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## **Methanol masers and millimetre lines : a common origin in protostellar envelopes**

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### **Citation**

Torstensson, K. J. E. (2011, December 6). *Methanol masers and millimetre lines : a common origin in protostellar envelopes*. Retrieved from <https://hdl.handle.net/1887/18187>

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## Refereed papers

- *Parallaxes and proper motions of interstellar masers toward the Cygnus X star-forming complex I. Membership of the Cygnus X region*  
Rygl, K. L. J., Brunthaler, A., Sanna, A., Menten, K. M., Reid, M. J., van Langevelde, H. J., Honma, M., **Torstensson, K. J. E.**, & Fujisawa, K. Submitted to A&A
- *Distribution and excitation of thermal methanol in 6.7 GHz maser bearing star-forming regions. I. The nearby source Cepheus A*  
**Torstensson, K. J. E.**, van der Tak, F. F. S., van Langevelde, H. J., Kristensen, L. E., & Vlemmings, W. H. T. 2011, A&A, 529, A32 (Chapter 3)
- *Dynamics of the 6.7 and 12.2 GHz methanol masers around Cepheus A HW2*  
**Torstensson, K. J. E.**, van Langevelde, H. J., Vlemmings, W. H. T., & Bourke S. 2011, A&A, 526, A38 (Chapter 2)
- *Magnetic field regulated infall on the disc around the massive protostar Cepheus A HW2*  
Vlemmings, W. H. T., Surcis, G., **Torstensson, K. J. E.**, & van Langevelde, H. J. 2010, MNRAS, 404, 134
- *A  $\log N_{\text{HI}} = 22.6$  damped Ly $\alpha$  absorber in a dark gamma-ray burst: the environment of GRB 050401*  
Watson, D., Fynbo, J. P. U., Ledoux, C., and 33 other authors including **Torstensson, K. J. E.** 2006, ApJ, 652, 1011

## Conference Proceedings

- *A preliminary distance to W75N in the Cygnus X star-forming region*  
Rygl, K., Brunthaler, A., Menten, K. M., Reid, M. J., van Langevelde, H. J., Honma, M., **Torstensson, K. J. E.**, Fujisawa, K., & Sanna, A. Proceedings of the 10th European VLBI network symposium and EVN users meeting: “VLBI and the new generation of radio arrays”. September 20-24, 2010. Manchester, UK. POS, id. 103
- *The magic of disc-worlds: non-rotating methanol masers*  
van Langevelde, H. J., **Torstensson, K. J. E.**, Bartkiewicz, A., Szymczak, M., Vlemmings, W. H. T., Surcis, G., & Brunthaler, A. Proceedings of the 10th European VLBI network symposium and EVN users meeting: “VLBI and the new generation of radio arrays”. September 20-24, 2010. Manchester, UK. POS, id. 2
- *EVN observations of the methanol masers in Cep A*  
**Torstensson, K. J. E.**, van Langevelde, H. J., Vlemmings, W. H. T., & van der Tak, F. F. S. Proceedings of the 9th European VLBI network symposium on “The role of VLBI in the golden age for radio astronomy” and EVN users meeting. September 23-26, 2008. Bologna, Italy. POS, p. 39
- *Where methanol masers spring*  
**Torstensson, K. J. E.**, van Langevelde, H. J., & Bourke, S. “Astrophysical masers and their environments”, Proceedings of the International Astronomical Union, 2007, IAU Symposium, Volume 242, p. 178

## Curriculum Vitae

I was born in Göteborg (Sweden) on the 4th of May, 1977. When I was a couple of years old, my family moved to Kullavik, a small village on the coast just 25 km south of Göteborg. Incidentally, I grew up halfway between Chalmers and the Onsala Space Observatory that would later set me on this path that has led me to where I am today.

After finishing my high-school studies at Aranäsgymnasiet (Kungsbacka) in 1996 I spent a year in northern Sweden doing my military service. To see (and hear) the aurora borealis on a cold winter night is a very special experience. Upon returning to southern Sweden I first studied a year as computer/network technician at Komvux (Kungsbacka) before starting my studies in electrical engineering at Chalmers Lindholmen College (Göteborg). In the spring of 2001, while finishing my B.Sc., I bought a small sailing boat and named her “Embla”. Sailing has since then been one of my greatest passions. I still felt that I wanted to continue my studies and after a year of qualifying courses I enrolled in the masters programme “Advanced Techniques in Radio Astronomy and Space Science” at Chalmers University of Technology in Göteborg.

While working on my master thesis “Radio aeronomy of planetary satellites”, under the supervision of Prof. Dr. John Black at the Onsala Space Observatory, I realised that astronomy was something that I could and wanted to pursue. After finishing my master thesis in the spring of 2004, I spent three months as a summer student at Astron, working with Dr. Willem Baan on EVN data of two AGN/Starburst galaxies. The power of interferometry fascinated me. I spent the next year working as a student support astronomer at the Nordic optical telescope (NOT) on La Palma, Spain, and took great pleasure in learning the inner workings of an (optical) observatory.

In the fall of 2006 I started my Ph.D. studies within the Marie Curie programme ESTRELA at JIVE and Leiden observatory under the supervision of Dr. Huib Jan van Langevelde. During my Ph.D. I have been fortunate to work on data from several top observatories such as: the EVN, JCMT, VLBA, ATCA, VLA, Merlin, and CARMA. In particular, I have benefitted from on-site observations at the JCMT and ATCA. I have also participated in several summer/winter schools such as the IRAM 30m school in Spain, the tenth summer synthesis imaging workshop in New Mexico, scientific writing for young astronomers in Belgium, YERAC 2007, as well as five ESTRELA workshops in Europe. Additionally I have had the opportunity to present my work at several international con-

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ferences, including “Astrophysical masers and their environments”, IAU Symposium 242 in Alice Springs, “Massive star formation: observations confront theory” in Heidelberg, “Masers: the ultimate astrophysical tools” in Bonn, and the 9th EVN Symposium “The role of VLBI in the golden age of radio astronomy” in Bologna.

I am currently employed on a joint project between JIVE and the Dutch ALMA centre Allegro on wide field imaging problems. After this I would like to pursue my career in astronomy with a post-doc, hopefully at one of the new generation radio/submm interferometers.

## Acknowledgements

First and foremost, I want to express my gratitude to my family back home in Sweden: Mamma and Pappa to whom I owe everything. My siblings: Ulrica, Lasse, Anders and Niklas. Not only have they supported me during all these years, they have also been taking care of my little boat in Sweden, while I have been enjoying myself in Leiden. My nieces Emma and Alva, and my nephews Max and Melker, I always look forward to seeing them when I come home. I thank my grandmothers, Signe and Ulla-Britt, who are always keen to hear about what I am doing. Also, I wish to thank the extended family with sambos, särbos, in-laws, uncles, aunts, and cousins. It's a great big family! I believe that I can also include my good friend Olof here, he always has something to say that puts astronomy in perspective.

This thesis represents the culmination of five years of work on my part. Still, it would not have been possible without the help and support of many others, all of whom I would like to thank. It has been a privilege to work at the Leiden Observatory, with its rich history and its smörgåsbord of expertise and experience. The students, post-docs, and staff make the "Astrochem corridor" a great and inspiring work environment. I especially wish to acknowledge Thanja, for her help with the Dutch part of this thesis. Over the years I have shared my office with several people and I am grateful to all of them for putting up with me. In particular, I want to thank Joseph and Olivier for the last couple of years, and for making it THE office.

During the first three years of my Ph.D., I was employed by JIVE within the ESTRELA network. My special thanks go to the wonderful staff, support scientists, and secretaries at JIVE whose help has been indispensable, in particular to Stephen for all our discussions. I also wish to express gratitude to my fellow "Estrelas" for the great workshops we had together all over Europe, and especially to Nikta and Hayden, my fellows in Leiden.

My collaborators: Floris, Wouter, and Lars. I have benefited immensely from their advice and guidance. I also wish to thank Ania, for our disk-world discussions. The observatory support groups at the JCMT, VLA, ATCA, and CARMA all have my appreciation for the help they have given me. Gary Fuller and his group in Manchester have my gratitude for housing me during my four-month visit in Manchester during the autumn of 2008.

## Acknowledgements

During my Ph.D., there was always a Nordic faction present at the institute, and it has been with great pleasure that I have partaken in the traditions that we all (more or less) have in common. With Julelunch, Påskelunch, Glöggkalas, Midsommarfirande and Kräftskivor; Jeanette, Karin, Stefan, Christian & Tonie, Karoliina, Lars, and Jes (& Suzanne) brought a little bit of the North to Leiden. I am also grateful to all my other friends in Leiden (too many to name), for the many hours of kayaking, climbing, kubb, mölkky, bike trips, picnics, poker, and sailing. In short, for making life in Leiden so good.

Last but not least, I want to send a thought and my deepest gratitude to my two grandfathers, Torsten and Verner, who saw the start of this adventure and whom I think of often.

**Notes:**



