*, 682, 745-757
51. Wise, J. H., & Abel, T. 2007, “Suppression of H₂ Cooling in the Ultraviolet Background,” *Astrophysical Journal*, 671, 1559-1567
 52. Wise, J. H., & Abel, T. 2007, “Resolving the Formation of Protogalaxies. I. Virialization,” *Astrophysical Journal*, 665, 899-910
 53. Abel, T., Wise, J. H., & Bryan, G. B. 2007, “The HII Region of a Primordial Star,” *Astrophysical Journal Letters*, 659, 87-90
 54. Kähler, R., Wise, J. H., Abel, T., & Hege, H.-C. 2006, “GPU-Assisted Raycasting of Cosmological Adaptive Mesh Refinement Simulations,” *Proceedings of Volume Graphics*, pg. 103-110, Boston, USA
 55. Wise, J. H. & Abel, T. 2005, “The Number of Supernovae from Primordial Stars in the Universe,” *Astrophysical Journal*, 629, 615-624
 56. Wise, J. H., Eracleous, M., Charlton, J. C., & Ganguly, R. 2004, “Variability of Narrow, Associated Absorption in Moderate- and Low-Redshift Quasars,” *Astrophysical Journal*, 613, 129-150
 57. Penny, L. R., Gies, D. R., Wise, J. H., Stickland, D. J., & Lloyd, C. 2002, “Tomographic Separation of Composite Spectra IX: The Massive Close Binary HD 115071,” *Astrophysical Journal*, 575, 1050-1056

B2. Conference Presentations with Proceedings (Refereed)

No data

B3. Other Refereed Material

No data

B4. Submitted Journal Articles (with date of submission)

1. Wise, J. H. 2017, “Introductory Review of Cosmic Reionization”, *Contemporary Physics*, submitted on January 2, 2017
2. Chen, P., Norman, M. L., Xu, H. Wise, J. H. 2017, “Fully Coupled Simulations of Cosmic Reionization . III. Stochastic Early Reionization by the Smallest Galaxies”, *Astrophysical Journal*, submitted on April 28, 2017
3. Cote, B., Silvia, D., O’Shea, B. W., Smith, B., Wise, J. H. 2017, “Validating Semi-Analytic Models of High-Redshift Galaxy Formation using Radiation Hydrodynamical Simulations”, *Astrophysical Journal*, submitted on October 18, 2017
4. #Barrow, K. S. S., #Aykutalp, A., Wise, J. H. “Observational signatures of massive black hole formation in the early universe”, *Nature Astronomy*, submitted on December 6, 2017
5. Luo, Y., Ardaneh, K. Shlosman, I. Nagamine, K. Wise, J. H., Begelman, M. C. 2017, “Direct collapse to supermassive black hole seeds with radiative transfer: Isolated haloes”, *Monthly Notices of the Royal Astronomical Society*, submitted on December 19, 2017

C. Other Publications

C1. Conference Proceedings and Posters (Non-refereed)

1. #Koh, D., Wise, J. H. “Amplification of magnetic fields in a primordial H II region and supernova”, First Stars V, Heidelberg, Germany, August 2016
2. #Park, K., Ricotti, M., Natarajan, P., Bogdanovic, T., Wise, J. H. “Bulge-Driven Fueling of Seed Black Holes”, First Stars V, Heidelberg, Germany, August 2016
3. Regan, J. A., Johansson, P H., Wise, J. H. 2016, “Probing the Direct Collapse Black Hole Seed Paradigm”, First Stars V, Heidelberg, Germany, August 2016
4. #Barrow, K. S. S., Wise, J. H. “First Light: Exploring the Spectra of High-Redshift Galaxies in the Renaissance Simulations”, Cosmic Dawn of Galaxy Formation, Paris, France, June 2016
5. Wise, J. H. “Propelling Reionization with the Faintest Galaxies”, 225th *American Astronomical*

- Society Meeting*, Seattle, WA, January 2015
6. #Ge, Q., Wise, J. H. “The impact of Lyman-alpha trapping on massive black hole seed formation”, *225th American Astronomical Society Meeting*, Seattle, WA, January 2015
 7. #Shi, C., Wise, J. H. “The Dynamics of Seed Black Holes in the First Galaxies”, *225th American Astronomical Society Meeting*, Seattle, WA, January 2015
 8. #Koh, D., Wise, J. H. “Magnetic Field Seeding through Supernova Feedback”, *225th American Astronomical Society Meeting*, Seattle, WA, January 2015
 9. #Barrow, K. S. S., Wise, J. H. “First Light: Exploring the Spectra of Galaxies in the Early Universe”, *225th American Astronomical Society Meeting*, Seattle, WA, January 2015
 10. Wise, J. H., Turk, M. J., Norman, M. L., & Abel, T. “Primordial Enrichment of the First Galaxies,” *European Week of Astronomy and Space Sciences 2013*, Turku, Finland, July 2013
 11. Wise, J. H., Abel, T., Turk, M. J., Norman, M. L., & Smith, B. D. “The Imprint of Pop III Stars on the First Galaxies,” *First Stars IV*, Kyoto, Japan, May 2012
 12. Smith, B. D., Wise, J. H., O’Shea, B. W. “The formation of the first second generation star”, *First Stars IV*, Kyoto, Japan, May 2012
 13. Spaans, M., Aykutalp, A., Wise, J. H., Meijerink, R. “The effects of X-rays on star formation and black hole growth in young galaxies”, *First Stars IV*, Kyoto, Japan, May 2012
 14. Wise, J. H., “Regulating Star Formation in High-Redshift Dwarf Galaxies through Radiation Pressure,” *219th American Astronomical Society Meeting*, Austin, TX, January 2012
 15. Wise, J. H., “First Light”, *Bash Symposium 2011*, Austin, TX, October 2011
 16. Wise, J. H., Turk, M. J., Norman, M. L., & Abel, T. “Formation of the First Galaxies: Metal Enrichment and Stellar Populations,” *Cosmic Radiation Fields*, Hamburg, Germany, November 2010
 17. Wise, J. H. & Cen, R., “Photon Escape Fractions from High Redshift Dwarf Galaxies,” *Joint European and National Astronomy Meeting*, Vienna, Austria, September 2008
 18. Wise, J. H. & Abel, T., “How the First Stars Shaped the First Galaxies,” *First Stars III*, Santa Fe, NM, July 2007
 19. Alvarez, M. A., Wise, J. H., & Abel, T., “Black Hole Remnants of the First Stars,” *First Stars III*, Santa Fe, NM, July 2007
 20. Kim, J.-H., Wise, J. H., & Abel, T., “Galaxy Evolution with Adaptive Mesh Refinement,” *First Stars III*, Santa Fe, NM, July 2007
 21. Wise, J. H. “Resolving the Formation of Protogalaxies”, Ph.D. dissertation, *Stanford University*, June 2007
 22. Wise, J. H., Abel, T., Bryan G. B., & Turk, M. J. “Resolving the Formation of Protogalaxies,” *Radiation Backgrounds from the First Stars, Galaxies and Black Holes*, College Park, MD, October 2006
 23. Wise, J. H. & Abel, T., “Numerically Resolved Protogalaxy Formation,” *207th American Astronomical Society Meeting*, Washington, DC, January 2006
 24. Wise, J. H. & Abel, T., “Numerically Resolved Protogalaxy Formation,” *Open Questions in Cosmology: The First Billion Years*, Garching, Germany, August 2005
 25. Wise, J. H. & Abel, T., “The Number of Supernovae from Primordial Stars in the Universe,” *First Stars II*, State College, PA, June 2003
 26. Wise, J. H. & Abel, T. 2003, “The Number of Supernovae from Primordial Stars in the Universe,” *AIP Conf. Proc. 666: The Emergence of Cosmic Structure*, 666, 97
 27. Penny, L. R., Gies, D. R., Bagnuolo, W. G., Wise, J. H., Herrero, A., Stickland, D. J., & Lloyd, C. 2003, “A critical comparison of spectroscopic and evolutionary masses for O-type binary systems,” *IAU Symposium*, 212, 216
 28. Wise, J. H. & Abel, T., “The Number of Supernovae from Primordial Stars in the Universe,” *201st American Astronomical Society Meeting*, Seattle, WA, January 2003
 29. Wise, J. H. & Abel, T., “The Number of Supernovae from Primordial Stars in the Universe,” *The Emergence of Cosmic Structure*, College Park, MD, October 2002

30. Wise, J. H., Eracleous, M., Charlton, J. C., & Ganguly, R. “A Search for Variability in Quasar Narrow, Associated Absorption Lines,” *199th American Astronomical Society Meeting*, Washington, DC, January 2002

D. Presentations

Invited presentations at conferences:

1. (07/2017) *Spectral Diagnostics with the James Webb Space Telescopes*, Baltimore, MD
2. (05/2017) *Blue Waters Symposium*, Sunriver, OR
3. (02/2017) *JINA-CEE Frontiers in Nuclear Astrophysics*, East Lansing, MI
4. (01/2017) *Dawn of Galaxies*, Obergurgl, Austria
5. (10/2015) *The Physics of SMBH Formation and Feedback*, Annapolis, MD
6. (06/2015) *Guillermo Haro Workshop*, Puebla, Mexico
7. (03/2015) *Laboratory Astrophysics for Beyond Hubble*, Callaway Gardens, GA
8. (11/2014) *Enzo User Workshop*, Hokudai University, Sapporo, Japan [2 Presentations]
9. (08/2014) *Lyman Continuum Leakage and Cosmic Reionization*, Stockholm, Sweden
10. (06/2014) *The First Stars and Galaxies in their Cosmological Context*, Edinburgh, Scotland [Review talk]
11. (05/2014) *Overcoming Great Barriers in Galactic Archaeology 2*, Palm Cove, Australia [Keynote Talk]
12. (11/2013) *Astro@GR Atlanta*, Atlanta, GA
13. (10/2013) *Enzo User Workshop*, Hokudai University, Sapporo, Japan [2 Presentations]
14. (08/2013) *Massive Black Holes*, Santa Barbara, CA [Review Talk & Blackboard Talk]
15. (07/2013) *European Week of Astronomy and Space Science*, Turku, Finland [Review talk]
16. (06/2013) *Cosmic Dawn*, Ringberg Castle, Germany
17. (10/2012) *East Asia Numerical Astrophysical Meeting*, Kyoto, Japan [Review talk]
18. (05/2012) *First Stars IV*, Kyoto, Japan
19. (05/2012) *Enzo User Workshop*, Hokudai University, Sapporo, Japan
20. (04/2012) *Einstein Workshop*, Atlanta, GA
21. (02/2012) *First Light and Faintest Dwarfs*, Santa Barbara, CA
22. (01/2012) *yt User Workshop*, Chicago, IL
23. (10/2011) *Bash Symposium*, Austin, TX [Review talk]
24. (10/2011) *Enzo Developer Workshop*, Columbia University, New York, NY
25. (06/2011) *The First Galaxies*, Ringberg Castle, Germany
26. (03/2011) *Enzo Developer Workshop*, Michigan State University, East Lansing, MI
27. (03/2011) *Hubble Fellow Symposium*, Austin, TX
28. (12/2010) *Future of AstroComputing*, San Diego, CA
29. (06/2010) *Enzo Workshop 2010*, UC-San Diego, La Jolla, CA
30. (06/2010) *The First Galaxies, Quasars, and Gamma-Ray Bursts*, State College, PA
31. (03/2010) *The First Stars and Galaxies*, Austin, TX [canceled]
32. (12/2009) *Missing Baryons 2009*, Sydney, Australia [Review talk]
33. (10/2008) *The Impact of Simulations in Cosmology and Galaxy Formation*, Trieste, Italy
34. (09/2008) *Cosmic Dust & Radiative Transfer*, Heidelberg, Germany

Invited presentations at universities & institutes:

35. (10/2017) University of Kentucky, Seminar
36. (04/2017) University of California – Berkeley, Seminar
37. (11/2016) Auburn University, Colloquium
38. (05/2016) Heidelberg Joint (6 institutions) Astronomy Colloquium
39. (02/2016) University of Tokyo – Kavli IPMU, Colloquium
40. (01/2016) University of South Carolina, Colloquium
41. (11/2015) Southern Methodist University, Seminar

42. (10/2014) California Institute of Technology, Colloquium
43. (01/2014) University of Victoria, Colloquium
44. (01/2014) Herzberg Institute for Astrophysics, Colloquium
45. (10/2013) University of Tokyo – Kavli IPMU, Seminar
46. (05/2013) Scuola Normale Superiore, Seminar
47. (05/2013) Massachusetts Institute of Technology, Colloquium
48. (03/2013) Georgia State University, Colloquium
49. (11/2012) University of Colorado – Boulder, Colloquium
50. (10/2012) University of Kentucky, Colloquium
51. (09/2012) University of Maryland, Colloquium
52. (05/2012) Hokudai University, Colloquium
53. (05/2011) Columbia University, Seminar
54. (03/2011) Michigan State University, Colloquium
55. (02/2011) Georgia Institute of Technology, Colloquium
56. (12/2010) University of Arizona, Colloquium
57. (11/2010) University of California – Santa Cruz, Seminar
58. (10/2010) Los Alamos National Laboratory, Colloquium
59. (09/2010) Kapteyn Astronomical Institute, Colloquium
60. (07/2010) Stanford University, Seminar
61. (05/2010) Canadian Institute for Theoretical Astrophysics, Seminar
62. (12/2009) Swinburne University, Seminar
63. (01/2009) Canadian Institute for Theoretical Astrophysics, Seminar
64. (01/2009) Carnegie Mellon University, Seminar
65. (08/2008) University of Heidelberg, Seminar
66. (10/2007) UCSB / Kavli Institute for Theoretical Physics, Seminar
67. (09/2007) NASA / Goddard Space Flight Center, SEAL Seminar
68. (02/2007) Canadian Institute for Theoretical Astrophysics, Seminar
69. (01/2007) American Museum of Natural History, Seminar
70. (10/2006) University of Maryland, Seminar
71. (10/2006) NASA / Goddard Space Flight Center, Colloquium
72. (10/2006) Harvard-Smithsonian Center for Astrophysics, Seminar
73. (10/2006) Princeton University, Seminar
74. (09/2006) University of California – Berkeley, Seminar

Contributed presentations at conferences:

75. (01/2017) *American Astronomical Society Meeting*, Grapevine, TX
76. (08/2016) *First Stars V*, Heidelberg, Germany
77. (06/2016) *The Cold Universe*, Santa Barbara, CA
78. (06/2016) *Cosmic Dawn of Galaxy Formation*, Paris, France
79. (12/2015) *Cosmology and First Light*, Paris, France
80. (07/2015) *Mocking the Universe*, Baltimore, MD
81. (06/2015) *First stars, galaxies, and black holes: Then and Now*, Groningen, Netherlands
82. (04/2015) *South by High Redshift*, Austin, TX
83. (12/2012) *Cosmological Radiative Transfer Comparison Project*, Austin, TX
84. (08/2012) *Santa Cruz Workshop on Galaxy Formation*, Santa Cruz, CA
85. (04/2012) *Epoch of Reionization*, Strasbourg, France
86. (11/2011) *Near Field Cosmology*, Annapolis, MD
87. (07/2011) *Galaxy Formation*, Durham, UK
88. (10/2010) *Cosmic Radiation Fields*, Hamburg, Germany
89. (09/2010) *Formation and evolution of black holes, galaxies, and their environment*, Potsdam, Germany

90. (01/2010) *American Astronomical Society Meeting*, Washington, DC
91. (01/2009) *American Astronomical Society Meeting*, Long Beach, CA
92. (02/2008) *The First Two Billion Years of Galaxy Formation*, Aspen, CO
93. (12/2007) *Grand Challenge Problems in Computational Astrophysics Reunion II*, Lake Arrowhead, CA
94. (09/2007) *Radiative Transfer Workshop*, Durham, UK
95. (07/2007) *First Stars III*, Santa Fe, NM
96. (08/2006) *Santa Cruz Workshop on Galaxy Formation*, Santa Cruz, CA
97. (07/2006) *Physics and Astrophysics of Black Holes*, Santa Fe, NM
98. (08/2005) *Santa Cruz Workshop on Galaxy Formation*, Santa Cruz, CA

E. Grants and Contracts

E1. As Principal Investigator

Currently funded:

- 07/01/2012-06/30/2017 NSF XSEDE AST-120046 (12.5 million core-hours total; no co-PIs) “The First Galaxies throughout Cosmic Time”
- 11/01/2015-10/31/2018 STScI HST-AR-14326.001 (\$90,695; Hubble Space Telescope Theory Grant; no Co-PIs) “Observational Diagnostics for High-Redshift Galaxies with Massive Black Hole Seeds”
- 09/01/2016-08/31/2019 NSF AST-1614333 (\$473,330; no Co-PIs) “Uncovering the Origin and Evolution of Dwarf Galaxies”
- 02/14/2017-02/13/2020 NASA ATP16-0025 (\$537,824, 24 million core-hours, no Co-PIs) “Simulating the First Stars and Galaxies: Predictions for JWST”

Previous funding:

- 05/01/2009-04/30/2013 NASA High-end Computing; allocations SMD-12-3130, SMD-11-2258, SMD-10-1876, SMD-09-1439 (19.8 million CPU-hours) “Radiation Hydrodynamics Simulations of Dwarf Galaxies”
- 09/01/2009-08/05/2011 NASA Hubble Postdoctoral Fellowship, NAS 5-26555, 120-6370 (\$199,876) “Ab Initio Dwarf Galaxy Formation – Predictions for JWST and ALMA”
- 09/01/2012-08/31/2015 NSF AST-1211626 (\$258,547; no co-PIs), “The Formation of the First Galaxies and their Connection to the Present Day”
- 01/01/2015-12/31/2015 NSF XSEDE AST-140081 (868k core-hours; Co-PIs Brian O’Shea, David Collins) “Examining the Processes of Formation and Feedback for Stars and AGN in the AMR Code Enzo”
- 12/01/2014-11/30/2017 STScI (Space Telescope Science Institute) HST-AR-13895.001 (\$108,000; Hubble Space Telescope Theory Grant; no Co-PIs) “Revealing the Properties of the Frontier Field Galaxies”

E2. As Co-Principal Investigator

Currently funded:

- 10/01/2015-09/30/2017 NSF PRAC (85.8 million core-hours on Blue Waters; \$31,452; PI Brian O’Shea) “Petascale Adaptive Mesh Simulations of Milky Way-type Galaxies and their Progenitors”

Previously funded:

- 04/01/2015-09/30/2016 Great Lakes Consortium for Petascale Computation (16.8 million core-hours on the NCSA Blue Waters supercomputer; PI Brian O’Shea) “Petascale adaptive mesh simulations of Milky Way-type galaxies and their progenitors”
- 09/01/2013-08/31/2017 NSF AST-1333360 (\$571,378, PI Pablo Laguna), “The Multi-scale Physics of Massive Black Hole Formation, Fueling, and Feedback”

E3. As Senior Personnel or Contributor

Currently funded:

09/01/2014-08/31/2017 NSF SI2-SSE ACI-1440709 (\$500,000; PI Michael Norman) “Petascale Enzo: Software Infrastructure Development and Community Engagement”
09/01/2016-08/31/2019 NSF AST-1615848 (\$542,040; PI Michael Norman & PI Matthew Turk)
“Collaborative Research: CDS&E: Renaissance Simulations Laboratory to Model and Explore the First Galaxies in the Universe”

Previously funded:

04/01/2010-03/31/2016 NSF PRAC OCI-0832662 (124 million core-hours on the NCSA Blue Waters supercomputer; PI Brian O'Shea) “Formation of the first galaxies: predictions for the next generation of observatories”

F. Other Scholarly Accomplishments

No data

G. Societal and Policy Impacts

Magazine Covers & Visuals

2014 Research featured in the 2015 CASC (Coalition for Academic Scientific Computing) Brochure
2013 Magazine cover image of *The Tower*
[*Undergraduate Research Journal at Georgia Tech, featuring the work of M. Halicek*]
2012 Magazine cover image of *XSEDE Science Highlights*
2011 Magazine cover image of *Science News*

Interviews

2015 GT *Tech+Knowledge+Y* Research Video Series
2013 Kavli Foundation Live Q&A session *Black Holes & Our Cosmic Evolution*
2013 Kavli Foundation spotlight *Black Holes Revisited*
2012 *Cosmic Front*, NHK Productions, a 60-min television episode on the first stars

H. Other Professional Activities

No data

V. Teaching

A. Courses Taught (last 6 years)

<i>Semester</i>	<i>Course number</i>	<i>Course title</i>	<i># of students</i>
Fall 2017	PHYS 2232	Honors Physics II	20
Fall 2017	PHYS 8803	Cosmology & Galaxies	5
Spring 2017	PHYS 3266	Computational Physics	30
Fall 2016	PHYS 2232	Honors Physics II	32
Spring 2016	PHYS 4347	Fundamentals of Astrophysics	18
Fall 2015	PHYS 8803	Cosmology & Galaxies	8
Spring 2015	PHYS 4347	Fundamentals of Astrophysics	16
Fall 2014	PHYS 2212	Intro Physics II	88
Spring 2014	PHYS 4347	Fundamentals of Astrophysics	24
Fall 2013	PHYS 8803	Cosmology & Galaxies	16
		[<i>Course developed from scratch</i>]	
Spring 2013	PHYS 2212	Intro Physics II	166
Fall 2012	PHYS 4803	Fundamentals of Astrophysics	10
		[<i>Course developed from scratch</i>]	
Fall 2011	PHYS 2212	Intro Physics II	161

B. Individual Student Guidance

B1. Ph.D. Students

1. Corey Brummel-Smith Georgia Tech Physics, Fall 2017-present
2. Danielle Skinner Georgia Tech Physics, Fall 2017-present
3. Kirk Barrow Georgia Tech Physics, Fall 2013-present
 - Southern Regional Education Board Doctoral Scholarship (2013-2016)
 - Advanced to candidacy, Summer 2016
 - Internship at Jet Propulsion Laboratory (Summer 2017)
4. Qi Ge Georgia Tech Physics, Fall 2013-present
 - Advanced to candidacy, Summer 2015
5. Daegene Koh Georgia Tech Physics, Fall 2012-Spring 2017
 - Advanced to candidacy, Spring 2014
 - Georgia Tech Student Government Association: Vice President of the Graduate Conference Fund and Vice President of Student Affairs
 - Successful Georgia Tech Grant (\$600) for an interactive “Galaxy Collider” exhibit at the 2014 Atlanta Science Festival
 - Received the NSF East Asian and Pacific Summer Institutes Fellowship, Summer 2014
 - Finalist in Georgia Tech Three-Minute Thesis Competition
 - Won Best Poster Prize (out of 75) in *First Stars V* (August 2016)
 - Awarded the AAS International Travel Grant (2016)
 - Defended PhD thesis (March 2017)
 - Initial position: Postdoctoral fellow at KIPAC (Stanford University)
6. Chao Shi Georgia Tech Physics, Spring 2012-Spring 2017
 - Advanced to candidacy, Spring 2013
 - Defended PhD thesis (May 2017)
 - Initial position: Data scientist at Pindrop

B2. M.S. Students

7. Joseph O'Harrow Georgia Tech Physics, non-thesis option, graduated 2013
 - Received a M.S. in Computer Science at the University of Chicago, 2015
 - Current a software developer at Glory Global Solutions, Chicago, IL

B3. Undergraduate Students

8. Talha Irfan Georgia Tech Physics major, Summer 2017-present
9. Amy Ralston Georgia Tech REU student, Summer 2017
10. Jai Chauhan Georgia Tech Computer Science student, Summer 2017
11. Carlos J. Llorente Georgia Tech Physics major, Spring 2017-present
12. Jamsheed Cooper Georgia Tech Biomedical Engineering major, Fall 2016
 - Currently an intern in the U.S. Senate
13. Kevin Choi Georgia Tech Applied Physics major, Summer 2016-Spring 2017
14. Davis Nelson Georgia Tech Physics major, Summer 2015-Spring 2017
15. Austin Gilbert Georgia Tech Physics major, Spring 2015-Spring 2017
 - Participated in an REU program at University of Illinois – Urbana-Champaign, Summer 2016
 - Participant in REU program at Michigan State University, Summer 2017
16. Collin Cunningham Georgia Tech Applied Math major, Fall 2015-Spring 2016
 - M.S. student in Mathematical Modeling at the Technical University of Denmark
17. John Bollenbacher Georgia Tech Physics major, Fall 2014
 - Currently a Ph.D. student in the University of Indiana
18. Kirk Barrow Georgia Tech Physics major, Fall 2012-Summer 2013

- Currently a Ph.D. student in the Wise Group
19. Vasily Demchenko Georgia Tech Physics major, Spring 2012-Spring 2013
 - Research option – thesis title: *Dependence of escape fraction of ultraviolet radiation on galaxy mass*
 - Received a M.S. in Physics from the University of Edinburgh, 2015
 - Currently a Ph.D. student in Physics in the University of Edinburgh
 20. Martin Halicek Georgia Tech Physics major, Spring 2012-Fall 2012
 - Research featured in an article and the cover *The Tower*
 - Currently a Ph.D./M.D. student in Medical Physics at Emory University
 21. Akshaya Suresh Yale Astronomy major, Summer 2012
 - Currently a Ph.D. student in the University of Chicago
 22. Erin Caldwell Georgia Tech Physics major, Spring 2012
 - Currently a Patent Attorney at Baker & Hostetler LLP

B4. Service on Thesis Committees

Yu Qiu	Ph.D. student (Georgia Tech Physics, graduating 2019)
Xiaomeng Zhai	Ph.D. student (Georgia Tech Aerospace Engineering, graduating 2019)
Raj Gohil	Ph.D. student (Georgia Tech Physics, graduating 2018)
Athanasios Stavropoulos	Ph.D. student (Georgia Tech Physics, graduated 2017)
Karan Jani	Ph.D. student (Georgia Tech Physics, graduated 2017)
Nicholas Gillet	Ph.D. student (Université de Strasbourg Astronomy, graduated 2016)
Katharine Tallaksen	M.S. student (Georgia Tech Computational Science & Engineering, graduated 2016)
Matthew Kinsey	Ph.D. student (Georgia Tech Physics, graduated 2016)
Michael Clark	Ph.D. student (Georgia Tech Physics, graduated 2016)
Joseph Schulz	Ph.D. student (Georgia Tech Aerospace Engineering, graduated 2015)
Jacob Daughhetee	Ph.D. student (Georgia Tech Physics, graduated 2015)
Thai Hoang	Ph.D. student (Georgia Tech Physics, graduated 2013)
Christine Simpson	Ph.D. student (Columbia University Astronomy, graduated 2013)
Aycin Aykotalp	Ph.D. student (University of Groningen Astronomy, graduated 2012)

B5. Mentorship of Postdoctoral Fellows and Visiting Scholarship

1. Yuya Sakurai (2018-2020)
 - Host and Mentor for the Foreign JSPS Fellowship (Japan Society for the Promotion of Science)
2. Gen Chiaki (2017-2019)
 - Host and Mentor for the Foreign JSPS Fellowship (Japan Society for the Promotion of Science)
3. KwangHo Park (2014-present)
 - Co-advising with Assistant Professor Tamara Bogdanovic
4. Aycin Aykotalp (2014-2017)
 - Invited to lead a discussion group at *First Stars, Black Holes, and Galaxies* in Groningen, Netherlands, 2015
 - Invited talk at the *Guillermo Haro Workshop on Black Hole Formation* in Puebla, Mexico, 2015
 - Invited talk at the American Physical Society April Meeting in Salt Lake City, UT, 2016
 - Currently a postdoctoral researcher at Los Alamos National Laboratory
5. Gabriel Altay (2012-2014)
 - Currently a senior software developer at Aledade, Inc., Washington, DC
 - Developed an open-source radiation transport code, Rabacus

- Invited seminars in University of Nevada and Leiden University
 - Active participant in the open-source analysis and visualization toolkit, *yt*
6. Daisuke Yamasawa (2013)
- Visiting postdoctoral researcher (1-month) from Tohoku University, Sendai, Japan
 - Funded by the Japan Society for the Promotion of Science (JSPS)

C. Other Teaching Activities

Outreach:

2012-present	CRA Visualization Laboratory, Demonstrator
2017	Provided visualization for planetarium show, “Seeing the Beginning of Time”
2014-2015	Provided visualization for planetarium show, “Solar Superstorms”
2011-2014	Georgia Tech Direct to Discovery Program
2014	Atlanta Science Festival, Demonstrator
2011-2013	Georgia Tech Observatory Open House, Volunteer
2012	Provided visualization, “The First Stars”, Alder Planetarium
2010	Provided visualization for planetarium show, California Academy of Sciences
2008	Provided visualization for planetarium show, American Museum of Natural History
2007-2009	Supercomputing Conference, Demonstrator
2005-2007	KIPAC Visualization Laboratory, Demonstrator
2004	Penn State Space Day, Volunteer
2001-2003	Penn State Astrofest, Volunteer
2001-2002	Penn State Astronomy Open House, Volunteer
2000	195 th American Astronomical Society Meeting, Atlanta, GA, Volunteer

VI. Service

A. Professional Contributions

Conference Organizing:

06/2018	Scientific Organizing Committee of <i>Rise and Shine: galaxies in the epoch of reionization</i> , Strasbourg, France
03/2015	Local Organizer Committee (Chair) of the <i>Annual TCAN Meeting</i> , Atlanta, GA
09/2013	Scientific Organizing Committee of the <i>KIPAC@10</i> Conference, Stanford, CA
10/2012	Lead Organizer of <i>Enzo Developer Workshop</i> , Atlanta, GA

Advisory Committees:

2016	Scientific Advisor for Senate Committee Hearing on the Space Weather Research and Forecasting Act by Sen. Gardner (R-CO), Sen. Peters (D-MI), Sen. Booker (D-NJ)
2014	Scientific Advisor for NOVA Special, <i>Mystery of Monster Black Holes</i>

Professional Societies:

No data

Membership in Professional and Honor Societies:

American Astronomical Society
 American Association of Physics Teachers
 American Physical Society (APS)
 APS Division of Astrophysics
 APS Division of Computational Physics
 APS Gravity Topical Group

Editorial Board Memberships:

No data

Community-driven Code Development:

Lead developer for the open-source code, Enzo (www.enzo-project.org)

Core member of the open-source code, yt (www.yt-project.org)

Peer Reviewing:

Manuscripts reviewed (~10 per year total) for:

Astronomy & Astrophysics

Astronomy & Computing

Astrophysical Journal

Monthly Notices of the Royal Astronomical Society

Science

Proposals reviewed for:

Space Telescope Science Institute, Hubble Theory Program

National Aeronautics and Space Administration, Astrophysics Theory Program and Postdoctoral Fellowship Program

National Science Foundation, Advanced Cyber-infrastructure Grants, Astronomy and Astrophysics Grants, Postdoctoral Fellowship Program, Small Business Innovation Research Grants, XSEDE Resource Allocations Committee

Netherlands Organisation for Scientific Research, Vidi Grants

Swiss National Science Foundation

Swiss National Supercomputing Center

B. Public and Community Service

Public Talks:

1. (04/2015) *TEDxDouglasville, In with the Old, In with the New*, Douglasville, GA
2. (11/2013) *Inquiring Minds @ Tech*, Georgia Institute of Technology, Atlanta, GA
3. (10/2013) *OIAS Sci-Tech Talk*, Hokudai University, Sapporo, Japan

C. Institute Contributions

2017-2018

Member of Reappointment, Promotion, and Tenure (RPT) Committee, School of Physics

Member of Periodic Peer Review Committee, School of Physics

Member of Computer Committee, School of Physics

Member of the Student Computer Ownership Committee, Institute-wide

2016-2017

Member of Colloquium Committee, School of Physics

Member of the Computer Committee, School of Physics

Member of the Student Computer Ownership Committee, Institute-wide

2015-2016

Chair of the Communications Committee, School of Physics

Member of the High Performance Computing Committee, College of Sciences

2014-2015

Chair of the Web Committee, School of Physics: Leading the redesign of the School's website
Leader of a Tech Fee Proposal "A Next-Generation Physics Computer Lab" (funded, \$61,117)
Faculty mentor for three undergraduate Physics majors

2013-2014

Chair of the Web Committee, School of Physics: Leading the redesign of the School's website
Member of the Outreach Committee, School of Physics
Faculty mentor for three undergraduate Physics majors

2012-2013

Member of the Outreach Committee, School of Physics
Member of the Undergraduate Studies Committee, School of Physics

2011-2012

Design and construction of the Center for Relativistic Astrophysics Visualization Lab