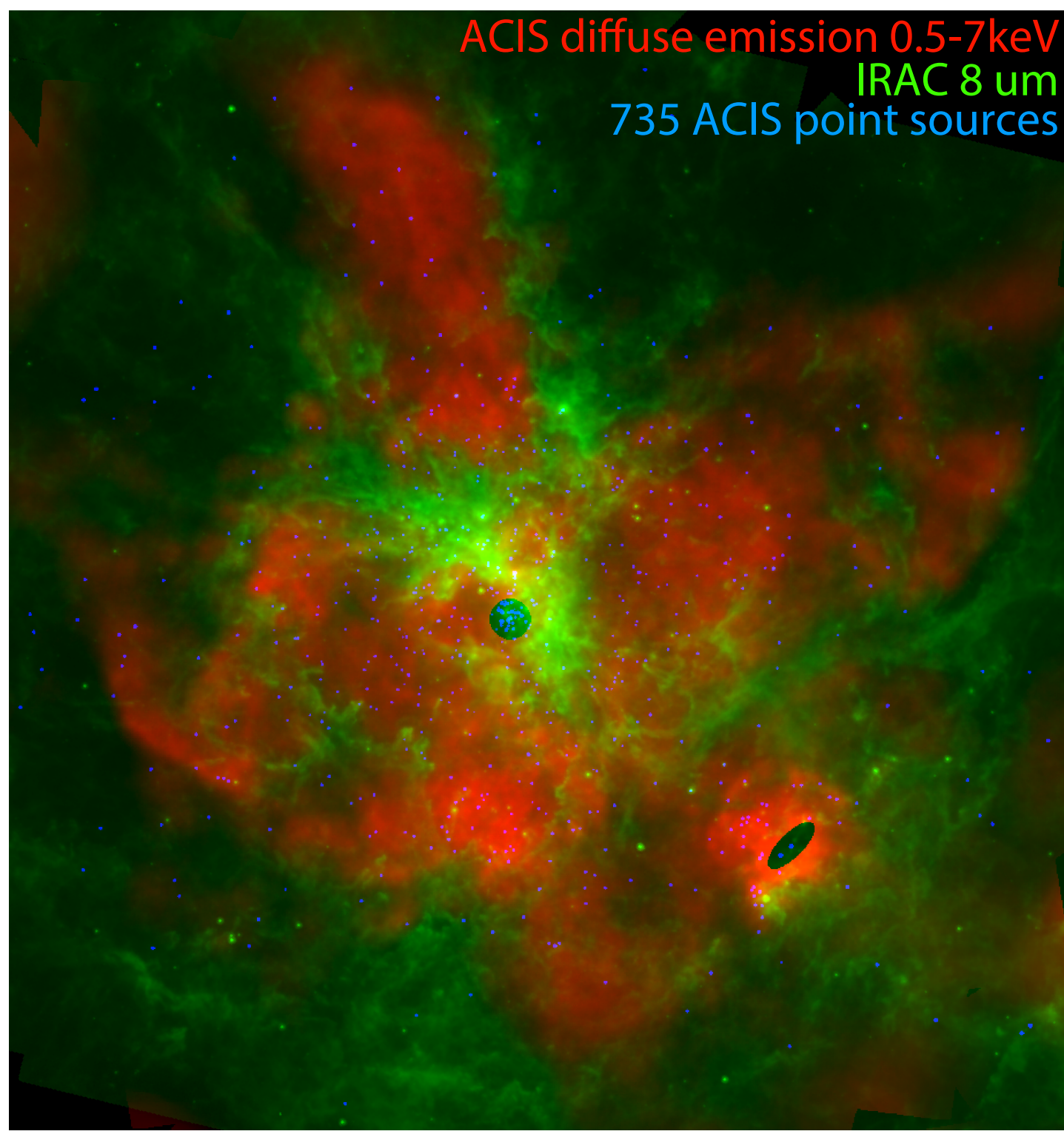


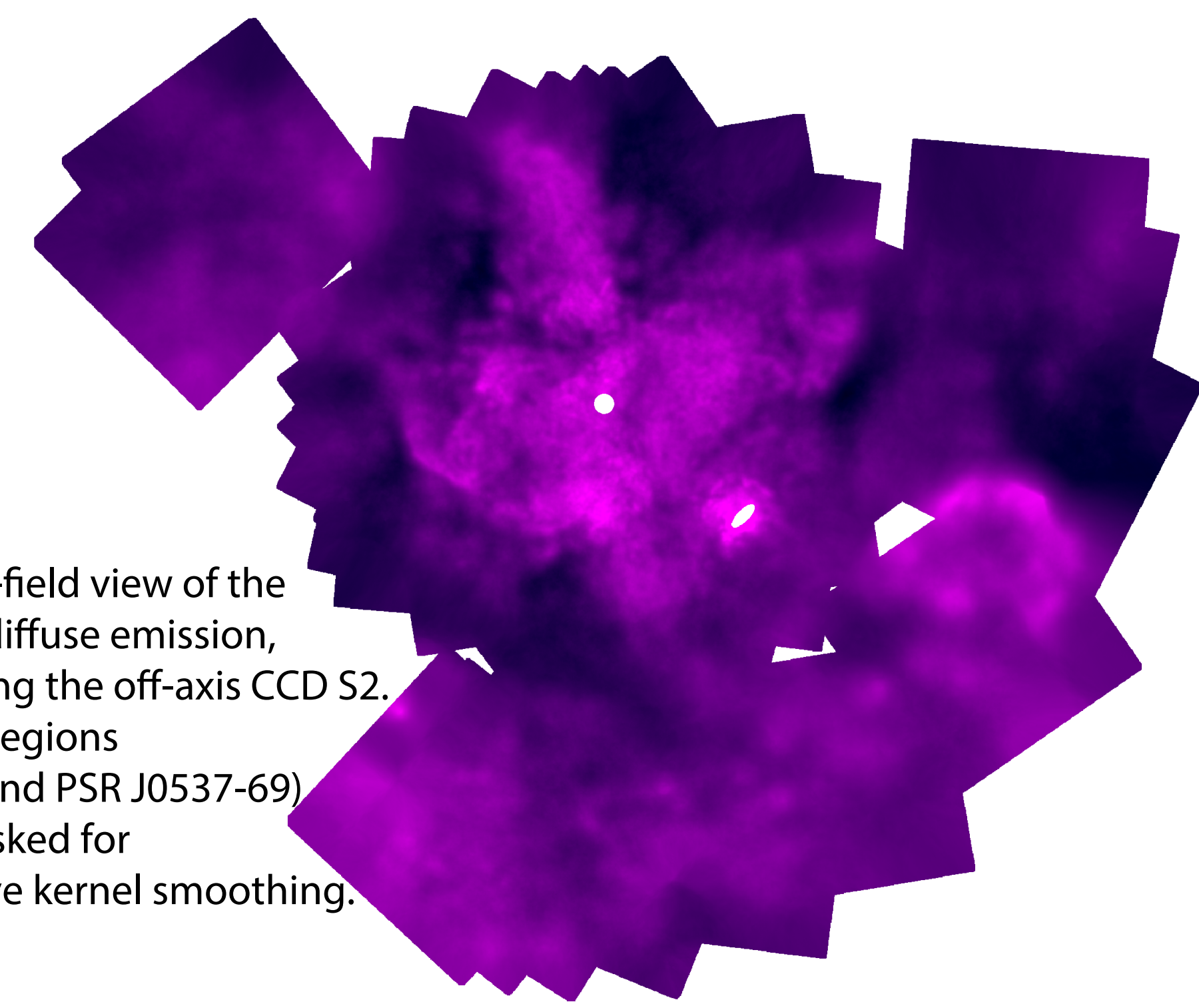
A First Look at 'The Tarantula -- Revealed by X-rays' (T-ReX)

A Cycle 15 XVP on 30 Doradus (1 Ms observed + 1 Ms scheduled)
 Patrick Broos and Leisa Townsley, representing the 35 members of the T-ReX Team



30 Doradus is the most important star-forming complex in the Local Group, offering a microscope on starburst astrophysics. At its heart is R136, the most massive resolved stellar cluster, containing the most massive stars known. Across 30 Dor's 250-pc extent, stellar winds and supernovae have carved its ISM into an amazing display of arcs, pillars, and bubbles.

Chandra is observing 30 Dor this year for the 2-Ms AO15 XVP 'T-ReX'. This deep observation will finally exploit Chandra's fine spatial resolution to study ISM interfaces on 1--10 pc scales, the full complement of massive stars, and the brightest pre-main sequence stars that trace 25 Myrs of star formation in this incomparable nearby starburst. Here we give preliminary results from the first 1 Ms of Chandra T-ReX observations.

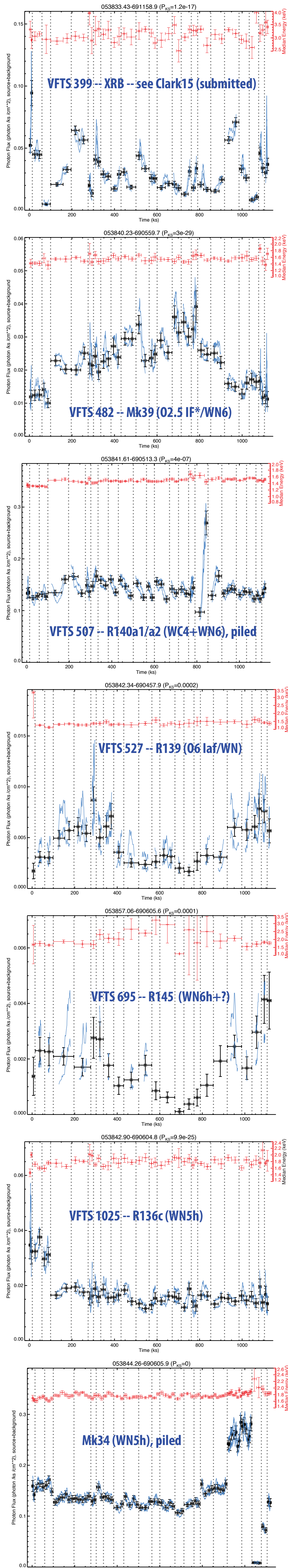


A wide-field view of the T-ReX diffuse emission, including the off-axis CCD S2. Bright regions (R136 and PSR J0537-69) are masked for adaptive kernel smoothing.

Diffuse X-rays, shown by excising detected point sources (marked by blue dots), R136, and PSR J0537-69.

Variable Emission from Known Massive Stars

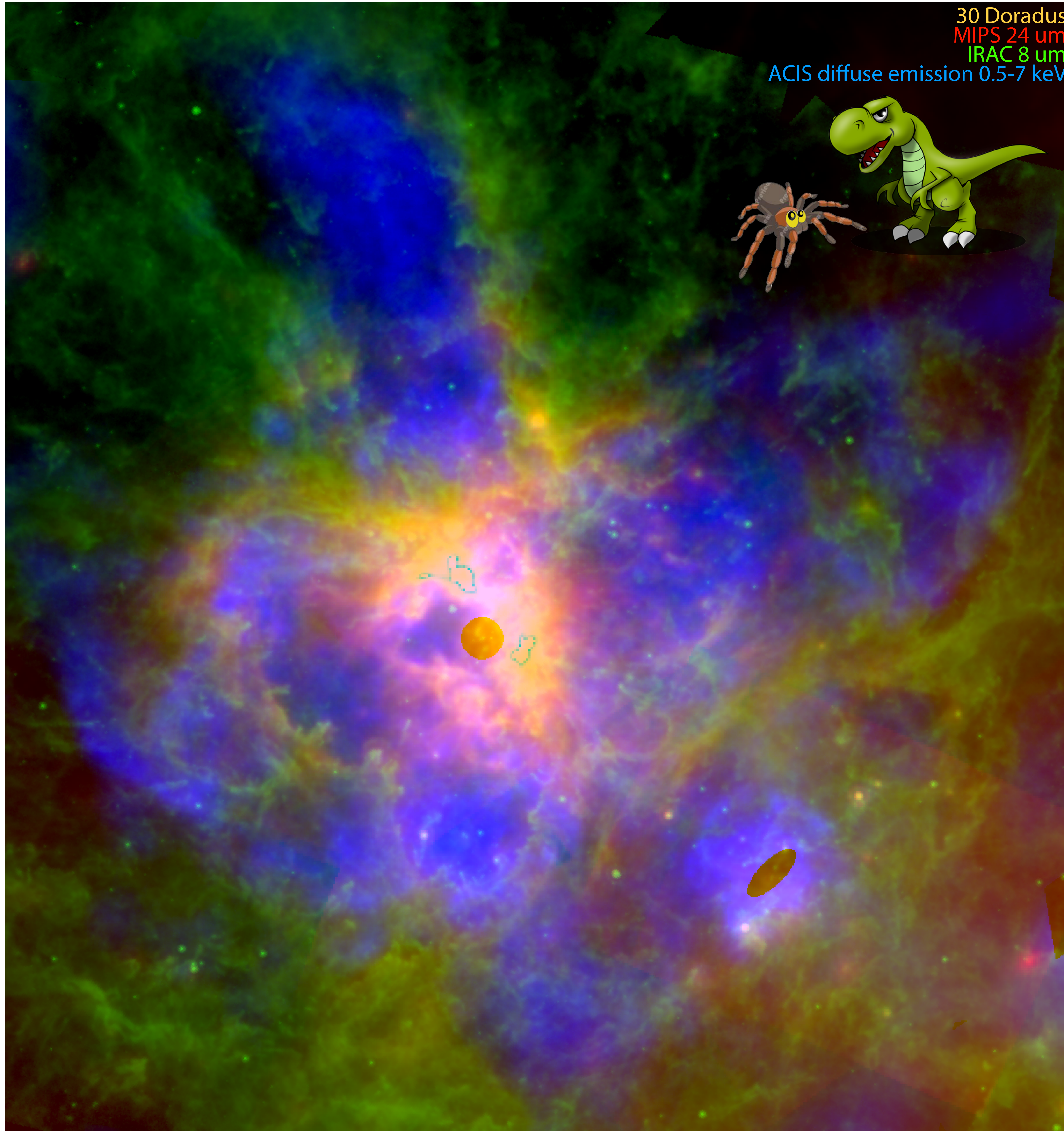
VLT-FLAMES Tarantula Survey counterparts are noted (Evans11)



Point source flux and median energy time series for multiple ObsIDs, shown abutted on a single non-physical time axis. Breaks between observations are indicated by dotted vertical lines. The first 3 ObsIDs are from 2006; others are T-ReX, May--Sept 2014.

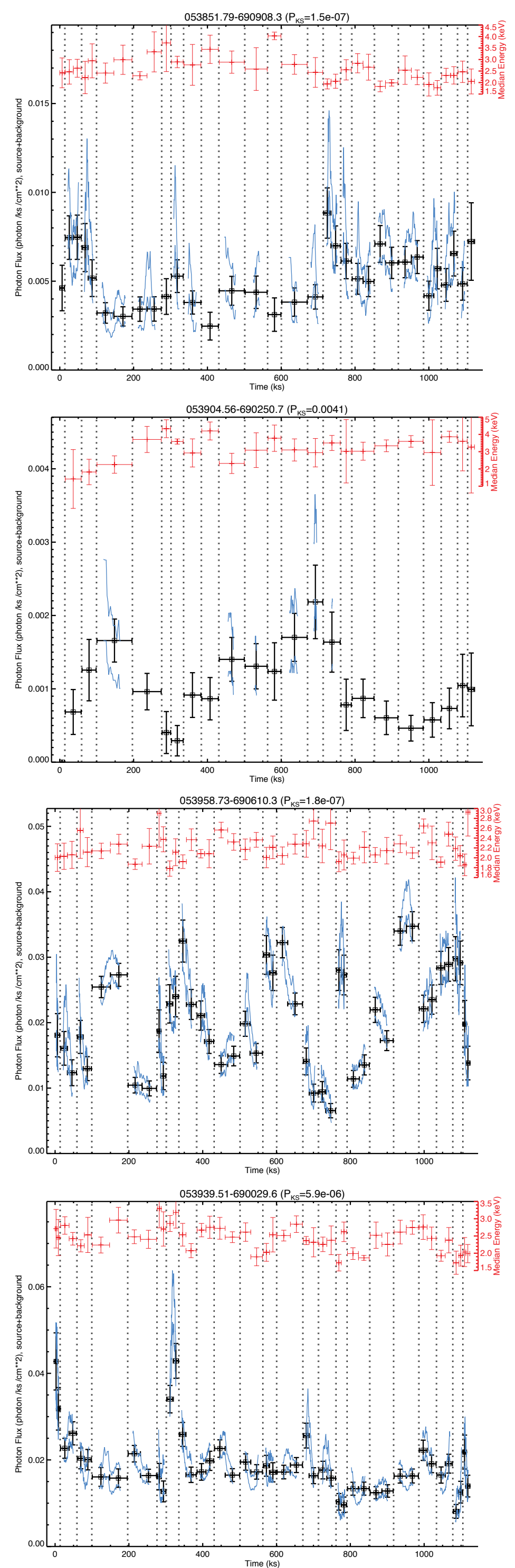
A binned light curve is shown in black, and the median energy of the events in the light curve bins is shown in red; the unequally sized time bins are represented by horizontal bars shaped like the letter 'H'. Poisson errors within a single time bin are represented by error bars along the Y-axis.

The pair of blue curves depict a 68% pointwise confidence band for the continuous lightcurve, estimated from the individual X-ray events using an adaptively-sized sliding window. Note that the confidence band is inherently smooth (due to the sliding window); variations in the confidence band are significant only if they are large compared to the width of the band.

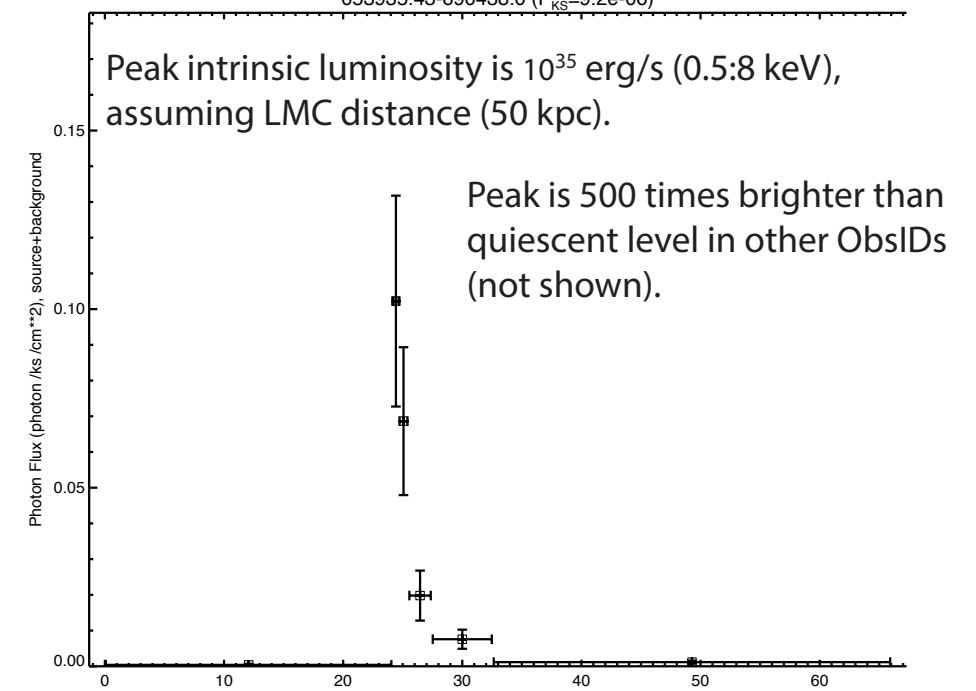


Hot X-ray plasma fills 100-pc-scale superbubbles outlined by heated dust and ionized gas.

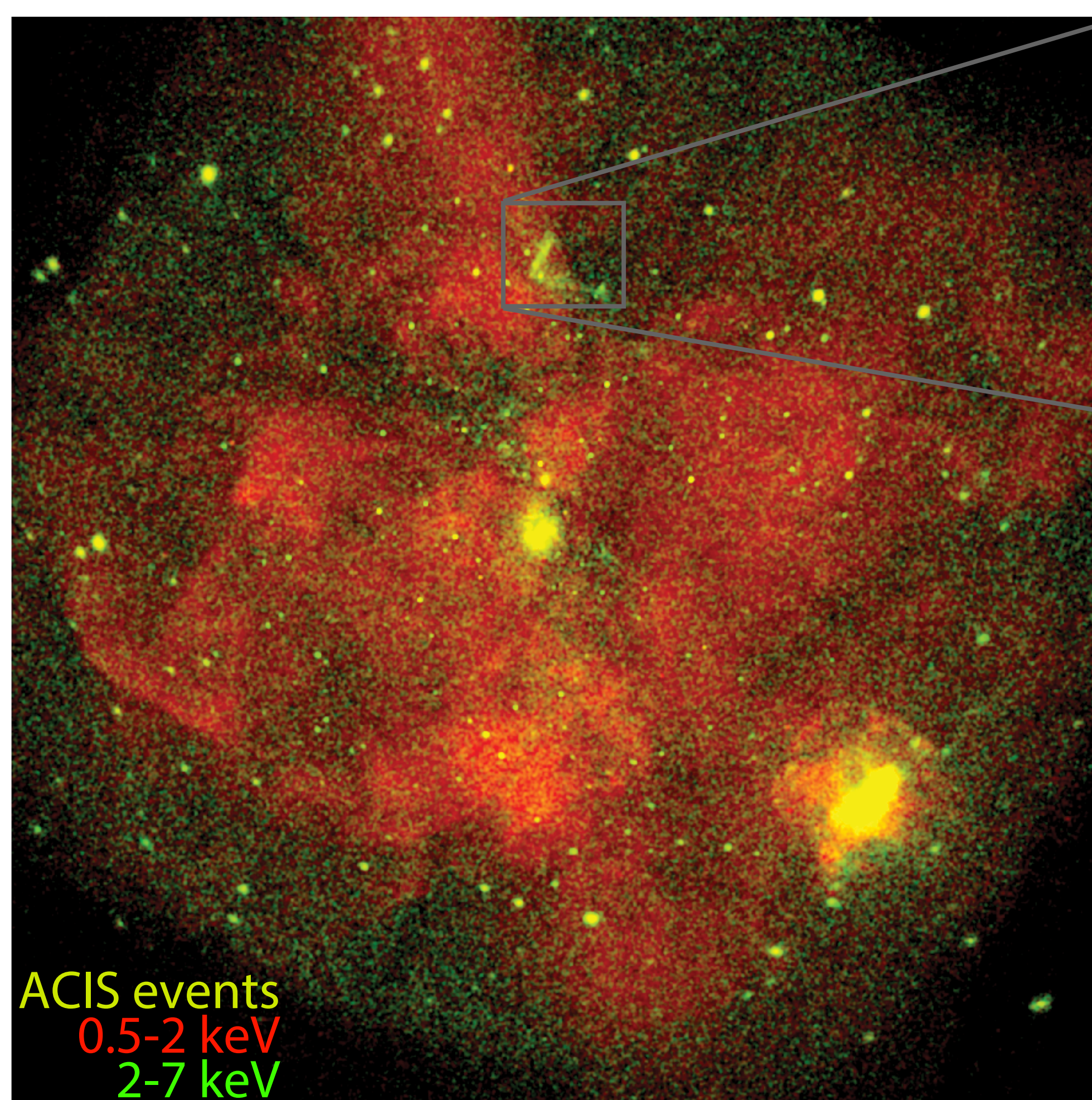
Other Variable Sources



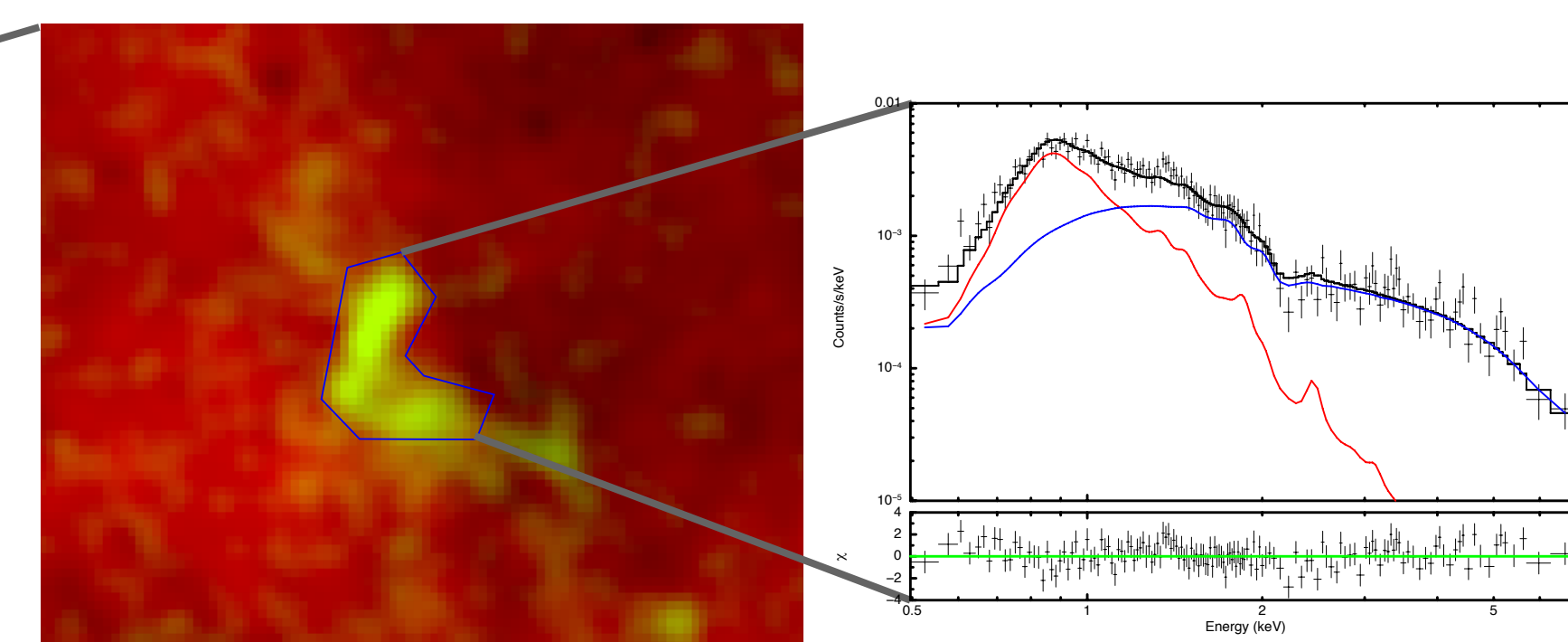
A Luminous, Brief Flare



T-ReX observations will be complete in early 2015!

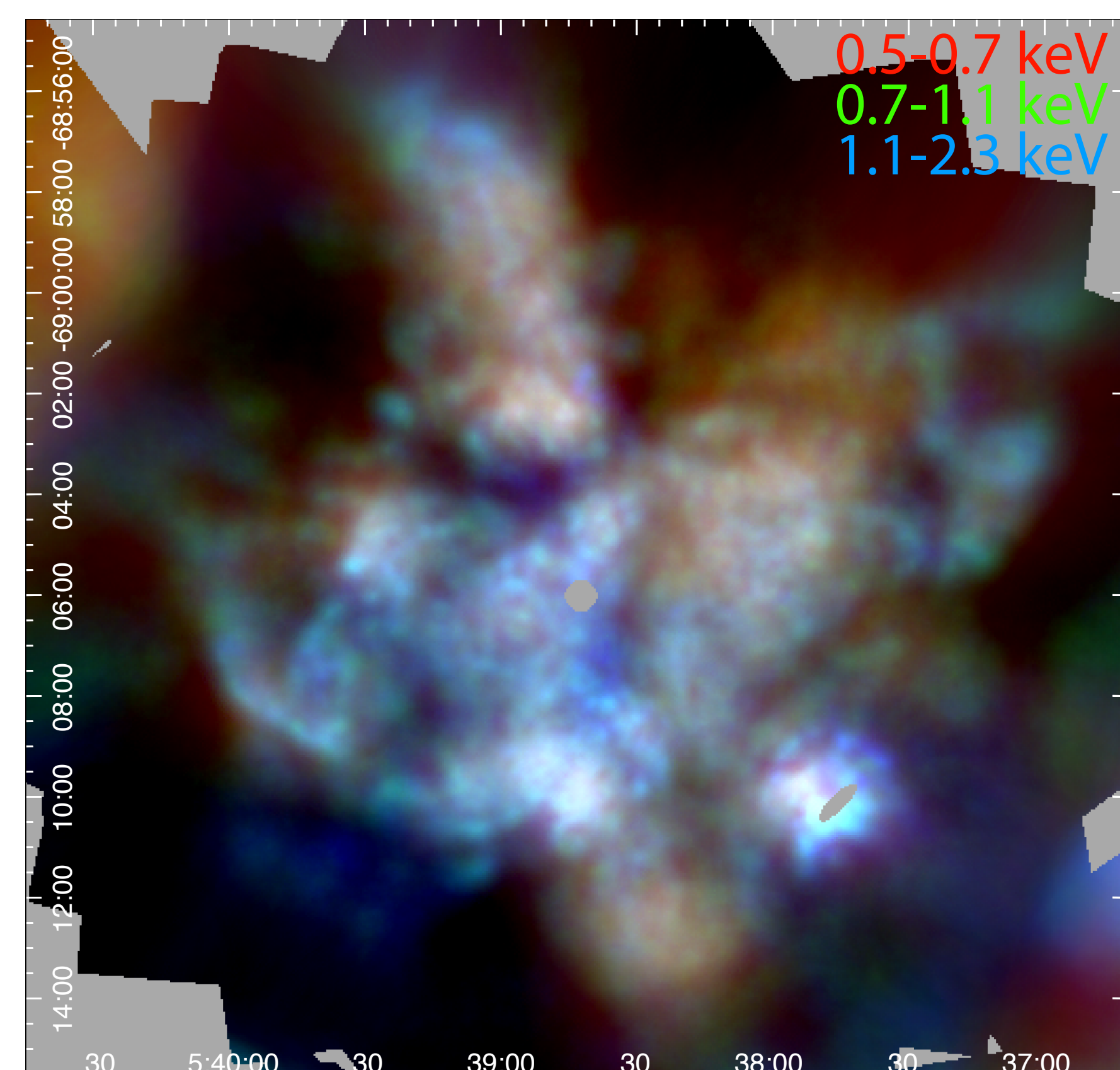


ACIS events 0.5-2 keV 2-7 keV



An unusual hard structure with 10^{34} erg/s intrinsic luminosity (0.5-8 keV), modeled equally well by a hot thermal plasma (8 keV, blue model) or a steep powerlaw (slope=1.7). A soft thermal component (0.7 keV, red model) represents the large-scale emission.

Two ACIS bands, highlighting soft diffuse emission, harder point sources, and PSR J0537-69.



Diffuse emission in three soft ACIS bands, highlighting absorption and temperature variations in 30 Dor's hot ISM.