

## *CURRICULUM VITAE*

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**Education:**  
Ph.D.: University of Chicago (Physics) 1998  
B.S.: MIT (Physics and Electrical Engineering) 1993

**Experience:**  
2003 – present Assistant Professor, Univ. of Wisconsin  
2001 – 2003 Fellow, CERN  
1998 – 2001 Postdoctoral Fellow, Univ. of Michigan

**Honors:** DOE Outstanding Junior Investigator Award, 2005.

**Interest Areas:** Theoretical Cosmology and High Energy Theory

**Professional Service:**

- Organizing Committee for Strings 2000 (Ann Arbor, MI)  
PASI 2006 (Puerto Vallarta)
- Referee: Physical Review D, Physics Letters B, Physical Review Letters, Journal of High Energy Physics, Modern Physics Letters A, Astrophysical Journal, Nuclear Physics B, Astrophysical Journal Letters, Classical and Quantum Gravity, International Journal of Modern Physics
- Grant Reviewer: DOE, NSF, NASA

### Publications in Refereed Journals

1. “Cuscuton Cosmology: Dark Energy meets Modified Gravity” (with N. Afshordi, Michael Doran, and G. Geshnizjani), arXiv:astro-ph/0702002, submitted for publication in Phys. Rev. **D**.
2. “Cuscuton: A causal field theory with an infinite speed of sound” (with N. Afshordi and G. Geshnizjani), arXiv:hep-th/0609150, submitted for publication in Phys. Rev. **D**.

3. “Mapping Luminosity-Redshift Relationship to LTB Cosmology” (with A. E. Romano), *Phys. Rev. D* **74**, 103507 (2006) [arXiv:astro-ph/0608403].
4. “High density preheating effects on Q-ball decays and MSSM inflation” (with M. Berkooz and T. Volansky), *Phys. Rev. Lett.* **96**, 031303 (2006) [arXiv:hep-ph/0510186].
5. “Approximate consistency condition from running spectral index in slow-roll inflationary models” (with A. E. Romano), *Phys. Rev. D* **73**, 103510 (2006) [arXiv:astro-ph/0508411].
6. “Constraining Modular Inflation from Giant Q-ball Formation” (with M. Berkooz and T. Volansky), *Phys. Rev. D* **73**, 063526 (2006) [arXiv:hep-ph/0507218].
7. “Do large-scale inhomogeneities explain away dark energy?”, (with G. Geshnizjani and N. Afshordi), *Phys. Rev. D* **72**, 023517 (2005) [astro-ph/0503553].
8. “Isocurvature constraints on gravitationally produced superheavy dark matter” (with E. W. Kolb, A. Riotto and L. Senatore), *Phys. Rev. D* **72**, 023511 (2005) [arXiv:astro-ph/0411468].
9. “Constraints on resonant particle production during inflation from the matter and CMB power spectra,” (with G. J. Mathews, K. Ichiki, T. Kajino and M. Ōrito), *Phys. Rev. D* **70**, 083505 (2004) [arXiv:astro-ph/0406046].
10. “The soft supersymmetry-breaking Lagrangian: theory and applications” (with L. Everett, G. Kane, S. King, J. Lykken, and L. Wang), *Phys. Rept.* **407**, 1 (2005) [arXiv:hep-ph/0312378].
11. “Running of the scalar spectral index from inflationary models,” (with M. Trodden and G. Shiu) *Phys. Rev. D* **68**, 063501 (2003) [arXiv:astro-ph/0305193].
12. “Minimal theoretical uncertainties in inflationary predictions” (with A. Notari and A. Riotto) *JCAP* **0310**, 012 (2003) [arXiv:hep-ph/0305074].
13. “Quintessence and the underlying particle physics theory” (with L. Everett and A. Riotto), *Phys. Lett. B* **556**, 61 (2003) [hep-ph/0210427].
14. “Lensed Density Perturbations in Braneworlds: Towards an Alternative to Perturbations from Inflation” (with K. Freese), *Phys. Rev. D* **67**, 103505 (2003) [astro-ph/0202066].
15. “Standard model baryogenesis through four-fermion operators in braneworlds” (with T. Dent), *Phys. Rev. D* **66**, 023501 (2002) [hep-ph/0112360].

16. “On the gravitational production of superheavy dark matter” (with P. Crotty, E. Kolb, and A. Riotto), *Phys. Rev. D* **64**, 043503 (2001) [hep-ph/0104100].
17. “Experimental probes of the Randall-Sundrum infinite extra dimension” (with L. Everett and H. Davoudiasl), *Phys. Rev. D* **64**, 065002 (2001) [hep-ph/0010103].
18. “Extra dimensions present a new flatness problem” (with E. W. Kolb and A. Riotto), *Phys. Rev. D* **65**, 083516 (2002) [hep-ph/0008126].
19. “Weighing the universe with accelerators and detectors” (with M. Brhlik and G. L. Kane), *Int. J. Mod. Phys. D* **10**, 367 (2001) [hep-ph/0005158].
20. “Probing Planckian physics: Resonant production of particles during inflation and features in the primordial power spectrum” (with E. W. Kolb, A. Riotto and I. I. Tkachev), *Phys. Rev.* **D62**, 043508 (2000) [hep-ph/9910437].
21. “Can geodesics in extra dimensions solve the cosmological horizon problem?” (with K. Freese), *Phys. Rev.* **D62**, 063513 (2000) [hep-ph/9910235].
22. “Cosmological challenges in theories with extra dimensions and remarks on the horizon problem” (with K. Freese), *Phys. Rev.* **D61**, 023511 (2000) [hep-ph/9906542].
23. “The MSW effect in quantum field theory” (with C.Y. Cardall), *Phys. Rev.* **D60**, 073012 (1999) [hep-ph/9904291].
24. “Classical inflaton field induced creation of superheavy dark matter,” *Phys. Rev. D* **67**, 083514 (2003) [hep-ph/9809489].
25. “Production of massive particles during reheating” (with E.W. Kolb and A. Riotto), *Phys. Rev.* **D60**, 063504 (1999) [hep-ph/9809453].
26. “Nonthermal supermassive dark matter” (with E.W. Kolb and A. Riotto), *Phys. Rev. Lett.* **81**, 4048 (1998) [hep-ph/9805473].
27. “Superheavy dark matter” (with E.W. Kolb and A. Riotto), *Phys. Rev.* **D59**, 023501 (1999) [hep-ph/9802238].
28. “Are ultrahigh energy cosmic rays signals of supersymmetry?” (with G.R. Farrar and E.W. Kolb), *Phys. Rev.* **D57**, 4606 (1998) [astro-ph/9707036].
29. “On the relic abundance of light photinos” (with G.R. Farrar and E.W. Kolb), *Phys. Rev.* **D56**, 6096 (1997) [astro-ph/9703145].

## Other Published Papers and Conference Contributions

1. “Constraints On Inflation In MSSM From Baryon Asymmetry,” AIP Conf. Proc. **805**, 17 (2006).
2. “An introduction to cosmology,” *Prepared for 5th Latin American Symposium on High Energy Physics (V-SILAFEA), Lima, Peru, 12-17 Jul 2004*
3. “Run, Spectral Index, Run,” published as a part of SUSY 2003 proceedings.
4. “On Embedding Quintessence into Physics Beyond the Standard Model,” published as a part of the Seventh Workshop on QCD - Villefranche proceedings.
5. “Towards a brane world alternative to inflationary cosmology,” published as a part of the SUSY 2002 proceedings.
6. “Extra Dimensions and the Horizon Problem”, published as a part of PASCOS 1999 proceedings.
7. “WIMPZILLAS!” (with E. W. Kolb and A. Riotto) *Dark matter in astrophysics and particle physics*, 592-614 (Heidelberg, 1998) [hep-ph/9810361].
8. “Superheavy dark matter,” in *Particles, strings and cosmology*, 176-179 (Boston, 1998) [hep-ph/9808323].

### Postdoctoral Advisee

Ghazal Geshnizjani

### Ph.D. Degrees

Antonio Enea Romano (2006)

### M.S. Degrees

Melanie Clarke (2005)