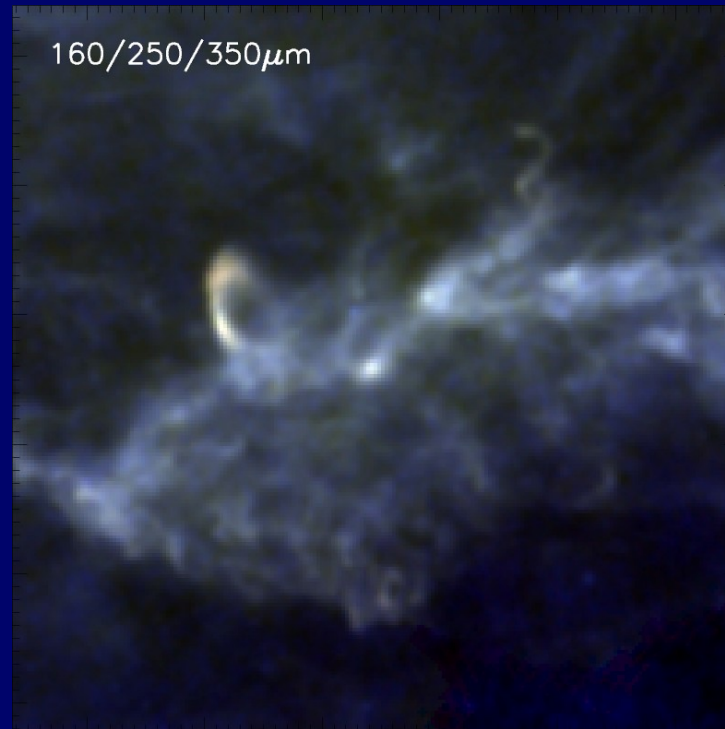


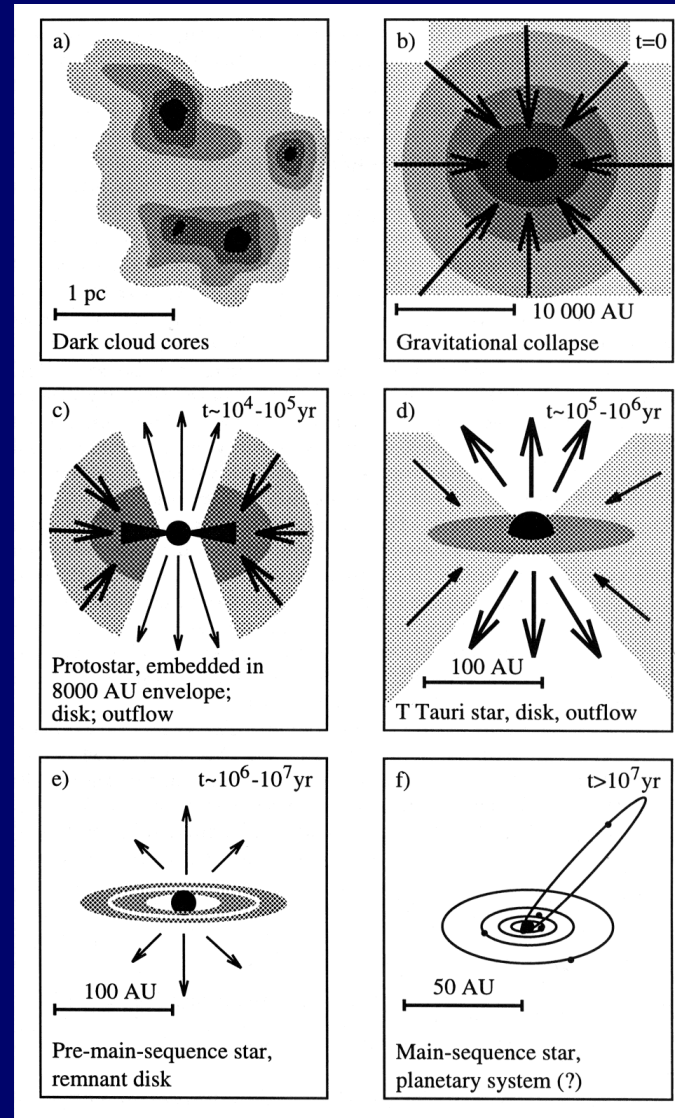
Observations of pre-stellar cores and the origin of the IMF



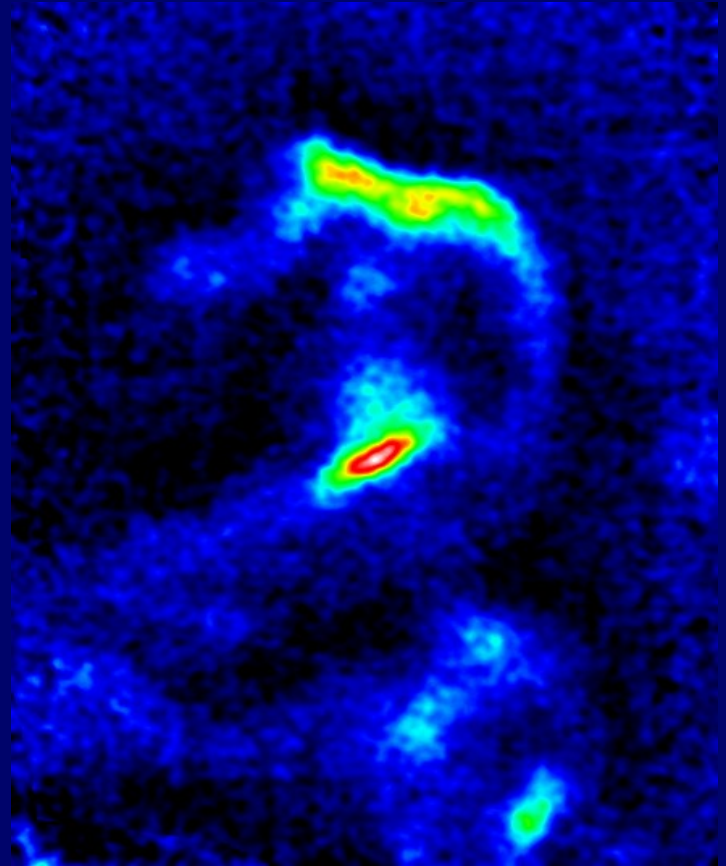
Derek Ward-Thompson
Cardiff University

Tenerife, October 18th, 2010

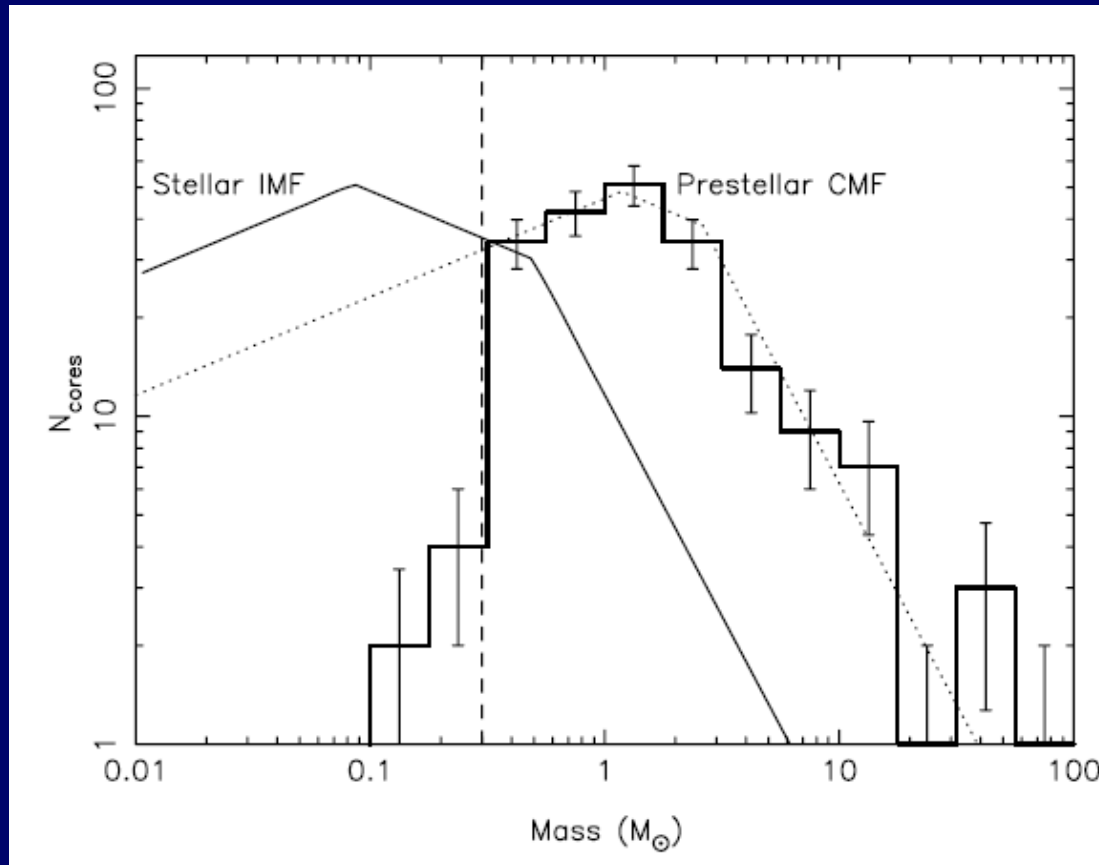
The initial conditions of low-mass star formation



Horsehead Nebula



Orion core mass function



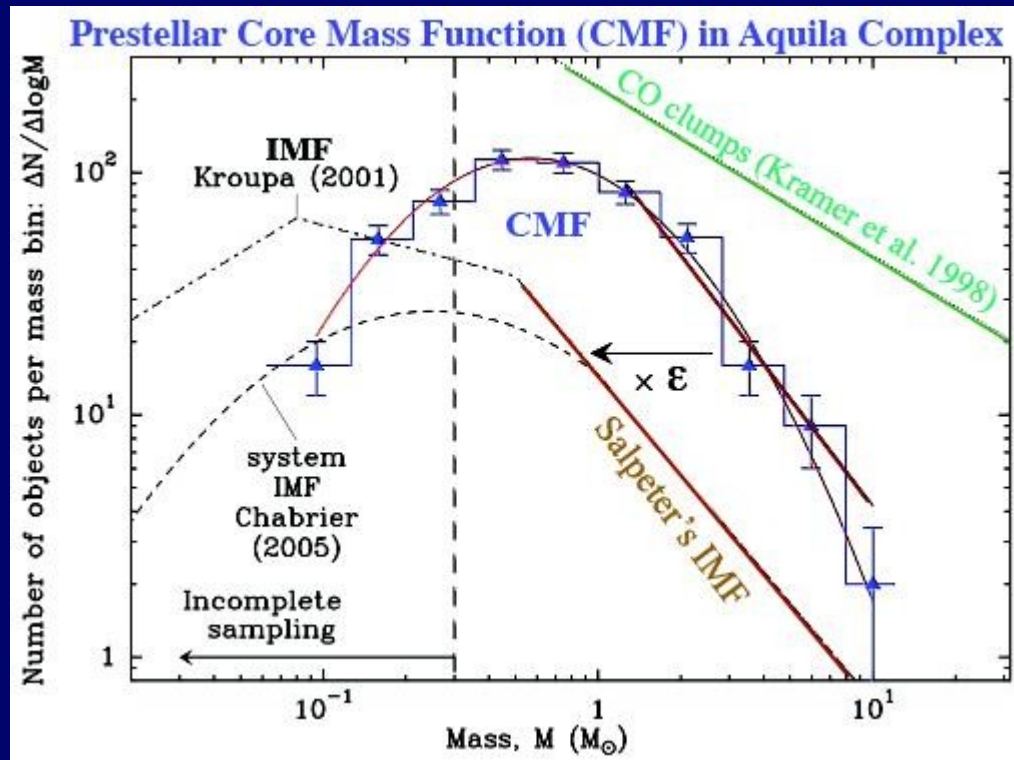
First image from GB survey



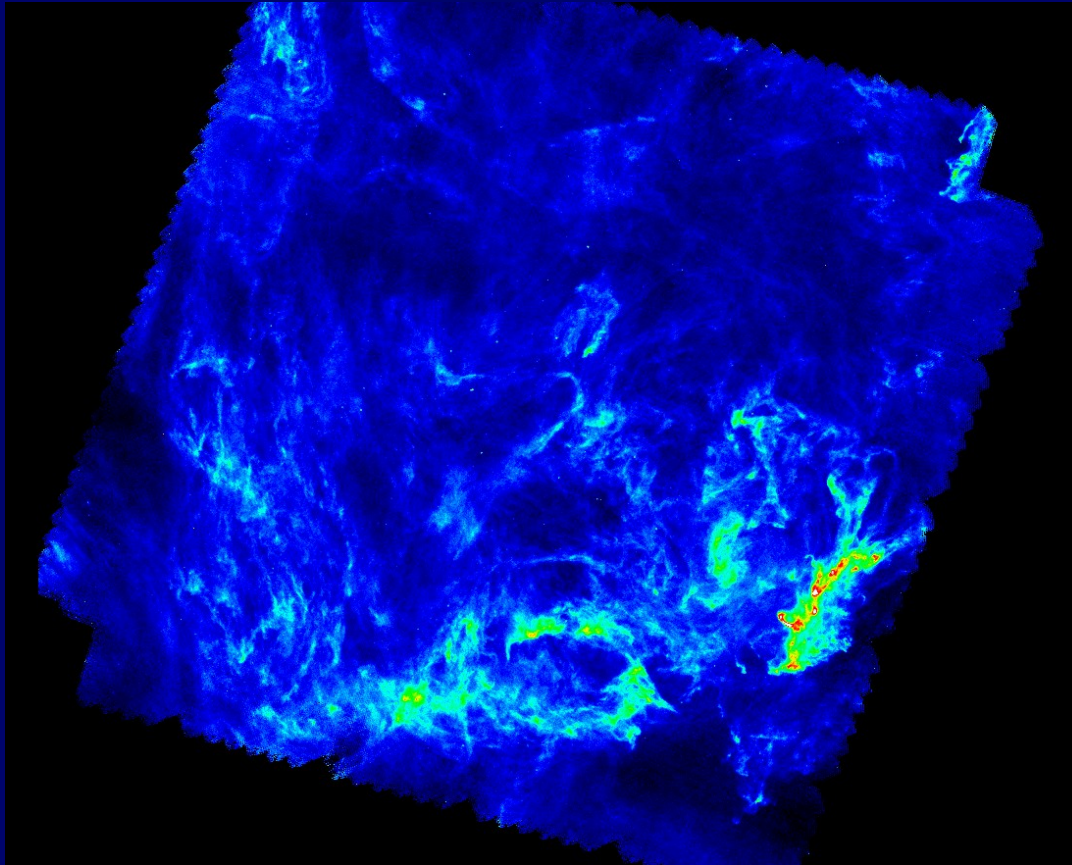
Aquila – 3x3deg – R:500, G:170, B:60um – 15 other such regions in survey

Andre et al 2010

Pre-stellar CMF in Aquila

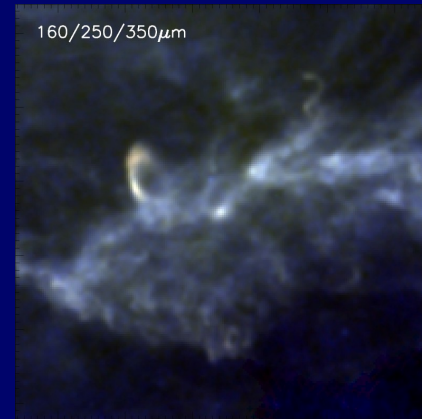
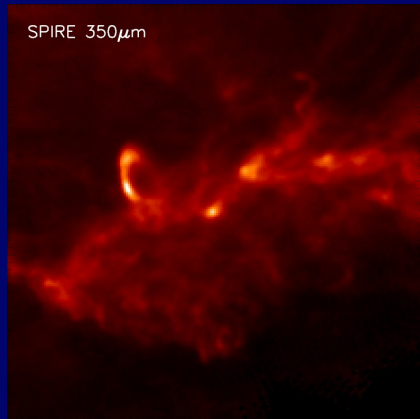
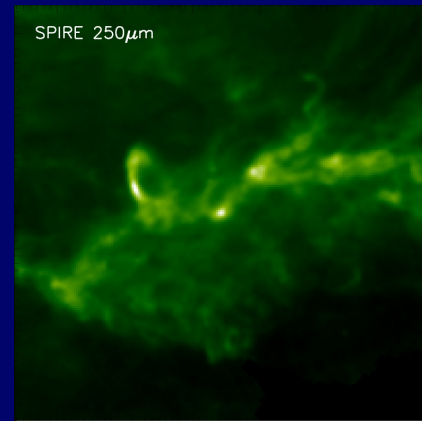
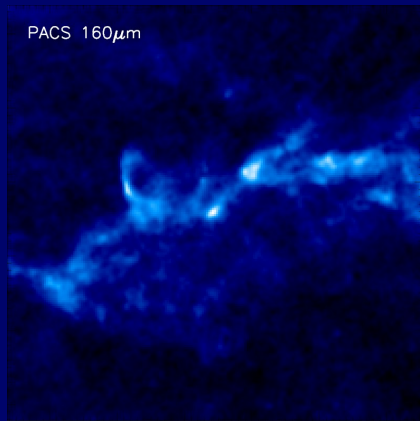


Polaris (SPIRE 250 μm)

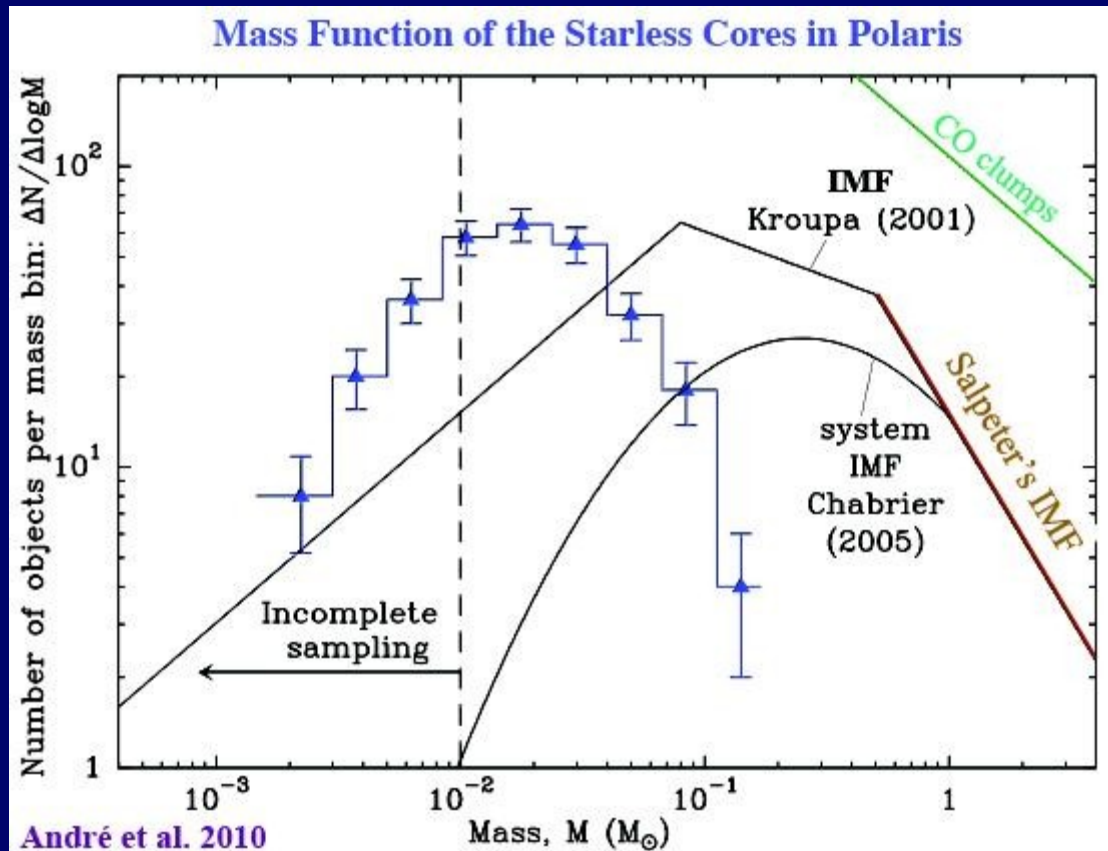


Ward-Thompson et al 2010

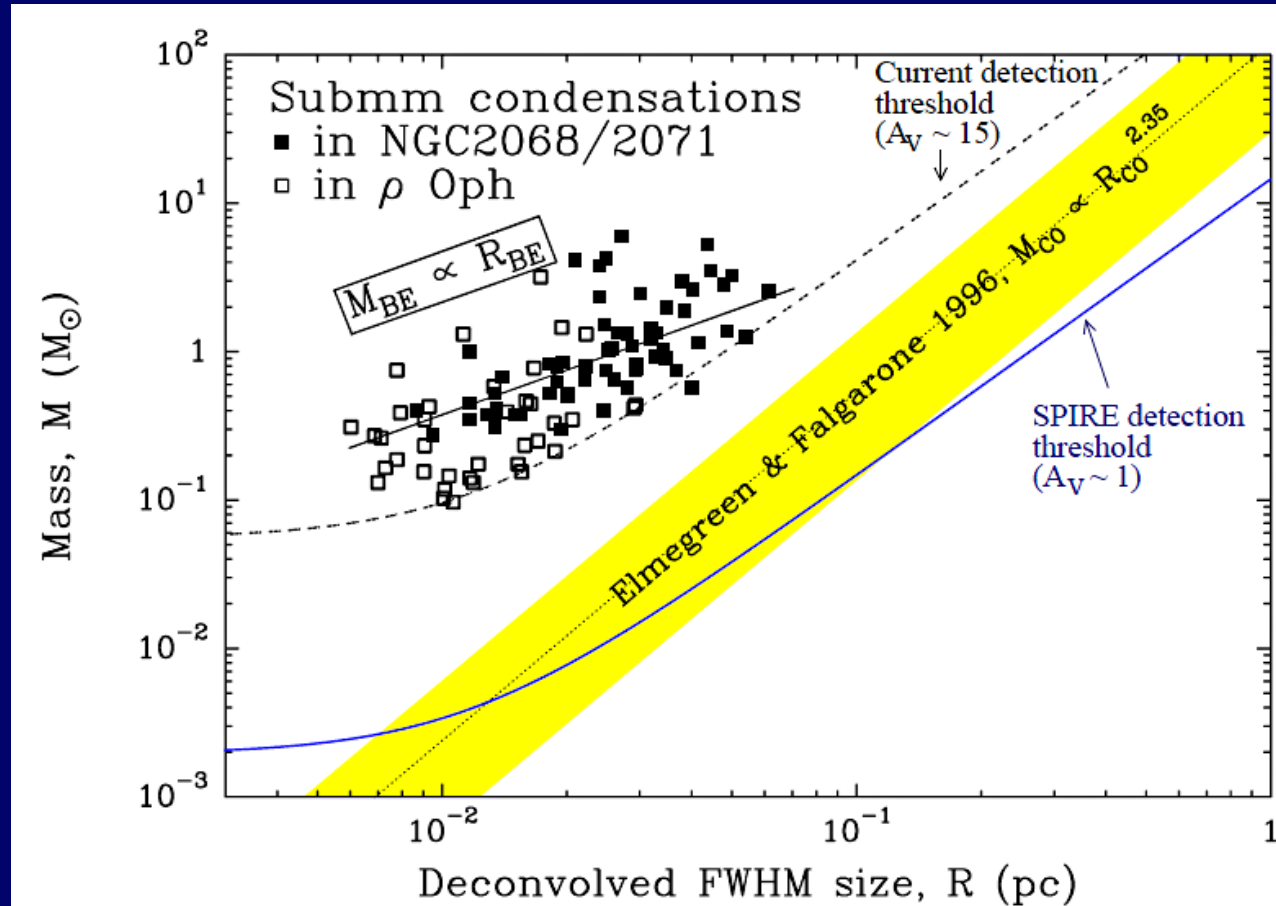
MCLD 123 and Loop 1



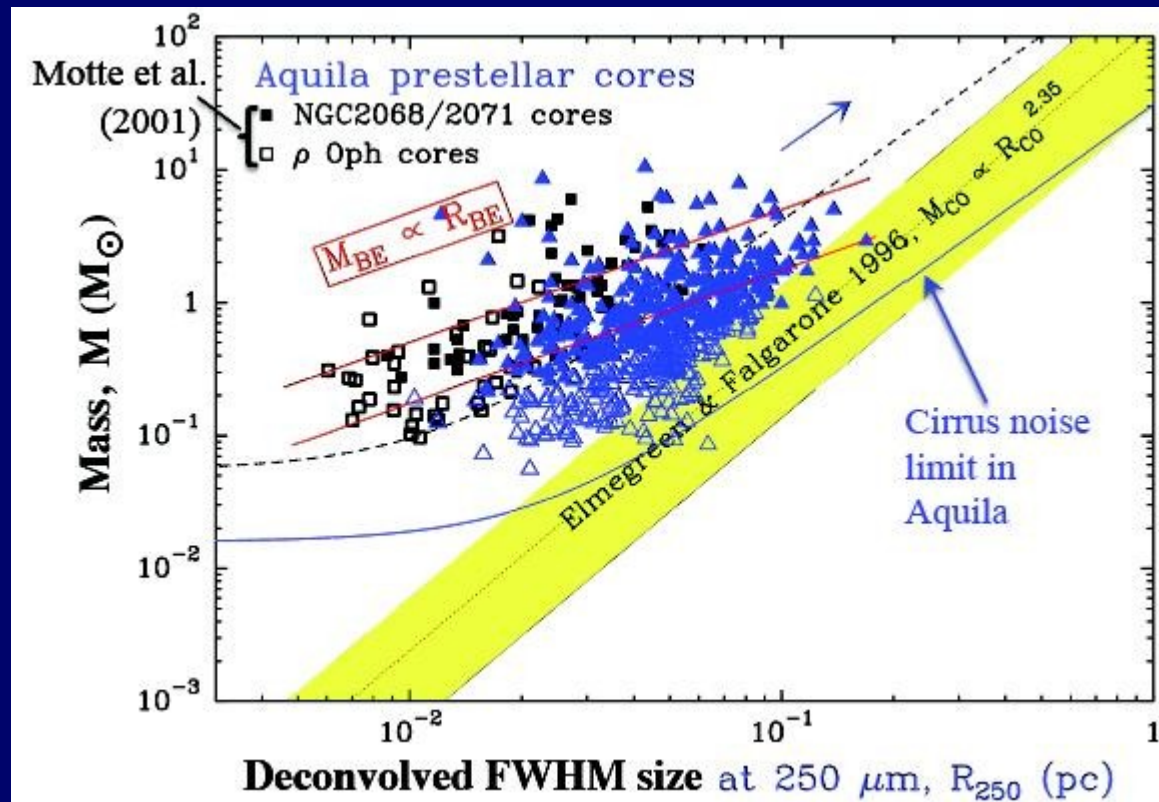
Starless CMF in Polaris



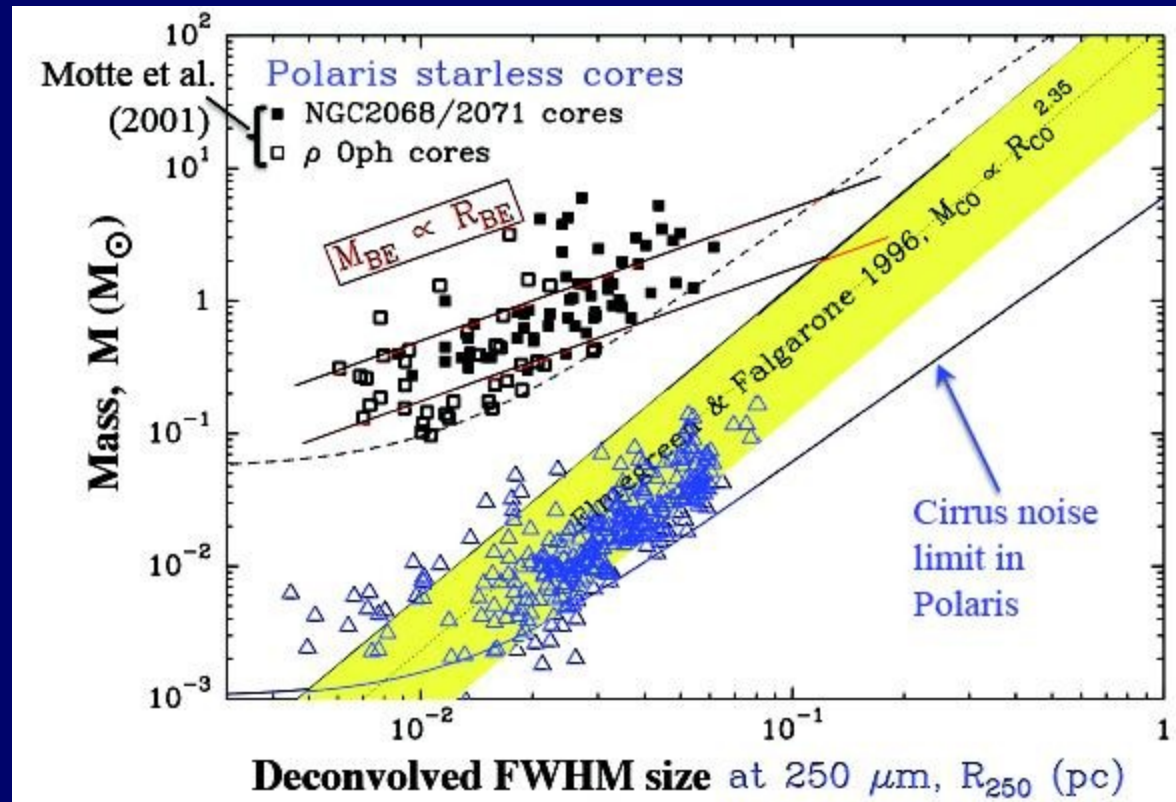
The picture before Herschel



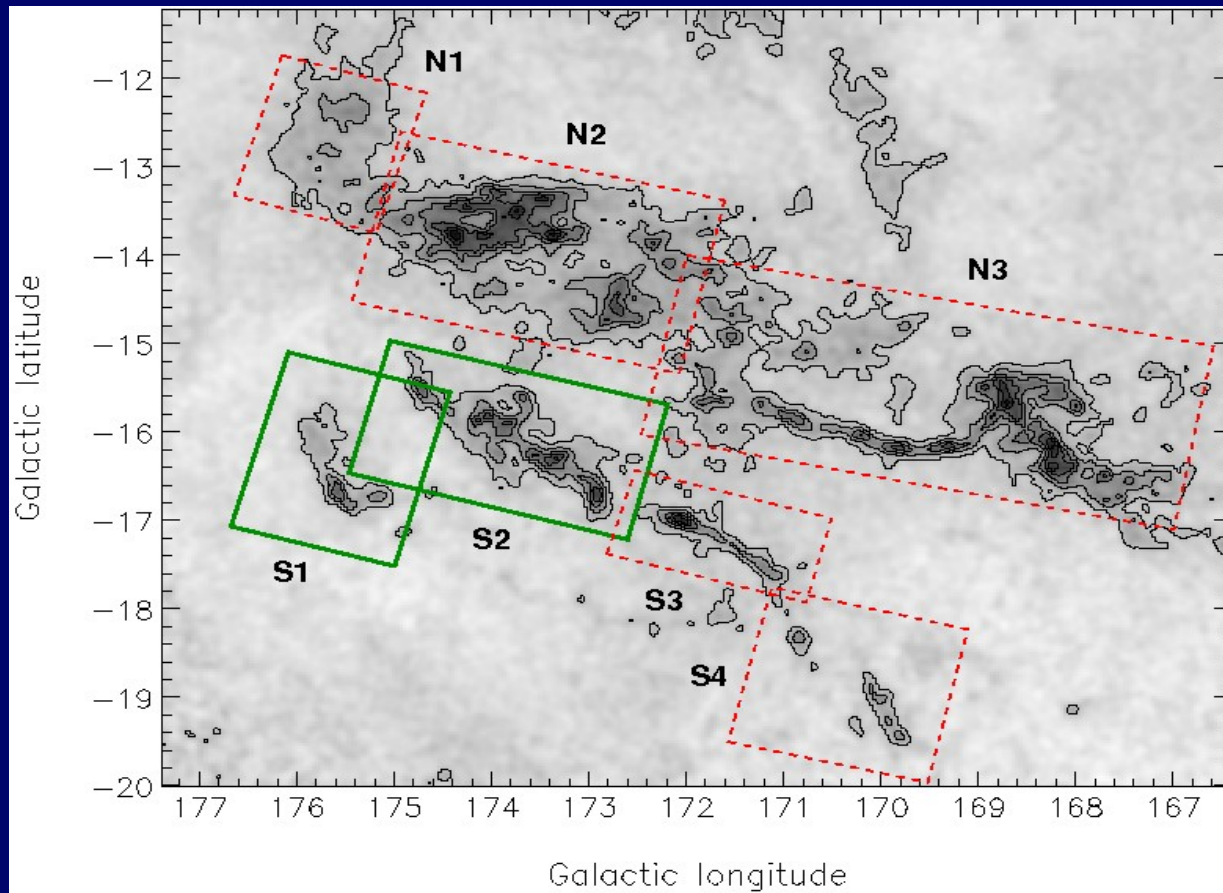
Mass-size relation in Aquila



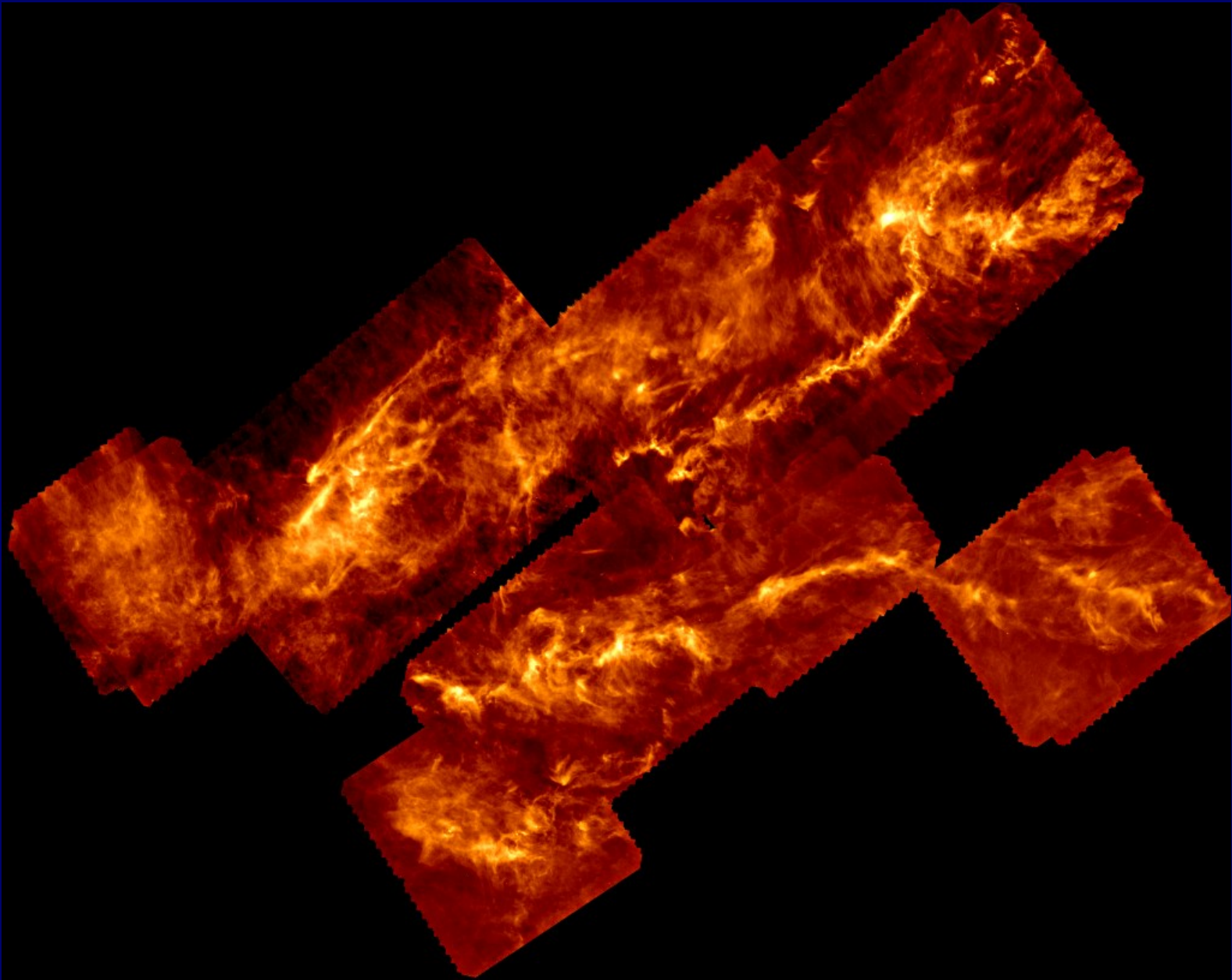
Mass-size relation in Polaris



Taurus finder chart



Spire 250um of whole of Taurus



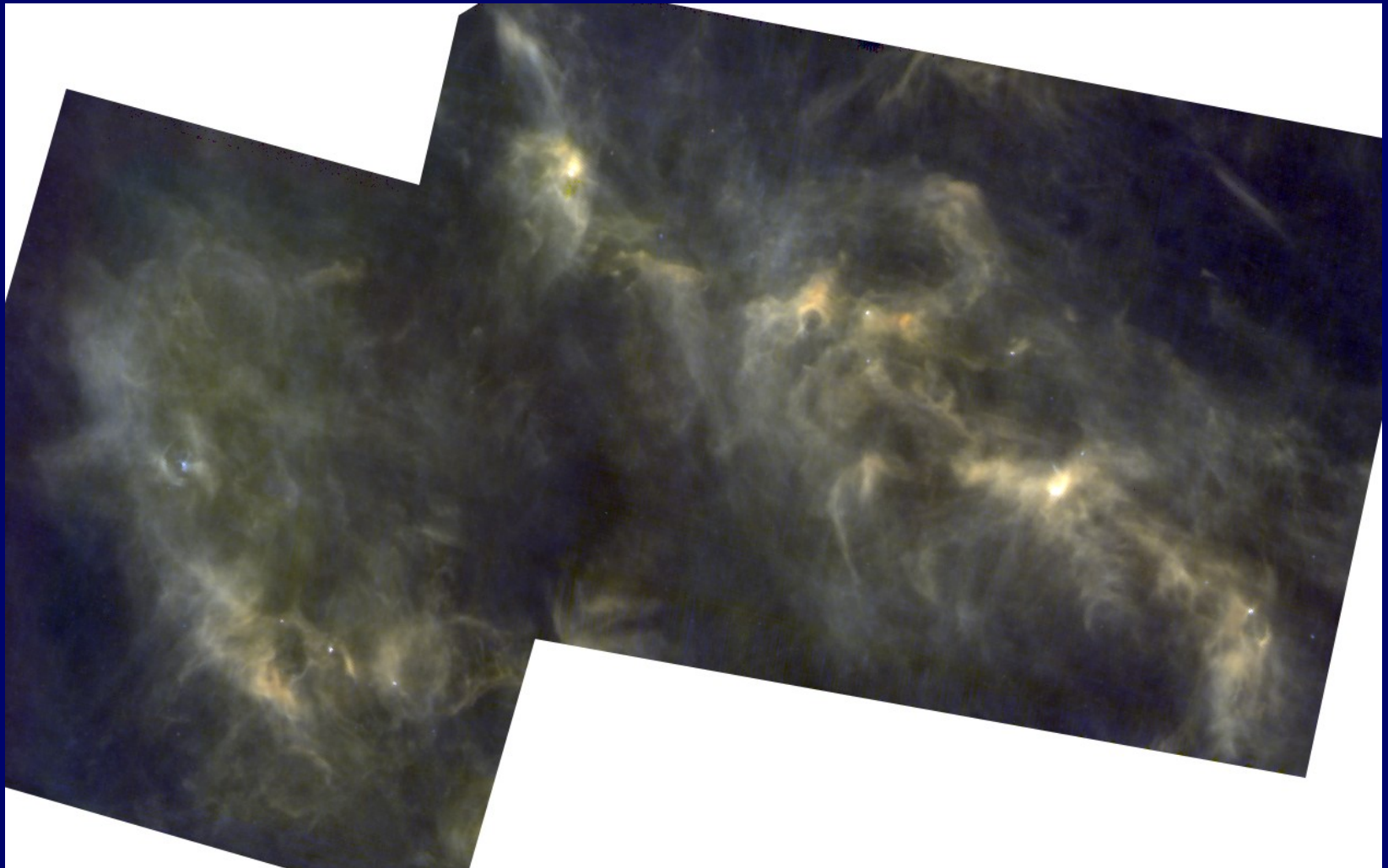
Taurus in the optical (DSS)



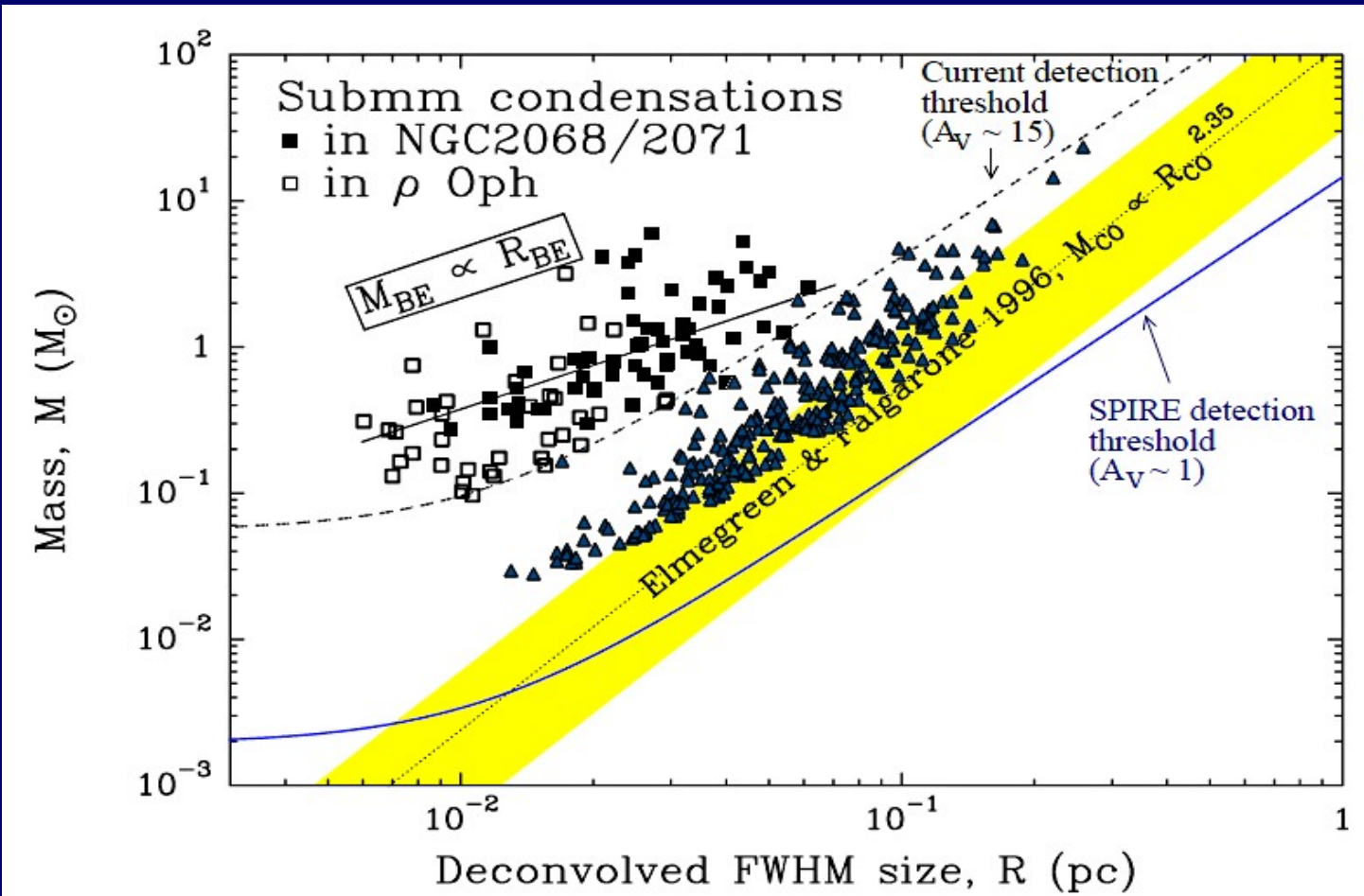
Taurus with Spire 250 overlaid



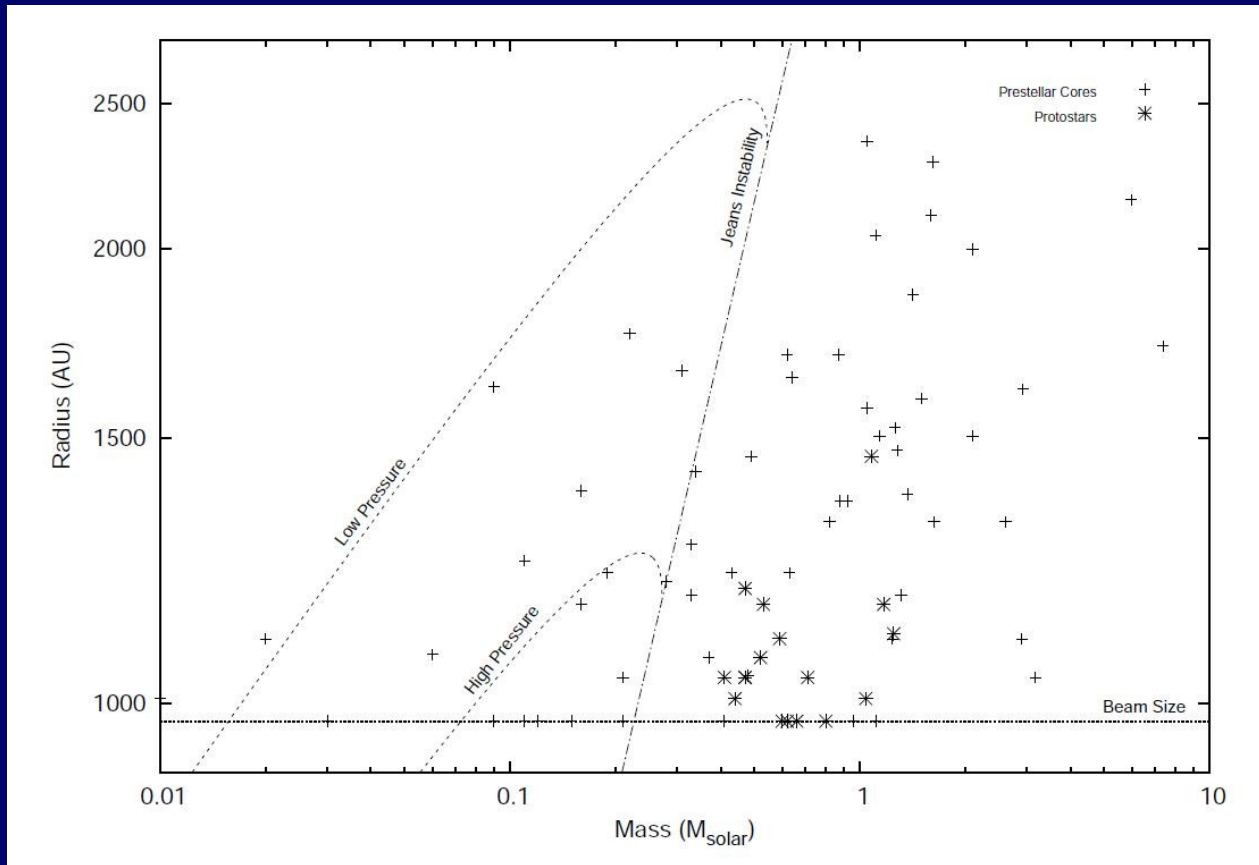
Taurus larger region (b160,g250,r350)



Taurus mass-size relation

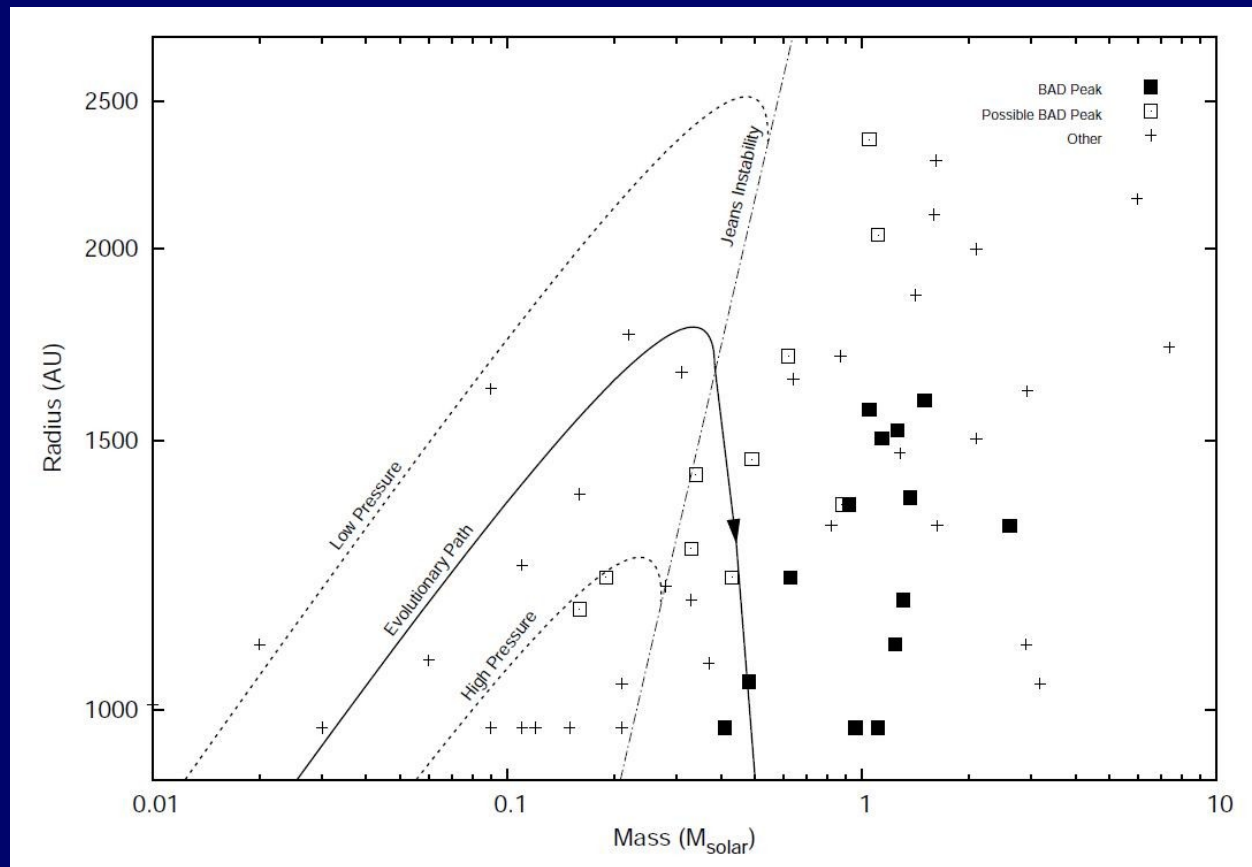


Size-mass in Ophiuchus



Simpson et al 2010

Size-mass (evolution?) in Ophiuchus

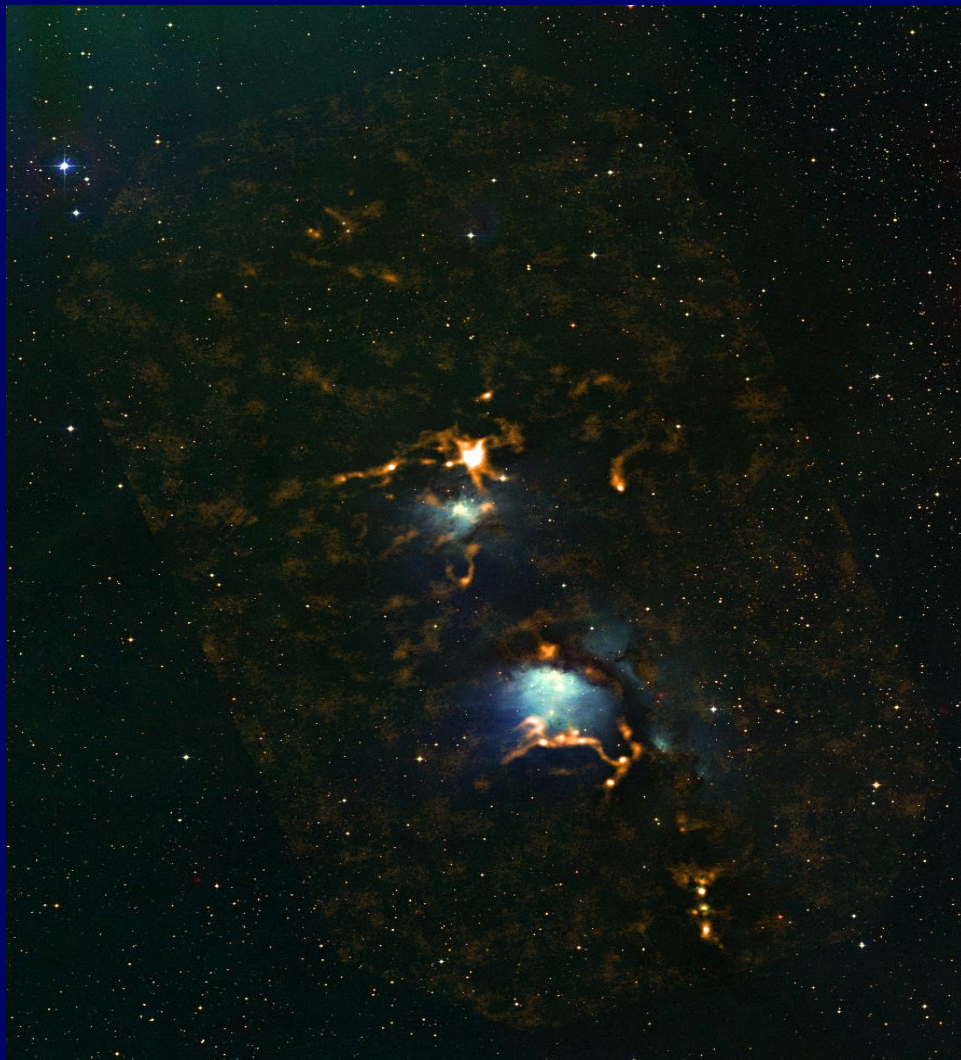


Orion B North (DSS)



Nutter et al
2010

Orion B North (Scuba2)



Nutter et al
2010

Conclusions

- Stars form in molecular cloud cores
- Core mass function determines IMF
- Need to understand physics of cores
- Need to observe different environments
- Link between starless & pre-stellar cores
- Evolutionary diagram for pre-stellar cores
- Much more to come – watch this space!