

**Curriculum Vitae**  
**Athena Stacy**

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**CONTACT INFORMATION**

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**EDUCATION**

*University of Texas, Austin, Texas*  
2007 – 2011 Ph.D. in Astronomy  
2005 – 2007 M.A. in Astronomy

*Rice University, Houston, Texas*  
2001 – 2005 B.S. in Astrophysics, Cum Laude

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**HONORS AND INVITED TALKS**

2007 Invited short talk, Frank N. Bash Symposium  
2010 Invited talk, 4th Meeting of the 3rd Coast Astronomical Society: Probing the Dark Ages  
2010 David Bruton, Jr. Graduate School Fellowship  
2011 Seminar presentation, NASA/GSFC Stellar and Extragalactic Astronomy Lunch  
2012 Seminar presentation, University of Maryland Theory Lunch  
2012 Invited short talk, Harvard Institute for Theory and Computation Luncheon  
2012 Contributed talk, First Stars IV Conference, Kyoto, Japan

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**RESEARCH ACTIVITIES**

2004 (June-July), NASA Undergraduate Student Research Program participant  
*Los Alamos National Laboratory, Los Alamos, New Mexico*  
Searched for Hawking radiation from primordial black holes using the Third EGRET Catalog of Gamma Ray Sources.

2004 – 2005 Undergraduate Senior Research  
*Rice University Physics and Astronomy Department, Houston, TX*  
Studied variability of the ultra-luminous X-ray sources in the nearby galaxy NGC 1313 using the XMM-Newton satellite.

2005 – 2007, Master's Graduate Student  
*University of Texas, Austin, TX*  
*Impact of Cosmic Rays on Population III Star Formation*  
Developed analytical models for cosmic ray (CR) production in the early universe. Combined with computer models describing the thermal and chemical evolution of primordial star-forming gas. Analyzed subsequent effect of CRs on the thermal evolution of primordial gas and the mass of the first stars.

2007 – 2011, Ph.D. Graduate Student  
*University of Texas, Austin, TX*  
*New Insights Into Primordial Star Formation*

1. Performed a number of high-powered cosmological simulations to study the formation of Pop III stars, the rotation speed of the first stars, the development of Pop III binaries and small multiple systems, and the stellar feedback effects on primordial star-forming gas.
2. Extensively utilized Texas Advanced Computing Center (TACC) supercomputers, Lonestar and Ranger.
3. Gained proficiency in massively parallel computation.
4. Implemented techniques for visualization of large datasets of simulation output.

2011 – present, NASA Postdoctoral Program Fellow  
*NASA Goddard Space Flight Center, Greenbelt, MD*

*Scientific Aspects:*

1. Studied interaction between dark matter and primordial star-forming gas to constrain potential impact of WIMP annihilation heating on Pop III star formation.
2. Used high-resolution datasets from cosmological simulations to analyze Pop III internal structure and rotation.
3. Currently simulating Pop III stellar growth under radiative feedback in a cosmological setting while resolving protostellar scales.
4. Currently performing a suite of cosmological simulations to constrain the range of characteristics of Pop III multiple systems.

*Computational Aspects:*

1. Utilized datasets from multiple simulation codes, GADGET2 and AREPO.
2. Proposed for and earned over 1.5 million CPU hours on the NASA Advanced Supercomputing Pleiades cluster.
3. Member of early user group for Stampede, the upcoming new TACC supercomputer.

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**SELECTED TEACHING, SERVICE, AND OUTREACH EXPERIENCE**

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2005– 2006 Teaching Assistant, Introduction to Astronomy

2007 Lab Teaching Assistant, Astronomy Discovery Lab

Included designing various lab assignments that covered subjects ranging from light and optics to Newton's Laws, guiding the students during their lab sessions, and running telescope observations at night.

2008 – 2009 Teaching Assistant, The History and Philosophy of Astronomy (UT Signature Course)

Included holding small group discussion sections and grading essay assignments. Earned a Teaching Certificate in First-Year Interdisciplinary Instruction.

2010 Teaching Assistant, Popular Astronomy (UT Signature Course)

2011 Public Speaker at March “Nerd Nite Austin”

Presented a lecture, “The Beginnings of the Universe,” at a monthly public educational event in Austin, TX

Reviewer for Astrophysical Journal Letters

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## FIRST AUTHOR REFEREED PUBLICATIONS

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*Impact of Cosmic Rays on Population III Star Formation*, Stacy A. & Bromm V. 2007, Monthly Notices of the Royal Astronomical Society, **382, 229**

*The First Stars: Formation of Binaries and Small Multiple Systems*, Stacy A., Greif T. H., & Bromm V. 2010, Monthly Notices of the Royal Astronomical Society, **403, 45**

*Rotation Speed of the First Stars*, Stacy A., Bromm V., & Loeb A. 2011, Monthly Notices of the Royal Astronomical Society, **413, 543**

*Effect of Streaming Motion of Baryons Relative to Dark Matter on the Formation of the First Stars*, Stacy A., Bromm V., & Loeb A. 2011, The Astrophysical Journal Letters, **730, 1L**

*Effect of Population III Multiplicity on Dark Star Formation*, Stacy A., Pawlik A. H., Bromm V., Loeb A. 2012, Monthly Notices of the Royal Astronomical Society, **421, 894**

*The First Stars: Mass Growth Under Protostellar Feedback*, Stacy A., Greif T. H., Bromm V. 2012, Monthly Notices of the Royal Astronomical Society, **422, 290**

*Rotation and Internal Structure of Population III Protostars*, Stacy A., Greif T. H., Klessen R. S., Bromm V., Loeb A. 2012, Monthly Notices of the Royal Astronomical Society, submitted (**arXiv: 1209.1439**)

*Constraining the Statistics of Population III Binaries*, Stacy A., Bromm V. 2012, Monthly Notices of the Royal Astronomical Society, submitted (**arXiv:1211.1889**)

*Constraints from Protostellar-Scale Feedback on the Population III Initial Mass Function*, Stacy A., Greif T. H., Bromm V. 2012, to be submitted

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## FURTHER SELECTED PUBLICATIONS

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### Refereed Journal Articles

*Multiwavelength Monitoring of the Unusual Ultraluminous Supernova SN 1978K in NGC 1313 and the Search for an Associated Gamma-Ray Burst*, Smith I. A., Ryder S. D., Böttcher M., Tingay S. J., **Stacy A.**, Pakull M., & Liang E. P. 2007, The Astrophysical Journal, **669, 1130**

*Probing Pre-galactic Metal Enrichment with High-Redshift Gamma-Ray Bursts*, Wang F. Y., Bromm V., Greif T. H., **Stacy A.**, Dai Z. G., Loeb A., Cheng K. S. 2012, The Astrophysical Journal, **760, 27**

### Conference Proceedings

*The Impact of Cosmic Rays on Population III Star Formation*, Stacy A. & Bromm V. 2008, Frank N. Bash Symposium 2007 ASP Conference Series, **393, 275**

*Open questions in the study of population III star formation*, Glover S. C. O., Clark, P. C., Greif T. H., Johnson J. L., Bromm V., Klessen R. S., & **Stacy A.** 2008, Proc. of the International Astronomical Union, IAU Symposium, **255, 3**

*The First Stars: Binary and Small Multiple Formation*, Stacy A., Greif T. H., & Bromm V. 2010, Frank N. Bash Symposium 2009 ASP Conference Series, **432, 265**

*The First Stars: Formation of Binaries and Small Multiples*, Stacy A., Greif T. H., & Bromm V. 2010, The First Stars and Galaxies: Challenges for the Next Decade, AIP Conference Proceedings, **1294, 289**

*The First Stars: Mass Growth Under Protostellar Feedback*, Stacy A., Greif T. H., & Bromm V. 2012, First Stars IV: From Hayashi to the Future, AIP Conference Proceedings, in press