Matt R. Mechtley

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Education

Arizona State University, 2009–2013
Ph.D. Astrophysics
Dissertation: *Markov Chain Monte Carlo Modeling of High-Redshift Quasar Host Galaxies in Hubble Space Telescope Imaging*

Arizona State University, 2002–2007
B.S. Mathematics, *Magna Cum Laude*

Professional Experience

Postdoctoral Scholar
Arizona State University 2015–Present
Prof. Rogier Windhorst
Continued work on quasar host galaxies at $z = 2$ and $z = 6$. Critical analysis of the evidence (or lack thereof) for a strong quasar-merger connection among the most strongly accreting quasars. Statistical methods for analysis and combination of expert- and citizen scientist-classified galaxy morphologies.

Wissenschaftlicher Mitarbeiter (Staff Scientist)
Max Planck Institute for Astronomy 2014–2015
Dr. Knud Jahnke
UV/Optical imagining and point source subtraction of quasar host galaxies at $z = 0$, $z = 2$, and $z = 6$. Critical analysis of the (lack of) evidence for a strong quasar-merger connection among massive quasars. Statistical methods for analysis and combination of expert- and citizen scientist-classified galaxy morphologies. Co-supervision and advisement of bachelor's and master's students.

Graduate Research Assistant
Arizona State University 2010–2013
Prof. Rogier Windhorst
Performed point-source modeling and subtraction on $z \sim 6$ and $z \sim 2$ quasars. Reduced and analyzed HST imaging data. Authored automated data reduction pipeline for the HIPPIES HST survey (P.I. H. Yan, 62 fields $\times$ 4 filters, $\sim$287 arcmin^2, $\sim$600 orbits). Authored HST, NOAO proposals. Prepared HST Phase II observing plans. Awarded HST GO program 12974 (25 orbits, see below).

Graduate Research Assistant
Arizona State University 2009–2010
Prof. Mark Robinson
Reduced and analyzed Lunar Reconnaissance Orbiter data, including LROC visible and Mini-RF radar observations of the lunar surface. Researched cratering and surface weath-

ering processes as traced by surface rock populations.

Undergraduate Research Assistant
Arizona State University 2006–2007
Prof. Rogier Windhorst
Developed a cross-platform interactive simulation of the Hubble Ultra Deep Field, allowing users to move about the dataset in three dimensions. Incorporated the Friedmann-Lemaître-Robertson-Walker metric to demonstrate non-Euclidean aspects of the expanding Universe's geometry and other key concepts in cosmology.

Grants and Awards

2012–2013
Hubble Space Telescope Cycle 20 GO Program 12974 (25 Orbits)
WFC3/IR Imaging of UV-Faint z=6 Quasars: Star-Forming Host Galaxies of AGN in the Early Universe $152,152

January 2012
AAS Chambliss Astronomy Achievement Student Award, Honorable Mention
WFC3 Imaging of z=6 Quasars: Examining AGN Host Galaxies in the Early Universe

May 2011
School of Earth and Space Exploration Graduate Research Merit Award
WFC3 Imaging of $z \sim 6$ QSO Host Galaxies $1,800

Aug. 2006
NASA Space Grant Undergraduate Research Fellowship
Appreciating Hubble At Hyper-speed: A Web Tool for Astronomy Education $3,000, 2 semesters

First-Author Refereed Publications

Hubble Space Telescope Imaging of FIR-Luminous Quasar Hosts at $z = 6$ **M. Mechtley**, R. A. Windhorst, K. Jahnke, et al. 2015, in preparation

Is Black Hole Growth at $z = 2$ Triggered By Major Mergers? **M. Mechtley**, K. Jahnke, R. A. Windhorst, et al. 2015, submitted to ApJ

Near-Infrared Imaging of a $z = 6.42$ Quasar Host Galaxy With The Hubble Space Telescope Wide Field Camera 3 **M. Mechtley**, R. A. Windhorst, R. E. Ryan, G. Schneider, S. H. Cohen, et al. 2012, ApJ, 756, L38

Other Refereed Publications

Physical Properties of Spectroscopically Confirmed Galaxies at $z >= 6$. II. Morphology of the Rest-frame UV Continuum and Ly Emission L. Jiang, E. Egami, X. Fan, R. A. Windhorst, S. H. Cohen, R. Davé, K. Finlator, N. Kashikawa, **M. Mechtley**, et al. 2013, ApJ, 773, 153

Physical Properties of Spectroscopically Confirmed Galaxies at $z >= 6$ I. Basic Characteristics of the Rest-frame UV Continuum and Lyα Emission L. Jiang, E. Egami, **M. Mechtley**, X. Fan, et al. 2013, ApJ, 772, 99

The Size Evolution of Passive Galaxies: Observations from the Wide Field Camera 3 Early Release Science Program R. E. Ryan Jr., P. J. McCarthy, S. H. Cohen, H. Yan, N. P. Hathi, A. M. Koekemoer, M. J. Rutkowski, **M. Mechtley**, et al. 2012, ApJ, 749, 53

Hubble Space Telescope Observations of Field Ultracool Dwarfs at High Galactic Latitude R. E. Ryan Jr., P. A. Thorman, H. Yan, X. Fan, L. Yan, **M. Mechtley**, et al. 2011, ApJ, 739, 83

The Surficial Nature of Lunar Swirls as Revealed by the Mini-RF Instrument C. D. Neish, D. T. Blewett, D. B. J. Bussey, S. J. Lawrence, **M. Mechtley**, et al. 2011, Icarus, 215, 186

The Hubble Space Telescope Wide Field Camera 3 Early Release Science Data: Panchromatic Faint Object Counts for 0.2-2 m Wavelength R. A. Windhorst, S. H. Cohen, N. P. Hathi, P. J. McCarthy, R. E. Ryan, Jr., H. Yan, I. K. Baldry, S. P. Driver, J. A. Frogel, D. T. Hill, L. S. Kelvin, A. M. Koekemoer, **M. Mechtley**, et al. 2011, ApJS, 193, 27

Conference Presentations and Posters

Markov Chain Monte Carlo Galfitting **M. Mechtley** 2015, Python in Astronomy, Apr. 2015

Host Systems of $z = 6$ Quasars: Evidence for Mergers or Dense Environments **M. Mechtley**, R. A. Windhorst, K. Jahnke, L. Jiang, et al. 2015, South by High$-z$, Apr. 2015

Quasar Host Galaxies at z=2 and z=6: Point Source Subtraction With MCMC **M. Mechtley**, A. M. Koekemoer, K. Jahnke, B. Smith, et al. 2013, AAS #221, Jan. 2013

WFC3 Imaging of z=6 Quasars: Examining AGN Host Galaxies in the Early Universe **M. Mechtley**, R. A. Windhorst, R. E. Ryan, S. H. Cohen, G. Schneider, et al. 2012, AAS #219, Jan. 2012

WFC3 Imaging of z=6 QSO Hosts: A Method for PSF Characterization and Subtraction **M. Mechtley**, R. A. Windhorst, G. Schneider, S. H. Cohen, X. Fan, et al. 2011, AAS #217, Jan. 2011

Coordinated Radar and Optical Observations of Young Craters With Obscured Ejecta Blocks **M. Mechtley**, S. J. Lawrence, M. S. Robinson, D. B. J. Bussey, & G. W. Patterson NASA Lunar Science Forum #3, July 2010

Coordinated LROC and Mini-RF Observations of the Lunar Surface S. J. Lawrence, **M. Mechtley**, P. D. Spudis, D. B. J. Bussey, & M. S. Robinson LPSC #41, Mar. 2010

The "Appreciating Hubble At Hyper-speed" Web-tool and Curriculum L. M. Will, **M. Mechtley**, S. H. Cohen, R. A. Windhorst, N. Pirzkal, et al. AAS #211, Jan. 2008

Appreciating Hubble at Hyperspeed: A Teaching Tool for Students & Educators **M. Mechtley**, R. A. Windhorst, L. M. Will, & S. H. Cohen Arizona/NASA Space Grant Undergraduate Research Program Statewide Symposium, Apr. 2007

Appreciating Hubble at Hyper-speed: A Web-tool for Students and Teachers L. M. Will, **M. Mechtley**, S. H. Cohen, R. A. Windhorst, S. Malhotra, et al. AAS #209, Jan. 2007

Technical Skills and Proficiencies

Operating Systems

Mac OS X, GNU/Linux, Unix, Windows

Programming Languages

Python, C#, C, Objective-C, Perl, IDL, Java, Javascript, PHP, C++

Software

Astrodrizzle, TinyTim, GalFit, SExtractor, IRAF, APT, `aXe`, LaTeX, Unity, Adobe Photoshop and Illustrator

Teaching Experience

Instructor, Astronomy Lab I, Arizona State University, Fall 2009

Other Professional Experience

Simulations Programmer 2007–2009
Flashbang Studios, LLC Tempe, AZ

System development and programming for games, simulations, visualizations, and other interactive media. Emphasis on physics simulation, 3-dimensional graphics and animation, developing autonomous agents, web integration, and hardware support.

Service and Outreach

Vice President, Arizona State University Astronomy Open House, 2009–2012

Council Member, School of Earth and Space Exploration Graduate Student Council, 2009–2010

Education and Public Outreach projects for ASU School of Earth and Space Exploration, Arizona/NASA Space Grant Consortium, Arizona Museum of Natural History, and Arizona Science Center, 2006–2013

Officer, Arizona State University Math Club, 2006–2007