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**EDUCATION**

Ph.D.	Astrophysics	University of California, Santa Cruz Santa Cruz, California	expected: 2010
M.S.	Astrophysics	University of California, Santa Cruz Santa Cruz, California	2006
B.A.	Physics & Astrophysics	University of California, Berkeley Berkeley, California	2003

**RESEARCH EXPERIENCE**

**Graduate Student  
Researcher**

University of California, Santa Cruz, Department of Astrophysics 2007 – present  
Lawrence Livermore National Laboratory  
Advised by Professor Puragra Guhathakurta

- Investigating the stellar kinematics of individual red giant branch stars in the compact elliptical galaxy M32
- Designing observing masks for the Keck II DEIMOS spectrograph
- Observing targets at Keck II DEIMOS
- Analyzing individual spectra to obtain stellar kinematics
- Building IDL routines to reduce long-slit spectra
- Creating IDL scripts to analyze the data and disentangle M31 and M32 stars
- Obtaining a radial velocity and dispersion profile for M32
- Writing the research paper for journal submission

University of California, Santa Cruz, Department of Astrophysics 2007 – present  
Lawrence Livermore National Laboratory  
Advised by Professor Puragra Guhathakurta

- Investigating the interaction between the dwarf elliptical galaxy, NGC205, & M31 via a restricted N-body simulation
- Building IDL & Fortran routines to simulate the interaction
- Optimizing the search of the larger parameter space defining NGC205's orbit by employing a genetic algorithm
- Managing the simulation on UVic's LLaima Cluster
- Presenting the work at conferences
- First author of the resulting journal research paper

University of California, Santa Cruz, Department of Astrophysics 2004

Advised by Professor Gregory Laughlin

- Exploring orbits in a  $M=2$  singular isothermal disk (constant temperature disk with surface mass density inversely proportional to radius and 2-fold symmetric periodic function)
- Designing movies to demonstrate the evolution of the orbits for variable eccentricities and initial phase space positions
- Coding a 4<sup>th</sup>-order Runge-Kutta integrator with an adaptive time step

**Research  
Assistantships**

Lawrence Berkeley National Laboratory, Astrophysics Group 2002 – 2004

Advised by Professor George Smoot

- Ascertaining the presence or absence of lensing events caused by cosmic strings in the HST GOODS fields
- Simulating synthetic strings and testing our efficiency at identifying them using IDL
- Designing a poster to communicate the background of our work

Lawrence Berkeley National Laboratory, Astrophysics Group 2002 – 2004

Advised by Professor George Smoot

- Creating and measuring weak shear caused by gravitational lensing in simulated galaxy fields using MATLAB
- Testing and comparing the 3 main analysis tools used to measure weak lensing shear
- Designing a poster to communicate the background of our work
- Training new students on how to use the analysis tools

Space Sciences Laboratory, University of California, Berkeley 2001 – 2002

Advised by Stewart Bowyer

- Analyzing EUVE and EURD data to determine the source of extreme ultraviolet emissions in Abell 2199 and Abell 1795
- Comparing EUV emissions with x-ray emissions to test for any correlations

**TEACHING EXPERIENCE**

**Instruction**

*COSMOS: Stars, Sight & Science*

2008

University of California, Center for Adaptive Optics

- Lecturing on stellar structure and globular clusters to high school students
- Overseeing an intense research project on globular clusters involving observation, data reduction and analysis
- Employing a “hands on” methods for exploring the nature of stellar evolution and globular clusters
- Assisting students in creating their own presentation on their research experience to present to their peers and high school

- COSMOS: Stars, Sight & Science* 2005  
University of California, Center for Adaptive Optics
- Constructing and presenting lectures focused on stellar structure and globular clusters to high school students
  - Overseeing an intense research project on globular clusters involving observation, data reduction and analysis
  - Developing a "hands on" methods for exploring the nature of stellar evolution and globular clusters
  - Organizing instruction materials and designing a website for future instructors: <http://www.ucolick.org/~kirsten/COSMOS05/>

**Teaching  
Assistantships**

- Observational Astronomy* 2006  
University of California, Santa Cruz, Department of Astrophysics
- Instructing students through observational astronomy laboratory assignments
  - Preparing and presenting material reviews for examinations
  - Grading class projects and examinations
  - Tutoring students in their assignments
  - Performing lectures for the professor in her absence

- Overview of the Universe* 2006  
University of California, Santa Cruz, Department of Astrophysics
- Preparing and presenting material reviews for homework and examinations
  - Grading homework, class projects and examinations
  - Tutoring students in their assignments

- The Violent Universe: Cosmic Catastrophes & Life on Earth* 2005  
University of California, Santa Cruz, Department of Astrophysics
- Designing and maintaining a class website
  - Preparing and presenting material reviews for homework and examinations
  - Grading homework, class projects and examinations
  - Tutoring students in their assignments
  - Performing lectures for the professor in his absence

- Light Color and Vision* 2005  
University of California, Santa Cruz, Department of Astrophysics
- Designing and maintaining a class website
  - Preparing and presenting material reviews for homework and examinations
  - Grading homework, class projects and examinations
  - Tutoring students in their assignments
  - Performing lectures for the professor in his absence

## HONORS & AWARDS

<b>Graduate Fellowships</b>	Lawrence Livermore National Laboratory (LLNL) 2008 – present Lawrence Scholars Program Award (LSP) Formerly the SEGRF Fellowship. Competitive 4 year award given to top students to conduct research of interest to the Laboratory while completing their thesis.
	Kavli Institute for Theoretical Physics (KITP) 2006 University of California, Santa Barbara Each semester, 3 fellowships are awarded to outstanding graduate students to fund participation in workshops and research at the Institute
	Eugene Cota-Robles Fellowship 2004 – 2006 University of California, Santa Cruz Each year, a limited number of students entering a UC PhD program are nominated for and awarded this prestigious UC fellowship.
<b>Student Appointments</b>	Lawrence Livermore National Laboratory (LLNL) 2007 Student appointed summer position with the lab to conduct research in the field of astrophysics.
<b>Honorable Mentions</b>	Graduate Research Symposium 2006 University of California, Santa Cruz
	FORD Foundation Predoctoral Fellowship 2006
<b>Scholarships</b>	NASA Space Grant Fellowship 2001 Space Sciences Laboratory, Berkeley, California
	Schwartz, A&H Scholarship 2000 University of California, Berkeley
<b>Other</b>	Sigma Xi, Associate Member 2003-2004 University of California, Berkeley

## REFEREED PUBLICATIONS

"Stellar Kinematics in the Region of M32, **Kirsten M. Howley**, Basilio Yniguez, Raja Guhathakurta, Jason Kalirai, Evan Kirby, & Marla Geha. 2009, in prep

"Darwin Tames an Andromeda Dwarf: Unraveling the Orbit of NGC 205 Using a Genetic Algorithm," **Kirsten M. Howley**, Marla Geha, Raja Guhathakurta, Ryan Montgomery, Gregory Laughlin, & Kathryn V. Johnston. 2008, ApJ, 683, 722

## SUCCESSFUL PROPOSALS

“Kinematics of Inner Disk and Bulge of the Andromeda Galaxy”, Keck Observing Proposal, PI: Puragra Guhathakurta, Co-PI: **Kirsten Howley**, 2008

## ABSTRACTS

“Stellar Kinematics in the Region of M32”, **Howley, K.**, Yniguez, B., Guhathakurta, P., Kalirai, J., Kirby, E., Geha, M. 2009, American Astronomical Society, AAS Meeting 213, 317.04

“Darwin Tames an Andromeda Dwarf: Unraveling the Orbit of NGC 205 Using a Genetic Algorithm”, **Howley, K.**, Geha, M., Guhathakurta, P., Montgomery, R., Laughlin, G. & Johnston, K. 2008, American Astronomical Society Meeting Abstracts, 211, 26.07

“Darwin Tames an Andromeda Dwarf: Unraveling the Orbit of NGC 205 Using a Genetic Algorithm”, **Howley, K.**, Geha, M., Guhathakurta, P., Montgomery, R., Laughlin, G. & Johnston, K. 2007, American Astronomical Society Meeting Abstracts, 209

“Unraveling NGC 205’s Interaction with Andromeda (M31)”, **Howley, K.**, Geha, M., Guhathakurta, P., Montgomery, R. & Laughlin, G. 2006, Bulletin of the American Astronomical Society, Vol. 38, No. 4, 1154

## PRESENTATIONS

“Stellar Kinematics in the Region of M32”, American Astronomical Society (AAS) Meeting, 5 Jan 2009

“The Tidally Distorted Satellites of the Andromeda Galaxy”, Friday Lunch Astrophysics Seminar (FLASH) at the University of California, Santa Cruz, 18 Jul 2008

“Darwin Tames an Andromeda Dwarf: Unraveling the Orbit of NGC 205 Using a Genetic Algorithm”, Lawrence Berkeley National Laboratory (LBNL) Institute for Nuclear and Particle Astrophysics (INPA) Invited Seminar, 30 May 2008

“Darwin Tames an Andromeda Dwarf: Unraveling the Orbit of NGC 205 Using a Genetic Algorithm”, American Astronomical Society (AAS) Meeting, 8 Jan 2008

“Darwin Tames an Andromeda Dwarf: Unraveling the Orbit of NGC 205 Using a Genetic Algorithm”, Lawrence Livermore National Laboratory (LLNL) IGGP Colloquium, 14 Dec 2007

“Dynamical Modeling of Tidally Distorted M31 Satellites”, Spectroscopic and Photometric Landscape of Andromeda's Stellar Halo (SPLASH) Team Meeting at the University of California, Santa Cruz, 21 Sept 2007

“Darwin Tames an Andromeda Dwarf: Unraveling the Orbit of NGC 205 Using a Genetic Algorithm”, Lawrence Livermore National Laboratory (LLNL) Summer Student Presentations, 7 Sept 2007

“The Galaxy Dance: Exploring the orbit of NGC 205 Using a Genetic Algorithm”, 3<sup>rd</sup> Annual

Graduate Research Symposium at University of California, Santa Cruz, 22 May 2007

"Dwarf Ellipticals & Galaxy Formation: Unraveling the Interaction between Andromeda & NGC205",  
Cosmology in Northern California 2007 (CINC'07), 11 May 2007

"Unraveling NGC 205's Interaction with Andromeda (M31)", FLASH at the University of California,  
Santa Cruz, 9 Mar 2007

"Unraveling NGC 205's Interaction with Andromeda (M31)", AAPT-AAS Joint Meeting, 9 Jan 2007

"Unraveling NGC 205's Interaction with Andromeda (M31)", UCSB AGN/Lensing Lunch Talk, 4 Dec  
2006

"Unraveling NGC 205's Interaction with Andromeda (M31)", Theoretical Astrophysics in Southern  
California (TASC), 20 Oct 2006

"Unraveling the Interaction between Andromeda & NGC205", 2<sup>nd</sup> Annual Graduate Research  
Symposium at University of California, Santa Cruz, 2 Jun 2006

"Women of Color in the Sciences Colloquium", Colloquium at the University of California, Santa  
Cruz, 29 May 2006

"M=2 Singular Isothermal Disks", FLASH at University of California, Santa Cruz, 19 Nov 2004

"Weak Lensing Methods", Presentation at Lawrence Berkeley National Laboratory, 27 Feb 2004

## **POSTERS**

"Darwin Tames an Andromeda Dwarf: Unraveling the Orbit of NGC205 Using a Genetic Algorithm",  
Lawrence Scholars Program Poster Symposium, Lawrence Livermore National Laboratory, 7 Oct 2008

"Darwin Tames an Andromeda Dwarf: Unraveling the Orbit of NGC205 Using a Genetic Algorithm",  
UCSC Postdoc Conference, 20-22 Aug 2008

"Darwin Tames an Andromeda Dwarf: Unraveling the Orbit of NGC205 Using a Genetic Algorithm",  
4<sup>th</sup> Annual Graduate Research Symposium at University of California, Santa Cruz, 16 May 2008

"Darwin Tames an Andromeda Dwarf: Unraveling the Orbit of NGC205 Using a Genetic Algorithm",  
Lawrence Livermore National Laboratory Student Research Symposium, 9 Aug 2007

"The Search for Cosmic Strings", Ihm, M., Howley, K., Zuniga, L., Lamoureux, J., & Smoot, G.,  
Lawrence Berkeley National Laboratory 2004 Student Poster Session, 2004

"Weak Gravitational Lensing by Clusters of Galaxies", Howley, K., 5<sup>th</sup> Annual Spring Poster Session, 4  
Apr. 2003

## **PROFESSIONAL SERVICE**

Graduate Student Orientation, University of California, Santa Cruz, 23 Sept 2008, Volunteer

Graduate Admissions Committee, Astronomy/Astrophysics Department, University of California, Santa Cruz, 2008, Graduate Student Representative

Graduate Council, University of California, Santa Cruz, 2008, Graduate Representative

Graduate Student Association (GSA), University of California, Santa Cruz, 2008, Internal Vice President

Graduate Student Commons Board Governance, University of California, Santa Cruz, 2007-present, Graduate Representative

Student of Color Conference, University of California, Santa Cruz, 10-12 Nov 2007, Workshop Designer, Workshop Presenter & Volunteer

Graduate Student Association (GSA), University of California, Santa Cruz, Fall Quarter 2007, Secretary

Graduate Student Orientation, Diversity Panel, University of California, Santa Cruz, 9 Sept 2007, Speaker

"Mastering the PhD Process", UC LEADS Workshop, University of California, Santa Cruz, 6 Apr 2007 & 4 May 2007, Organizer & Presenter

"Women of Color in the Sciences Colloquium", Colloquium at the University of California, Santa Cruz, 29 May 2006, Head Organizer & Presenter

"Excellence Through Diversity", Chancellor Denice Denton's Inaugural, 3 Nov 2005, Organizer & Facilitator

UCSC 1<sup>st</sup> Annual Diversity Dinner, 10 Oct 2005, Speaker

University of California Leadership Excellence through Advanced Degrees Program (UCLEADS) Symposium, San Francisco, CA 5-6 Oct 2005, Speaker

California Forum for Diversity in Graduate Education, University of the Pacific, Stockton, 30 Oct 2004, Speaker

"National Analysis of Diversity in Science and Engineering Faculties at Research Universities", Briefing at the House of Representatives, 15 Jan 2004, Speaker

## **SKILLS**

O/S: Linux, Unix, MacOS, Windows  
Software: SAOimage (ds9), SExtractor, IRAF, DAOPHOT  
Languages: IDL, MATLAB, FORTRAN, LaTeX, Python, PBS, LAM/MPI

## **PROFESSIONAL AFFILIATIONS**

American Astronomical Society (AAS), Associate Member  
Alliances for Graduate Education in the Professoriate (AGEP)  
National Society of Hispanic Physicists (NSHP)  
Society for the Advancement of Chicanos and Native Americans (SACNAS)