# Multidimensional data: ALMA

#### ALMA

- 66 mm/sub-mm antennas in the Atacama Desert
- General purpose telescope ("cold universe")
- Early Science has started in 2011

### Data products

- raw data, science-grade data cubes, metadata
- VO: metadata, science-grade cubes
- Data is still "mid-sized", i.e. user downloads for processing are possible
- Maybe in the far future: higher-level products (moments, extracted spectra)

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### VO standards:

- Use: OpenCADC TAP, voview (2.0)
- Will use: SAMP, AladinLite(?)
- Will provide: ObsCore, TAP, SIAPv2
- Will probably provide: cut-outs, reprocessing
- May provide: read-only VOspace for data requests

### General

- All data is multidimensional (with potentially complex supports or degenerate axes)
- Photons only can carry 4 properties