



Universiteit
Leiden
The Netherlands

Facets of radio-loud AGN evolution : a LOFAR surveys perspective

Williams, W.L.

Citation

Williams, W. L. (2015, December 10). *Facets of radio-loud AGN evolution : a LOFAR surveys perspective*. PhD Thesis. Retrieved from <https://hdl.handle.net/1887/37016>

Version: Not Applicable (or Unknown)

License: [Leiden University Non-exclusive license](#)

Downloaded from: <https://hdl.handle.net/1887/37016>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/37016> holds various files of this Leiden University dissertation.

Author: Williams, Wendy L.

Title: Facets of radio-loud AGN evolution : a LOFAR surveys perspective

Issue Date: 2015-12-10

Publications

Refereed

Heald, G. H., et al. (including **Williams, W. L.**) 2015. *The LOFAR Multifrequency Snapshot Sky Survey (MSSS) I. Survey description and first results* A&A in press.

Williams, W. L., Röttgering, H. J. A. 2015. *Radio-AGN feedback: when the little ones were monsters*. MNRAS 450, 1538-1545.

Coppejans, R., Cseh, D., **Williams, W. L.**, van Velzen, S., Falcke, H. 2015. *Megahertz peaked-spectrum sources in the Boötes field I - a route towards finding high-redshift AGN*. MNRAS 450, 1477-1485.

van Weeren, R. J., **Williams, W. L.**, et al. 2014. *LOFAR Low-band Antenna Observations of the 3C 295 and Boötes Fields: Source Counts and Ultra-steep Spectrum Sources*. The AJ 793, 82.

Williams, W. L., Kraan-Korteweg, R. C., Woudt, P. A. 2014. *Deep NIR photometry of HI galaxies in the Zone of Avoidance*. MNRAS 443, 41-57.

de Gasperin, F., Intema, H. T., **Williams, W. L.**, Brügger, M., Murgia, M., Beck, R., Bonafede, A. 2014. *The diffuse radio emission around NGC 5580 and NGC 5588*. MNRAS 440, 1542-1550.

Williams, W. L., Intema, H. T., Röttgering, H. J. A. 2013. *T-RaMiSu: the Two-meter Radio Mini Survey. I. The Boötes Field*. A&A 549, A55.

Non-refereed

Williams, W. L., Röttgering, H. J. A. 2015. *LOFAR and Radio-Loud AGN*. IAU Symposium 309, 137-140.

Williams, W. L., Röttgering, H., van Weeren, R. 2014. *LOFAR and Radio Loud AGN*. IAU Symposium 304, 86-92.

Williams, W. L., Woudt, P. A., Kraan-Korteweg, R. C. 2011. *Deep NIR Photometry of HI Galaxies Behind the Milky Way*. in 'Ten years of Infrared Survey Facility and the Future', eds. Nagayama, T., Sato, S., and Wakamatsu, K.

Curriculum Vitae

I was born on August 16, 1986 in Edenvale, Gauteng, South Africa. I attended Eastleigh Primary School for the first 4 years of primary school, before moving to Sunnyridge Primary School and then on to Dawnview High School where I matriculated with distinction in 2004. From an early age I was fascinated by the stars and planned to pursue a career in Astronomy. My interest in science was fostered by public lecture demonstrations and Open nights held by a University of the Witwatersrand Physics professor at the old Royal Observatory in Johannesburg.

In January 2005 I moved to Cape Town and enrolled in the Science Faculty of the University of Cape Town for a degree in Physics and Astrophysics. As part of my first year Astronomy course I made my first of many trips to the South African Astronomical Observatory site in Sutherland. I completed my BSc degree with distinction in 2007 and in 2008 I completed the BSc Honours course as part of the National Astrophysics and Space Science Programme.

In 2009 I started a research Master's degree in Astronomy at the University of Cape Town under Prof. R. Kraan-Korteweg. During this time I studied the cosmic flow fields in the Zone of Avoidance, where dust in our Galaxy obscures the galaxies beyond. This multiwavelength project had a dual approach including near-infrared galaxy photometry, for which I spent many nights observing on the Japanese InfraRed Survey Telescope situated in Sutherland, and radio HI spectral line observations, for which I had the opportunity to observe at the Parkes Radio Telescope. I was awarded my MSc degree in Astronomy with distinction in 2011.

Also in 2011, I moved to Leiden Observatory, where I started my PhD position with Prof. H. Röttgering. My thesis work focussed on using low frequency radio observations to understand how active galactic nuclei evolve over cosmic time and how this interplays with the formation and evolution of galaxies. As part of this I have reduced data from the newly commissioned LOw Frequency ARray (LOFAR) located in the Netherlands, and been actively involved in the LOFAR Surveys team. During my time in Leiden, I assisted in organising the conference "Astronomy, Radio Sources and Society", and I was a teaching assistant for the Master's course "Detection of Light", for which I was awarded a prize for the Best Teaching Assistant of the Semester. During my PhD, I have presented my work at conferences in Bonn (Germany), Groningen (the Netherlands), Yerevan (Armenia), Vienna (Austria), Tempe (USA), and Cape Town (South Africa).

In the next three years I will continue my career in Astronomy as a postdoctoral researcher at the Centre for Astrophysics Research at the University of Hertfordshire in the United Kingdom.

Acknowledgements

This thesis would not have been possible without the friendship, help, guidance, and support of family, friends and colleagues. This list cannot fully capture my gratitude and is likely to be incomplete.

Firstly, on a practical note, I owe my thanks to the Leiden computer group, particularly for your support on the para cluster, and to the administrative staff at the Observatory for keeping things running smoothly. I am grateful also for the support of the staff at ASTRON, in particular to those in Science Support.

I would not have made it to starting a PhD without some people in my early academic career. In particular my thanks go to my B.Sc (Hons) and M.Sc supervisors Patrick Woudt and Renée Kraan-Korteweg. I am grateful for the continued support of the South African government to the development of Astronomy in general and which has in particular benefited me through the National Astrophysics and Space Science Programme and the South African SKA project.

Several people played a very key role in the work I have done over the past few years. Huib, Reinout, and Cyril, I have learned most of what I know about Radio interferometry from you. Philip Best, George Miley, thank you for your advice and guidance. For the useful discussions on AGN: Renier, Gaby, and Jarle Brinchmann. Thanks also to my collaborators, Mike Brown for the Boötes photometry and Ivo Labbe, for the advice on SED fitting. I have been fortunate to be a part of a dynamic research group. So my thanks go to those in the Leiden LOFAR group, which has over the years evolved from technical discussions to more science: Aayush, Andra, Bas, David, Duy, Edwin, Joris, and Raymond. I have been fortunate, also, to be a part of the larger LOFAR Surveys group: Francesco, George H., Ilse, Jon, Liz, Martin, and Pepe. I owe my thanks also to those other Leiden colleagues: Berenice, Renske, and Steven. A special note of thanks goes to Xander Tielens for helping me through the final lap.

Over the years in Leiden I have had the pleasure to count some wonderful people in the Observatory as friends. To the postdocs in our group, Emma and Tim, you have not only added guided me, but you have been good friends. Leah, you made Leiden so much better when you joined our Group. I have learned a lot from you. Your enthusiasm is inspiring.

I have been privileged to meet some incredible friends in Leiden. Annalize, I could not have asked for a better flatmate. I look forward to one day eating excellent food and drinking cocktails with you again on the Mediterranean. Bruha Holly, I'm not going to forget you any time soon! To Dan and Sam and your beautiful family, it was a pleasure to share your time in Leiden. And to Dan, thank you for your support at the Observatory and interesting discussions. To my friends I met in Leiden: Abby, Alina, Amy, Ben, Daniëlle, Hanna, Jérôme, Joshua, Liza, Lydia, Marie, and Paulina, one day I hope to visit you in your places all over the world.

Acknowledgements

To my fellow South Africans and very special friends now in Nijmegen, Deanne, Rocco, and Sally, thank you for all the times I have been able to step away from work and laugh and have some fun with you. Kosma, my friend so far away, your words of encouragement gave me the strength to endure. You open my mind. And to immortalise it in writing: “JDB – You are Awesome!”

Most importantly, my thanks go to my family. Despite being a continent away, your love and support have seen me through some hard times and I would not be where I am today without you. Mom, you may not know exactly what a tutorial or a journal paper is, but you have always encouraged me. Angie, your love of Physics and Astronomy has inspired me to get to this point. Veronica and Heather, my two very different big sisters, you have both guided me in your own way and stood with me.