

CONTACT INFORMATION	<i>Address:</i> 800 N Smith Rd Apt 3D Bloomington, IN 47408	<i>Cell:</i> (330) 304-4412 <i>E-mail:</i> mtpatter@nmsu.edu <i>Website:</i> astronomy.nmsu.edu/mtpatter
EDUCATION	<p>New Mexico State University (NMSU), Las Cruces, NM</p> <p>Ph.D., Astronomy May 2013</p> <ul style="list-style-type: none"> Thesis Title: "Properties of Star Formation and the Interstellar Medium in Galaxy Outskirts" <p>M.S., with Honors, Astronomy May 2011</p> <p>University of Chicago, Chicago, IL</p> <p>B.A., with Honors, Physics with Specialization in Astrophysics June 2007</p> <ul style="list-style-type: none"> Thesis Title: "Direct Cherenkov Detection with the Very Energetic Radiation Imaging Telescope Array System (VERITAS)" 	
SPECIAL SKILLS	<p>Computing and Programming</p> <ul style="list-style-type: none"> Proficient in Windows, Linux (Ubuntu), and other Unix-based operating systems. Proficient in C/C++, Python, and L^AT_EX. Working knowledge of R, Fortran, Supermongo, and HTML/CSS. <p>Data Modeling and Analysis</p> <ul style="list-style-type: none"> Special experience creating models of gas kinematics in galaxy disks to understand the origin of gas in sensitive radio data sets. Special experience processing and analyzing optical telescope data to recover and characterize faint signatures from unresolved stellar streams around galaxies. 	
RESEARCH AND WORK APPOINTMENTS	<p>Royal Observatory / School of Informatics, University of Edinburgh Edinburgh, Scotland</p> <p>Open Science Data Cloud (OSDC) PIRE Fellow June - August 2013</p> <ul style="list-style-type: none"> Exploring row-oriented vs. column-oriented databases to maximize query speed in the astronomical database for the VISTA Variables in the Via Lactea (VVV) Survey. <p>Sapling Learning Inc., Macmillan (Remote)</p> <p>Astronomy Content Author April 2013 - present</p> <ul style="list-style-type: none"> Writing questions and solutions of varying difficulty to test students' understanding of astronomical concepts. <p>Department of Astronomy, New Mexico State University Las Cruces, NM</p> <p>Graduate Research Assistant August 2007 - present</p> <ul style="list-style-type: none"> Constructing detailed 3-dimensional models of the morphology and kinematics of gaseous galaxy halos to study accretion of gas as part of the HALOGAS (Hydrogen Accretion in Local GALaxieS) Survey. Collecting and analyzing deep, wide-field optical images of galaxies to search for faint signatures of galaxy mergers and young star formation as Principal Investigator of an accepted observing proposal to the National Optical Astronomy Observatory. Organized a 5-day scientific workshop of presentations, breakout sessions, and evening activities for the HALOGAS collaboration of twenty internationally-based scientists. Reduced and analyzed spectroscopic data to study the abundances of metals in faint star forming regions. <p>Head Teaching Assistant January 2010 - May 2010</p>	

- Prepared laboratory equipment for all teaching assistants, led weekly meetings to plan exercises, and operated the campus observatory telescopes twice weekly.

Laboratory Instructor

August 2007 - December 2009

- Taught laboratory component to an undergraduate Astronomy course for non-majors and operated campus observatory telescopes.

Department of Physics, University of Chicago

Chicago, IL

Undergraduate Research Assistant

June 2005 - May 2007

- Assembled and tested equipment for the VERITAS high energy gamma ray telescopes at the Whipple Observatory in Amado, AZ.

PROFESSIONAL DEVELOPMENT

Big Data and Cloud Computing Workshop
University of Edinburgh, School of Informatics

June 17 - 21, 2013

Summer School in Statistics for Astronomers IX
Pennsylvania State University, Center for Astrostatistics

June 3 - 7, 2013

Introduction to Data Science Course
University of Washington through Coursera Online

May - June 2013

PUBLICATIONS AND PRESENTATIONS

Papers

An oxygen abundance gradient into the outer disc of M81

M.T. Patterson, R.A.M. Walterbos, R.C. Kennicutt, C. Chiappini, D.A. Thilker
Monthly Notices of the Royal Astronomical Society, May 2012, Volume 422, Issue 1, pages 401-419

HALOGAS: Extraplanar gas in NGC 3198

G. Gentile, G.I.G. Jozsa, P. Serra, G.H. Heald, W.J.G. de Blok, F. Fraternali, **M.T. Patterson**,
R.A.M. Walterbos, T. Oosterloo
Astronomy & Astrophysics, June 2013, Volume 554, id.A125, 10 pp.

HALOGAS observations of NGC 5023 and UGC 2082: Modeling of non-cylindrically symmetric gas distributions in edge-on galaxies

P. Kamphuis, R.J. Rand, G.I.G. Jozsa, L.K. Zschaechner, G.H. Heald, **M.T. Patterson**, G.
Gentile, R.A.M. Walterbos, P. Serra, W.J.G. de Blok
Monthly Notices of the Royal Astronomical Society, Accepted

Deep observations of HI and star formation in NGC 5055 from the HALOGAS survey

M.T. Patterson, R.A.M. Walterbos, G.H. Heald, G. Gentile, G.I.G. Jozsa, P. Serra, D.A.
Thilker, et al., in prep

An Extended Oxygen Abundance Gradient of M31 from HII regions

M.T. Patterson, R.A.M. Walterbos, R.C. Kennicutt, C. Chiappini, in prep

Talks

Evolutionary Processes in Nearby Spiral Galaxies: Characterizing the Metallicities, Star Formation, and Accretion in Galaxy Outskirts

January 2013: 221st Meeting of the American Astronomical Society, Long Beach, CA

Early Results from the HALOGAS Survey: HI Observations of NGC 5055

April 2012: Tully-Fisher at 35: Global Properties of HI in Galaxies Workshop, NRAO, Green Bank, WV

HALOGAS: A Deep HI Survey

March, 2012: NMSU Astronomy Department Pizza Lunch, Las Cruces, NM

HII Region Abundances: A Metallicity Gradient for M81

October, 2011: NMSU Astronomy Department Pizza Lunch, Las Cruces, NM

The HALOGAS Survey: HI Observations and Modeling of NGC 5055 and NGC 4258

October, 2011: 27th Annual New Mexico Symposium, Socorro, NM

Posters

Deep HI Observations of NGC 5055 from the HALOGAS Survey

May 2012: STScI May Symposium: Gas Flows in Galaxies, Baltimore, MD

M.T. Patterson, the HALOGAS Team

HI Streams and Spurs in HALOGAS Observations of NGC 5055

January 2012: 219th Meeting of the American Astronomical Society, Austin, TX

M.T. Patterson, R.A.M. Walterbos, G. Heald, G. Jozsa, G. Gentile, D. Thilker

The HALOGAS Project: HI Observations of NGC 5055 and NGC 4258

June 2011: Gas in Galaxies: From Molecular Clouds to Cosmic Web, Kloster Seeon, Germany

M.T. Patterson, the HALOGAS Team

The HALOGAS Project: HI Observations of NGC 5055

January 2011: 217th Meeting of the American Astronomical Society, Seattle, WA

M.T. Patterson, R.A.M. Walterbos, G. Heald, G. Jozsa, L. Zschaechner, R. Rand, D. Thilker

HII Regions in the Outer Disk and Tidal Arms of M81

January 2010: 215th Meeting of the American Astronomical Society, Washington D.C.

January 2010: 25th Annual New Mexico Symposium, Socorro, NM

M.T. Patterson, R.A.M. Walterbos, D.A. Thilker, R.C. Kennicutt, C. Chiappini

Extraplanar Gas Extent of Edge-on Galaxies: A Comparison of the Galaxies NGC 4244 and NGC 891

June 2009: Galaxy Metabolism Conference, Sydney, Australia

M.T. Patterson, R.A.M. Walterbos

Interstellar Gas and Massive Stars in External Galaxies: Initial Results for the Galaxies M33 and NGC 4517

April 2009: NMSU Graduate Research and Arts Symposium, Las Cruces, NM

M.T. Patterson, R.A.M. Walterbos

Multi-long-slit Spectroscopy for Kinematic Studies. I. Implementation and Demonstration

January 2008: 211th Meeting of the American Astronomical Society, Austin, TX

R.A.M. Walterbos, J. Choi, S. Cisneros, **M.T. Patterson**, C. Wu

Multi-long-slit Spectroscopy for Kinematic Studies. II. Initial Results for the Edge-On Galaxies NGC 891 and NGC 4244

January 2008: 211th Meeting of the American Astronomical Society, Austin, TX

J. Choi, S. Cisneros, C. Wu, **M.T. Patterson**, R.A.M. Walterbos

SUCCESSFUL
TELESCOPE
OBSERVING
PROPOSALS

“Continuing Observations of Stellar Streams and Star Formation in the Outskirts of HALOGAS Spiral Galaxies”

- National Optical Astronomy Observatory (NOAO) Proposal ID: 2012A-0185
- 4 full nights granted on the Kitt Peak National Observatory (KPNO) Mayall 4-meter Telescope Mosaic 1.1 Wide Field Imager

“Stellar Streams and Star Formation in the Outskirts of HALOGAS Spiral Galaxies”

- NOAO Proposal ID: 2011B-0355
- 4 full nights granted on the KPNO Mayall 4-meter Telescope Mosaic 1.1 Wide Field Imager

AWARDS AND GRANTS	Academic Fellowships and Awards	
	<ul style="list-style-type: none"> • Open Science Data Cloud NSF PIRE Fellowship Summer 2013 • OSDC-PIRE Challenge, 3rd Place Paper June 2013 • Murrell Award for Professional Development and Research Accomplishment 2013 • NMSU Outstanding Graduate Assistant Award 2008-2009 & 2012-2013 • Pegasus Award for Excellence in Teaching 2010 • New Mexico Space Grant Graduate Research Fellowship 2009-2010 & 2010-2011 • New Mexico Higher Education Department Fellowship 2008 - 2011 • NMSU Merit-Based Enhancement Fellowship 2009 - 2010 	
	Conference and Travel Grants	
	<ul style="list-style-type: none"> • <i>NM Celebration of Women in Computing</i> Conference Scholarship Las Cruces, NM, 2012 • NMSU College of Arts and Sciences Graduate Student Travel Award <i>Gas Flows in Galaxies May Symposium</i> Baltimore, MD, 2012 • American Astronomical Society International Travel Grant <i>HALOGAS Collaboration Workshop</i> Bochum, Germany, 2011 • <i>Women in Astronomy and Space Science</i> Conference Travel Grant College Park, MD, 2009 • <i>The Evolution of Galaxies Through the Neutral Hydrogen Window</i> Conference Travel Grant Arecibo Observatory Puerto Rico, 2008 	
EXTRA-CURRICULAR AND VOLUNTEER EXPERIENCE	New Mexico State University, Las Cruces, NM	
	<p>Colloquium Committee Member August 2011 - present</p> <ul style="list-style-type: none"> • Organizes scheduling of visiting colloquium speakers to the Astronomy Department. <p>Astronomy Team Captain, ACS Relay for Life December 2010 - April 2011</p> <ul style="list-style-type: none"> • Led Astronomy Team to raise over \$2000 for American Cancer Society. <p>Committee Member, NMSU Relay for Life October 2008 - April 2009</p> <ul style="list-style-type: none"> • Organized NMSU's American Cancer Society all-night walk-a-thon fundraiser. <p>Secretary, NMSU Astronomy GSO August 2008 - May 2009</p> <ul style="list-style-type: none"> • Responsible for re-chartering Astronomy Graduate Student Organization. 	
	University of Chicago, Chicago IL	
	<p>Volunteer, UChicago Alumni Schools Committee August 2009 - present</p> <ul style="list-style-type: none"> • Interviews prospective undergraduates for possible admission to the University of Chicago. <p>Committee Member, UChicago Class of 2007 Council August 2007 - present</p> <ul style="list-style-type: none"> • Responsible for planning class reunions, raising funds for the University, and acting as a liason for the University to alumnae. <p>Treasurer, Samahan Filipino Cultural Association August 2005 - May 2007</p> <ul style="list-style-type: none"> • Maintained account records, processed reimbursements, and prepared annual allocations budget proposal for Student Government Fund Committee approval 	
COLLABORATORS	Dr. Rene Walterbos - (NMSU Advisor) New Mexico State University, Las Cruces, NM	
	Dr. George Heald - ASTRON, Dwingeloo, Netherlands	
	Dr. David Thilker - Johns Hopkins University, Baltimore, MD	
	The HALOGAS Collaboration	