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## **Probing the darkness : the link between baryons and dark matter**

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**Author:** Velliscig, Marco

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## Publications

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1. *The impact of galaxy formation on the total mass, mass profile and abundance of haloes*  
**Velliscig, Marco**; van Daalen, Marcel P.; Schaye, Joop; McCarthy, Ian G.; Cacciato, Marcello; Le Brun, Amandine M. C.; Dalla Vecchia, Claudio  
Monthly Notices of the Royal Astronomical Society, Volume 442, Issue 3, p.2641-2658  
(Chapter 2)
2. *The alignment and shape of dark matter, stellar, and hot gas distributions in the EAGLE and cosmo-OWLS simulations*  
**Velliscig, Marco**; Cacciato, Marcello; Schaye, Joop; Crain, Robert A.; Bower, Richard G.; van Daalen, Marcel P.; Dalla Vecchia, Claudio; Frenk, Carlos S.; Furlong, Michelle; McCarthy, I. G.; Schaller, Matthieu; Theuns, Tom  
Monthly Notices of the Royal Astronomical Society, Volume 453, Issue 1, p.721-738  
(Chapter 3)
3. *Intrinsic alignments of galaxies in the EAGLE and cosmo-OWLS simulations*  
**Velliscig, Marco**; Cacciato, Marcello; Schaye, Joop; Hoekstra, Henk; Bower, Richard G.; Crain, Robert A.; van Daalen, Marcel P.; Furlong, Michelle; McCarthy, I. G.; Schaller, Matthieu; Theuns, Tom  
Monthly Notices of the Royal Astronomical Society, in press (Chapter 4)
4. *The clustering of baryonic matter. II: halo model and hydrodynamic simulations*  
Fedeli, Cosimo; Semboloni, Elisabetta; **Velliscig, Marco**; Van Daalen, Marcel; Schaye, Joop; Hoekstra, Henk  
Journal of Cosmology and Astroparticle Physics, Issue 08, article id. 028, pp. (2014)



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# *Curriculum Vitae*

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I was born on January 11th, 1985, in Udine, a town in the center of the beautiful Italian region of Friuli where the sea and the mountains meet. I attended the Istituto Tecnico Industriale "Arturo Malignani," one of the most well known schools in the region, with a specialisation in Electronics and Telecommunications. Even though interested in technology, I always had a deep curiosity for science, especially astrophysics. This curiosity, which later became a passion and then a profession, was surely sparked by reading many science fiction novels and watching popular Italian TV shows such as "Super Quark" with Piero Angela and Paco Lanciano.

In 2004, after my high school studies and faced with a decision for university, I decided to switch to physics to explore this passion further. I enrolled in the Bachelor of Physics program at the University of Trieste. For my Bachelor thesis, I worked on PAMELA (Payload for Antimatter Matter Exploration and Light-nuclei Astrophysics) data analysis for 3 months during spring-summer 2008 in collaboration with the INFN (Italian National Institute for Nuclear Physics) and Dr. Emiliano Mocchiutti. That was my first hands-on experience with what research was really about, and I enjoyed it.

In 2008, I started my Masters in Astrophysics and Space Science. I concluded my thesis with Prof. Stefano Borgani and Dr. Luca Tornatore on "The role of Diffusion in Lagrangian SPH codes." After obtaining my degree with honours, I was ready to leave the city where I lived for almost 7 years, and so I applied to PhD programs in Germany and in the Netherlands.

In 2011, I was offered a PhD position at Leiden Observatory working with Prof. Joop Schaye on the shape and alignment of galaxies in cosmological hydrodynamical simulations. I presented my work at conferences and workshops in the Netherlands, Italy, the UK and in the US. I also attended the ICTP summer school in cosmology in July 2012 and the 6<sup>th</sup> Heidelberg Summer School on Computational Astrophysics in September 2012. Besides my research work, during my years at the Sterrewacht I served as a teaching assistant for the course "The formation of galaxies and large-scale structure" taught by Dr. Jarle Brinchmann. I also had the opportunity to organise the Phd Talks in 2014 as well as the Borrel in 2013.



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# Acknowledgments

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*Experience is not what happens to a man;  
it is what a man does with what happens to him.*  
(Aldous Huxley)

Even if sometimes during my PhD I felt alone, I really never was, thanks to the people that shared this experience with me.

First, I want to thank the PhD candidates in my year that were a real support to me and with whom I shared both the good and the bad parts of these four years: Alex South for our Borrel organization together. I will always remember the brainstorming about what beer to buy and the headaches caused by squaring the accounts of the Borrel; Heather, no matter what you can always find a way to laugh and to speak your mind; Andra, even if you were always travelling somewhere you made the times when you were here even more special; Monica, sharing an office with you was fun in so many ways and I was lucky to have someone like you to speak to less than half a meter away; Alex North, you were always kind and helpful beyond the call of duty, no matter if it was for a scientific discussion, proof reading, or just borrowing a ladder.

Then I want to thank the “older” PhD students that were already here when I arrived and that made me feel immediately welcome and at home in this country: Matteo, I could always count on you for a serious talk, and even if we were having different experiences, I was sure that you would understand me; Irene, Irenita linda, thank you for your infinite moral support, for the spritz at your place, my new plants, and mostly for just being there; Berenice, thank you for the discussion about science fiction, the good advice on books, and the brownie recipe (even if I think it was from Jesus); Nicola, thank you for your movie advice and your over the top storytelling; Silvia, thank you for making me realise that I have a “better green” in me; Thanja (and Daan), thank you for your vegetarian cuisine and for your meals at the vrijplaats.

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Then I want to thank some people that do not fit in the aforementioned categories: Emanuele thank you for your weird stories, your gossiping, your loudness, and in general for bringing something “different” to the corridor; Alessandra and Fabio, thank you for the discussion

about “True Detective”, science fiction books, and life in general. Luke thank you so much for the help in proofreading the intro for me, for your real English breakfast, and for your words of support; Massimo, thank you for your support for the ESD catalogues, for reminiscing with me about the good old times in Trieste, and for your hilarious stories about life as a senior PostDoc; Marcello, you supported me way before it was officially part of your duties and collaborating with you made this PhD so much better both on the scientific and on the human side; Elena, thank you for your multiple dinner invitations, your soya-based meat, the ammazza-stecchito, and the very good times I had with you, Marcello, and Alma.

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