

Neutrinos from the milky way

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I, Erwin Lourens Visser, was born on the 2nd of January 1987 in Hoorn, a small town in the Netherlands. I lived most of my life in the nearby town of Enkhuizen, in which I also attended high school at the *Regionale Scholengemeenschap*.

From the courses followed at high school, physics was by far my favourite and so the choice of studying physics at the Vrije Universiteit (VU) in Amsterdam was quickly made. When not following courses I could be found in AIK, the physics study association at the VU, for which I was also the treasurer for a year.

I performed my bachelor project in the LHCb group at the Nikhef Institute in Amsterdam, studying the forward-backward asymmetry in the decay of B^0 to $K^{*\,0} + \mu^+ + \mu^-$. After obtaining my bachelor degree cum laude in 2008, I chose to continue in the field of particle physics with the Particle and Astroparticle physics master. I also performed my master project in the LHCb group, with a more experimental subject this time: the preventing, monitoring and curing of the aeging in the LHCb Outer Tracker.

After obtaining my masters degree in 2010 (also cum laude), I decided to look around for a PhD position at Nikhef. Some of my friends and fellow students did their masters research in the ANTARES group at Nikhef, in the field of astroparticle physics. I applied for a position in the group and was accepted. I didn't apply for a specific position, so an analysis had to be thought up. A presentation in Paris by an IceCube scientist on the subject of neutrinos from cosmic ray interactions with the interstellar medium, lead to the question why ANTARES hadn't performed an analysis on this subject yet, and this became the subject of my dissertation.

Besides working on my analysis, I also did some hardware work for the future KM3NeT telescope, by testing PMTs and later (at the end of my time at Nikhef) full DOMs.

In addition to presenting my work at the numerous collaboration meetings in several European (and one African) cities, I also presented my analysis at the TeVPA conference in Amsterdam and the ECRS2014 conference in Kiel, Germany.

The work described in this dissertation was performed in the ANTARES group at the *Nationaal Instituut voor Subatomaire Fysica* (Nikhef) in Amsterdam. Although writing a disseration is something that you generally do by yourself, the end result wouldn't be the same without the help of a number of people.

First and foremost I would like to thank my supervisor, Dorothea Samtleben. She always made time to answer any questions I had and her suggestions were always very helpful. I am also grateful for her encouragement at those times that I lost my resolve.

My promotor, Maarten de Jong, also deserves my thanks for his useful advice. Thanks to his suggestions I was able to improve this dissertation and the associated propositions by a great amount.

My work at Nikhef was made enjoyable thanks to the people, past and present, of the ANTARES/KM3NeT group: Aart, Akis, Arjen, Bardo, Ching-Cheng, Claudio, Daan, Dimitris, Els, Jeroen, Karel, Maria, Martijn, Mieke, Paul, Robert, Ronald, Stephan, Tino and Tri. Thanks to all of you! A special thanks to Robert and Tino for being my office mates and for the always interesting discussions we had.

The Nikhef group is only one part of the larger ANTARES collaboration and I would also like to thank my colleagues abroad. Thanks in particular to Antoine Kouchner and Thierry Stolarczyk for their useful comments on my analysis during the unblinding process.

Thanks are also due to my parents for always supporting me in my choices and for their interest in my research, which they showed by attending the yearly *open dag* at Nikhef and listening to me explaining the status of neutrino detection.

Last, but definitely not least, I would like to thank Michelle Nicol for all her love and support, especially during the writing of this dissertation. I also owe her thanks for proof-reading my manuscript and correcting my English mistakes. Without her, this dissertation would not look the same.

Erwin Visser