

Cover Page



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Publications

First author:

1. *A direct measurement of tomographic lensing power spectra from CFHTLenS*
F. Köhlinger, M. Viola, W. Valkenburg, B. Joachimi, H. Hoekstra and K. Kuijken
2016, Monthly Notices of the Royal Astronomical Society, Volume 456, Issue 2, pp 1508–1527 (**Chapter 4**)
2. *Statistical uncertainties and systematic errors in weak lensing mass estimates of galaxy clusters*
F. Köhlinger, H. Hoekstra and M. Eriksen
2015, Monthly Notices of the Royal Astronomical Society, Volume 453, Issue 3, pp 3107–3119 (**Chapter 3**)
3. *Strong lensing in RX J1347.5–1145.5 revisited*
F. Köhlinger and R. W. Schmidt
2014, Monthly Notices of the Royal Astronomical Society, Volume 437, Issue 2, pp 1858–1871 (**Chapter 2**)

Contributed:

1. *The first and second data releases of the Kilo-Degree Survey*
J. T. A. de Jong et al. (**incl. F. Köhlinger**)
2015, Astronomy & Astrophysics, Volume 582, p. A62
2. *Constraints on the alignment of galaxies in galaxy clusters from ~14000 spectroscopic members*
C. Sifón, H. Hoekstra, M. Cacciato, M. Viola, **F. Köhlinger** et al.
2015, Astronomy & Astrophysics, Volume 575, p. A48
3. *The Kilo-Degree Survey*
J. T. A. de Jong et al. (**incl. F. Köhlinger**)
2013, The Messenger, Volume 154, pp 44–46
4. *Infrared properties of active OB stars in the Magellanic Clouds from the Spitzer SAGE survey*
A. Z. Bonanos, D. J. Lennon, D. L. Massa, M. Sewilo, **F. Köhlinger** et al.
2011, Proceedings of the International Astronomical Union, Volume 272, pp 254–259
5. *The Infrared Properties of Massive Stars in the Magellanic Clouds*
A. Z. Bonanos, D. J. Lennon, D. L. Massa, M. Sewilo, **F. Köhlinger** et al.
2011, Bulletin de la Société Royale des Sciences de Liège, Volume 80, pp 346–350
6. *Spitzer SAGE-SMC Infrared Photometry of Massive Stars in the Small Magellanic Cloud*
A. Z. Bonanos, D. J. Lennon, **F. Köhlinger** et al.
2010, The Astronomical Journal, Volume 140, Issue 2, 416, pp 416–429

Curriculum Vitae

I was born on 8th October 1985 in Gießen, Germany, but I spent my childhood and school years in the neighbouring town of Wetzlar. There, I also attended high school with specializations in maths and history. After graduating from the ‘Goetheschule Wetzlar’ in 2005, I was recruited to accomplish nine months of military service as required by German law at the time. Consequently, I spent (too) much time in the forests of the rainy Eifel area, which strengthened my motivation to continue with university and to study physics from day to day. Therefore, after fulfilling my duty in 2006, I enrolled at Heidelberg University.

In 2009, during a six week voluntary ‘mini research’ at the ‘Astronomisches Rechen-Institut’ in Heidelberg under supervision of Dr. Robert Schmidt, I gained my first experiences with conducting (guided) research. This presented an entirely new view on physics and astronomy beyond lectures and weekly problem sets. The following ten weeks of that summer I participated in the ‘Space Astronomy Summer Program (SASP)’ hosted by the ‘Space Telescope Science Institute (STScI)’ in Baltimore in the United States. There, I conducted research on massive stars in the Small Magellanic Cloud under supervision of Dr. Daniel J. Lennon and Dr. Alceste Bonanos. In the fall of 2009, I left Heidelberg again and spent the academic year 2009/2010 following general studies in the ‘Kyoto University International Education Program (KUINEP)’ in the beautiful town of Kyoto, Japan. After my return to Heidelberg I concluded my studies with passing the final exams for the ‘Diplom’ degree. In my final year, I joined Prof. Joachim Wambsganz’s lensing group at the ‘Astronomisches Rechen-Institut’. Under his and Dr. Robert Schmidt’s supervision I wrote my ‘Diplom’ thesis on strong gravitational lensing in galaxy clusters. Already during that year I could gain my first hands-on experience as an observer at the ‘South African Astronomical Observatory (SAAO)’ in the Karoo desert.

In October 2012, I moved to the Netherlands and started my PhD research as a fellow of the ‘Leiden de Sitter Cosmology Programme’ jointly hosted by Leiden Observatory and the Lorentz Institute for Theoretical Physics at Leiden University. I decided to continue my research in gravitational lensing and started my first research project with Dr. Henk Hoekstra on weak gravitational lensing of galaxy clusters. Consequently, I also joined his and Prof. Koenderaad Kuijken’s (weak) lensing research group. Rich interactions with other group members triggered further projects changing my focus slowly but surely from galaxy clusters to cosmic shear, the ‘Kilo-Degree Survey (KiDS)’, and the study of the cosmic large-scale structure. I presented results of this work at many conferences, workshops, and seminars in Canada, Italy, Japan, the Netherlands, Switzerland, the (still) United Kingdom, and the United States. I am very grateful for having had the opportunity to participate in excellent summer/winter schools on gravitational lensing and/or cosmology in Puerto de la Cruz on Tenerife, Spain; in Varenna, Italy; and in Tokyo, Japan. Moreover, as a researcher somewhere half-way between theory and high-level data, I embraced the opportunity to expand my observational experience at the ‘Isaac Newton Telescope (INT)’ on La Palma in two observation runs during my PhD. In addition to performing research, I supervised for two semesters Bachelor students in one of the experiments of the physics laboratory course (‘Natuurkundig Onderzoek/Experimenten’) ‘organized’ by Dr. Peter Gast. Together with a fellow PhD student I also organized for about two years a biweekly journal club on cosmology in an attempt to further strengthen the ties between observational and theoretical cosmologists in Leiden.

Starting this autumn, I will continue my research as a fellow of the ‘Kavli Institute for the Physics and Mathematics of the Universe (Kavli IPMU)’ at the University of Tokyo, Japan.

Acknowledgements

*Wissen kann man mitteilen, Weisheit aber nicht.
Man kann sie finden, man kann sie leben,
man kann von ihr getragen werden,
man kann mit ihr Wunder tun,
aber sagen und lehren kann man sie nicht.*

*Knowledge can be conveyed, but not wisdom.
It can be found, it can be lived,
it is possible to be carried by it,
miracles can be performed with it,
but it cannot be expressed in words and taught.*

(Hermann Hesse, Siddhartha)

First of all, I would like to thank the citizens of the Netherlands for still funding natural sciences at a level allowing even me as a PhD student to receive a decent salary so that I never had to worry about financial aspects. This and the weather here enabled me to focus entirely on science for the last four years.

In view of recent events, I would also like to express my thanks to all people who worked so hard on making a great idea become the reality that allows me, a German citizen, to move and transit so easily between borders. Even working in the Netherlands is/was possible without having to go through a tedious visa application process. A fact I always took for granted, but recent events remind us that it really is not.

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A PhD is not only dependent on your own abilities, but it is also very dependent on the people who join your group and office just by mere chance the same day your appointment starts: this thesis would have taken an entirely different route, if it would exist at all, without the support from you, Massimo. Thank you for always investing your time in quick discussions and checking of intermediate results, despite your own very busy schedule. This helped tremendously in keeping up the pace over the last four years and making things actually hap-

pen. Moreover, your knowledge and attitude towards how science should be done are inspiring and I learnt a lot from that and I hope to always be able to keep up to these standards. Your attitude towards how science actually works is both enlightening and entertaining (especially when Marcello joins in on the discussion) and helps me to keep a realistic view on ‘the game’ (or more accurately ‘the gamble’ when you take the current PhD-to-staff ratio into account...).

Another very influential aspect and as important as ‘chance encounters’ for the writing of a thesis are your collaborators or the collaboration(s) you might become a member of. In that regard I consider myself very lucky to be part of the KiDS ‘family’, which not only produces great and thorough science, but also manages to keep a nice and thriving attitude while doing that! Special thanks are due to Benjamin, Catherine, Hendrik, and Ludo for reliable delivery of critical data products, thorough feedback, and discussions during which I learnt a lot.

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Thank you, Jeroen, not only for also sharing the office with me, suffering through ‘club power’, interesting discussions about science and politics, and the de Sitter experience, but also for all your help related to ‘Dutch things’, especially in the beginning.

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Extremely helpful in an attempt to keep the balance during the last months of writing this thesis was playing football in the least successful team I have ever participated in. Playing with you guys was nevertheless great fun and kept the thesis off my mind at least for the time we played. So, thank you, Emanuele, not only for initiating the team, but also your random ‘jokes’ turning very often into real life ‘Family guy’ moments (or is it performance art after all?!). Thank you, Clement, for sharing so many good football moments (either playing or watching) and the many beers and good discussions we had! Thanks also to all other (core) members of our football team and training partners: Andrew, Duy, François, Jit (traitor!), Pedro, Santiago, Tim, Vicente, and Victor.

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