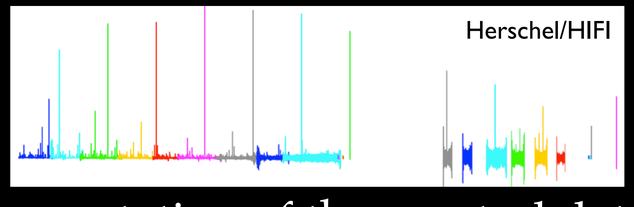
The small-scale structure of OMC-2 FIR 4

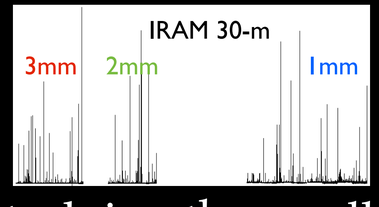
Interferometric observations of an intermediate-mass protocluster

A.López-Sepulcre*, V. Taquet[1], Á. Sánchez-Monge[2], M. Kama[3], C.Ceccarelli[4], C.Dominik[5,6], E.Caux[7], Y. Shimajiri[8] et al.

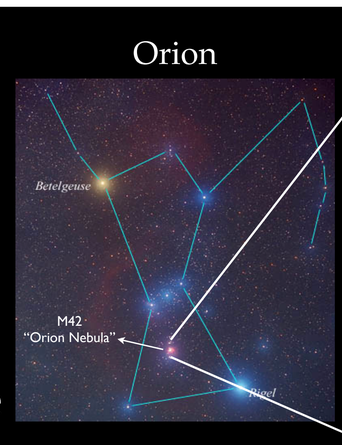
- The source: An intermediate-mass star forming region in Orion
- Spectral surveys: Herschel/HIFI 500 - 1900 GHz; IRAM 30-m 80 - 270 GHz

see M. Kama's poster 1H021 !





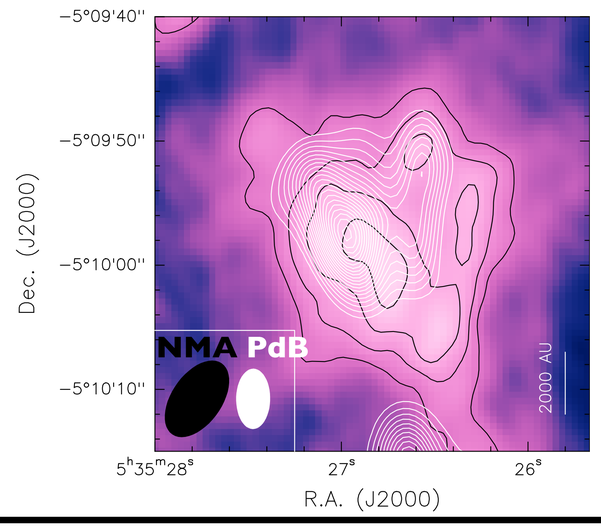
- Aim: to aid the interpretation of the spectral data by studying the small-scale morphology of the region



d = 420 pc

www.spitzer.caltech.edu

Dust continuum emission



Plateau de Bure Interferometer (PdB): 2mm
Nobeyama Millimeter Array (NMA): 3mm

Clumpy morphology, several cores of one of several solar masses each

OMC-2 FIR 4 is a protocluster

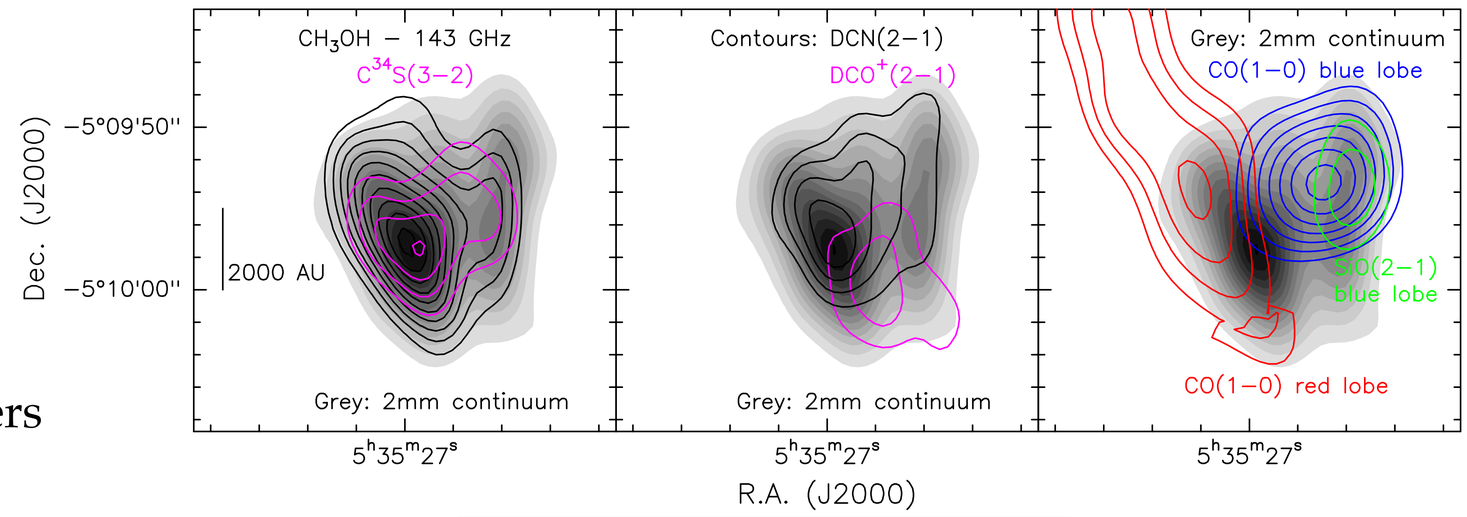
López-Sepulcre et al. (2013)
Shimajiri et al. (2008)

Molecular line emission

CH_3OH, $C^{34}S$ and DCN follow roughly the dust continuum emission

DCO^+ traces a southern , likely colder, region not well detected in the other tracers

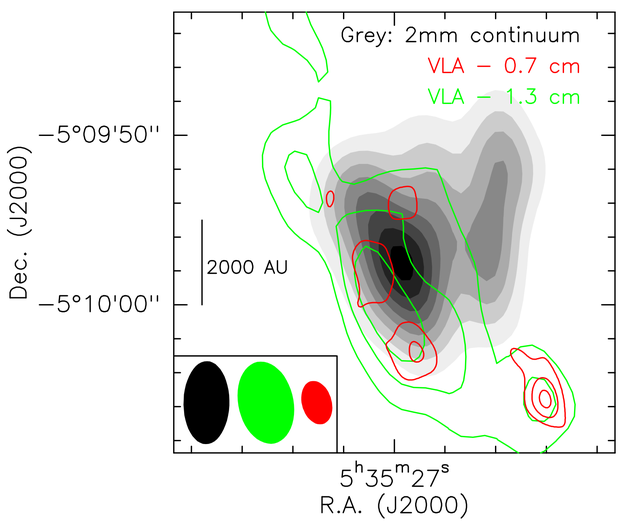
CO and SiO high-velocity emission to the north of the region suggests the presence of shocked gas



Chemical differentiation

Interaction with an external molecular outflow?

López-Sepulcre et al. (2013)
Shimajiri et al. (2008)



Ionised gas

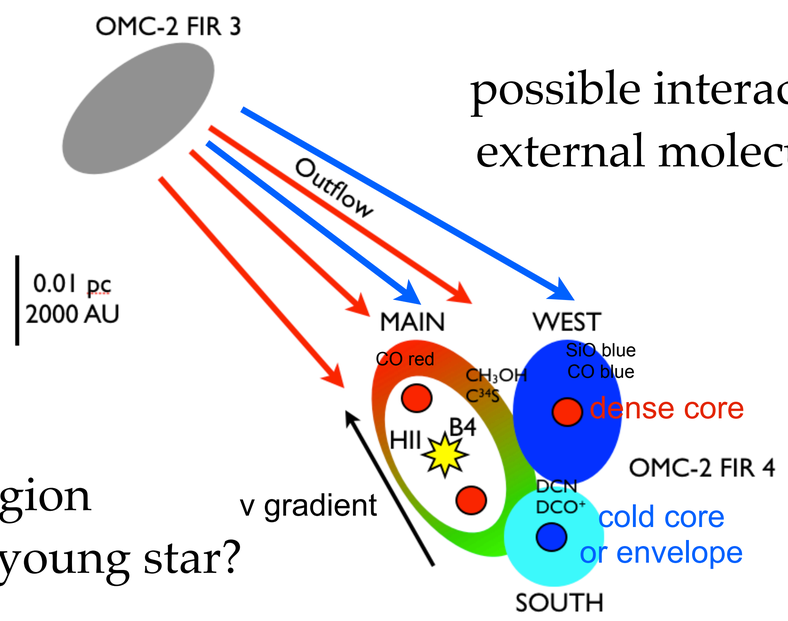
Very Large Array (VLA): free-free continuum emission at cm wavelengths
(6 cm emission currently under analysis)

Radio jet? No clear molecular outflow counterpart
HII region? Radio emission compatible with a B4 young star

A clumpy ionised region under study

A cartoon of OMC-2 FIR 4

An ideal laboratory to explore the formation of low- and intermediate-mass stars in the context of a whole protocluster



possible interaction with an external molecular outflow

radio jet or HII region powered by a B4 young star?

at least 3 distinct components, one (*south*) likely colder than the other two

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