



Universiteit
Leiden
The Netherlands

Radio galaxies near the epoch of reionisation

Saxena, A.

Citation

Saxena, A. (2019, June 26). *Radio galaxies near the epoch of reionisation*. Retrieved from <https://hdl.handle.net/1887/74474>

Version: Not Applicable (or Unknown)

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

Downloaded from: <https://hdl.handle.net/1887/74474>

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

Cover Page



Universiteit Leiden



The following handle holds various files of this Leiden University dissertation:

<http://hdl.handle.net/1887/74474>

Author: Saxena, A.

Title: Radio galaxies near the epoch of reionisation

Issue Date: 2019-06-26

List of publications

First author

Saxena A., Marinello M., Overzier R.A., Best P.N., Röttgering H.J.A., Duncan K.J., Prandoni I., Pentericci L., Magliocchetti M., Paris D., Cusano F., Marchi F., Intema H.T. and Miley G.K., 2018, *Discovery of a radio galaxy at $z = 5.72$* , MNRAS, 480, 2733.

Saxena A., Jagannathan P., Röttgering H.J.A., Best P.N., Intema H.T., M. Zhang, Duncan K.J., Carilli C.L. and Miley G.K., 2018, *A search for faint high-redshift radio galaxy candidates at 150 MHz*, MNRAS, 475, 5041.

Saxena A., Röttgering H.J.A. and Rigby E.E., 2017, *Modelling the luminosities and sizes of radio sources: radio luminosity function at $z = 6$* , MNRAS, 469, 4083.

Saxena A. and Röttgering H.J.A., 2018, *High-redshift radio galaxies at low radio frequencies*, Proceedings of the IAU Focus Meeting 3: “Radio Galaxies: Resolving the AGN phenomenon”.

Contributing author

Omar A., **Saxena A.**, Chand K., Paswan A., Röttgering H.J.A., Duncan K.J., Kumar T.S., Krishnareddy B., Pant J., 2019, *Optical detection of a GMRT-detected candidate high-redshift radio galaxy with 3.6-m Devasthal optical telescope*, Journal of Astrophysics and Astronomy, 40, 9.

Sabater J., et al., 2019, *The LoTSS view of radio AGN in the local Universe. The most massive galaxies are always switched on*, A&A, 622, A17.

Shimwell T.W., et al., 2019, *The LOFAR Two-metre Sky Survey. II. First data release*, A&A, 622, A1.

Morabito L.K., Williams W.L., Duncan, K.J., Röttgering H.J.A., Miley, G.K., **Saxena, A.**, et al., 2017, *Investigating the unification of LOFAR-detected powerful AGN in the Boötes field*, MNRAS, 469, 1883.

Kerkhoven A.H., Russo P., Land-Zandstra A.M., **Saxena A.** and Rodenburg F.J., 2016, *Gender Stereotypes in Science Education Resources: A Visual Content Analysis*, PLoS ONE, 11(11): e0165037.

Curriculum Vitae

I was born in New Delhi, India on 30 September 1992. As a kid, I always found myself doing well at science and maths. But if given a choice, I much preferred going out to play football rather than be in the classroom. I started developing an interest in astronomy at the age of around 13, thanks to some introductory physics courses about gravitation and how it kept the planets in motion around the Sun. I was also part of the Astronomy Club in middle school and a field trip out in the country side with the club, armed with some amateur telescopes and plenty of snacks, changed my perception of the cosmos forever. On a moonless night, we saw the moons of Jupiter, the rings of Saturn and for the first time in my life, I could see the Milky Way, which for a city boy like me was absolutely mind-blowing. I remember just laying on the grassy field for an hour, looking up and feeling insignificant. From that day my interest in Astronomy grew, and I think I knew somewhere at the back of my mind that Astronomy is what I truly enjoyed studying.

After finishing school, I enrolled in a Bachelor in Physics (with Honours) at the University of Delhi. During my Bachelors degree, I had the pleasure of coming across many nice teachers and supervisors who helped build my motivation to apply for a Masters degree. I then obtained a Masters in Astrophysics from University College London, towards the end of which I knew that I would like to pursue a career in scientific research. The main driving force was my Masters thesis supervisor, Prof. Kinwah Wu, who taught me so much, inspired me everyday with his knowledge and his personality and motivated me to not just be a good scientist, but also be a good human being. His selflessness and intelligence gave me something to strive for, and if not for his advice, I probably would not have ended up in Leiden for my PhD.

I will never forget my time in Leiden, both because of the amazing life experiences I've had and because of how much I have grown as a scientist and as a person. I arrived at Leiden Observatory in November of 2014 to start a PhD with Prof. Huub Röttgering, studying distant radio AGN. I had very little experience with radio astronomy, and had been a theoretician all my life. Leiden gave me the

platform and the resources to continue my growth as a scientist. Thanks to Huub's unwavering support, I was fortunate to have worked on a project that involved theory/modelling, radio astronomy, optical spectroscopy and near-infrared imaging. In Leiden I gained my first telescope observing experience, which has the power to reinforce one's love for astronomy and I have found myself going observing regularly ever since. I also had the opportunity to travel to the biggest institutes and conferences around the world to collaborate and present my results. Being surrounded by inspiring people helped me set high standards for myself and step out of my comfort zone.

I aim to continue my growth as a scientist and maintain a wide variety of research interests, which is why I have switched gears a little bit and decided to pursue research in the formation and evolution of galaxies at high redshifts. I have now moved to the Osservatorio Astronomico di Roma, Italy for my postdoc and I am looking forward to seeing the sun a lot more, and learning new things and accumulating new experiences. One thing that has not changed is the fact that if given an option, I would still much prefer to play (or watch) football, any day of the week.

Acknowledgements

There are so many people to thank that it is hard to know where to start. As the famous Nigerian saying goes, “*it takes a village to raise a child*”, it is certainly true that it takes the support of a large number of people to produce a successful PhD thesis. It seems fitting to start by thanking the amazing support staff at Leiden Observatory. Evelijn Gerstel, Alexandra Schouten-Voskamp, Marjan Balkestein and Yvonne Kluijt, thank you so much for making me feel welcome and settled in right from the very first day. The IT staff, including Erik Deul and Eric van der Kraan, thank you for always being there to solve our issues and making sure we have absolutely no troubles at all when it comes to doing our jobs. Having this kind of support is vital to performing our research duties to the best of our capabilities. Also thanks to the members of the open source community all around the world who put in countless hours to make software easily accessible.

I deeply cherished my time in Leiden and so many people made it worthwhile. Mieke, we have come a long way from when we first started out on the 11th floor and struggled to learn each other’s names. Thank you for always being there and I always knew that I could talk to you about anything in the world. Ele, I admire your positivity and your appetite to learn. Your calming influence, even though you seem to almost always be in a state of panic, was vital in maintaining (I hope mutually) our mental stability. Jorryt, I thoroughly enjoyed discussing everything from resonant scattering of $\text{Ly}\alpha$ photons to the aerodynamics of a road bike with you and look forward to more such discussions. Ken, thanks for playing the role of my academic ‘big brother’ and I learnt a lot from you. Gaby, we started our PhD journey together and it is lovely to see you grow and evolve into a wonderful scientist and human being. Christian, it has been an absolute pleasure knowing you and I will always remember our adventures early in the PhD. Thanks to my PhD cohort – Andrew, Ann-Sofie, Chris, Eva, Geert-Jan, Igone, Kirstin, Mason, Mike, Pedro – we did it! Thank you Christos, Jit, Maria Cristina and Tommaso for the great memories. A special thanks to my research group – Andra, Alex, Duy, Edwin, Frits, Gabriella, Huib, Jonah, Josh, Julius, Kim, Leah, Martijn, Rafael, Reinout, Wendy and all other current and past members. Maolin, it was a pleasure getting to know

a kind and gentle soul like yours and we miss you. Thanks to the other wonderful people I met at the observatory – Allison, Andrej, Berenice, Carmen, Clement, Daniel, David, Emanuele, Francisca, Fraser, Jeroen, Kirsty, Leindert, Leo, Liz, Luke, Marcelo, Marco, Mattia, Matus, Michael, Nico, Niels, Pedro, Pratik, Santiago, Themiya, Valeria and anyone else I may have missed.

Outside of work, I had the pleasure of meeting some great people through organisation of festivals and sporting activities. Laura, it has been great getting to know you over the past few years and curating films, organising LISFE, supporting each other through crises and talking about so many different topics is something I will cherish. Thanks to my other friends from LISFE – Anastasia, Dieter, Eleonora, Evita, Izzy, Klara, Melissa, Stefano and Yara. A massive thank you to all members of my football team, Leiden Football Factory – I looked forward to our training sessions and matches every week. Benoit, Jelmer and Pedro, thanks for the good times, even though beer and McDonald's after matches was probably not what the doctor ordered.

There are a few key people who helped shape my scientific career so far. Prof. Patrick Das Gupta, thank you for giving me my first research experience in astrophysics. Prof. Kinwah Wu, thank you for inspiring me to become a good scientist and an even better human being. George, your undying passion for astronomy and using it to make the world a better place serves as an inspiration for all of us. I hope to follow in your footsteps and never lose the drive to use astronomy to make people's lives better. Although it is not customary to thank your supervisor for "doing their job", Huub, you have been more than just a supervisor and working with you has been a pleasure. Thanks to your mentorship, I have become a more independent and capable researcher. I thoroughly enjoyed discussing Johan Crujff's footballing philosophies with you in our free time and I hope all my future supervisors share the same passion for sport (and life in general) as you do.

Silvia, thank you so much for standing by me through some of the toughest periods of the PhD. I know how annoying I can be and the patience and affection you have shown is something that I am deeply grateful for. I hope in a couple of years I can be there for you as you finish your PhD, although you are much smarter and I'm sure you will handle it better than I did.

Perhaps the most important people I would like to thank are my parents, Anil and Seema. You have always supported me throughout my life and my career, and without your unconditional love and support none of this would have been possible. Papa, thank you for inspiring me to be a critical thinker and having discussions with you and taking your advice has always helped me. Mumma, thank you for teaching me to stay humble, and for showing me that sometimes thinking from the heart is the right thing to do.