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Universiteit Leiden



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# Curriculum Vitae

At the start of my PhD defense I will be 29 years old. I went to elementary school in Veenendaal where I grew up, then to high school in Ede at the Marnix College which I completed in 2003.

After finishing high school, I went to Utrecht University to study physics and astronomy. Astronomy caught my interest, and I did my bachelor research with Rob Rutten and Alfred de Wijn on solar spicules which I completed in 2006. For my master's I stayed in astronomy, and my thesis concerned upgrading the adaptive optics system on the McMath-Pierce solar telescope under supervision of Christoph Keller, and I obtained my master's degree in 2008.

After finishing my master's research I spent nine months at the Institute for Solar Physics in Stockholm as a Marie Curie trainee. Together with Göran Scharmer and others I worked on the implementation and data reduction of the wide-field wavefront sensor on the Swedish Solar Telescope to be used for site-testing for the European Solar Telescope.

When I came back I decided to continue in science and do a PhD with Christoph Keller, on a project aimed at combining expertise from several fields to implement adaptive optics in microscopy, which resulted in the first part of this thesis. After the unexpected closure of the astronomical institute in Utrecht, our group moved to Leiden in 2012 where I gained an interest in exoplanets, and collaborated with colleagues there to produce what is now the second part of this thesis. During my PhD I gave presentations at various international conferences in January, February, May, June, July, and August.



# Dankwoord

Regarding acknowledgements, the Leiden University PhD regulations states in Article 16 that people may be thanked ‘With the restraint customary for acknowledgements in international scientific literature’ which is probably the most-ignored part in the regulation. Nonetheless, now that I have everyone’s unconditional attention, I would like to spend some words on acknowledging the people without whom this dissertation might have never seen the light of day (or in some cases, could have seen the light earlier).

I would like to start by thanking my previous supervisors and teachers, starting with Christoph Keller for supervising my master’s research project. Thanks for the trips to Kitt Peak observatory and the opportunity to work there.

I am also grateful to my bachelor research supervisors, Rob Rutten and Alfred de Wijn. Rob was the first to take me to a telescope, involuntarily introduce me to  $\text{\TeX}$  and show me what an archetype professor looks like. It was under their supervision that I first got involved with research. I am also immensely grateful for Rob’s superb  $\text{\LaTeX}$  instructions (although I partly add this because we were not allowed to leave this acknowledgement out).

Before going to university, my physics and mathematics teachers taught me the foundations that I would later build upon. I am therefore very grateful to my teachers at the Marnix College and the Tweespan, their enthusiasm inspired me to continue in physics.<sup>4</sup>

During my time at the university and specifically at the astronomical institute, there were countless people whom contributed to this work in one way or another. During the first years of my PhD I very much enjoyed walking into their offices to discuss whatever was on my mind. It took a few more years to understand this might not always have been convenient for *them*. The cake breaks were always a lot of fun, as were the football games and other activities that we organised together. Of all things, the sinterklaas parties were perhaps the ones I will remember best, we’ve made some awesome *surprises*. Thanks Sjors (reddit), Maria (aiiii), Carlo

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<sup>4</sup>The corollary is that their enthusiasm *failed* to encourage me to pursue other careers, such as biology, chemistry, mathematics, or something completely different altogether, like baseball. However, I ascribe this to my own innate preferences, and not to their lack of motivating me.

(tiramisu), Gerard (xbox power supply), Joke (vlaams), Alex (everything), Nikola (complaining), Visa (cakes), Ana (Gill Sans), Esteban (kutu kutu?), Héctor (jajaja), Sander (orderliness), Jos (climbing), Laurens (ExPo), Klara (Oxford), Stefano (piano), Sara (smiling), and everyone else for everything!

Of all colleagues, I saw my office mates Sjors and Nikola most, and I had the good fortune that also they improved my experience during my PhD, sharing cartoons, jokes and what not on the one hand, or providing a melodramatic stream of complaints in the background that put my own problems into perspective. One unforgettable highlight is of course our ‘field trip’ to Athens and Lefkada. I cannot imagine the amount of stress this must have caused you, Alex, when you organised this so well. Thanks for hosting us and making frappés in the morning! A specific thanks to my mediterranean friends and colleagues is also in place: although my life is significantly less punctual now, I’m much better able to arrive at the appropriate arrival time (instead of the one that’s written on the invitation). Also, I’m even able to join parties that are on the same day (sometimes)! I also very much enjoyed organising the *sterrenkunde olympiade* together with Selma, Eveline, Bob, Edwin, Joost en Masha, the 2008 edition must by far be the best olympiad ever organised.

I’m also grateful for my later office companions at both the Molecular Biophysics group and at Leiden observatory, it’s been great to share stories & gossip. Thanks Gilles, Koen, Jesse, Sasha, Gerhard, Hoa, Dave, Matthia, Johan, Imaad, Oleg, Farzad, Nina, Jissy, Marlous, and everyone else!

Finally I would like to thank Jacopo, with whom I’ve spent many hours in the lab to ensure a successful conclusion of our experiments. I’m glad that after spending all the time in the lab we were also able to spend time far away from it. Thanks for all your efforts!

While professional help as described above is very important, the unprofessional support I had was also very helpful. Thanks to Maarten, Joshua (de Ridder), Martijn, ReinierB, ReinierZON, BasB, BasG, Jan (zonder streepje) Jaap, Gerrit, Titus, Simon, and Anneloes at !PulSe (‘shocked gaming since 2004’ trololol) for having awesome (birthday) parties, festivals, game/beer evenings and much more. I’m looking forward to a decade more of fun and can’t wait to the second lustrum party (where was the first?).

Not strictly unprofessional but not entirely professional either, I’m glad I was part of the Promovendi Network Utrecht, or *PrOUt* for short (mind the capitalisation). Thanks Arjon, Jeroen, Martijn, Ralph, Negar, Moniek, Sylvia, Jasper, Jules, and everyone else for (especially) the New Year’s drinks and many other fun events. Now that I have a real job I could even give a talk myself at the PhD day.

Furthermore I would like to thank Luc, Ward, Cintia, Pédzi, Hans and Jan, with whom I started my bachelor’s together in 2003 (more or less). It’s been great sharing beers, exam weeks, and of course some nice Full House parties together. Luc, I’ve always enjoyed our dinner conversations, they were never boring. Ward: fortunately *schraalhans* never was *keukenmeester*. Cintia & Hans: I’ve enjoyed our trips,

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outings and parties together. Pédzi, I'm stilling planning to visit Curaçao someday. Jan: it's always good to have someone in your wheel when biking, thanks. I hope we'll still be able to keep in touch.

I would also like to thank Jasper, Joël, Cor and Kinge. I hope we can spend more time together now that this is done. Thanks Tom & Aspa for the nice chats and dinners we've had. I hope you will score many points on your chart. Спасибо Олер & Юлия, that everyone may be as fond of cars as you are. Thanks Joke & Jonas for the nice discussions over the dinners we had and games we played. Also: you language is funny. Mirte: it's been great cooking together (where 'together' meant I provided a kitchen and you the food), my cooking significantly improved (peer-reviewed!) thanks to you. Roald: thanks for all the fun we had both in Sweden and the Netherlands, and for sharing my sense of humor. A big thank you also goes out to the friends I made during my stay in Stockholm, Anna Katharina, Christoph, Dorka, Julia, Serena, Aline, Azadeh, Λευτέρης (Bob), Sebastian, Riccardo and many others. Thanks for having me over at Pax all the time, and thanks for the great time we had in Sweden and still have across Europe!

A special thanks also goes out to my house mates Ward and Anna-Carolina. Ward, you've always provided a sense of calm in the house with your very stressless lifestyle. Anna-Carolina, it's been good living together at the Cambridgelaan before and I'm glad we still see each other very regularly. I'm looking forward to the next carnival party in Aachen!

Verder wil ik mijn ouders en mijn broertje voor alles bedanken. Zij hebben het meer dan wie dan ook mogelijk gemaakt om mij op deze manier te ontplooiën. Bedankt voor de steun Pap, Mam, Frank, Jannie en Kees!

Als laatste wil ik degene bedanken met wie ik dit avontuur het meest intens heb beleefd. Helene, bedankt voor de steun over de afgelopen jaren en het delen van de stress. Ik hoop dat we samen nog veel avonturen zullen beleven in Nederland en daarbuiten. Я всегда рад тебя видеть!

So to everyone: *thanks!* Thanks a lot! No really, your help was quite useful, most of the time!