

## Marcus S. Seigar, Ph.D.

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OBJECTIVE	Placement in an academic faculty position that allows research into: the evolution, morphology, and dynamics of galaxies; dark matter halos; and supermassive black holes.	
EDUCATION	<b>Liverpool Astrophysics Research Institute</b> , Liverpool, U.K. Ph.D., Astrophysics, April 1998 <ul style="list-style-type: none"><li>• Thesis Title: <i>Observational Studies of the Structure of Spiral Galaxies</i></li><li>• Adviser: Dr. Philip A. James</li></ul> <b>University of Manchester</b> , Manchester, U.K. M.Sc., Radio Astronomy, December 1994 <ul style="list-style-type: none"><li>• Thesis title: <i>Proper Motions in the Virgo A Jet</i></li><li>• Adviser: Professor Ralph Spencer</li></ul> <b>Imperial College</b> , London, U.K. B.Sc., Physics, June 1993 <ul style="list-style-type: none"><li>• Awarded with Honors</li></ul>	
EXPERIENCE	<b>University of Arkansas at Little Rock</b> , Little Rock, Arkansas, U.S.A. <i>Assistant Professor</i> August 2007 – Present - Adjunct Affiliation: Arkansas Center for Space and Planetary Sciences, University of Arkansas at Fayetteville <b>University of California, Irvine</b> , California, U.S.A. <i>Assistant Project Scientist</i> October 2004 – July 2007 <i>McCue Fellow</i> January 2007 – July 2007 <b>Joint Astronomy Centre</b> , Hilo, Hawaii, U.S.A. <i>Staff Astronomer, UKIRT</i> May 2001 – September 2004 - Affiliate Position: Department of Physics & Astronomy, University of Hawaii at Hilo August 2003 – December 2003 <b>Imperial College</b> , London, U.K. <i>Postdoctoral Research Fellow</i> May 2000 – April 2001 <b>Universiteit Gent</b> , Ghent, Belgium <i>Postdoctoral Research Fellow</i> May 1998 – April 2000 <b>Space Telescope Science Institute</b> , Baltimore, Maryland, U.S.A. <i>Visiting Astronomer</i> June 1998 – December 1998	

- Please refer to the following pages for detailed work experience.

SUBMITTED  
JOURNAL  
PUBLICATIONS

Treuthardt, P., **Seigar, M. S.**, Sierra, A. D., Al-Baidhany, I. A. A., Kennefick, D., Kennefick, J., & Lacy, C. H. S., *On The Link Between Central Black Holes, Bar Dynamics, and Dark Matter Halos in Spiral Galaxies*, Monthly Notices of the Royal Astronomical Society, submitted.

Barrows, R. S., Lacy, C. H. S., Kennefick, D., Kennefick, J., & **Seigar, M. S.**, *A Highly Eccentric Accretion Disk as Evidence for a Candidate Supermassive Black Hole in SDSS J08425.57+075925.58*, The Astrophysical Journal, submitted.

REFEREED  
JOURNAL  
PUBLICATIONS

Davis, B. L., Berrier, J., Sheilds, D. W., Kennefick, J., Kennefick, D., **Seigar, M. S.**, Lacy, C. H. S., & Puerari, I., *Measurement of Galactic Logarithmic Spiral Arm Pitch Angle Using Two-Dimensional Fast Fourier Transform Decomposition*, The Astrophysical Journal Supplement, accepted (2012).

Ho, L. C., Li, Z.-Y., Barth, A. J., **Seigar, M. S.**, & Peng, C. Y., *The Carnegie-Irvine Galaxy Survey. I. Overview and Atlas of Optical Images*, The Astrophysical Journal Supplement **197**: 21 (2011).

**Seigar, M. S.**, & Berrier, J., *Galaxy Rotation Curves in the Context of  $\Lambda$ CDM Cosmology*, Advances in Modern Cosmology **1**: 77–102

**Seigar, M. S.**, *The Dark Matter Halo Density Profile, Spiral Arm Morphology, and Supermassive Black Hole Mass of M33*, ISRN Astronomy and Astrophysics **2011**: 725697 (2011).

Barrows, R. S., Lacy, C. H. S., Kennefick, D., Kennefick, J., & **Seigar, M. S.**, *Unusual double-peaked emission in the SDSS quasar J093201.60+031858.7*, New Astronomy **16**: 122–127 (2011).

**Seigar, M. S.**, Bullock, J. S., & Barth, A. J., *A revised  $\Lambda$ CDM mass model for the Andromeda Galaxy*, Monthly Notices of the Royal Astronomical Society **389**: 1911–1923 (2008)

**Seigar, M. S.** *A cosmologically motivated description of the dark matter halo profile for the low surface brightness galaxy, Malin 1*, Publications of the Astronomical Society of the Pacific **120**: 945–951 (2008).

**Seigar, M. S.**, Kennefick, D., Kennefick, J. D., Lacy, C. H. S., *Discovery of a relationship between spiral arm morphology and supermassive black hole mass in disk galaxies*, The Astrophysical Journal **678**: L93–L96 (2008).

Majewski, S. R., Beaton, R. L., Patterson, R. J.; Kalirai, J. S., Geha, M. C., Muñoz, R. R., **Seigar, M. S.**, Guhathakurta, P., Gilbert, K. M., Rich, R. M., Bullock, J. S., & Reitzel, D. B., *Discovery of Andromeda XIV: A Dwarf Spheroidal Dynamical Rogue in the Local Group?*, The Astrophysical Journal **670**: L9–L12 (2007).

Iverson, R. J., Greve, T. R., Dunlop, J. S., Peacock, J. A., Egami, E., Smail, I., van Kampen, E., Aretxaga, I., Babbedge, T., Biggs, A. D., Blain, A. W., Chapman, S. C., Clements, D. L., Coppin, K., Farrah, D., Halpern, M., Hughes, D. H., Ibar, E., Jarvis, M. J., Jenness, T., Jones, J. R., Mortier, A. M. J., Oliver, S., Perez-Gonzalez, P. G., Pope, A., Rawlings, S., Rieke, G. H., Rowan-Robinson, M., Savage, R. S., Scott, D., **Seigar, M. S.**, Serjeant, S., Simpson, C., Stevens, J. A., Vaccari, M., & Wagg, J., *The SCUBA HALF Degree Extragalactic Survey (SHADES) III. - Identification of radio and mid-infrared counterparts to submillimetre galaxies in the SHADES source catalogue*, Monthly Notices of the Royal Astronomical Society **380**: 199–228 (2007).

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- Seigar, M. S.**, Graham, A. W., & Jerjen, H., *Intracluster light and the extended stellar envelopes in cD galaxies: an analytical description*, Monthly Notices of the Royal Astronomical Society **378**: 1575–1588 (2007).
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Leggett, S. K., Hawarden, T. G., Currie, M. J., Adamson, A. J., Carroll, T. C., Kerr, T. H., Kuhn, O. P., **Seigar, M. S.**, Varricatt, W. P., & Wold T., *L' and M' standard stars for the Mauna Kea observatories near-infrared system*, *Monthly Notices of the Royal Astronomical Society* **345**: 144–152 (2003).

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James, P. A., & **Seigar, M. S.**, *The nature of near-infrared emission from spiral galaxies*, *Astronomy & Astrophysics* **350**: 791–796 (1999).

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Treuthardt, P. M., & **Seigar, M. S.**, *The Apparent Counter-Winding Bar-Spiral Hybrid of NGC 3124*, *Bulletin of the American Astronomical Society* **44**: #346.18 (2012).

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Berrier, J. C., Bullock, J. S., Stewart, K. R., Kenefick, D., Kenefick, D., **Seigar, M. S.**, & Lacy, C., *Galaxy Cluster Assembly: Cluster and Protocluster Populations*, *Bulletin of the American Astronomical Society* **44**: #338.12 (2012).

Davis, B. L., Berrier, J. C., Shields, D. W., Kenefick, J., Kenefick, D., **Seigar, M. S.**, Lacy, C. H. S., & Puerari, I., *Measurement of Galactic Logarithmic Spiral Arm Pitch Angle Using Two-Dimensional Fast Fourier Transform Decomposition*, *Bulletin of the American Astronomical Society* **44**: #246.01 (2012).

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- Seigar, M. S.**, Adamson, A. J., Rees, N. P., Hawarden, T.G., Currie, M. J., & Chuter, T. C., *Seeing statistics and the upgraded 3.8m UK Infrared Telescope (UKIRT)*, Proceedings of the SPIE **4844**: 366–375 (2002).
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Seigar, M. S., Carollo, C. M., Stiavelli, M., Dejonghe, H., & de Zeeuw, P. T., *Spiral galaxies with HST - Near-infrared properties of bulges*, in *Galaxy dynamics: from the early universe to the present*, edited by F. Combes et al., ASP Conf Series **197**: 269–270 (2000).

Seigar, M. S., & James, P. A., *The structure of spiral galaxies*, in *Extragalactic astronomy in the infrared*, edited by G. Mamon et al., Editions Frontières: Paris, pp 33–38 (1997).

RESEARCH  
EXPERIENCE

**University of Arkansas at Little Rock**, Little Rock, Arkansas, U.S.A.

*Assistant Professor*

**August 2007 – Present**

- Co-PI of the Arkansas Galaxy Evolution Survey (AGES), a survey (using archival data) with the goal of determining mass build-up in supermassive black holes over cosmic times.
- Continued involvement in the Carnegie-Irvine Galaxy Survey (CGS) until May 2011. This survey is an imaging survey of the 605 brightest southern hemisphere galaxies.
- Collaborator in the DarkSide program. DarkSide is a program of dual-phase liquid-argon detectors, to be placed deep underground, with the goal of detecting Weakly Interacting Massive Particles (WIMPs), a class of dark matter particle candidates.
- Mentor to two post-doctoral researchers (Anton Empl and Patrick Treuthardt).
- Mentor to three graduate students (Ismaeel Al-Baidhany, Sarah Lindsay, and Amber Sierra).
- Mentor to six undergraduate students (Philip Chandler, Chris Gravenmier, Seeburn James, Sarah Lindsay, Thomas Mears, and Charles Wilson).

**University of California, Irvine**, Irvine, California, U.S.A.

*Assistant Project Scientist*

**October 2004 – July 2007**

(Supervisor: Associate Professor Aaron Barth)

- Collaborated in the Carnegie-Irvine Nearby Galaxy Survey (CGS), an imaging survey of the 605 brightest southern hemisphere galaxies. I observed 70 percent of the optical imaging data and 80 percent of the infrared data, and processed all of the data to the point that it could be used for science.
- Collaborated with Alister Graham on a survey of giant elliptical galaxies in galaxy clusters, in an effort to determine the nature of their extended stellar halos, and their relation to intracluster light.
- Collaborated with James Bullock on mass modeling galaxies using a relationship between rotation curve shear and spiral arm pitch angle, and further modeling of the dark matter halo of M31.
- Collaborated in the SPLASH consortium, a project to understand the stellar halo of M31 using spectroscopic and photometric data.
- Became a member of the LSST Galaxies working group.

**Joint Astronomy Centre**, Hilo, Hawaii, U.S.A.

*Staff Astronomer, UKIRT*

**May 2001 – September 2004**

- Collaborated on the H $\alpha$  Galaxy Survey (HaGS; PI: Philip A. James). I traveled to the Jacobus Kapteyn Telescope in La Palma for three observing runs for this project.
- Observed infrared imaging data for GRB 020232 at UKIRT.
- Took data for a program that monitored infrared flux standard stars in the JHKLM' Mauna Kea filters.
- Monitored the seeing statistics at UKIRT/Mauna Kea.
- Continued investigations into spiral structure in disk galaxies, and its connection with central mass concentration.
- Initiated an investigation into the link between rotation curve shear and star formation rate in spiral galaxies.
- Mentor to two summer intern students (Nicole Chorney and Amanda Leonard).

**Imperial College**, London, U.K.

*Postdoctoral Research Fellow*

**May 2000 – April 2001**

(Supervisor: Professor Michael Rowan-Robinson)

- Developed a Level 2 pipeline for the Planck mission.
- Continued research into spiral structure, and nuclear morphology in disk galaxies.

**Universiteit Gent**, Ghent, Belgium

*Postdoctoral Research Fellow*

**May 1998 – April 2000**

(Supervisor: Professor Herwig Dejonghe)

- Collaborated on an HST survey of the nuclei of 100 nearby disk galaxies using optical WFPC2 data and infrared NICMOS data.
- Continued investigations into spiral structure in disk galaxies.

**Liverpool John Moores University**, Liverpool, U.K.

*Graduate Research Assistant*

**September 1994 – April 1998**

(Supervisor: Dr. Philip A. James)

- Processed infrared imaging data for a sample of 45 galaxies observed in the J and K bands at UKIRT.
- Processed H $\alpha$  imaging data for a sample of 20 galaxies observed at the 1-m Jacobus Kapteyn Telescope.
- Began and completed a study of secular evolution in disk galaxies by comparing the bulge structural parameters with disk structural parameters.
- Began and completed a study to test theories of spiral structure using near-infrared K band imaging data.

RESEARCH  
GRANTS

**University of Arkansas at Little Rock**

- NASA: *The nature of dark matter in the Universe*, \$40k 12/01/10–11/30/11.
- ASGC: *Towards a new universal density profile for dark matter halos*, \$118k 04/16/10–04/15/13.
- NASA: *A census of supermassive black holes in the Universe*, \$1,400k 09/01/08–08/31/12.
- ASGC: *The growth of supermassive black holes in the Universe*, \$5k, 04/16/08–04/15/09.
- NASA: *Toward a census of supermassive black holes in the Universe*, \$65k, 12/01/07–11/30/08.
- NASA: *Central mass concentrations of disk galaxies: The nuclear spiral connection*, \$39k, 08/01/07–11/30/10.

**University of California, Irvine**

- NASA: *Central mass concentrations of disk galaxies: The nuclear spiral connection*, \$51k, 07/01/06–07/31/07.
- NASA: *The co-evolution of spiral structure and mass distribution in disk galaxies*, \$93k 08/01/05–07/31/07.

OBSERVING  
EXPERIENCE

Experience in optical, near-infrared and submillimeter observing and data analysis, using the following telescopes:

- European Southern Observatory Danish 1.5-m Telescope
- European Southern Observatory Very Large Telescope
- Hubble Space Telescope
- Jacobus Kapteyn Telescope
- James Clerk Maxwell Telescope
- Kitt Peak National Observatory 2.2-m Telescope
- Las Campanas Observatory du Pont 100-inch Telescope
- Spitzer Space Telescope

- United Kingdom Infrared Telescope
- W. M. Keck Observatory

TEACHING  
EXPERIENCE

**University of Arkansas at Little Rock**, Little Rock, Arkansas, U.S.A.

*Assistant Professor*

**August 2007 – Present**

- I instruct, oversee, and direct the dissertation research of two Astronomy graduate students.
- I instruct, oversee, and direct the undergraduate research of five students.
- I have taught ASTR 1301 Introduction to Astronomy since Fall 2007.
- I have taught ASTR 1101 Introduction to Astronomy Lab since Fall 2008.
- I have taught ASTR 4301/5301 Astrophysics since Spring 2010.
- I have taught ASTR 2300 Principles of Astronomy since Spring 2011.
- I have taught PHYS 4311/5311 Classical Mechanics since Fall 2011.

**University of Hawaii at Hilo**, Hilo, Hawaii, U.S.A.

*Adjunct Professor*

**August 2003 – December 2003**

- Taught AST 110 Introductory Astronomy for two semesters.

STUDENTS  
CURRENT AND  
PAST

**Joint Astronomy Center**

Summer Interns:

- Nicole Chorney – 2002
- Amanda Leonard – 2003

**University of Arkansas at Little Rock**

Summer REU Students:

- William Ring – 2002

Undergraduate Students:

- Phillip Chandler – Graduated 2010
- Sarah Lindsay – Graduated 2011
- Chris Gravenmier – Expected graduation 2013
- Thomas Mears – Expected graduation 2013
- Seeburn James – Expected graduation 2015
- Charles Wilson – Expected graduation 2015

Graduate Students:

- Ismaeel Al-Baidhany – Expected graduation 2014
- Amber Sierra – Expected graduation 2014
- Sarah Lindsay – Expected graduation 2016

INVITED  
PRESENTATIONS

April 2010 – Invited Speaker, IEEE Arkansas Chapter  
 April 2010 – Colloquium, University of Texas at Arlington  
 November 2009 – Colloquium, University of Oklahoma  
 April 2009 – Keynote Lecture, Arkansas Academy of Science  
 February 2009 – Colloquium, University of Arkansas, Department of Physics  
 November 2008 – Colloquium, University of Alabama, Department of Physics  
 July 2008 – Seminar, Arkansas Center for Space and Planetary Sciences  
 December 2007 – Colloquium, Arkansas Center for Space and Planetary Sciences

September 2007 – Colloquium, University of Arkansas at Little Rock, Applied Science Department  
 March 2007 – Colloquium, University of Arkansas at Little Rock, Physics Department  
 January 2007 – Seminar, Berkeley Cosmology Group  
 December 2006 – Colloquium, ESO, Santiago, Chile  
 October 2006 – Seminar, UC Santa Cruz, Astronomy Department  
 September 2006 – Seminar, IPAC, Caltech  
 May 2006 – Invited Talk, Galaxies In The Cosmic Web, NMSU  
 February 2006 – Seminar, UC San Diego, Center for Astrophysics & Space Sciences  
 February 2006 – Colloquium, UCLA, Division of Astronomy and Astrophysics  
 February 2006 – Seminar, Observatories of the Carnegie Institution of Washington  
 July 2004 – Colloquium, Institute for Astronomy, Manoa  
 June 2004 – Invited talk, Bars Congress, South Africa  
 March 2004 – Colloquium, CFHT Headquarters  
 March 2004 – Subaru Telescope Headquarters  
 January 2004 – Colloquium, Gemini North Operations Center  
 December 2000 – Seminar, Imperial College Astrophysics Research Group  
 December 1998 – Colloquium, Liverpool Astrophysics Research Institute  
 September 1997 – Colloquium, SISSA, Trieste, Italy  
 May 1997 – Invited Talk, Extragalactic Astronomy in the Infrared, Les Arcs, France

#### AWARDS

University of California, Irvine

- Gary McCue Fellowship, 2007.

Liverpool John Moores University

- Particle Physics and Astronomy Research Council Graduate Student Fellowship, 1994 – 1997.

Imperial College London

- Upper second class honors, Bachelor of Science, June 1993 (equivalent of Magna Cum Laude).
- Associate of the Royal College of Science, 1993.

#### PROFESSIONAL SOCIETIES

- Member of the International Astronomical Union, 2006 – present.
- Member of the American Astronomical Society, 2004 – present.
- Member of the Royal Astronomical Society, 1998 – present.

#### CONFERENCE SERVICE

Chair of the Scientific and Local Organizing Committees. *Structure and Dynamics of Disk Galaxies*, Petit Jean Mountain, Arkansas, August 12 – 16, 2013.

Session Chair. *219th Meeting of the American Astronomical Society*, Austin, Texas, January 8 – 12, 2012.

Session Chair. *19th Annual Arkansas Space Grant Consortium Symposium*, Petit Jean Mountain, Arkansas, April 22, 2011.

Session Chair. *95th Annual Meeting of The Arkansas Academy of Science*, Monticello, Arkansas, April 8 – 9, 2011.

Session Chair. *217th Meeting of the American Astronomical Society*, Seattle, Washington, January 9 – 13, 2012.

Chair of the Scientific Organizing Committee. *94th Annual Meeting of The Arkansas Academy of Science*, Little Rock, Arkansas, April 9 – 10, 2010.

#### SERVICE

*Reviewer*

Papers submitted to Monthly Notices of the Royal Astronomical Society.  
 Papers submitted to The Astrophysical Journal.

**Since 2002**

<i>Reviewer</i>		<b>Since 2008</b>
	NASA Research Grant proposals. Arkansas Academy of Science Undergraduate Research Awards.	
<i>Volunteer</i>		<b>2011</b>
	International Observe the Moon Night, Little Rock, Arkansas	
<i>Outreach</i>		<b>2009 – 2011</b>
	Duke TIP 2011 Ceremony Little Rock Science Cafe Panelist	
<i>UALR Graduate Council</i>		<b>2009 – present</b>
<i>UALR Applied Science Doctoral Affairs Committee</i>		<b>2009 – present</b>
<i>UALR Faculty Senate</i>		<b>2009 – 2011</b>
<i>Vice President and President-Elect</i>		<b>2010 – present</b>
	Arkansas Academy of Science	
<i>Volunteer</i>		<b>2004 – 2007</b>
	UCI Observatory Public Viewing Nights	
<i>Volunteer</i>		<b>2001 – 2004</b>
	Mauna Kea Visitors Information Station Public Observing and Summit Tours.	

**SPECIAL SKILLS**

Skills associated with the acquisition and analysis of data, including:

- Proficiency with IRAF and in IDL programming language in Linux development environment.
- Proficiency in Unix/Linux and Windows operating systems.
- Experience with Unix shell scripting, C/C++, LaTeX, HTML, LabVIEW, Pascal, OpenOffice, and Microsoft Office (including Word, Excel, and Powerpoint).
- Experience in writing competitive proposals for telescope observing time and federal granting agencies.
- Experience in the use of large telescopes and supporting software for near-IR imaging and both 1D and 2D spectroscopy.