

MARIANA LAZAROVA

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PERSONAL

- Visa status: U.S. resident

POSITIONS

- 2013 – present Visiting Assistant Professor, Colorado College, Colorado Springs, CO
- 2012 – 2013 Visiting Assistant Professor, Pomona College, Claremont, CA
- 2005 - 2012 Graduate Student Research/Teaching Assistant, UC Riverside, Riverside, CA

EDUCATION

- 2012 Ph.D. in Physics, UC Riverside, expected graduation: June 2012
 Thesis: “*The Nature of Low-ionization Broad Absorption Line QSOs*”
 Advisor: Prof. Gabriela Canalizo
- 2007 M.S. in Physics, UC Riverside
- 2005 B.S. in Physics, Magna Cum Laude, Sweet Briar College, VA

RESEARCH INTERESTS

- Broad Absorption Line QSOs
- QSO host galaxies
- AGN/Galaxy evolution
- Black hole scaling relations
- AGN-driven outflows

REFEREED PUBLICATIONS

- “*The Nature of LoBAL QSOs: II. Host Galaxy Morphologies with HST/WFC3*”
 Lazarova, M., Canalizo, G., & Lacy, M. 2013, in preparation
- “*The Lick AGN Monitoring Project 2011: FeII Reverberation from the Outer Broad Line Region*”
 Barth, A., et al. (including Lazarova), 2013, ApJ, 769, 128
- “*The Nature of LoBAL QSOs: I. SEDs and Mid-infrared Spectral Properties*”
 Lazarova, M., Canalizo, G., Lacy, M., & Sajina, A. 2012, ApJ, 755, 29
- “*Probing the M-sigma Relation in the Non-Local Universe Using Red QSOs*”
 Canalizo, G., Wold, M., Hiner, K., Lazarova, M., Lacy, M., & Aylor, K. 2012, , 760, 38
- “*The Lick AGN Monitoring Project 2011: Dynamical Modeling of the Broad Emission Line Region in Mrk 50*”
 Pancoast, A., et al. (including Lazarova), 2012, ApJ, 754, 49
- “*The Lick AGN Monitoring Project 2011: Reverberation Mapping of Markarian 50*”
 Barth, A., et al. (including Lazarova), 2011, ApJL, 743, 4

CONFERENCE PROCEEDINGS

- **“Infrared and Optical Properties of Low-*z* Low-Ionization Broad Absorption Line QSOs”**
Lazarova & Canalizo, 2009, APSC, 408, 288
Proceeding of “The Starburst – AGN Connection Conference”, 27-31 October 2008, Shanghai, China
- **“Quasar Black Hole Masses from Velocity Dispersions”**
Canalizo, Wold, Lazarova & Lacy, 2008, AIPC, 1053, 63C
Proceedings of the 2nd Kolkata Conference on “Observational Evidence for Black Holes in the Universe”, 10-15 February 2008, Kolkata, India

CIRCULARS

- **“Supernova 2011cf in NGC 2939 = Psn J09380828+0931111”**
Silverman, J. M., Li, W., Filippenko, A. V., Canalizo, G., Hiner, K., & Lazarova, M. 2011, CBET, 2716, 2
- **“Supernova 2011cf in NGC 2939 = Psn J09380828+0931111”**
Kandrashoff, M., Lin, K., Cenko, S. B. Li, W., Filippenko, A. V., Silverman, J. M., Canalizo, G., Hiner, K., & Lazarova, M. 2011, CBET, 2716, 1

TALKS

- Jan 7, 2013 “LoBAL QSOs Found in Galaxies with Disturbed Morphologies”
221th Meeting of the American Astronomical Society, Jan 7-10, 2013, Long Beach, CA
- Jan 11, 2012 “SEDs and Morphologies of Low-redshift LoBAL QSOs”
219th Meeting of the American Astronomical Society, Jan 9-12, 2012, Austin, TX
- June 24, 2010 “Infrared SEDs and star-formation rates of LoBAL QSOs”
“Extreme Starbursts in the Local Universe,” June 21-25, 2010, Granada, Spain
- April 29, 2010 “The relevance of mergers in galaxy evolution”
Department of Physics and Engineering, Sweet Briar College, VA
- June 13, 2008 “Broad Absorption Line Quasars”
UC Riverside Physics Department commencement ceremony
- Oct 11, 2007 “Low-redshift Low-ionization Broad Absorption Line QSOs”
UC Riverside Weekly Astronomy Seminar

POSTER ABSTRACTS

- Oct 3, 2011 “SEDs and mid-infrared spectral properties of LoBAL QSOs”
Lazarova, M., Canalizo, G., Lacy, M., & Sajina, A.
“Through the IR looking glass: dusty view of AGN and galaxy evolution,” Pasadena, CA
- Jan 5, 2010 “Investigating the M - σ Relation of Red QSOs”
Hiner, K., Canalizo, G., Wold, M., Lazarova, M., & Lacy, M.
215th meeting of the American Astronomical Society, Washington, DC
- Sept 17, 2009 “The host galaxies of low-ionization broad absorption line QSOs”
Lazarova, M., & Canalizo, G.
Keck Science Meeting 2009, Caltech, Pasadena, CA
- Jan 7, 2009 “Mergers and Starbursts in Low-ionization BAL QSOs”
Lazarova, M., & Canalizo, G.
213th meeting of the American Astronomical Society, Long Beach, CA
- Jan 8, 2009 “Adaptive Optics Integral Field Unit Observations of Cygnus A”
Canalizo, G., Max, C., Medling, A., & Lazarova, M.
213th meeting of the American Astronomical Society, Long Beach, CA

- Oct 31, 2008 “*Optical Properties of Low-z Low-ionization BAL QSOs*”
Lazarova, M., & Canalizo, G.
“The Starburst – AGN Connection” conference, Shanghai, China
- Jan 6, 2003 “*Helium Accretion and Detonation on White Dwarfs*”
Lazarova, M. S.
201st meeting of the American Astronomical Society, Seattle, WA
- Jan 8, 2002 “*Multi-Epoch Monitoring of Magnetic Field Structures in Three Blazars*”
Denn, G. R., Mutel, R. L., Lazarova, M. S., Dreier, C. & Helton, A.
199th meeting of the American Astronomical Society, Washington, DC

PROFESSIONAL MEMBERSHIPS

- American Astronomical Society (AAS)
- American Association of University Women (AAUW)

AWARDS

- 2012 Physics and Astronomy Outstanding Teaching Assistant for the 2011-2012 academic year
Graduate Division, UC Riverside
- 2010 Robert E. Neumann ('66,'67 M.A.) Graduate Student Scholarship for 2010-2011, \$2,500
Alumni Association, UC Riverside
- 2009 Dean's Dissertation Year Fellowship, granted for quarters Winter 2010 and Spring 2010, \$13,332
Graduate Division, UC Riverside
- 2008 Michael Devirian Graduate Scholarship Award, \$1,000 of research funds
Department of Physics and Astronomy, UC Riverside
- 2008 2008 Outstanding Teaching Assistant of the Year
American Association of Physics Teachers, UC Riverside section
- 2008 Physics Outstanding Teaching Assistant for the 2007-2008 academic year
Graduate Division, UC Riverside
- 2005 First-year Graduate Division Fellowship award for 2005-2006, \$10,000
Dept. of Physics, UC Riverside

UNDERGRADUATE AWARDS

- 2004 Sweet Briar Grant, \$1,000
- 2003 2004 – 2005 Honors Scholarship, Sweet Briar College, \$7,350
- 2004 Dean's Honor List, Sweet Briar College
- 2004 Sweet Briar Grant, \$4,000
- 2003 Honors Travel Grant (for presenting at the 203st AAS Meeting), \$500
- 2003 Dean's Honor List, Sweet Briar College
- 2003 2003 – 2004 Honors Scholarship, Sweet Briar College, \$7,350
- 2002 Honors Travel Grant (for presenting at the 201st AAS Meeting), \$500
- 2002 Sweet Briar College Redtop International Scholarship, \$3,000
- 2002 Three-year Sweet Briar Dornette Computer Scholarship
- 2001 CRC Press Freshmen Chemistry Achievement Award
- 2001 Sweet Briar College Chemistry Golden Test Tube Award
- 2001 Four-year International Scholarship, Sweet Briar College, \$60,000

GRANTS

- 2009 Hubble Space Telescope observation approved with funding (>\$100,000)
- 2008 Spitzer Space Telescope observation approved with funding (\$77,000)
- Various UCR *Graduate Student Association Student Travel Grants* to attend the following conferences:
 - *Through the IR Looking Glass: A Dusty View of Galaxy and AGN Evolution*, Oct 2-5, 2011, Pasadena, CA
 - *2011 Keck Science Meeting*, Sept 23-24, 2011, Pasadena, CA
 - *Extreme Starbursts in the Local Universe*, June 21-25, 2010, Granada, Spain
 - *213th American Astronomical Society meeting*, Jan 4-7, 2009, Long Beach, CA
 - *The Starburst-AGN Connection*, Oct 27-31, 2008, Shanghai, China
- 2008 AAS International Travel Grant, \$1,100
- 2008 Financial Support from the LOC of “The Starburst-AGN Connection,” Oct 27-31, 2008, Shanghai

TRAINING

- Jan 18 - 20, 2013 Conference for Undergraduate Women in Physics, Caltech, Pasadena, CA
- May 5, 2012 SoCal CAE Regional Teaching Exchange, MiraCosta College, Oceanside, CA
- January 21, 2012 Southern California PKAL Regional Meeting, Pomona College, Claremont, CA
- January 7 - 8, 2012 Center for Astronomy Education, Tier I Workshop, Austin, TX
- August 26 - 29, 2008 6th Spitzer Data Analysis Workshop, Spitzer Science Center, Caltech, CA
- August 4 - 8, 2008 9th Annual Summer School for Adaptive Optics, UC Santa Cruz, CA
- Nov 20 - Dec 1, 2006 XVIII Canary Islands winter school of Astrophysics, Tenerife, Spain
- August 5 - 11, 2006 7th Annual Summer School for Adaptive Optics, UC Santa Cruz, CA
- June 15-22, 2004 9th Synthesis Imaging Summer School, NRAO, Socorro, NM

APPROVED OBSERVING PROPOSALS

- **Keck** Observatory Co-I 10-meter Keck II telescope with Echelle Spectrograph and Imager
2 nights: February 12-13, 2012
“Stellar populations of Low-ionization BAL QSOs”
- **Keck** Observatory Co-I 10-meter Keck I telescope with the Low Resolution Imaging Spectrometer
1 night: April 7, 2011
“The host galaxies of Low-ionization BAL QSOs”
- **Hubble** Space Telescope Co-I Wide Field Camera 3, both UVIS & IR channels
23 orbits in Cycle 17
“The nature of Low-ionization BAL QSOs”
This program was approved with funding (start date: Sept 2009).
- **Keck** Observatory Co-I 10-meter Keck I telescope with the Low Resolution Imaging Spectrometer
2 nights: February 24-25, 2009
“The host galaxies of Low-ionization BAL QSOs”
- **Spitzer** Space Telescope Co-I Multiband Imaging Photometer for Spitzer & InfraRed Spectrograph
16.5 hours in Cycle 5
“The nature of Low-ionization BAL QSOs”
This program was approved with funding (start date: Nov 27, 2008).

- *Lick* Observatory PI 3-meter Shane with IRCAL + Laser Guide Star Adaptive Optics
3 nights: March 6-8, 2009
“*The relationship between mergers and LoBAL QSOs*”
- *Lick* Observatory PI 3-meter Shane with IRCAL + Laser Guide Star Adaptive Optics
2 nights: March 19-20, 2008
“*The relationship between mergers and LoBAL QSOs*”

TEACHING EXPERIENCE

CLASSES SCHEDULED TO TEACH AT COLORADO COLLEGE (2013-PRESENT)

- Spring 2014, Block 8 *PC 133: Astronomy*
- Spring 2014, Block 7 *PC 357: Astrophysics*
- Spring 2014, Block 6 *PC 242: Introductory Classical Physics II (mechanics, thermodynamics)*
- Fall 2013, Block 3 *PC 142: Introductory Physics II (E&M, optics)*
- Fall 2013, Blocks 1&2 *PC 120: Special Topics in Physics: Life in the Universe (First-year seminar)*

CLASSES TAUGHT AT POMONA COLLEGE (2012-2013)

- Spring 2013 *ASTR 003: Life in the Universe*
- Spring 2013 *ASTR 003L: Life in the Universe Laboratory*
- Spring 2013 *PHYS 041L: General Physics Laboratory*
- Fall 2012 *ASTR 001: Introductory Astronomy*
- Fall 2012 *ASTR 001L: Introductory Astronomy Laboratory*
- Fall 2012 *PHYS 070L: Spacetime, Quanta, and Entropy Laboratory*

TEACHING ASSISTANTSHIPS AT UNIVERSITY OF CALIFORNIA - RIVERSIDE

- Winter 2012 *PHYS 006: The Violent Universe (Prof. Gabriela Canalizo),* 4 discussion sections
- Winter 2011 “ 4 discussion sections
- Fall 2007 “ 4 discussion sections
- Fall 2006 “ 3 discussion sections
- Spring 2009 *PHYS 007: Space-Time, Relativity, and Cosmology (Prof. Wudka),* 4 discussion sections
- Winter 2008 “ 3 discussion sections
- Spring 2007 “ 6 discussion sections
- Spring 2006 *PHYS 02LC: General Physics Laboratory (Prof. Chun Ning Lau),* 2 lab sections
- Winter 2006 *PHYS 02LC: General Physics Laboratory (Prof. Roland Kawakami),* 1 lab section

OUTREACH ACTIVITIES

- **2013 Pomona College Academy for Youth Success (PAYS):** (June 24 – July 19, 2013)

PAYS is an intensive 4-week college-preparation summer program for high school students, grades 9 through 12, targeted at local students from under-represented minorities, low-income families, and prospective first-generation college students. My involvement in the program was to teach mathematics to the rising 11th graders.

- **Sycamore Elementary Science Fair:** Evaluating the science projects of the 4th-6th graders (May 21, 2013)
- **NanoDays 2013:** Leading hands-on science activities at the Claremont Public Library (March 30, 2013)
- **Pomona College:** Planetarium Show for 2nd-3rd graders from Sycamore Elementary (April 25, 2013)
Planetarium Show for 2nd-3rd graders from the Fremont Academy (Dec 17, 2012)
Planetarium Show for 7th-9th graders from the Fremont Academy (Dec 1, 2012)
Founder's Day Brackett Observatory Open House (Oct 14, 2012)
- **UCR Physics and Astronomy Open House:** Solar Telescope (March 10, 2012)
- **2012 Inland Empire Regional Science Olympiad** (March 3, 2012)
Judge for the Middle School Astronomy division "Reach for the Stars"

- **High school program** (2010 – 2012)

During the 2011-2012 and 2010-2011 academic years, I have been involved in a public outreach program with local high schools in Riverside, CA, called "Science in the Classroom." Riverside high schools suffer from one of the lowest enrollment of students in science classes in the entire USA. With a groups of graduate students, I have been visiting K-12 physics classes, and giving presentations on topics from the physics curriculum, as well as, on my own research on a level accessible to the students, with emphasis on active student participation. The program is focused on making students aware of how science research is done at universities and encouraging high school seniors to pursue college education in the sciences. The success of this program has been recognized by NSF with a continuation of their funding. Program coordinator: Dr. Shan-Wen Tsai (swtsai@physics.ucr.edu).

- **Teacher retention program** (Summer 2011)
I was involved in the training of science teachers in southern California through the UC Riverside extension center as part of the Inland Area Science Project Teacher Retention Initiative (IASP TRI). The teachers who participate in the program work in schools in southern California's "Inland Empire", a region that serves a very large number of minority students. This project involves participation in a series of 5- and 6-day summer science institutes for fourth through eighth grade teachers from schools that have a high percentage of English learners. During these institutes, we provide teachers with the opportunity to participate in a simple hands-on science project that they might take to their school and share with their own students. Program faculty advisor: Dr. Gabriela Canalizo (gabriela.canalizo@ucr.edu).
- **Public talks to local amateur astronomy clubs**
Title: "Catastrophic galaxy collisions and the birth of quasars"
 - Oct 7, 2011 Orange County Astronomers, Chapman University, Orange, CA
 - Jan 18, 2011 Osher Lifelong Learning Institute (Joshua Tree National Park), La Quinta, CA
 - Aug 28, 2010 Riverside Astronomical Society, La Sierra University, Riverside, CA
- **Outreach video**
As a graduate student, I was featured in an outreach video for the Lick Observatory about what inspires astronomers to pursue careers in science: <<http://astro.ucr.edu/what-drives-us-to-pursue-science/>>

UNDERGRADUATE RESEARCH EXPERIENCE

- Summer 2005 Palomar 60" telescope operation
Department of Astronomy, California Institute of Technologies, Pasadena, CA
Faculty sponsor: Dr. Shri Kulkarni; Supervisors: Dr. Derek Fox and Bradley Cenko

- Summer 2004 NRAO Summer School
(July-August) *“Turbulent Characteristics of Galactic HI”*
NRAO - Green Bank, Green Bank, WV; Advisor: Dr. Anthony Minter
- Summer 2004 Student researcher
(May-June) *“Helium Accretion and Detonation on White Dwarfs”*
Los Alamos National Laboratory, Los Alamos, NM; Advisor: Dr. Alexander Heger
- Summer 2003 Los Alamos Summer School
“Helium Accretion and Detonation on White Dwarfs”
Los Alamos National Laboratory, Los Alamos, NM; Advisor: Dr. Alexander Heger
- Winter 2002 Student researcher
“A Search for Radio Transients in the Galactic Center”
Sweet Briar College, Sweet Briar, VA; Advisor: Dr. Scott Hyman
- Summer 2002 Student researcher
“An Examination of Magnetic Field Structure and Motion of Shocks in AGN”
Sweet Briar College, Sweet Briar, VA; Advisor: Dr. Grant Denn
- Winter 2001 Student researcher
“Search for x-ray transients with radio counterparts”
Sweet Briar College, Sweet Briar, VA; Advisor: Dr. Scott Hyman

GRADUATE CLASSES (UC RIVERSIDE)

Winter 2009	PHYS 401, Science Writing and Illustration	Dr. Barish	grade: S
Fall 2008	PHYS 251, Techniques of Observational Astronomy	Dr. Canalizo	grade: A
Spring 2008	PHYS 216, Star Formation	Dr. Canalizo	grade: A
Fall 2007	PHYS 215, Dynamics and Evolution of Galaxies PHYS 251, Techniques of Observational Astronomy	Dr. Jungwiert Dr. Canalizo	grade: A+ grade: S
Spring 2007	PHYS 214, Techniques of Observational Astrophysics PHYS 251, Techniques of Observational Astronomy	Dr. Canalizo Dr. Canalizo	grade: A grade: S
Winter 2007 – UCLA	ASTR 271, Fundamentals II: Radiation ASTR 274, Galaxies	Prof. Jura Prof. Larkin	grade: A grade: A
Spring 2006	PHYS 210B, Electromagnetic Theory PHYS 212B, Thermo & Stat Mechanics PHYS 221C, Quantum Physics	Dr. Pryadko Dr. Zandi Dr. Desai	grade: B grade: A+ grade: B+
Winter 2006	PHYS 210A, Electromagnetic Theory PHYS 212A, Thermo & Stat Mechanics PHYS 221B, Quantum Physics	Dr. Pryadko Dr. Tsai Dr. Desai	grade: B+ grade: B+ grade: A-
Fall 2005	PHYS 210A, Classical Mechanics PHYS 221B, Quantum Physics PHYS 231, Methods of Theoretical Physics PHYS 301, Teaching Physics at College Level	Dr. Tsai Dr. Desai Dr. Rice Dr. Tom	grade: A- grade: B+ grade: A grade: S

REFERENCES**• Prof. Gabriela Canalizo**

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Astronomy
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• Dr. Mark Lacy

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• Prof. Bahram Mobasher

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