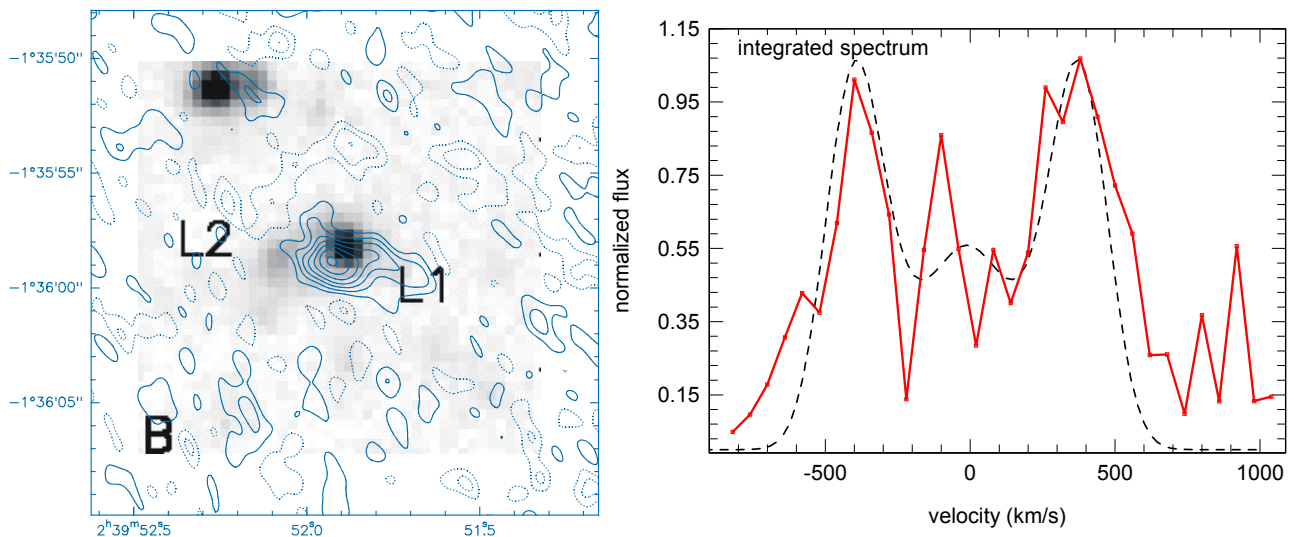


We have observed the  $z=2.8$  submm galaxy SMM02399-0136 with  $\sim 1.5''$  resolution continuum and CO 3-2, Plateau de Bure millimeter interferometry. This source was originally discovered by Ivison et al. (1998), is gravitationally lensed by the cluster Abell 370, and is one of only three known members of the submm population with a confirmed mm-redshift (Frayser et al. 1998, ApJ 506, L7). We resolve the mm continuum and line emission to come from an elongated structure, extended approximately  $3''$  E-W, and centered within  $<1''$  of the brightest rest-frame UV emission peak, L1 (left inset of Figure). The CO data show that the structure is rotating. A disk/ring model of the CO emission requires a rotation velocity of 430 km/s at a radius of  $1''$  (2.5 kpc for  $i=70^\circ$ ,  $\Omega_m=0.3$ ,  $\Lambda=0.7$  and corrected for a lens magnification of 2.45). Hence the dynamical mass of the central 7.5 kpc diameter region containing most of the mm line/continuum emission is  $1.6 \times 10^{11} M_\odot$ , half of which could be in the form of molecular material (see also Frayer et al. 1998). The properties of SMM02399-0136 are similar to those of the most luminous ( $\sim 10^{13} L_\odot$ ) and massive local ultra-luminous/hyper-luminous IRAS galaxies, powered by a mixture of AGN activity and star formation.



Observations of the  $z=2.8$  submm galaxy SMM02399-0136. Left:  $1.8 \times 1.4''$  (FWHM)  $1.27\text{mm}$  continuum (blue contours in steps of and lowest contour  $0.4\text{mJy/beam}$ ), overlaid on the B-band (rest  $1100 \text{ \AA}$ ) CFHT image of Ivison et al. (1998, MNRAS 298, 583). The combined absolute positional accuracy of the B-band/mm registration is  $\pm 1''$ , consistent with the peak of the mm source being on L1. Right: Integrated CO 3-2 spectrum (red), along with a disk/ring model of the line emission fitting profiles and spatial distribution. The rotation velocity of the model is 430 km/s at a radius of  $1''$ .