

Exploring the Structure of Magnetic Fields of Young Circumstellar Disks & their Environments using CanariCam at the 10.4-m GTC

Charles M. Telesco¹, Dan Li¹, Chris Wright², Han Zhang¹, Eric Pantin^{1,3}, Peter Barnes¹, Naibí Mariñas¹, James Hough⁴, & Chris Packham⁵

¹Dept. of Astronomy, U. Florida, Gainesville, FL 32611 USA

²School of Physical, Environmental & Mathematical Sciences, U. New South Wales, Canberra, ACT 2610, Australia

³Laboratoire AIM, CEA/DSM – CNRS – U. Paris Diderot, IRFU/Sap, 91191 Gif sur Yvette, France

⁴Centre for Astrophysics Research, U. Hertfordshire, Hatfield, AL10 9AB, UK

⁵Physics & Astronomy Dept., U. Texas at San Antonio, 1 UTSA Circle, San Antonio, TX 78249, USA

CanariCam is the mid-IR multi-mode facility camera that has been obtaining exciting science at the 10.4-m Gran Telescopio Canarias (GTC) on La Palma, Spain, since early 2012. CanariCam can carry out imaging and spectroscopy, but CanariCam's truly unique science mode is polarimetry, often working near the GTC's diffraction limit of 0.3 arcsec. Polarimetry in the mid-IR wavelength region offers some very special advantages, particularly with a telescope as large as the GTC. I will review the technique, and then show highlights from the initial phases of our program using both imaging polarimetry and spectropolarimetry. These early results indicate that CanariCam is a potentially powerful tool for determining the magnetic field morphology and dust properties in young disks circumstellar disks as well as more complicated regions associated with star formation. The GTC is a partnership of Spain, Mexico, and the University of Florida.