

# Madhura Killedar

## Curriculum Vitae

Ludwig Maximilians University  
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Citizen of Australia

## Education

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| April 2011 | Ph.D. in Astronomy<br>Sydney Institute for Astronomy, The University of Sydney, Australia                                   |
| Nov 2006   | B.Sc. (Advanced) with First Class Honours in Physics<br>Sydney Institute for Astronomy, The University of Sydney, Australia |

## Research

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| 2013 – Present | Postdoctoral Researcher<br>Universitäts-Sternwarte München, Ludwig Maximilians Universität, Germany   |
| 2010–2013      | Marie Curie Early-Stage Researcher Postdoc<br>European Commission Framework Programme 7, Initial Training Network<br>University of Trieste, Italy                             |
| 2007–2010      | Ph.D. Thesis: <i>Fortuitous Lines of Sight: Cosmological Applications of Gravitational Lensing</i><br>University of Sydney, Australia; Supervisor: Geraint Lewis              |
| 2006           | Honours, Thesis: <i>Mapping Ages by Determining the H<math>\alpha</math>-to-Ultraviolet Ratio in spiral Arms</i><br>University of Sydney, Australia; Supervisor: John O'Byrne |

## Short-Term Projects

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| 2015 | 1 month  | Implementing MCMC algorithms for modelling HIV treatment effect and costing<br>Kirby Institute, University of New South Wales<br>Project leaders: David Wilson & Cliff Kerr |
| 2006 | 2 months | Summer Project (with scholarship): <i>Polarimetry of A3667</i><br>University of Tasmania; Supervisor: Melanie Johnston-Hollitt  |
| 2005 | 4 months | Undergraduate Project: <i>Accretion Disk Theory of Cataclysmic Variables</i><br>University of Sydney; Supervisor: Zdenka Kuncic   |

## Supervisory Experience

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Present	Co-supervisor to Florian Semrau	Masters Student at Ludwig Maximilians Uni.
2007	Co-supervisor to Francesca von Braun-Bates currently: Masters at University of Oxford	Uni. Sydney Talented Student Program

## Computing

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OS	UNIX/Linux, Mac OSX
Programming	Python, Fortran 90, R, Matlab
Collaboration Tools	git/Github, Write $\LaTeX$ /Overleaf
Text	$\LaTeX$ , emacs, MS Word
Web	HTML, CSS

## Honors & Awards

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2014	<i>Accenture</i> Best Presentation Award (€ 1000) at 2nd Bayesian Young Statisticians' Meeting
2007	Secured AUD\$1400 travel funding through Postgraduate Research Support Scheme
2007	University of Sydney (Science Faculty) Postgraduate Award Scholarship
2006	Henry Chamberlain Russell Prize for Best Astronomy Honours Project
2006	Summer Vacation Research Scholarship (Uni. Tasmania)

## Service & Outreach

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March 2015	SOC for <i>Perth Galaxy Cluster Comparison Workshop</i>
June 2013	LOC for <i>Tracing Cosmic Evolution with Clusters of Galaxies</i>
Apr 2013	Outreach Program discussing Astronomy with Swedish high school students
Oct 2012	Manuscript review for <i>Astrophysical Journal (ApJ)</i>
March 2012	Lead Organiser for <i>Star Formation and Chemical Enrichment Workshop</i>
June 2009	SOC for Harley Wood Winter School
2008-2009	Creation, design and maintenance of website for Gravitational Astrophysics Research Group, University of Sydney
Sept 2008	LOC for <i>OzLens 2008</i>
June 2008	Lead Organiser for MPI-programming workshop
Sept 2007	LOC for <i>Dark2007</i>
Jul 2007- Jul 2008	Sydney Institute for Astronomy Department Seminar Coordinator
May 2006	Outreach Program guiding students in grades 5 & 6 in scientific methodology
2005	Executive Committee member for University of Sydney Physics Society

## Selected Talks & Presentations

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Nov 2014	<b>Invited talk:</b> University Seminar; Vienna, Austria Talk title : <i>The ABCs of Strong Lensing Cosmology</i>
Sept 2014	2nd Bayesian Young Statisticians Meeting (BAYSM'14) ; Vienna, Austria Talk title : <i>A New Strategy for Testing Cosmology with Simulations</i> <b>Accenture Best Presentation Award</b>
May 2014	Statistical Challenges for 21st Century Cosmology; Lisbon, Portugal Poster : <i>Strong Lensing: A New Strategy for Testing Cosmology with Simulations</i>
Oct 2013	Dark Side of the Universe; SISSA, Trieste, Italy Talk title : <i>Aiding Cluster Cosmology with Simulations</i>
July 2013	Cosmic Evolution with Galaxy Clusters; Sesto, Italy Talk title : <i>Triaxial Galaxy Clusters and the <math>z &gt; 0.5</math> MACS study</i>
April 2013	Seminar; Argonne National Laboratory, Chicago, USA Talk title : <i>Are the <math>z &gt; 0.5</math> MACS clusters consistent with <math>\Lambda</math>CDM?</i>
April 2013	<b>Invited talk:</b> Cluster Lensing Workshop; STScI, Baltimore, USA Talk title : <i>Are the <math>z &gt; 0.5</math> MACS clusters consistent with <math>\Lambda</math>CDM?</i>
July 2012	<b>Invited talk:</b> Beyond LCDM: DM haloes and LSS; Sesto, Italy Talk title: <i>The Role of Baryons in Strong Lensing Properties of Simulated Clusters</i>
July 2012	Cosmology School; Abdus Salam International Centre for Theoretical Physics, Italy Talk title: <i>The Role of Baryons in Strong Lensing Properties of Simulated Clusters</i>
May 2012	XMM-Newton Science Workshop Galaxy Clusters as Cosmic Labs; ESA, Madrid Talk title: <i>The role of AGN Feedback in Strong Lensing Predictions</i>
July 2011	A New Generation of Galaxy Surveys; Sesto, Italy Talk title: <i>The Effect of Baryons on Giant Arc Statistics</i>
June 2009	<b>Invited Speaker:</b> Cosmology weekend school for Senior High School students Talk title: <i>Cosmology (and more!) with Gravitational Lensing</i>

## Teaching & Examining

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2009	Exam marker for Honours (4th year) General Relativity course
2009	Supervisor Guide for Undergraduate Astronomy Night Sky Viewing
2006, 2008-09	Computational Lab Tutor for Undergraduate (3rd year) Scientific Computing
2007-2009	Supervisor (& summary lecturer) for Undergraduate (1st year) Physics
2006-07, 2009	Computational Lab Tutor for Undergraduate (1st year) Astronomy
2006	Assistant Guide for Undergraduate Astronomy Night Sky Viewing

## Peer-Reviewed Publications

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- 1 *Gravitational lensing in WDM cosmologies: the cross-section for giant arcs*  
Mahdi H. S.; van Beek M.; Elahi P. J.; Lewis G. F.; Power C.; **Killedar M.**, 2014, *MNRAS*, 441, 1954
- 2 *On the role of AGN feedback on the thermal and chemodynamical properties of the hot intracluster medium*  
Planelles S.; Borgani S.; Fabjan, D.; **Killedar, M.**; Murante, G.; Granato, G. L.; Ragone-Figueroa, C.; Dolag, K., 2014, *MNRAS*, 438, 195
- 3 *Characterizing diffused stellar light in simulated galaxy clusters*  
Cui, W.; Murante, G.; Monaco, P.; Borgani, S.; Granato, G. L.; **Killedar, M.**; De Lucia, G.; Presotto, V.; Dolag, K., 2014, *MNRAS*, 437, 816C
- 4 *Galactic Winds in Cosmological Simulations of the Circumgalactic Medium*  
Barai P.; Viel M.; Borgani S.; Tescari E.; Tornatore L.; Dolag K.; **Killedar M.**; Monaco P.; D'Odorico V.; Cristiani S., 2013, *MNRAS*, 430, 3213
- 5 *How Baryonic Processes affect Strong Lensing properties of Simulated Galaxy Clusters*  
**Killedar M.**, Borgani S.; Meneghetti M.; Dolag K.; Fabjan D.; Tornatore L., 2012, *MNRAS*, 427, 533
- 6 *Gravitational lensing with three-dimensional ray-tracing*  
**Killedar M.**, Lasky P. D., Lewis G. F., Fluke C. J., 2012, *MNRAS*, 420, 155
- 7 *Ly- $\alpha$  absorbers in motion: consequences of gravitational lensing for the cosmological redshift drift*  
**Killedar M.**, Lewis G. F., 2010, *MNRAS*, 402, 650

### Submitted

- 1 *The Overlooked Potential of Generalized Linear Models in Astronomy - I: Binomial Regression and Numerical Simulations*  
de Souza, R. S.; Cameron, E.; **Killedar M.**; Hilbe, J.; Vilalta, R.; Maio, U.; Biffi, V.; Ciardi, B., arXiv:1409.7696, submitted to *Astronomy & Computing*

## Other Publications

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- 1 Article, "How do you weigh a cluster of galaxies?", *Significance Magazine*, Dec 2014, Vol 11, Issue 5

## Society Memberships

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2014	ISBA (International Society for Bayesian Analysis)
2014	IAA (International Astrostatistics Association)
2012-2013	INAF (Italian National Institute for Astrophysics)
2007-2008,2014	ASA (Astronomical Society of Australia)

## Academic Referees

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Geraint Lewis  
Professor of Astrophysics  
Sydney Institute for Astronomy  
The University of Sydney  
44 Rosehill Street  
Redfern, NSW, 2016  
Australia

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