



Communication and Marketing Department
Isebe loThungelwano neNtengiso
Kommunikasie en Bemerkingsdepartement

Private Bag X3, Rondebosch 7701, South Africa
Welgelegen House, Chapel Road Extension, Rosebank, Cape Town
Tel: +27 (0) 21 650 5427/5428/5674 Fax: +27 (0) 21 650 5628

www.uct.ac.za

20 December 2013

UCT PhD graduate uses multi-wavelength observations to study galaxies' dark matter

Focusing his research on the mass distribution and dynamics of molecular gas in nearby galaxies, University of Cape Town PhD graduate Dr Bradley Frank has analysed one of the most direct ways to study the distribution of dark matter in galaxies.

Starting his MSc in astronomy at UCT in 2009, Dr Frank has also been working on the configuration design for South Africa's Square Kilometre Array (SKA) pathfinder, the MeerKAT radio telescope. He is one of 99 PhD students who graduated at UCT earlier this month.

Dr Frank's thesis combines a comprehensive, high-sensitivity survey of the carbon-monoxide content of galaxies. This survey includes observations of the stars and neutral hydrogen to determine the interplay between phases of galaxies' interstellar medium.

His analysis incorporates measuring the rotation curves of the molecular gas from velocity fields, derived by measuring the relativistic Doppler shift of the carbon monoxide's emission. Combining these new measurements with that of the stellar and neutral gas distributions, forms the basis of the multi-wavelength approach that he uses to calculate the properties of the dark matter content of the galaxies.

Dr Frank finds the molecular gas to be a reliable tracer of the rotation curve in the inner parts of galaxies, especially where bars and accretion disks are present. In his thesis he confirms the correspondence between the molecular gas mass surface density and stellar mass surface density, and finds that the molecular gas makes a negligible impact on the aggregate dynamics of nearby galaxies.

Dr Frank also holds a BSc (Hons) in physics from the University of the Witwatersrand.

ENDS

Issued by: UCT Communication and Marketing Department

Kemantha Govender

Media Liaison Officer

Communication and Marketing Department
University of Cape Town
Welgelegen, Upper Chapel Road Extension, Rosebank
Tel: (021) 650 5672 Fax: (021) 650 3780
Cell: (084) 737 6522
E-mail: kemantha.govender@uct.ac.za
Website: www.uct.ac.za