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Born: Jan. 16, 1978 Poughkeepsie, NY (U.S. citizenship)

Education

<p>Sept. 2007 May 2004</p>	<p>Johns Hopkins University Ph.D. in Astronomy M.S. in Astronomy Admitted on Kerr partial fellowship</p>
<p>May 1999</p>	<p>Cornell University B.S. in Applied & Engineering Physics with a concentration in Astrophysics Cum Laude and Departmental Honors</p>

Research

<p>Sept. 2007 – Sept. 2010</p>	<p>Caltech Postdoctoral Scholar at Jet Propulsion Laboratory with Leonidas Moustakas</p>
<p>June 2000 – Sept. 2007 Jan. 2006 – Sept. 2007</p>	<p>ACS GTO Science Team Research Asst. hired to work at IAA (Andalucian Institute for Astrophysics) toward completion of my JHU degree with Narciso Benítez and Holland Ford, JHU / IAA</p>
<p>June 1997 – May 2000</p>	<p>Binary Black Hole Grand Challenge Project with Prof. Saul Teukolsky, Cornell Univ.</p>
<p>Sept. 1998 – May 1999</p>	<p>N-body galaxy simulations B.S. honors project with Prof. Richard Lovelace, Cornell Univ.</p>

Research Interests

- The nature of dark matter
 - Future astrophysical constraints
 - Small-scale power cutoff as potentially revealed by gravitational lensing
- The distribution of dark matter in galaxy clusters; galaxy cluster formation
 - Strong and weak gravitational lensing analyses
- The nature of dark energy
 - Cosmological constraints
 - Gravitational lens time delays
- Galaxy evolution
 - Photometric redshifts

2009 JPL Award for Outstanding Postdoctoral Resesarch

“Cosmological Constraints from Gravitational Lens Time Delays”

Observing Time Awarded

Hubble ACS prog. 11689 (sched. Nov. 2009), P.I. Dupke

“Direct Observations of Dark Matter from a Second Bullet: The Spectacular Abell 2744”

\$50,000 will fund my strong+weak lensing mass map reconstruction

Observing Runs

Mar., Sept. '06; Feb. '07 Calar Alto: Alhambra Project

April '03 Gemini NIR Imaging of ACS GTO Cluster Survey Targets

Thesis (Sept. 2007, JHU)

Towards an Understanding of Dark Matter: Precise Gravitational Lensing Analysis

Complemented by Robust Photometric Redshifts (available [here](#))

Software Publicly Released and Supported

[Fisher.py](#) – Fisher matrices and confidence contours: calculations & plots

[LensPerfect](#) – Strong gravitational lens mass map reconstructions yielding exact reproduction of all multiple images

[BPZ v1.99.2](#) (original version written by N. Benítez) – Bayesian Photometric Redshifts

[ColorPro](#) – PSF-corrected aperture-matched photometry

[SExSeg](#) – Force SExtractor to analyze predefined objects (using an input segmentation map)

Students Supervised

June 2008 – August 2008 Prakhar Goel – Caltech SURF program

Teaching

Sept. 2000 – May 2001 Teaching Asst. Cornell A&EP labs

Outreach

2/09 – [JPL blog](#)

5/09 – ScientificBlogging.com: “[An Awful Waste of Space](#)”

3/08 – LAPD’s Deputy Auxillary Program (8-13 year-olds): launched paper rockets

1/08 – AstroZone outreach event at AAS: displayed 20-foot 3-D Mars panorama to 250 attendees

12/07 – “L.A.’s Best” (4th / 5th graders): planet demos & activities

4/05 – JHU Physics Fair, 2nd Annual

8/01 – Camp Sunrise: astronomy demos, incl. rockets and telescopes

Languages: English (native), Spanish (semi-fluent), French (8 years of study)

References:

Leonidas Moustakas (JPL)

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Jason Rhodes (JPL)

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Holland Ford (JHU)

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Narciso Benitez (IAA)

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Selected Papers

Cosmological Constraints from Gravitational Lens Time Delays
(Coe & Moustakas 2009; [ApJ 706, 45](#))

Fisher Matrices and Confidence Ellipses: A Quick-Start Guide and Software
(Coe 2009b; [arXiv:0906.4123](#))

Astro2010 Decadal Survey White Paper:

Detailed dark matter maps of galaxy cluster substructure and direct comparison to simulations
(Coe 2009a; [arXiv:0902.3474](#))

LensPerfect: Gravitational Lens Mass Map Reconstructions Yielding Exact Reproduction of All Multiple Images (Coe et al. 2008; [ApJ 681, 814](#))

Galaxies in the Hubble Ultra Deep Field I. Detection, Multiband Photometry, Photometric Redshifts, and Morphology (Coe et al. 2006; [AJ 132, 926](#))

Strong-Lensing Analysis of A1689 from Deep Advanced Camera Images
(Broadhurst et al. 2005; 3rd of 42 authors; [ApJ 621, 53](#))

Discovery of a Dark Matter Ring in the Core of the Galaxy Cluster CL0024+17: A Peculiar Substructure Revealed by Gravitational Lensing with the Advanced Camera for Surveys (Jee et al. 2007; 6th of 16 authors; [ApJ 661, 728](#))

New Multiply-Lensed Galaxies Identified in ACS/NIC3 Observations of Cl0024+1654, Using an Improved Mass Model (Zitrin et al. 2009; 4th of 12 authors; [MNRAS 396, 1985](#))

Using Weak-Lensing Dilution to Improve Measurements of the Luminous and Dark Matter in A1689 (Medezinski et al. 2007; 4th of 9 authors; [ApJ 663, 717](#))

The Sextet Arcs: A Strongly Lensed Lyman Break Galaxy in the ACS Spectroscopic Galaxy Survey toward Abell 1689 (Frye et al. 2007; 2nd of 14 authors; [ApJ 665, 921](#))

$z \sim 7-10$ Galaxies Behind Lensing Clusters: Contrast with Field Search Results
(Bouwens et al. 2009; 8th of 9 authors; [ApJ 690, 1764](#))

Resolved Galaxies in the Hubble Ultra Deep Field: Star Formation in Disks at High Redshift
(Elmegreen et al. 2007; 4th of 4 authors; [ApJ 658, 763](#))

Other Refereed Publications

Observations of the Gas Reservoir around a Star-Forming Galaxy in the Early Universe (Frye et al. 2008; 8th of 11 authors; [ApJ 685, 5](#))

Color, 3D simulated images with shapelets (Ferry et al. 2008; 5th of 6 authors; [APh 30, 65](#))

Lyman Break Galaxies, Ly α Emitters, and a Radio Galaxy in a Protocluster at $z = 4.1$ (Overzier et al. 2008; [ApJ 673, 143](#))

GRB 060121: Implications of a Short-/Intermediate-Duration γ -Ray Burst at High Redshift (de Ugarte Postigo et al. 2006; [ApJ 648, 83](#))

Mass Modeling of Abell 1689 Advanced Camera for Surveys Observations with a Perturbed Navarro-Frenk-White Model (Zekser et al. 2006; [ApJ 640, 639](#))

Clustering of Star-forming Galaxies Near a Radio Galaxy at $z=5.2$ (Overzier et al. 2006; [ApJ 637, 58](#))

Hubble Space Telescope Advanced Camera for Surveys Weak-Lensing and Chandra X-Ray Studies of the High-Redshift Cluster MS 1054-0321 (Jee et al. 2005; [ApJ 634, 813](#))

The Nature of Blue Cores in Spheroids: A Possible Connection with Active Galactic Nuclei and Star Formation (Menanteau et al. 2005; [ApJ 620, 697](#))

Ultracompact Dwarf Galaxies in Abell 1689: A Photometric Study with the Advanced Camera for Surveys (Mieske et al. 2004; 4th of 40 authors; [AJ 128, 1529](#))