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## Hidden star formation in the early Universe

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### Citation

Leeuwen, I. F. van. (2026, April 9). *Hidden star formation in the early Universe*. Retrieved from <https://hdl.handle.net/1887/4301034>

Version: Publisher's Version

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# PUBLICATIONS

## Refereed publications

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### **Characterising the contribution of dust-obscured star formation at $z \geq 5$ using 18 serendipitously identified [CII] emitters**

*I. F. van Leeuwen, R. J. Bouwens, P. P. van der Werf, J. A. Hodge, S. Schouws, M. Stefanon, H. S. B. Algera, M. Aravena, L. A. Boogaard, R. A. A. Bowler, E. da Cunha, P. Dayal, R. Decarli, V. Gonzalez, H. Inami, I. de Looze, L. Sommovigo, B. P. Venemans, F. Walter, L. Barrufet, A. Ferrara, L. Graziani, A. P. S. Hygate, P. Oesch, M. Palla, L. Rowland and R. Schneider,*

*Published in Monthly Notices of the Royal Astronomical Society  
Volume 534, Issue 3, November 2024, Pages 2062-2085*

### **The ALMA REBELS survey: [OIII] $_{88\mu\text{m}}$ line scans of UV-bright $z \geq 7.6$ galaxies**

*I. F. van Leeuwen, R. J. Bouwens, J. A. Hodge, P. P. van der Werf, H. S. B. Algera, S. Schouws, M. Aravena, R. A. A. Bowler, P. Dayal, A. Ferrara, R. Fisher, Y. Fudamoto, C. Gulis, T. Herard-Demanche, H. Inami, I. de Looze, A. Pallottini, R. Smit, L. Sommovigo, and M. Stefanon,*

*Published in Monthly Notices of the Royal Astronomical Society  
Volume 542, Issue 2, September 2025, Pages 1388-1402*

## Publications to be submitted

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### **A JWST/NIRCam View of [CII] $_{158\mu\text{m}}$ -Selected Companion Galaxies: A Key Population for Probing Dust-Obscured Star Formation at $z > 4$**

*I. F. van Leeuwen, R. J. Bouwens, J. A. Hodge, P. P. van der Werf, T. Herard-Demanche, S. Schouws, H. S. B. Algera, M. Aravena, E. da Cunha, P. Dayal, R. Fisher*

*To be submitted to Monthly Notices of the Royal Astronomical Society*



# CURRICULUM VITAE

I was born in Woerden, the Netherlands, on 15 November 1997. I spent the first 19 years of my life there, with my primary school and high school (Minkema College) only a five-minute bike ride from home. As a child, my interests ranged from ancient Egypt and ballet to science shows such as *Mythbusters*. My first introduction to astronomy came from a children's encyclopedia about the solar system, which I would often read before bed. My path to astronomy was not straightforward, as my favorite subject in high school was Latin. I discovered astronomy as a field of study when my physics teacher mentioned he had studied it at university, which immediately intrigued me. After graduating high school in 2016 with a focus on Nature & Technology as well as Nature & Health courses, I applied to study Astronomy at Leiden University.

In September 2016, I began the three-year Bachelor's program in Astronomy in Leiden. The curriculum focused primarily on mathematics and physics, and in my final year I applied this knowledge in an astronomical context. I was introduced to research through a project modeling ALMA observations of water within protoplanetary disks. During this time, I was also on the board of the study association L.A.D. 'F. Kaiser', where I helped organize observing nights in the Old Observatory. In addition, I volunteered at an IAU conference in Brussels, which marked my first experience with the international academic community. Motivated to continue my journey in astronomy I applied for the two-year Master's program in Leiden, specializing in Astronomy Research.

I began my Master's in September 2019, shortly before the COVID-19 pandemic drastically changed daily life. The majority of my Master's degree has therefore been carried out from my 16 m<sup>2</sup> room, which lacked a proper workspace. Despite these challenges, I thoroughly enjoyed the Master's program and conducted two research projects. The first project explored the Cosmic Web around Local Group analogues in cosmological simulations with Marius Cautun. For the second research project I focused on more distant galaxies, serendipitously identifying galaxies in ALMA data with Sander Schouws and Rychard Bouwens. I graduated cum laude and was fortunate to be offered a PhD position at Leiden Observatory.

In September 2021, I began my PhD under the supervision of Dr. Rychard Bouwens and Dr. Jacqueline Hodge, with Prof. Dr. Paul van der Werf as promotor. My research focused on extragalactic astronomy, studying (dust-obscured) star formation of galaxies in the high-redshift Universe. During my PhD, I presented my work at international conferences and collaborated with many inspiring colleagues. Moreover, I hosted the Galaxies Journal Club to facilitate knowledge sharing among peers and helped organize social events within the observatory, activities which I enjoyed arranging.

While my experience in astronomy has been invaluable, I have chosen

to broaden my horizons toward research closer to Earth with a more direct societal impact. I am excited to begin my new role as Space Weather Specialist at the Royal Netherlands Meteorological Institute (KNMI).

# ACKNOWLEDGEMENTS

This thesis would not have been possible without the support of many wonderful people. To begin, I would like to thank my supervisors, Rychard and Jackie, and my promotor, Paul. Rychard, I am very grateful for the invaluable lessons you have taught me and for sharing your expertise and enthusiasm. Jackie, you have been a role model to me since my time as a Bachelor's student, and I am thankful for all the great advice and guidance you have given me over the years. Paul, your words of encouragement made a world of difference, and your ability to see the bigger picture is indispensable.

I would also like to thank the secretaries and IT staff at the Observatory, with whom I have had the pleasure of interacting over the years. Moreover, I am grateful for the many insightful discussions with my collaborators in REBELS and with my colleagues in Rychard's and Jackie's research groups, as well as in the Galaxies Journal Club. I cannot name you all, as I would easily surpass the word limit, but I would like to express my sincere gratitude to all of you.

At the Observatory, I was fortunate to meet an exceptional group of women with whom I shared this PhD journey: Amy, Anniek, Chloe, Lucie, Marta, Martje, and Verónica. The PhD would have been far less fun without you. I am grateful for all of our vacation trips, dressing-up dinners, and oversharing sessions, but most of all for always being there for me. I am incredibly proud of all that you have already achieved, and you continue to inspire me in many ways.

Leiden Observatory is home to many amazing people who have contributed immensely to my enjoyment of these four years. Thomas, my academic brother, I am so glad for all the great memories we made on our travels and for always being your true, authentic self. Christian, thank you for being such a great listener and for turning me more into a cat person. Josh, I'm grateful to you for introducing me to many nerdy pastimes and for never failing to make me laugh. Alessia, you have made our office such a fun place to be. Andrew, Aniruddh, Alfred, Bas, Beth, Bianca, Ciarán, Christiaan, Colin, Dilovan, Elia, Erik, Fraser, Frits, Jeger, Jelle, Joey, Jurjen, Karin, Kirsty, Lars, Luna, Mantas, Niccolò, Nicole, Osmar, Piyush, Paola, Pranjali, Rico, Roi, Roland, Sid, Sill, Silvia, Thijs, Timo, Victorine, and Will, thank you for all the after-defense dance parties, D&D sessions, Comic Cons, NYT games, ski trips, pancake days, and movie nights. A special thanks to the old Kaiser Lounge, which hosted many puzzle sessions and hilarious conversations.

I have been at Leiden University since my Bachelor's and have met many friends along the way. I would like to especially thank Alex, Jillis, Max, Nathan, and Yke for making life in lectures and beyond so enjoyable. I will also never forget the best Master's office ever: Aoife, Gabe, Giannis, Gijs,

Jeroen, and Mariya, thank you for keeping me sane during the pandemic and for supporting me from all corners of the world.

Beyond astronomy, many others have had a great impact on my journey. During my PhD, I lived with wonderful people who became my friends and non-biological sisters. Emma, Lior, Manon, Sora, Sterre en Tessa, door jullie voelde ons oude huisje als thuis. Bedankt voor alle lachaanvallen, verjaardagsuitjes, festivals en surfpartijen die mij de energie en het perspectief gaven wanneer ik die het hardst nodig had.

I want to thank my family for their unwavering support. Mam en pap, jullie onvoorwaardelijke steun betekent zo veel voor mij. Jullie hebben mij altijd aangemoedigd om mijn hart te volgen en te doen wat mij gelukkig maakt. Dank jullie wel voor alles. Opa en oma Van Leeuwen<sup>†</sup> en opa en oma Noordhof, jullie hebben een onvergetelijke, positieve indruk achtergelaten op mijn kindertijd. Ik ben jullie enorm dankbaar voor jullie voortdurende steun en betrokkenheid. I am also very grateful to Aaron's family for supporting me all the way from the other side of the Atlantic, and in particular to Olivia for making my cover design dreams come true.

Last, but certainly not least, I would like to thank Aaron. You have been at my side since the very beginning of this PhD journey, supporting me through every challenge and highlight with chocolate bars, flowers, hugs, and kind words. I am so happy we met that one day at the Observatory borrel; who could have thought a beer could lead to such a great outcome? Thank you for being a voice of reason, for listening to me complain patiently, and for diving into old textbooks with me when a unit is confusing. I cannot wait to create more memories and to keep growing together.