ETHAN RYAN SIEGEL

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Education

2001-present **University of Florida**
Ph.D. in Physics (*Anticipated, Summer 2006*), Thesis Advisor: Jim Fry
Thesis: *Cosmological Perturbations and their Effects on the Universe: from Inflation to Acceleration*

1996-2000 **Northwestern University**
B.A. in Physics, Classics, & Integrated Science Program, June 2000.

Research and Teaching Experience

8/2005-present, 8/2002-5/2003 **University of Florida**, *Teaching Assistant*
Teaching assistant and co-lecturer for undergraduate physics courses.

5/2003-8/2005 **University of Florida**, *Research Assistant*
Theoretical astrophysics and cosmology research with J. N. Fry.

9/2000-6/2001 **King-Drew Medical Magnet High School**, *High School Teacher*
High school teacher in physics and physical science; Los Angeles Unified School District.

1/2000-6/2000 **Northwestern University**, *Teaching Assistant*
Teaching assistant for introductory physics courses.

6/1998-9/1999 **Northwestern University**, *Research Assistant*
Planetary astrophysics research with M. S. Robinson.

6/1997-9/1997 **Northwestern University/Fermi National Accelerator Laboratory**, *Research Assistant*
Experimental particle physics research with B. Gobbi.

Awards and Fellowships

2002 **University Women's Club Award**, *University of Florida*
In recognition of excellent scholarship as a graduate student.

2001 **University of Florida Alumni Fellowship**, *University of Florida*
To provide outstanding graduate students with research opportunities.

1998 **Illinois Aerospace and Aeronautics Award**, *University of Chicago*
In recognition of an exceptional research presentation.

Seminars Given, Conferences and Summer Schools Attended

02/2006 **University of Florida**, Gainesville, FL. *Invited Seminar:* "Origins of Cosmic Magnetic Fields."

01/2006 **Fermi National Accelerator Laboratory**, Batavia, IL. *Invited Seminar:* "Cosmic Magnetic Fields: A New Beginning."

01/2006 **207^{th} Meeting of the American Astronomical Society**, Washington, DC. *Dissertation Talk presented:* "Cosmological Magnetic Fields from Primordial Perturbations"

11/2005 **Southeast Section of the American Physical Society**, Gainesville, FL. *Talk presented:* "Magnetic Fields from Cosmological Perturbations."

10/2005 **University of California at Berkeley**, Berkeley, CA. *Invited Seminar:* "Effects of Inhomogeneities on Cosmic Expansion."

10/2005 **University of California at Santa Cruz**, Santa Cruz, CA. *Invited Seminar:* "Effects of Inhomogeneities on Cosmic Expansion."

10/2005 **University of California at Davis**, Davis, CA. *Invited Seminar:* "Effects of Inhomogeneities on Cosmic Expansion."

09/2005 **University of Florida**, Gainesville, FL. *Invited Seminar:* "Effects of Inhomogeneities on Cosmic Expansion."

07/2005 **Santa Fe 2005 Cosmology Summer Workshop**, Santa Fe, NM. *Talk presented:* "Effects of Inhomogeneities on Cosmic Expansion."

06/2005 **59^{th} Yamada Conference: Inflating Horizon of Cosmology and Particle Astrophysics**, Tokyo, Japan. *Talk and Poster presented:* "Effects of Inhomogeneities on Cosmic Expansion."

04/2005 **American Physical Society April Meeting**, Tampa, FL. *Talk presented:* "A Thermal Graviton Background from Extra Dimensions."

11/2004 **University of Florida**, Gainesville, FL. *Invited Seminar:* 'Starburst Galaxies at High Redshift: A New Method for Precision Cosmology'."

08/2004 **XXV International Conference on Group Theoretical Methods in Physics**, Cocoyoc, Mexico. *Poster presented:* "Group Theory in Gravitationally Bound Systems."

07/2004 **Enrico Fermi School of Physics on Intracluster Cosmology and Background Microwave Radiation**, Varenna, Italy.

01/2004 **205^{th} Meeting of the American Astronomical Society**, Atlanta, GA. *Poster presented:* "Constraining Ω_m from High-z HII Galaxies."

Computational Experience

Proficient in **C, C++**, with a working knowledge of **Fortran 77**. Experience using and editing **COSMICS** and **CMBfast**. Proficiency using the software packages **SuperMongo** and **Mathematica**, and some experience with **Maple**, **IDL**, and **GADGET**.

Memberships of Professional Organizations

2005-present **American Physical Society**, member.

2004-present **American Astronomical Society**, member.

2000-present **Sigma Pi Sigma**, member.

References

James N. Fry, Professor of Physics at the University of Florida.
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Steven Detweiler, Professor of Physics at the University of Florida.
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Rafael Guzmán, Associate Professor of Astronomy at the University of Florida.
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Research Publications

Cosmological Structure Formation creates Large-Scale Magnetic Fields, *E. R. Siegel and J. N. Fry, astro-ph/0604526 (2006) [9 pages].*
A new theory for the origins of seed magnetic fields on galactic and larger scales. We show that growing cosmological perturbations will create small seed fields on all scales at early times, providing a possible mechanism for the creation of the large-scale fields observed today.

Effects of Inhomogeneities on Cosmic Expansion, *E. R. Siegel and J. N. Fry, Astrophys. J.* **628**, *L1 (2005) [4 pages].*
We investigate the possibility that gravitational inhomogeneities on sub-horizon scales can induce an accelerated expansion rate in the universe. Our findings indicate that the energy in inhomogeneities never dominates the expansion rate and does not mimic the effects of dark energy or induce an accelerated expansion.

A Thermal Graviton Background from Extra Dimensions, *E. R. Siegel and J. N. Fry, Phys. Lett. B* **612**, *122S (2005) [5 pages].*
We show that the gravitational wave background, as predicted by inflation, may have its spectrum altered in the presence of extra dimensions. We determine under what conditions a thermal spectrum will be obtained, and investigate possibilities for direct and indirect detection of such a background.

Towards a Precision Cosmology from Starburst Galaxies at z > 2, *E. R. Siegel, R. Guzmán, J. P. Gallego, M. O. López, and P. R. Hidalgo, Mon. Not. R. Astron. Soc.* **356**, *1117S (2005) [6 pages].*
We investigate the feasibility of using high redshift galaxies as a distance indicator to measure the composition of the universe. We find that, despite large systematic errors, luminous compact blue galaxies have the potential to make an excellent standard candle. Results for the cosmological parameters are presented, along with methods for improving the constraints in future work.