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

Torstensson, K.J.E.

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

Cover: Photograph of a shot glass filled with Rhodamine 6G laser dye dissolved in methanol. The dye is illuminated by the 355 nm output of a pulsed Nd:YAG laser. The exposure time of 25 s corresponds to ~250 pulses, each with a duration of 4 ns. Produced with a lot of help from Dr. Guss.

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

PROEFSCHRIFT

ter verkrijging van
de graad van Doctor aan de Universiteit Leiden,
op gezag van de Rector Magnificus prof.mr. P.F. van der Heijden,
volgens besluit van het College voor Promoties
te verdedigen op dinsdag 6 december 2011
klokke 11.15 uur

door

Karl Johan Erik Torstensson
geboren te Högsbo, Sweden
in 1977

Promotiecommissie

| | | |
|---|---|---|
| Promotores: | Prof. dr. E. F. van Dishoeck | |
| Co-promotor: | Dr. H. J. van Langevelde | |
| Overige Leden: | Prof. dr. K. Kuijken | |
| | Prof. dr. A. G. G. M. Tielens | |
| | Prof. dr. J. E. Conway | Onsala Space Observatory |
| | Dr. F. F. S. van der Tak | SRON Netherlands Institute for Space Research |
| | Dr. W. H. T. Vlemmings | Chalmers University of Technology |

# Contents