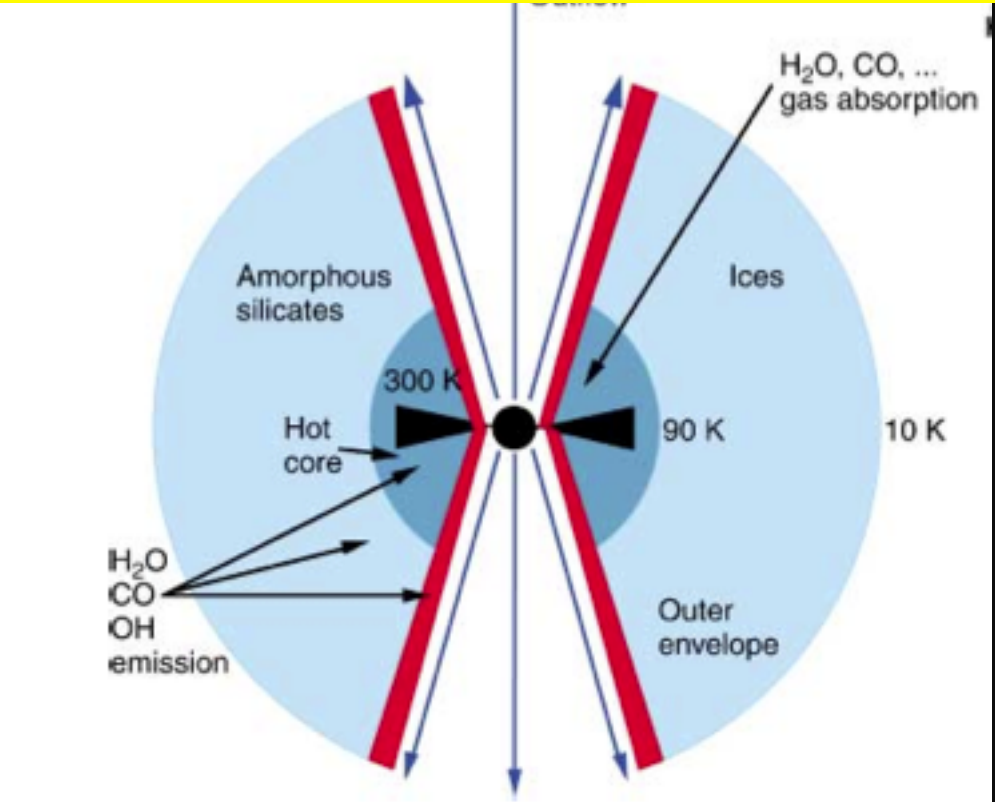
SPICA WILL PLAY A MAJOR ROLE IN PROVIDING OBSERVATION OF LINES FROM HIGH-J CO and HIGH LYING H_2O TRANSITIONS AS WELL AS FROM MANY OTHER ABUNDANT HYDRIDES LIKE NH_3, OH, HCO^+, HCN…



1. COLD ENVELOPE
2. HOT CORINO
3. INNER SHOCKS
4. UV ILLUMINATED GAS
5. INNER DISK

THE CHEMICAL COMPOSITION

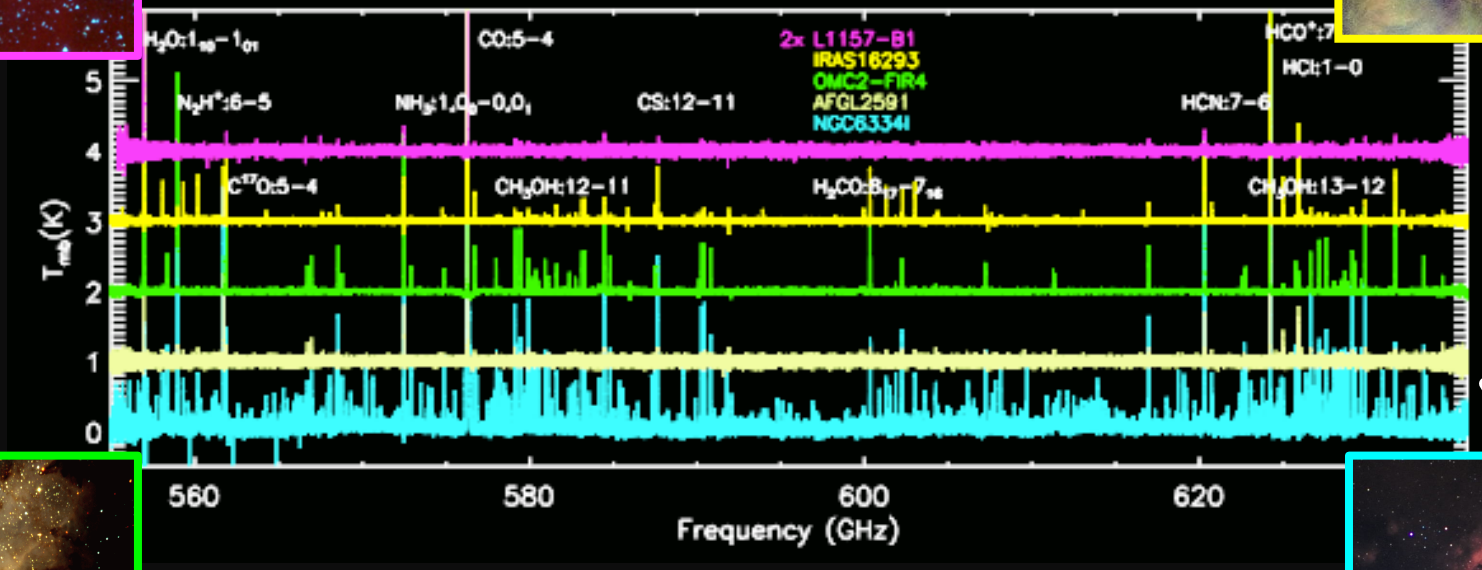
THE HERSCHEL UNBIASED SPECTRAL SURVEYS ARE HELPING US IN UNDERSTANDING THE CHEMICAL COMPOSITION OF HIGH AND LOW MASS PROTOSTARS.

THEY WILL ALSO GUIDE THE NEW SPICA-SAFARI OBSERVATIONS TO DO.

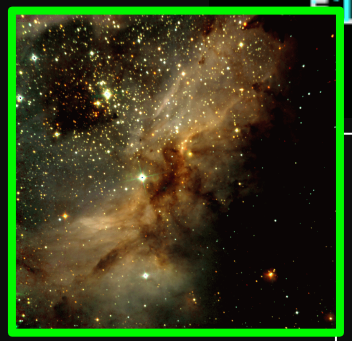
OVERVIEW of 555-635GHz SPECTRA

THE CHESS HERSCHEL KEY PROGRAM

Ceccarelli et al. 2010



LUM



The large majority of the lines have upper level energy >100K => they originate in warm/hot gas.

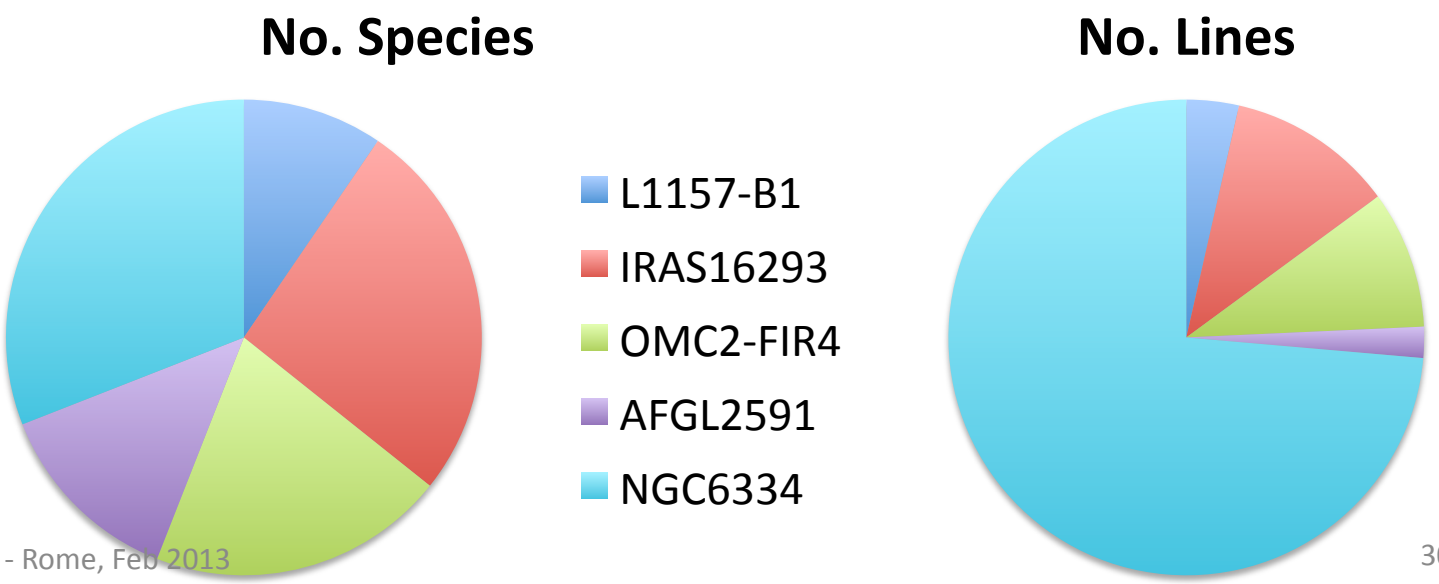
Exceptions: fundamental lines of some hydrides, H_2O, NH_3, HCl, and D_2O => from cold gas.

OVERVIEW of 555-635GHz SPECTRA

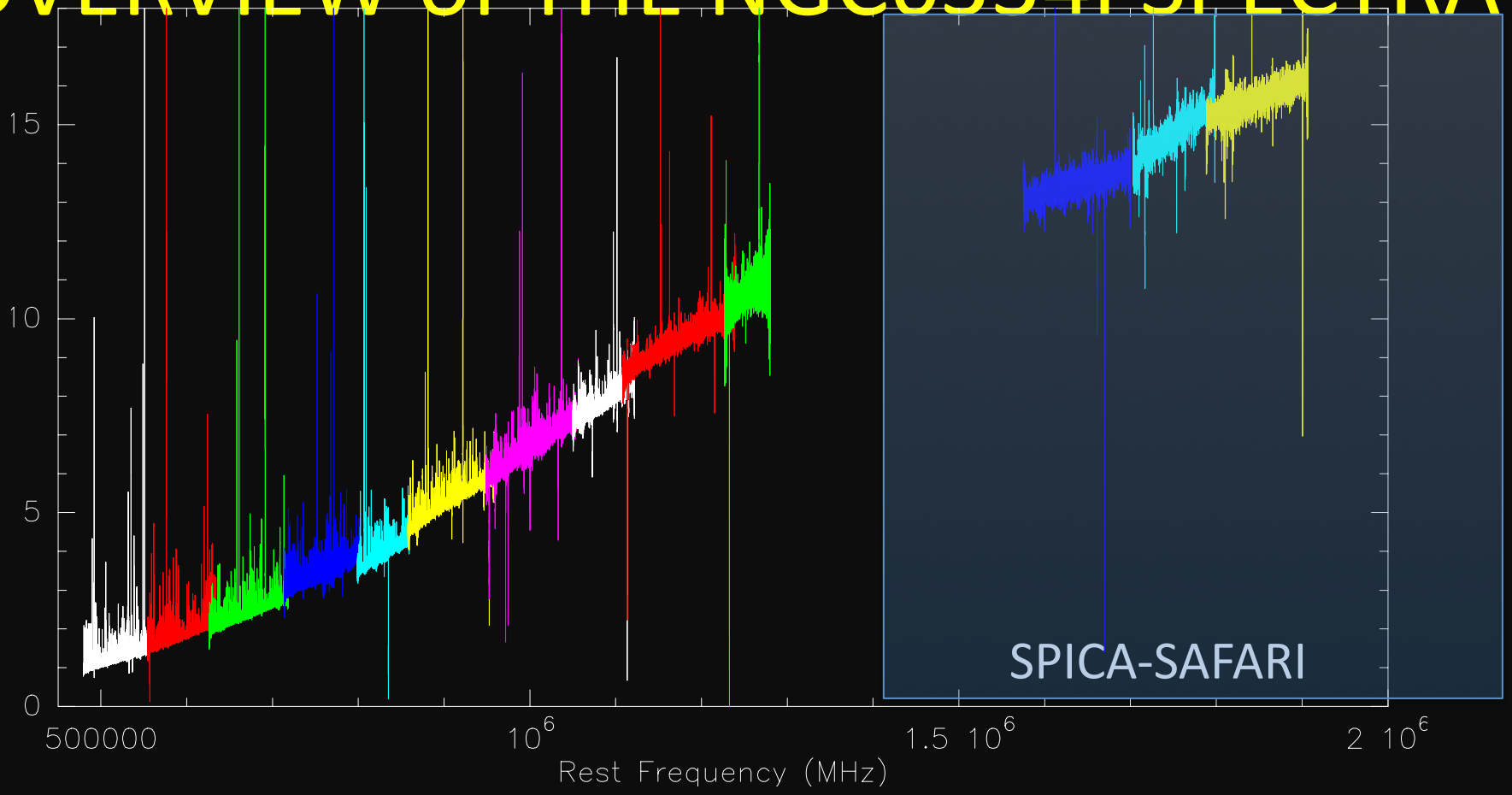
A bit of statistics

Source	Luminosity (Lo)	No Lines	No Species
L1157-B1	-	27	8
IRAS16293	21	86	22
OMC2-FIR4	$1x10^3$	71	17

The number of lines in a spectrum is NOT a unique criterion for chemical richness



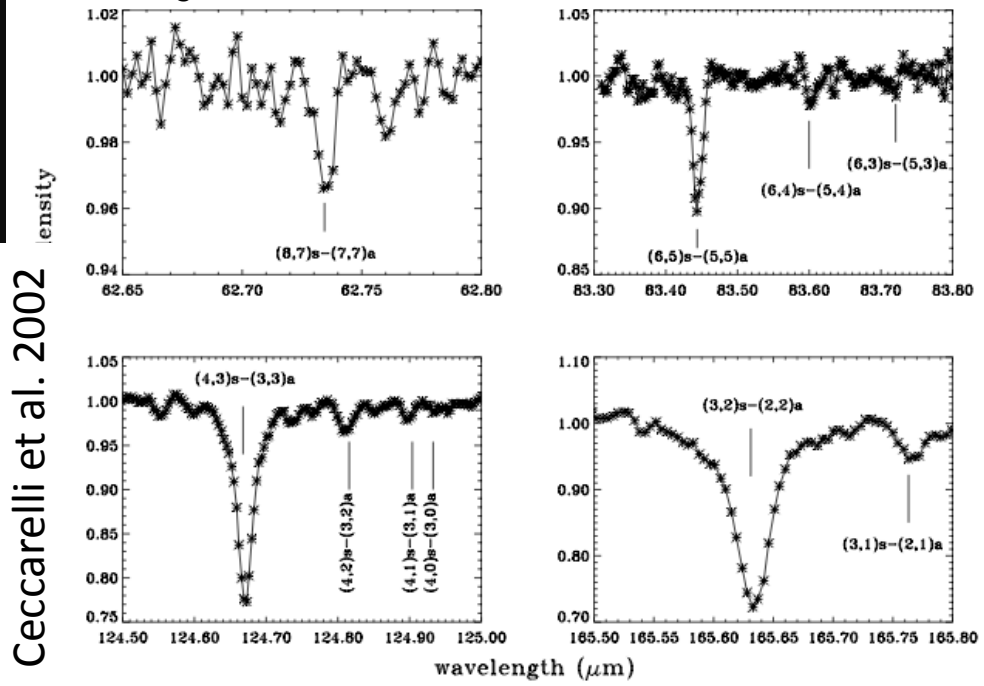
OVERVIEW of THE NGC6334I SPECTRA



THE NUMBER OF LINES DECREASES WITH INCREASING FREQUENCY, BECAUSE OF THE LINES EXCITATION AND DUST ABSORPTION

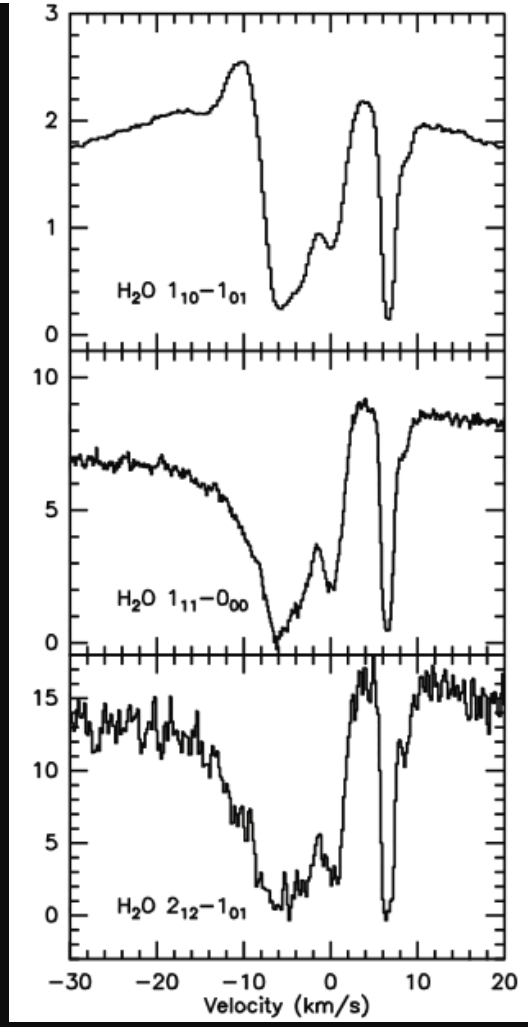
HIGH MASS = HIGH ABSORPTION

ISO: NH_3 towards SgrB2



Ceccarelli et al. 2002

Herschel: H_3O towards NGC6334I



Empreictinger et al. 2013

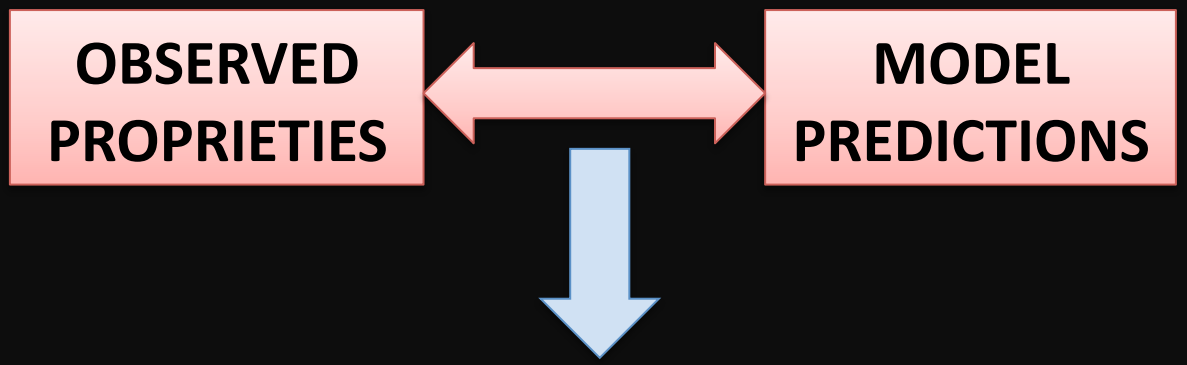
SPICA-SAFARI WILL BE A GREAT INSTRUMENT TO STUDY LOW-MASS BUT NOT NECESSARELY HIGH-MASS STAR FORMING REGIONS

OUTLINE

1. The census
2. The structure
3. The chemistry
4. The outflow

THE OUTFLOW

WHY: OUTFLOWS ARE UBIQUITOUS AND A KEY INGREDIENT IN THE STAR FORMATION PROCESS: THEY GET RID OF THE ANGULAR MOMENTUM, DISSIPATE THE PLACENTAL ENVELOPE, DESTROY THE PARENTAL CLOUD INJECTING TURBULENCE IN ISM



How much energy is injected in the ISM? How? What kind of shocks are created? How are they cooled? How are they generated? Jets/wide winds? What species are injected in the ISM from those shocks?