

## Acknowledgements

The PhD thesis in front of you is the result of a very enjoyable, yet – as probably all PhD projects – at times challenging journey. I would not have been able to complete it without the numerous great colleagues, friends and family members with whom I have traveled these past years.

First off, I am grateful to my supervisor, Sander, who has showed me how to be an exceptional scientist, and who has taught me a lot of physics, with great patience. I am sure that there is no one who is able to complement even the dullest of explanations with connections to art, movies, music, literature and the ancients as fun and interestingly as he does, making every second of such explanations exciting. I hope we will continue to collaborate for a very long time. Secondly, I'd like to thank my co-supervisor, Vinod, for explaining us the many things we did not know about amyloids when we first started working in the field, and for being an exemplary scientist and supervisor. Similarly, although in the different tones of 'exemplary PhD student and collaborator who showed us the way in the amyloid research field', I have to thank Aditya, without whom this thesis would have looked very differently. I enjoyed the many different projects we embarked on (even though quite some failed in the end/so far, but I blame our erratic proteins for that), especially the parts where we eventually managed to understand many results that puzzled us at first. Hopefully we will continue our fruitful collaborations, because you have a keen eye for interesting biophysical questions, a perseverance that is to be admired, and really, Groningen is not that far away. Other people that were important for this thesis, by steering me onto the path of this PhD project, and by taking place in the thesis committee, are Mischa, Kramer and Ellen, who introduced me into the field of vibrational spectroscopy, and – with their contagious energy and enthusiasm – inspired me to continue in science, and in this specific field (especially Kramer's speech at my master's ceremony meant a lot for me in this respect). And I am grateful to Tobias for allowing me to continue on this path even further by supporting me while I was finishing this thesis, and also already in advance, for the hopefully plethora of interesting studies we will do during my post-doctoral time in your group.

The studies presented in this thesis could not have been performed without the great (technical) support we have in our group and at the UvA (/Science Park) as a whole. Specifically I'd like to thank Michiel Hilbers, Hans Sanders, and Paul Reinders of our group, Wim van Aartsen of the workshop, Tjeerd Weijers of electronic engineering, Wim van der Meijden of many things, Hincó Schoenmakers of the AMOLF workshop, Thomas van Wissen and Rob Balk of the ICT services, and Winfried Roseboom and Henk Dekker of the Swammerdam Institute for Life Sciences. Also Marijke Duyven-

dak of the UvA library and Marjo Wijnands of the AMOLF reception have always made the quest for articles, books and people an enjoyable one.

During my time in/around the Molecular Photonics group one could say there has been an 'old guard' and a 'new guard' of (PhD) students, and I am happy to have been a part of both – only together with transitional group members Arthur, Tomislav and Ariana I guess. Notable members of the old guard were Adriana (whom I am thankful for all the things I have learned when I just joined the group), Matthijs (who has patiently taught me all his magical tricks of the 2D-IR trade, and even though we had some very lengthy experimental sessions, it was always inspiring and fun to work on it in such a cheerful fashion), Sérgio (whom I thank for the many beers back in the days and still, all over Europe, and for the scientific, football and musical collaborations), Heleen (for the nice collaborations during working hours and in the bars) and Saeed (for the lively debates about everything ranging from football to politics, as well as for the past, current and hopefully future collaborations). A special thanks goes out to Chris, who has not only taught me (and many other group members) the programming skills that our careers rely on onto this very day, but who also helped a great deal with the layout of this thesis (and of many other theses in our group). Of my other transitional group members I'd like to thank Arthur (for bringing some Caribbean swag to the university, possibly related to the fact that he's the world's sexiest man, according to some), Tomislav (for his big character and big heart), and Ariana (for the seemingly endless energy that you have and spread around). Then I'd like to thank the new guard for the many invigorating group meetings, the gezellige lunches and the interesting conferences and Tulip summer schools, both during the days and nights. Specifically Ben and Wim (both for the many interesting political and scientific discussions), Roberto (for your unique brand of random humor), Dong Dong (for defying all clichés one might think to know about Chinese, and thereby setting an example for all of us in terms of openness and absurdism), and Dina, Elena, Bruno, René (B.), Linda, Vincent, Fenna, Olivier, Koen, Jing and the rest of the Chinese maffia, Rebecca, Joen, Wybren-Jan, Hong, René (W.), Fred, Jocelyn (with a special thanks for proof reading a part of the thesis!), Bernd, Peter, Tatu, Robbert, Esther, Jurriaan, Marcin, Wagner, Jeroen, etc., etc... Finally, I also like to specially thank Anna and Alina for making the UvA and Amsterdam as a whole a more exciting place!

Furthermore, a very important and serious team during these past years was the Levantkade crew of Michele, Jacopo, Paulie, Bertus, Tita, Tarq, Pepe, Fra, Diego, Jasmijn, Shanti, and last but not least, Benny and his better half – hopefully you all know how much you have meant for me over the past years and will in the future. Other (old) AMOLF friends, most notably Maga, José, Agata, Simona, Tzeni, Cristina, Konrad, Freek and Leonie have also brought extraordinary joy to many traveling & working days and drinking nights for which I'm very grateful.

The few scientific visits I've made to the MPIP in Mainz were extra fun due to the

presence of Sérgio, Johannes, Helmut, Lars, Ruth, Andy, Mike, Søren, Alejandra, Marc-Jan, and Leonie.

I also have to acknowledge the students here whom I've been honored to supervise during the past years, especially Gergely Tordai, who has measured a large portion of the spectra and images presented in chapter 7, but also the students who have gathered data sets that are still in the process of being turned into papers; Sander Westerveld, Paul Mazzella, Danny Kroon, Lara Polak, Gea Nieuwboer and Roxane Biersteker.

While wrapping up my thesis I have been happy to have my good friend Rutger Marsman to help out with designing the book, at which I personally think he did a great job, and I'm very grateful for this. And I'm also very grateful to Noortje Thijssen for proof-reading the epilogue.

Furthermore, I probably couldn't have endured the harshness of what at times seemed to be an infinite PhD project without making music with my dear Urban Achievers (Roel, Dennis, Roman, Ceci and Nieke) as well as with the Attics (or whatever final project name we'll come up with, Bertz and Cops:) – hopefully all those sessions will result in some non-scientific produce soon. Also the many magnificent get-togethers with my dear study friends Tim, Yvonne and Gijs, and with my buddies Leon, Owen and Judith have meant a lot. And also, with too many names to be all mentioned, I'd briefly like to thank all my friends in the Nijmegen & the Amsterdam football teams and the NDGRND team that have kept me in shape and relaxed in the first two and following halves.

Then, I have to thank my two paranymphs, Tibert and Ruben, already in advance for the great way in which they'll undoubtedly perform their paranymphial duty, as well as for being such epic friends – if my scientific career in Amsterdam has brought me one good thing, it's for sure our friendship!

And, almost-last but surely not least, I would like to thank my mother, father and sister for everything, especially for their pure interest, love and support, which is also the case for our 'extended family' of Jos, Ien and Michiel, Maud and Charles, and Sjoerd. And, finally, Lotte and Juno, the loves of my life, who are surely as happy as I am that this book is finally done, and I am wholeheartedly looking forward to the upcoming new chapter in our lives.

We also like to express our gratefulness to a number of collaborators for their help with the articles covered in this thesis, specifically: Huib Bakker for critically reading the manuscript of **chapter 3**, Saeed Amirjalayer for performing the amide-I' frequency calculations on the acetyl-derivatives, and Alex de Beer for contributing to the Mathematica script. We also thank H. Menges for measuring the Raman spectrum. We have to thank Riita Suihkonen for technical assistance with hydrophobins required to realize **chapter 4**. For **chapter 5**, we thank Nathalie Schilderink from the University of Twente for assistance with  $\alpha$ S expression and purification, Slav Semerdzhiev

from the University of Twente for discussions, and Prof. Antoinette Killian from the Utrecht University and Prof. Roberta Croce from the VU University Amsterdam, for facilitating the UV-CD spectroscopy measurements. This work is part of a project titled "A Single Molecule View on Protein Aggregation" (No. 127) funded by Foundation for Fundamental Research on Matter (FOM), and it is supported by NanoNextNL, a micro- and nanotechnology consortium of the Government of the Netherlands and 130 partners. **Chapter 6** is also a part of this project, for which we thank Nathalie Schilderink and Kirsten van Leijenhorst-Groener for assistance in protein expression and purification, Prof. Roberta Croce from the VU University Amsterdam and Prof. J. Antoinette Killian from the Utrecht University for access to their CD spectrometers. We thank Dr. Volodymyr Shvadchak for discussions and for providing the polarity sensitive FE dye. Finally, for **chapter 7**, we acknowledge Gertien Smits for suggesting the slow hydrolysis reaction as an explanation for the loss of peptide bonds at long time scales.