

Prof. Eric Gawiser

Curriculum Vitae

Department of Physics and Astronomy
Rutgers University
136 Frelinghuysen Rd.
Piscataway, NJ 08854-8019
(732)445-5500 x2733
gawiser@physics.rutgers.edu
<http://physics.rutgers.edu/~gawiser>

EDUCATION

Ph.D. Physics, University of California at Berkeley, 1999, Ph.D. Thesis: “Big Bang Leftovers in the Microwave: Cosmology with the Cosmic Microwave Background Radiation,” thesis committee Joseph Silk (advisor), George Smoot, Tom Broadhurst

M.A. Physics, University of California at Berkeley, 1996

A.B. Physics, *magna cum laude*, Princeton University, 1994, Senior Thesis: “Cosmic Strings in an Open Universe,” advisors David Spergel & Neil Turok. Certificates in Applied and Computational Mathematics and in Science Policy (from the Woodrow Wilson School of Public and International Affairs)

Language Skills: English (native), Spanish (fluent), French (reading)

RESEARCH INTERESTS

I study cosmological structure formation for the dual purpose of understanding the role that physics plays in creating galaxies, stars, and black holes and using these astrophysical objects to probe fundamental physics.

The nature of dark energy and dark matter: The influence of the dark energy on the expansion rate of the universe makes it possible to use large surveys of high-redshift galaxies as a cosmological probe. As a member of HETDEX and Co-Chair of the LSST science collaboration on Large-Scale Structure, I will compare the “standard rod” provided by the spatial scale of baryon acoustic oscillations with the scale at which excess galaxy clustering is seen. This allows us to infer the dark energy equation-of-state and to probe its evolution with time. We will also investigate whether the acceleration of the universe’s expansion is caused by modifications to general relativity rather than dark energy. The galaxy power spectrum measured by these experiments will constrain dark matter properties including neutrino masses and their hierarchy.

Formation of galaxies like the Milky Way: Hierarchical cosmology predicts that typical present-day galaxies were formed by multiple low-mass protogalaxies at high redshift that underwent significant merging and rapid star formation. I study the clustering, morphology, luminosity functions, and spectral energy distributions of high-redshift galaxies in order to determine their dark matter halo masses, merger rates, star formation histories, and present-day descendants.

PUBLICATIONS

209 publications, including 5 invited review articles, 84 papers in refereed journals, 19 conference proceedings, and 86 conference abstracts/circulars. These publications have received more than 4000 citations, with an h -index of 40.

RESEARCH EXPERIENCE

Associate Professor (with tenure), Department of Physics and Astronomy, Rutgers University, Jan. 2012-present

- Led MUSYC collaboration, a group of 30 astrophysicists studying the formation and evolution of galaxies and supermassive black holes (60 refereed publications since 2007)
- Used the Millenium-II simulation dark matter halo merger trees to show that most Lyman α Emitting galaxies at redshift 3 evolve into typical (L^*) central galaxies today but a significant minority evolve into lower-mass satellite galaxies residing in groups and clusters (with graduate student J. Walker Soler, Walker Soler et al. 2012).
- Showed that the Fisher Matrix formalism is an accurate and efficient way to estimate uncertainties on Spectral Energy Distribution fitting parameters and can therefore be used for astronomical survey design (with research scientist V. Acquaviva, Acquaviva et al. 2012b)
- Used stacked spectroscopy of high-redshift star-forming galaxies to find that subsets with and without Lyman α emission show Galactic winds comprised of neutral gas clouds embedded in ionized gas (with graduate student M. Berry, Berry et al. 2012)

Assistant Professor, Department of Physics and Astronomy, Rutgers University, Sep. 2007-Dec. 2011

- Introduced a new cosmological parameter that can falsify the concordance Λ CDM cosmological model by revealing scale-dependence in the growth of density fluctuations (with postdoc V. Acquaviva, Acquaviva & Gawiser 2010)
- Identified Lyman α Emitting galaxies at redshifts 2 and 3 as progenitors of typical (L^*) present-day galaxies. Found that these galaxies are low in mass and undergoing rapid star formation (with graduate student L. Guaita, Guaita et al. 2010, 2011, Gawiser et al. 2007)
- Showed that Lyman α Emitting galaxies at redshift 3 are the smallest galaxies yet studied and that their Lyman α emission is no more extended than their ultraviolet continuum. Found that morphological differences between rest-frame optical and ultraviolet emission are greater for star-forming than for passive galaxies (with postdoc N. Bond, Bond et al. 2009, 2010, 2011, 2012)
- Developed an optimal algorithm for simultaneous stacking and deblending of source fluxes in astronomical images and used it to measure and compare star formation rates of galaxies at X-ray, ultraviolet, sub-millimeter, and radio wavelengths (with research scientist P. Kurczynski, Kurczynski & Gawiser 2010, Kurczynski et al. 2012)
- Made first measurement of dark matter halo masses of X-ray-selected AGN at redshift 3 (with graduate student H. Francke, Francke et al. 2008)
- Created GalMC, a Markov Chain Monte Carlo code for galaxy spectral energy distribution fitting which is ~ 100 times more efficient than standard methods and produces accurate estimates of parameter uncertainties. Found using this code that Lyman α Emitting galaxies at $z = 3$ appear older and more massive than those at $z = 2$, which shows that the earlier sample of galaxies cannot evolve directly into the later one (with postdoc V. Acquaviva, Acquaviva, Gawiser & Guaita 2011, Acquaviva et al. 2012a)

Visiting Professor, U.C. Davis, Jan.-Aug. 2010, Jan.-Aug. 2011

Visiting Professor, Berkeley Center for Cosmological Physics and Lawrence Berkeley National Laboratory, June 2008-Aug. 2009

Visiting Professor, Rutgers University, Sep. 2006-Aug. 2007

NSF Astronomy & Astrophysics Postdoctoral Fellow (AAPF) and Andes Prize Fellow, Yale University, 2002-2007

- Created MUSYC collaboration (with P.G. van Dokkum, C.M. Urry, J. Maza and P. Lira)
- Showed that Lyman α Emitting galaxies at redshift 3 are young objects undergoing rapid star formation (Gawiser et al. 2006b)
- Developed APCORR (corrected aperture) photometry method for use on MUSYC catalog of 277,341 optically-selected objects over a square degree of sky (Gawiser et al. 2006a)

Postdoctoral Research Physicist, University of California at San Diego, 1999-2002

- Determined the cosmic star formation rate from Damped Lyman α systems, which contain the majority of neutral hydrogen gas in the universe (with A.M. Wolfe & J.X. Prochaska, Wolfe et al. 2003ab)
- Made first measurement of the spatial cross-correlation of Damped Lyman α systems and Lyman break galaxies (Gawiser et al. 2001)

Graduate Research Fellow, University of California at Berkeley, 1994-1999

- Found evidence for non-zero neutrino masses from the combination of CMB anisotropy and large-scale structure data (Gawiser & Silk 1998)
- Developed method to break degeneracy between cosmological parameters and the primordial power spectrum, enabling both to be measured from combined CMB anisotropy and large-scale structure data (Gawiser 1999)
- Quantified the foreground contamination of CMB anisotropy experiments caused by microwave emission from luminous infrared galaxies, radio galaxies, and galaxy clusters (Gawiser & Smoot 1997, Sokasian et al. 2001, Gawiser 1999)

Visiting Graduate Researcher, Institut d'Astrophysique de Paris, Fall 1997

FELLOWSHIPS & AWARDS

National Science Foundation CAREER Award, 2011–2016

Rutgers School of Arts & Sciences Distinguished Contributor to Undergraduate Education Award, 2012

Rutgers Society of Physics Students Outstanding Teacher Award, 2012

Awarded \$20,000 in research support from Isaac Newton Fund, Yale Astronomy Department, 2004–2006

NSF Astronomy & Astrophysics Postdoctoral Fellowship, 2002–2006

Andes Prize Fellowship, Yale University, 2002–2004

Phi Beta Kappa Fellowship, U.C. Berkeley, 1999

Outstanding Graduate Student Instructor Award, U.C. Berkeley, 1998
NSF Graduate Research Fellowship, U.C. Berkeley, 1995–1998
Department of Education GAANN Fellowship, U.C. Berkeley, 1995
Elected to Phi Beta Kappa, Sigma Xi at Princeton University, 1994

STUDENTS AND RESEARCHERS MENTORED

Ph.D. Thesis advisor for Harold Francke, Universidad de Chile, 2005-2008. Paulina Lira was his co-advisor at U. de Chile. Harold is now a Postdoctoral Fellow at U. Católica.

Ph.D. Thesis advisor for Lucia Guaita, U. Católica, 2007-2010. Nelson Padilla was her co-advisor at U. Católica. Lucia is now a Postdoctoral Fellow at the Oskar Klein Centre for Cosmology at Stockholm University.

Ph.D. Thesis advisor for Jean Walker Soler, Rutgers, 2008-present.

Graduate research and Research Qualifying Exam advisor for Michael Berry, Rutgers, 2009-present

Postdoctoral supervisor for Nicholas Bond, Rutgers, 2007-2010. Nick is now a NASA Postdoctoral Fellow at Goddard Space Flight Center.

Postdoctoral supervisor for Viviana Acquaviva, Rutgers, 2009-present

Supervisor for research scientist Peter Kurczynski, Rutgers, 2008-present

Co-advisor for UC San Diego graduate student Jeff Cooke (2000-2002)

Ph.D. Committee member for U.T. Austin graduate student Guillermo Blanc (Ph.D. 2011). Guillermo is now a Carnegie Postdoctoral Fellow.

Ph.D. Committee member for Rutgers graduate students Hyowon Park (Ph.D. 2011), Sean Stratton, Dmitri Ivanov, and Chelsea Sharon

Senior Honors Thesis advisor for Rutgers undergraduates Carlos Vargas (2011-2012) and Graham Kanarek (2007-2008, now an Astronomy Ph.D. student at Columbia)

Research supervisor for Rutgers undergraduate Heidi Moreira (Fall 2010), Yale data assistant David Herrera (2003-2006, now a staff member at the National Optical Astronomy Observatory), Yale undergraduates Alison Kaptur (2006), Ruth Toner (2004, now a graduate student at Oxford), and David Moore (2003) and U. de Chile undergraduate Gullermo Blanc (2004)

Faculty mentor for Rutgers Honors Program undergraduates Vishal Gandhi, Richa Rana & Liz Tatum (2011-present), Punit Arora & Michelle Huang (2010-present), Danielle Caminiti, Priya Jaisinghani, Nilesh Jambhekar, & Margaret Zientek (2009-present), and Deflin Balili, Teresa Harvey, Helen Janiszewski & Paul Menell (2008-2012)

GRANTS AWARDED AS P.I.

NSF Astronomy & Astrophysics Research Grant 1055919, “CAREER: Explaining the Connection between Lyman Alpha Emitters and Typical Present-day Galaxies,” (2011-2016), \$843,442.

Spitzer Space Telescope AO-8 GO-80100, “Spitzer-HETDEX Exploratory Large Area (SHELA) Survey,” (2011-2014), \$12,400 awarded for Rutgers portion of project (Program PI Casey Papovich).

Hubble Space Telescope Multi-Cycle Treasury GO-12060.57, “Cosmic Assembly Near-IR Deep Extragalactic Legacy Survey (CANDELS) - I” (2010-2013), \$26,334 awarded for Rutgers portion of project (Program PIs Sandy Faber, Harry Ferguson)

NSF Astronomy & Astrophysics Research Grant 0807570, “Collaborative Research: The Physical Properties of Lyman Alpha Emitters at $2 < z < 3$,” (2008-2011), \$227,806.

DOE Dark Energy Pathfinder Experiment, “Lyman Alpha Emitting Galaxies at $2 < z < 3$: Towards a Calibrated Probe of Dark Energy,” (2008-2009), \$78,264.

Spitzer Space Telescope AO-5 AR-50805, “Comparing the Stellar Populations of Star-forming Galaxies at $z = 2$,” (2008-2011), \$75,000.

Spitzer Space Telescope AO-4 AR-40823, “A SIMPLE Proof that Lyman Alpha Emitters are Galaxies in the Act of Formation” (2007-2010), \$63,281.

Hubble Space Telescope Cycle 16 AR-11253, “Sizes and Morphology of $z = 3.1$ Lyman Alpha Emitting Galaxies in the Extended CDF-S” (2007-2009), \$67,400.

Spitzer Space Telescope AO-3 GO-30873, “The Ages and Star Formation Rates of Massive Galaxies at $z = 2 - 3$ ” (2006-2008), \$50,466 awarded for Yale portion of project (Program PI Ivo Labbé).

Co-P.I., NSF conference grant, “NSF Astronomy and Astrophysics Postdoctoral Fellows Symposium” (2005), \$14,234.

NSF AAPF, “A Square-Degree Survey for Galaxies at $z = 3 - 5$ ” (2002-2006), \$194,000.

GRANTS AWARDED TO RESEARCH GROUP MEMBERS

AAS Small Research Grant to Dr. Viviana Acquaviva, “Lyman Alpha Emitters through Cosmic Time” (2012), \$3015.

NASA Keck Principal Investigator Data Analysis Grant to Dr. Peter Kurczynski, “Extreme Star Formation in the Young Universe” (2011), \$13,000.

AAS Small Research Grant to Dr. Peter Kurczynski, “Measuring the Rise and Fall of Cosmic Star Formation” (2011), \$6808.

Sigma Xi Grant-In-Aid-of-Research to Jean Walker Soler, “How did the Milky Way Form? A Semi-Analytical Study of Galaxy Evolution” (2011), \$3690.

Sigma Xi Grant-In-Aid-of-Research to Michael Berry, “Evaluating the Structure and Kinematics of the Gas Surrounding Galaxies at $z = 2.1$ ” (2011), \$3000.

SCIENTIFIC COLLABORATIONS

P.I., MUSYC (Multiwavelength Survey by Yale-Chile), 2003-present (Pieter van Dokkum served as joint PI until 2008)

Co-Chair, LSST (Large Synoptic Survey Telescope) Science Collaboration on Large-Scale Structure, 2010-present (Member since 2006, Hu Zhan is the other Co-Chair)

Member, LSST Science Collaboration on Galaxies, 2006-present

Coordinating Council Member and Co-Chair of Ancillary Data Working Group, LADUMA (Looking At the Distant Universe with the MeerKAT Array) 5000-hour Large Survey Project, 2010-present

Member, HETDEX (Hobby Eberly Telescope Dark Energy Experiment), 2009-present

Member, CANDELS (Cosmic Assembly Near-IR Deep Extragalactic Legacy Survey) 900-orbit HST Multi-Cycle Treasury program, 2010-present

Member, LESS (Laboca ECDF-S Sub-mm Survey), 2007-present

Member, FLAMINGOS-2/GOODS Unified Survey Team, 2009-present

P.I., WOMBAT (Wavelength-Oriented Microwave Background Analysis Team), 1998-1999

PROFESSIONAL SERVICE

Steering Committee, National User Facility Organization (NUFO), 2010-present. NUFO represents scientists who utilize NSF and DOE user facilities to Congress and the public; I am the first astrophysicist to serve in this capacity.

National Optical Astronomy Observatory (NOAO) Users' Committee, Chair 2011-present, Member 2007-present. Represented the U.S. astronomical community in advising NOAO on capital and procedural improvements.

Candidate for APS Division of Astrophysics Executive Committee Member-at-Large, 2011

Referee, Physical Review (5 articles), Astrophysical Journal (11 articles), Astronomy & Astrophysics (7 articles), Monthly Notices of the Royal Astronomical Society (2 articles)

Panelist, NASA Astrophysics Theory Program proposal review, 2009

Panelist, Hubble Space Telescope proposal review, Cycle 17 (2008)

Panelist, NSF Astronomy CAREER proposal review, 2007

Reviewer, NSF Physics Frontiers Centers, 2011

Reviewer, Grant proposals for Research Corporation, CONICYT

Reviewer, Observing proposals for Spitzer Space Telescope, Gemini Observatory, William Herschel Telescope

Chair, MUSYC collaboration meetings (2003-present)

Member, SOC/LOC, Rutgers-Chile Astrophysics Meeting, Dec. 2009

Member, SOC, Oct. 2008 Understanding Lyman Alpha Emitters Conference at MPIA-Heidelberg

Chair, SOC/LOC, NSF Astronomy & Astrophysics Postdoctoral Fellows Symposia 2004, 2005

Member, SOC, 2004 Annual Meeting of Sociedad Chilena de Astronomía

Organizer, Calán-Yale collaboration meetings (Oct. 2002, Jun. 2003, Oct. 2003)

Colloquium Organizer, Yale Astronomy Department, 2004-2005

Created and led UCSD Cosmic Microwave Background Discussion Group, 2000

Journal Club Organizer, UCSD Center for Astrophysics & Space Sciences, 1999-2000

Professional Memberships: American Physical Society, American Astronomical Society, American Association of Physics Teachers, Sociedad Chilena de Astronomía, Astronomical Society of the Pacific, Sigma Xi

RUTGERS SERVICE

Institutional Representative for Rutgers University, Large Synoptic Survey Telescope (LSST) Corporation Board, 2008-2009, 2010-2011

Rutgers Day Lecture, Physics Lecture Hall, Apr. 2010, "A Tour of the Universe"

Rutgers Day Volunteer, Physics Sidewalk Demos, Apr. 2009

Member, SAS Faculty Focus Group, Nov. 2009

Organizer, Rutgers Astrophysics seminars, Spring 2009

Rutgers Physics & Astronomy Committees: Colloquium (2008-09, Co-Chair 2009-2010, Chair 2011-2012), TA Training (Chair, 2011-2012), Newsletter (Chair, 2007-08), Undergraduate Studies (Fall 2007, Fall 2010), Outreach (Spring 2008, 2009-2010, Fall 2010, 2011-2012), Graduate Recruiting (2008-09), Graduate Student Organization Liaison (Spring 2010)

OBSERVING EXPERIENCE

Lead author of successful telescope observing proposals for Keck, VLT, Subaru, Gemini, Magellan, CTIO 4m, WIYN, and SALT

Visiting Astronomer, Keck Telescopes (15 nights), Subaru Telescope (1 night), Very Large Telescope (3 nights), Magellan Telescopes (14 nights), Cerro Tololo Interamerican Observatory (38 nights), Palomar Observatory (6 nights), Kitt Peak National Observatory (4 nights), Lick Observatory (1 night)

INVITED TALKS

Over 100 invited scientific talks, including 45 departmental colloquia, 11 conference talks, five conference reviews, and two lecture series.

Astrophysics Seminar: Institute for Advanced Study, May 2012, “Probing Dark Matter and Dark Energy with Lyman Alpha Emitting Galaxies”

Invited Review: Dark Energy Camera Community Workshop, NOAO-Tucson, August 2011, “The Capabilities (and Limitations) of DECam for High-redshift Science”

Research Progress Meeting: Physics Division, Lawrence Berkeley National Laboratory, May 2011, “Probing Dark Energy and Dark Matter with Distant Galaxies from HETDEX and LSST”

Astrophysics Seminar: IGPP, Lawrence Livermore National Laboratory, Mar. 2011, “Probing Dark Matter and Dark Energy with Distant Galaxies”

Colloquium: Physics & Astronomy Department, Rutgers, Jan. 2011, “Distant Galaxies, Dark Matter and Dark Energy”

Colloquium: Physics Department, U.C. Davis, Jan. 2011, “Probing Dark Matter and Dark Energy with Distant Galaxies”

Invited Talk: LSST All-Hands Meeting, Tucson, Aug. 2010, “The LSST Large-Scale Structure Science Collaboration: Progress and Plans”

Invited Talk: Workshop on Lyman Alpha Emitting Galaxies, CCAPP, Ohio State University, Apr. 2010, “Lyman Alpha Emitters: Their Place in the High-redshift Zoo and Present-day Descendants”

Colloquium: Astronomy Department, U. Massachusetts, Mar. 2010, “Lyman Alpha Emitting Galaxies at $2 < z < 3$: Progenitors of Present-day L^* Galaxies”

Colloquium: Astrophysics, Stanford/SLAC, Feb. 2010, “Probing the Dark Matter-Galaxy Formation Connection with Lyman Alpha Emitting Galaxies”

Invited Talk: Rutgers-Chile Astrophysics Meeting, Santiago, Chile, Dec. 2009, “The Galaxy Formation-Dark Matter Connection: Making Sense of the High-redshift Zoo”

Invited Lecture Series: Workshop on Observational Cosmology, Turkish National Observatory, Oct. 2009, “The Cosmic Microwave Background Radiation”, “Observational Techniques” & “Galaxy Formation”

Colloquium: Institute of Astronomy, U. Hawaii, May 2009, “Lyman Alpha Emitting Galaxies at $z \sim 3$: Progenitors of Present-day L^* Galaxies”

Visitor’s Seminar: Max Planck Institute for Astronomy, Heidelberg, Feb. 2009, “Probing the Dark Matter-Galaxy Formation Connection with Lyman Alpha Emitting Galaxies”

Colloquium: Physics & Astronomy Department, Tufts University, Feb. 2009, “Probing Dark Matter and Dark Energy with Distant Galaxies”

Colloquium: Astronomy Department, U. Maryland, Feb. 2009, “Probing the Dark Matter-Galaxy

Formation Connection with Lyman Alpha Emitting Galaxies”

Colloquium: Physics Department, Boğaziçi University (Istanbul, Turkey), Nov. 2008, “Probing Dark Matter and Dark Energy with Distant Galaxies”

Invited Talk: Great Surveys of Astronomy Conference, Santa Fe, NM, Nov. 2008, “From MUSYC to LSST”

Colloquium: Astronomy Department, U.C. Santa Cruz, Oct. 2008, “Probing the Dark Matter-Galaxy Formation Connection with Lyman Alpha Emitting Galaxies”

Invited Review: MPA Heidelberg Conference on Understanding Lyman Alpha Galaxies, Oct. 2008, “Comparing Lyman Alpha Emitters with Other High-redshift Galaxies”

Colloquium: Astronomical Research Institute, U. Heidelberg, Oct. 2008, “Probing the Dark Matter-Galaxy Formation Connection with Lyman Alpha Emitting Galaxies”

Colloquium: Astronomy Dept., U. Texas at Austin, Apr. 2008, “Lyman Alpha Emitters at $z=3.1$: L^* Progenitors Experiencing Rapid Star Formation”

Colloquium: Physics and Astronomy Dept., University of North Carolina, Apr. 2008, “Using High-redshift Galaxies to Probe Dark Matter and Dark Energy”

Colloquium: Dept. of Astrophysical Sciences, Princeton University, Mar. 2008, “Lyman Alpha Emitters at $z=3.1$: L^* Progenitors Experiencing Rapid Star Formation”

Invited Talk: American Astronomical Society Meeting, Topical Session on Lyman Alpha Galaxies, May 2007, “The Physical Nature of Lyman Alpha Emitters at $z=3.1$ ”

Colloquium: Astrophysics Dept., American Museum of Natural History, Apr. 2007, “The Physical Nature of Lyman Alpha Emitters at $z=3.1$ ”

Invited Lecture Series: Summer School on the Cosmic Microwave Background and Large-Scale Structure, Santiago, Chile, Mar. 2007, “Formation and Clustering of High-Redshift Galaxies”

Invited Talk: LSST All-Hands Meeting, SLAC, Dec. 2006, “The LSST Galaxies Collaboration”

Colloquium: Astronomy Dept., U. de Chile, Oct. 2006, “The MUSYC Census of Galaxy Formation: Harmony or Dissonance?”

Colloquium: Astronomy Dept., P.U. Catolica, Oct. 2006, “The MUSYC Census of Galaxy Formation: Harmony or Dissonance?”

Invited Talk: NERQUAM AGN Meeting, MIT, May 2006, “MUSYC Studies of the AGN-Galaxy Connection”

Colloquium: Astronomy, UCLA, Apr. 2006, “The MUSYC Census of Protogalaxies at $z = 3$ ”

Colloquium: Physics Dept., Drexel University, Feb. 2006, “The MUSYC Census of Protogalaxies at $z = 3$ ”

Colloquium: Astronomy Dept., Indiana University, Feb. 2006, “The MUSYC Census of Protogalaxies at $z = 3$ ”

Colloquium: Gemini Observatory, Feb. 2006, “The MUSYC Census of Protogalaxies at $z = 3$ ”

Colloquium: Astronomy Dept., Cornell University, Jan. 2006, “The MUSYC Census of Protogalaxies at $z = 3$ ”

Invited Talk: NSF Astronomy & Astrophysics Postdoctoral Fellows Symposium, Jan. 2006, “The MUSYC Census of Protogalaxies at $z = 3$ ”

Colloquium: Astronomy Dept., Boston University, Nov. 2005, “The MUSYC Census of Protogalaxies at $z = 3$ ”

Invited Review: Symposium on New Horizons in Astronomy, UT Austin, Oct. 2005, “Galaxy

Formation”

Invited Talk: Probing Early Structure Formation with Mass, Light, and Chemistry, U. Minnesota, Oct. 2005, “Constraints on Early Structure Formation from Protogalaxies at $z = 3$ ”

Colloquium: Astronomy Dept., Columbia, Sep. 2005, “The MUSYC Census of Protogalaxies at $z = 3$ ”

Colloquium: Astrophysics, MIT, Sep. 2005, “The MUSYC Census of Protogalaxies at $z = 3$ ”

Colloquium: Astronomy Dept., U. Florida, Mar. 2005, “The MUSYC Census of Protogalaxies at $z = 3$ ”

Invited Talk: NSF Astronomy & Astrophysics Postdoctoral Fellows Symposium, Jan. 2005, “The MUSYC Census of Protogalaxies at $z = 3$ ”

Colloquium: Cerro Tololo Interamerican Observatory, Aug. 2004, “MUSYC: A Square-degree $UBVRIZJHK$ Survey of the Formation and Evolution of Galaxies”

Colloquium: Astronomy Dept., P.U. Catolica, June 2004, “A Rejuvenated Universe Without Initial Singularity”

Colloquium: Astronomy Dept., U. de Chile, June 2004, “A Rejuvenated Universe Without Initial Singularity”

Invited Talk: NSF Astronomy & Astrophysics Postdoctoral Fellows Symposium, Jan. 2004, “The MUSYC Survey: A Census of Protogalaxies at $z = 3$ ”

Colloquium: Cerro Tololo Interamerican Observatory, Dec. 2003, “Star Formation in Damped Lyman α Systems”

Colloquium: Astronomy Dept., U. de Chile, May 2003, “What Does WMAP Tell Us About the Universe?”

Colloquium: Astronomy Dept., Yale University, May 2003, “What Does WMAP Tell Us About the Universe?”

Colloquium: Astronomy Dept., U. Massachusetts, Apr. 2003, “The First Measurement of Star Formation Rates in Damped Lyman α Systems”

Colloquium: Astronomy Dept., Wesleyan University, Feb. 2003, “Which Came First, the Star or the Galaxy?”

Colloquium: Astronomy Dept., P.U. Catolica, Jan. 2003, “Towards a Complete Picture of Damped Lyman α Systems”

Colloquium: Astronomy Dept., U. de Chile, Dec. 2002, “Which Came First, the Star or the Galaxy?”

Colloquium: Arecibo Observatory, March 2002, “Towards a Complete Picture of Damped Lyman α Systems”

Colloquium: Institute for Astronomy, U. Hawaii, Dec. 2001, “Towards a Complete Picture of Damped Lyman α Systems”

Colloquium: Center for Space Science and Astrophysics, Stanford University, Oct. 2001, “Towards a Complete Picture of Damped Lyman α Systems”

Colloquium: Astronomy Dept., Yale University, Sep. 2001, “Towards a Complete Picture of Damped Lyman α Systems”

Colloquium: Astrophysics Dept., American Museum of Natural History, Sep. 2001, “Towards a Complete Picture of Damped Lyman α Systems”

Invited Review: Low Z at Low z and High z : Early Chemical Evolution, Minneapolis, Mar. 2001, “Abundances in Damped Lyman α Systems”

Colloquium: Center for Astrophysics and Space Sciences, U.C. San Diego, May 2000, “Limits on

Neutrino Masses from Cosmological Structure Formation”

Colloquium: Astronomy, UCLA, Apr. 2000, “Limits on Neutrino Masses from Cosmological Structure Formation”

Invited Review: UK Neutrino Physics Meeting, Oxford, May 1999, “Neutrinos and Cosmology”

Additional Invited Research Seminars (1997-2011) given at: Aspen Center for Physics, Arizona State, Berkeley, Caltech, Cambridge, Case Western Reserve, Chicago, Columbia, Dartmouth, Edinburgh, Fermilab, Florida, Harvard-CfA, Institut d’Astrophysique de Paris, IAS, JILA-Colorado, LBNL, MPIA-Heidelberg, NOAO, Ohio St., Oxford, Padova, Penn St., Princeton, Rutgers, STScI, Sussex, TESRE-Bologna, UC Davis, UC Riverside, UCSB-KITP, UCSD, University College London, U. Texas Austin, Yale

RECENT CONFERENCE TALKS

American Astronomical Society Meeting, Seattle, Jan. 2011, “Emission Line Profiles of Lyman Alpha Emitting Galaxies at $z = 2.1$ and $z = 3.1$ ”

Discussion Leader (joint with Jason Tumlinson), STScI May Symposium on Stellar Populations in the Cosmological Context, May 2010, “Stellar Populations at High Redshifts”

HETDEX Science Meeting, Munich, Germany, Apr. 2010, “Probing the Galaxy Formation-Dark Matter Connection with Lyman Alpha Emitting Galaxies”

Moriond Cosmology Conference, La Thuile, Italy, March 2010, “Probing Dark Energy and Dark Matter with HETDEX”

American Physical Society April Meeting, Washington, D.C., Feb. 2010, “Probing the Dark Matter-Galaxy Formation Connection with Lyman Alpha Emitting Galaxies”

AAPT Meeting, Washington, D.C., Feb. 2010, session on Graduate and Upper Level Education, “Emphasizing Written and Oral Presentation in Graduate Astrophysics Courses”

American Astronomical Society Meeting, Washington, D.C., Jan. 2010, “Lyman Alpha-emitting Galaxies at $z = 2.1$: Characterizing the Progenitors of Typical Present-day Galaxies”

One Degree Imager Workshop, Yale, Oct. 2009, “What the WIYN-ODI Survey Can Learn From (and Teach) LSST”

AAPT Meeting, Ann Arbor, July 2009, session on Innovations in Teaching Astronomy, “Graduate Cosmology as Professional Training in Written and Oral Presentation”

American Physical Society April Meeting, Denver, May 2009, “Probing the Dark Matter-Galaxy Formation Connection with Lyman Alpha Emitting Galaxies”

American Astronomical Society Meeting, Long Beach, Jan. 2009, “Probing the Dark Matter-Galaxy Formation Connection with Lyman Alpha Emitting Galaxies”

The First Two Billion Years of Galaxy Formation, Aspen Center for Physics, Feb. 2008, “Lyman Alpha Emitters at $t=2$ Gyr: L^* Progenitors Experiencing Rapid Star Formation”

American Astronomical Society Meeting, Austin, Texas, Jan. 2008, “Lyman Alpha Emitters at $z=3.1$: L^* Progenitors Experiencing Rapid Star Formation”

Magellan Science Symposium, Harvard University, Oct. 2007, “Lyman Alpha Emitters at $z=3.1$: L^* Progenitors Experiencing Rapid Star Formation”

IAP Lyman Alpha Workshop, Institut d’Astrophysique de Paris, Oct. 2007, “Lyman Alpha Emitters at $z=3.1$: L^* Progenitors Experiencing Rapid Star Formation”

Galaxy Evolution in a Dark Universe, Heidelberg, Germany, July 2007, “The Physical Nature of Lyman

Alpha Emitters at $z=3.1$ ”

PUBLIC LECTURES

Rutgers Astronomical Society, Mar. 2012, “Studying Galaxies Far, Far Away Using Hydrogen, Big Mirrors, and Digital Cameras”

Rutgers Day, Rutgers’ Busch Campus, Apr. 2010, “A Tour of the Universe”

Digital Universe Lecture for Latino high school students from around New Jersey hosted by Rutgers’ Society of Hispanic Engineers, Apr. 2010, “A Tour of our Galaxy and Universe”

Hayden Planetarium, AMNH, Dec. 2009, “Using Light to Reveal the Dark Universe”

Amateur Astronomers, Inc. of New Jersey, Sep. 2009, “Studying Galaxies Far, Far Away Using Hydrogen, Big Mirrors, and Digital Cameras”

Society of Physics Students, Rutgers University, Apr. 2009, “Studying Galaxies Far, Far Away Using Hydrogen, Big Mirrors, and Digital Cameras”

Hayden Planetarium, AMNH, July 2008, “Things That Go Bang”

Hayden Planetarium, AMNH, May 2008, “How Much Space Is There in the Universe?”

Hayden Planetarium, AMNH, Nov. 2007, “Why Does the Universe Look the Way It Does?”

Hayden Planetarium, AMNH, Aug. 2007, “The Dark Side”

Frontiers in Astrophysics Lecture, Hayden Planetarium, AMNH, Apr. 2007, “Studying Galaxy Formation With Hydrogen, Big Mirrors, and Digital Cameras”

Leitner Observatory, Yale University, May 2007, “Studying Galaxy Formation With Hydrogen, Big Mirrors, and Digital Cameras”

Hayden Planetarium, AMNH, Aug. 2006, “Digital Universe: The Grand Tour”

Society of Physics Students, Yale University, Feb. 2006, “Studying Galaxy Formation Using the Hydrogen Atom, Big Mirrors, and Digital Cameras”

Hayden Planetarium, AMNH, Sep. 2005, “The Big Bang and Beyond”

Hayden Planetarium, AMNH, Aug. 2004, “Clustering in the Universe”

Hayden Planetarium, AMNH, Jul. 2004, “Structure of the Milky Way”

OUTREACH EXPERIENCE

Hayden Associate, Hayden Planetarium, American Museum of Natural History (AMNH), 2007-present.

Visiting Astronomer, AMNH, 2002-2007. Added the full SDSS and 2dF datasets to the publicly available Extragalactic Atlas of Hayden Planetarium’s Digital Universe project.

MEDIA COVERAGE

Press Conference, NASA TV, June 15, 2011, “The Veiled and Self-Regulated Growth of the First Black Holes at $z > 6$ ” (coincided with publication of paper in *Nature*). Covered in over 20 newspaper articles around the world plus the CNN.com front page, BBC radio, and the Osgood files

“Collaborator and Teammate: Eric Gawiser”, by Anna Spitz, Large Synoptic Survey Telescope E-Newsletter, Oct. 2010, <http://www.lsst.org/News/enews/gawiser-201010.html>

“Introducing the young Milky Ways: Astronomers discover ancestors of modern-day spiral galaxies”, by Ron Cowen, Science news, May 4, 2009

Press Conference, American Astronomical Society 211th meeting, Austin, TX, Jan. 2008, “Discovery

of the Ancestors of Milky Way-type Galaxies”. Covered in over 20 newspaper articles around the world, including USA Today, Yahoo.com front page, Rutgers.edu front page, BBC radio, and a New Jersey Network News interview

“Physicists Work to Unlock Nature’s Secrets”, Rutgers SAS Newsletter Spring 2008, p. 9-10 [profile of Profs. Gawiser, Halkiadakis & Yuzbashyan]

“Celestial MUSYC”, by Charles Liu, Natural History, Sep. 2006, p.61 [results on Lyman Alpha Emitters]

“Who’s Hot? Who’s Not?”, by Robin Wilson, Chronicle of Higher Education, Sep. 22, 2006, p.A8 [discussion of the faculty job market]

“The Case of the Curved Universe: Open, Closed, or Flat?”, by Marc Kamionkowski, Science, May 29, 1998, p.1397 [research commentary on my Ph.D. thesis results]

“A Little Hot Dark Matter Matters”, by Joel Primack, Science, May 29, 1998, p.1398 [research commentary on my Ph.D. thesis results]

TEACHING EXPERIENCE

Physics 341, Principles of Astrophysics for physics majors, Rutgers, Fall 2011. 61 students in total, with average evaluation score 4.7 out of a best possible 5.

Physics 110, Astronomy and Cosmology for non-science majors, Rutgers, Fall 2007, Spring 2008, Fall 2009, Fall 2010. 462 students in total, with average evaluation score 4.6 out of a best possible 5.

Physics 608, Cosmology for graduate students, Rutgers, Spring 2009. 11 students, with average evaluation score 4.5 out of 5.

Physics 689, graduate seminar in Galaxy Formation, Rutgers, Fall 2009. 10 students, with average evaluation score 4.7 out of 5.

Lecturer, U.C. Berkeley, Introductory Astrophysics for non-science majors, Summer 1999. Taught two consecutive six-week classes of 30 students each with ten hours of lecture per week. The average rating on the students’ evaluations was 6.3 out of a best possible 7.

Graduate Student Instructor, U.C. Berkeley, Honors Introductory Physics 1997, Introductory Astrophysics 1995, Introductory Physics 1994

Woodrow Wilson School Senior Thesis, Princeton University, 1994, “An Evaluation of the Princeton University Science Requirement”, advisor David Wilkinson

Excerpts from 2011 anonymous student evaluations for Physics 341:

Professor Gawiser was one of the best professors I have ever had the privilege of learning from. He spoke with passion, and knew so much about the material that I would ask questions hoping I could stump him. I never did.

This class has the most concise presentation of material I have ever encountered in a college level course.

He encourages doing your best and not worrying about the grade. He wants you to learn, not just spit back the information at him.

Professor Gawiser made the lectures interesting with visual aids and personal knowledge based on his own research.

If I become a teacher, I want to teach like this professor does.

Thank you professor, for reinstating what a college course should be. I learned more from you than from all of my other professors combined this semester, and I deeply regret that I do not have more time in my undergraduate study to take more courses with you. Thanks!

The entire course setup was wonderful, especially the way the iClicker questions are run.

The professor always welcomed my questions, and not only answered them, but helped me understand the material and approach problems from more than one angle. I think I learned a lot while doing the problem sets, not just about the material itself but about how to organize my work so I don't make unnecessary mistakes and how to glean relevant information from everything I know and apply it to the problem at hand. At the beginning of the semester the problem sets seemed really intimidating and I feel a lot more capable now. In general, after having some teachers who seem to begrudgingly teach their undergraduate courses, having one that clearly cares about encouraging students' intellectual growth and progress makes a huge difference.

I aspire to be like Dr. Gawiser as he seems to have unlimited energy, ambition, and passion for astrophysics.

This was really enlightening, and spent time explaining things I had been wondering about forever. Also, Gawiser makes it really very fun!

Air-rock Gawiser is without a doubt one of the best professors I've had in my 4 years at this University. Someone give this man a raise!

Excerpts from 2007-2010 anonymous student evaluations for Physics 110:

This is by far the BEST instructor I have ever had. Professor Gawiser understands how to keep the students interested while teaching. He handles a large audience perfectly.

The class was the first science class I've ever taken which I actually understood.

I loved the professor's enthusiasm and humor.

I like that Professor Gawiser is an active researcher in his field, and that he references his own research in lectures.

Dr. Gawiser is one of the best professors I've ever had. He not only fosters an environment where we become genuinely interested in the course, he also makes sure that he doesn't just spew facts at us, he encourages questions and gives us a deeper understanding of the subject matter. He also gives us opportunities to discuss the concepts with other students before giving us the answer to a question and I think it is a much more valuable lesson when we teach each other rather than just being given the answer.

I like science a lot more than I did before.

one of the most exciting classes i have ever taken

Even though our class had over 100 enrolled students, Professor Gawiser knew almost all of our names, and he was extremely caring toward all his students.

Lectures were highly organized. Use of iClicker kept me involved in the lecture. Professor Gawiser answered all questions posed by students exhaustively. Demos were entertaining and informative. Professor Gawiser is an excellent professor.

[What I liked best:] Learning and understanding (not memorizing) about our Universe. I learned so many new things in this course that I won't forget after the final exam!

The course has made me want to go and research about cosmological topics myself.

[If you were teaching this course, what would you do differently?:] I WOULD FIRE MYSELF, AND HIRE PROF. GAWISER FOR EVERY LECTURE

great teacher, my best so far

This is the first big college course I have that has been really effective. In none of my other large lectures do students participate like they do in this astronomy class. This is absolutely how a college

lecture should be run. Professor Gawiser also gives students many opportunities for help or just to learn about the material outside of class (the observation nights and the Hayden Planetarium) where as other teachers just teach the material and leave it there. Thank you!!

excellent professor and excellent course

give this man a raise. he is easily one of the best professors in the entire university. dont ever let him leave.

I think Dr. Gawiser is an excellent teacher and if he taught any other course I would take it, purely because I enjoy his teaching method. He is that "one amazing professor" students get at university. The clicker questions helped engage the class so I would actually have to think & comprehend the material rather than listening to a lecture mindlessly.

I recommend this class to others interested in Astronomy although for a 4-credit 110 course, a lot of time & dedication is required to keep up a good grade.

[What I liked best:] The philosophy of the course, i.e., that students are encouraged to work together and are not set-up to compete against each other. This atmosphere of academic accord is most conducive for learning.

I will continue to take physics & astronomy courses, possibly making it my career.

It was the best class I've taken at Rutgers.

Best class ever, best teacher ever.

Excerpts from 2009 anonymous student evaluations for Physics 689:

Being able to present research well is an extremely important skill for modern scientists, and those of us who have opportunities to take courses like this definitely have a leg up in our career paths.

The format of the course made the subject very approachable and enjoyable.

This class has defined several terms that I have heard in talks. This class also gave a very concise overview of the unresolved problems in the subject which also helps me to better understand the colloquium.

Keep up the excellent work!

Excerpts from 2009 anonymous student evaluations for Physics 608:

I thought this course was excellently designed. Specifically, keeping the lectures focused on broader issues, HW sets and presentations that also gave practical experience, and the incorporation of classic literature.

The instructor presented very clear and physically minded explanations for key concepts. [He] is immensely capable of holding one's attention during long class hours. The instructor never passed up on a question - he tried to answer each and everything as effectively as possible.

The class environment was quite conducive for putting everyone at ease, thereby aiding to more interesting discussions taking place.

Preparation of homework assignments as journal [articles] really made certain I understood the material; a bit of a pain to type up at first, but really paid off.

Use of external articles to supplement text was a great help in outlining how knowledge of cosmology progressed and how scientific breakthroughs come about.

EXTRACURRICULAR ACHIEVEMENTS

Quarterfinalist, World Universities Debating Championships, 1994

63rd Place, U.S. Collegiate National Triathlon Championships, 1996

REFERENCES

Prof. Karl Gebhardt, U. Texas Austin, gebhardt@astro.as.utexas.edu

Prof. Joseph Silk, Oxford University, silk@astro.ox.ac.uk

Prof. Tony Tyson, U.C. Davis, tyson@physics.ucdavis.edu

Prof. C. Megan Urry, Yale University, meg.urry@yale.edu

Prof. Arthur M. Wolfe, U.C. San Diego, awolfe@ucsd.edu