# **Expressions of Interest: Early Access to new ThrUMMS data products**

## Monday 28th April 2025

## What is ThrUMMS?

The "*Three-mm Ultimate Mopra Milkyway Survey*" is a project to map multiple spectral lines in star-forming molecular clouds across a large swath of the Milky Way with the Mopra telescope (formerly part of ATNF), and perform numerous sophisticated analysis tasks on the data. The latest paper describing the project, and science results so far, is available at <u>arXiv:2503.04887</u>. Along with this paper, Data Release 6 is now available <u>here</u> and will soon also be at IRSA.

## What is Data Release 6 (DR6)?

DR6 consists of full 3D data cubes (i.e.,  $60^{\circ}$  in longitude *l*,  $2^{\circ}$  in latitude *b*, ~200 km/s in velocity *V*) for the *J*=1–0 emission line from the species <sup>12</sup>CO, <sup>13</sup>CO, and C<sup>18</sup>O, plus a number of 2D moment maps extracted from these cubes, such as 0th, 1st, and 2nd sky-moments (i.e., integrated over *V*: see the banner on the left), *lV* maps (i.e., integrated over *b*), and noise and error maps. The data volume is large: each single-species DR6 cube is ~6 Gb when binned by 4 channels (0.34 km/s *V* resolution). Full-*V* resolution (0.085 km/s) cubes are also available at >4× the size.

#### What is Early Access (EA)?

There are many downstream data products that have been, are being, or can be constructed from the line emission data. For example, we are working on: investigations using the existing column density  $N_{CO}$ , excitation temperature  $T_{ex}$ , or opacity  $\tau$  data cubes (derived from an LTE radiative transfer analysis of the 3 iso-CO species: see the banner on the right); kinematic distance modelling; cloud segmentation and cataloguing; individual cloud/GMC studies using *lbV* cutouts; etc. Many of these products will be made available to the community in the near future (~6–12 months), but some are available now for collaborative projects.

#### **Expressions of Interest**

In order to gauge interest from the community and maximise the science output of Thr-UMMS, scientists desiring the above data and/or custom products for new investigations are invited to contact us for EA. They should, in the first instance, provide the general information indicated below, for a nominal target date of 31st May, 2025. The ThrUMMS team will then collate the EA inquiries received in order to coordinate similar interests and minimise duplication of effort through mutual cooperation. The intention is to create an informal but productive collaboration to foster the best science use of the ThrUMMS data, organised according to topical interest. Cross-fertilisation of ThrUMMS with related projects is specifically encouraged.

The target date is not a hard deadline: each topical group will have "open borders", i.e. be able to add more scientists as interest or need dictates. Depending on the community response, we hope to set up zoom meeting(s) to share plans, progress, and results.

Name(s), and optionally, institution(s)... Anticipated timeframe for completion... Brief project title/description...

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