

SCHOOL OF PHYSICS

UNIVERSITY OF NEW SOUTH WALES



COLLOQUIUM

4-5 p.m., Wednesday, 13 May, 2009

School of Physics Common Room
Room 64, Old Main Building

Dr Tracey Hill
University of Exeter

“Spectral Energy Distribution Analysis and Parkes Ammonia Observations of Massive Star Formation Regions”

The formation and evolution of a massive star is a fundamental astrophysical process that is still largely unclear, especially the earliest phases of their evolution. Massive stars form and evolve rapidly, in clustered environments, deeply embedded in their natal molecular cloud. The rarity of candidates means that the field has also been lacking a large sample of objects at the earliest evolutionary phases. We have, through two large-scale (sub)millimetre continuum surveys (SIMBA/SEST and SCUBA/JCMT), identified a new class of object - the 'mm-only' core which may represent the earliest phases of massive star formation.

The millimetre continuum (SIMBA/SEST) survey (Hill et al., 2005) detected 405 sources, the majority of which (255) were previously unknown and unstudied cores devoid of any indications of high-mass star formation. Subsequent submillimetre (SCUBA/JCMT) observations (Hill et al., 2006) and spectral energy distribution modelling (Hill et al., 2009) indicate these mm-only cores to be excellent candidates for early stage protostars. That is, the mm-only core may represent the very earliest stages of high-mass star formation, satisfying the much-sought young massive star candidates. We have recently undertaken a complementary ammonia spectral line survey, in the lowest two inversion transitions, of a large sample of the SIMBA sources using the new K-Band receiver on the Parkes telescope. The purpose of this work was to obtain accurate temperatures in order to constrain further SED fitting and facilitate accurate determinations of the source mass.

I present here, the results of our SED fitting and analysis as well as data and preliminary results from our Parkes ammonia study.

The audience is invited to meet the speaker beforehand at 3.45 p.m. over coffee and biscuits in the Common Room.

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