PROTOSTARS IN THE ORION MOLECULAR CLOUD COMPLEX

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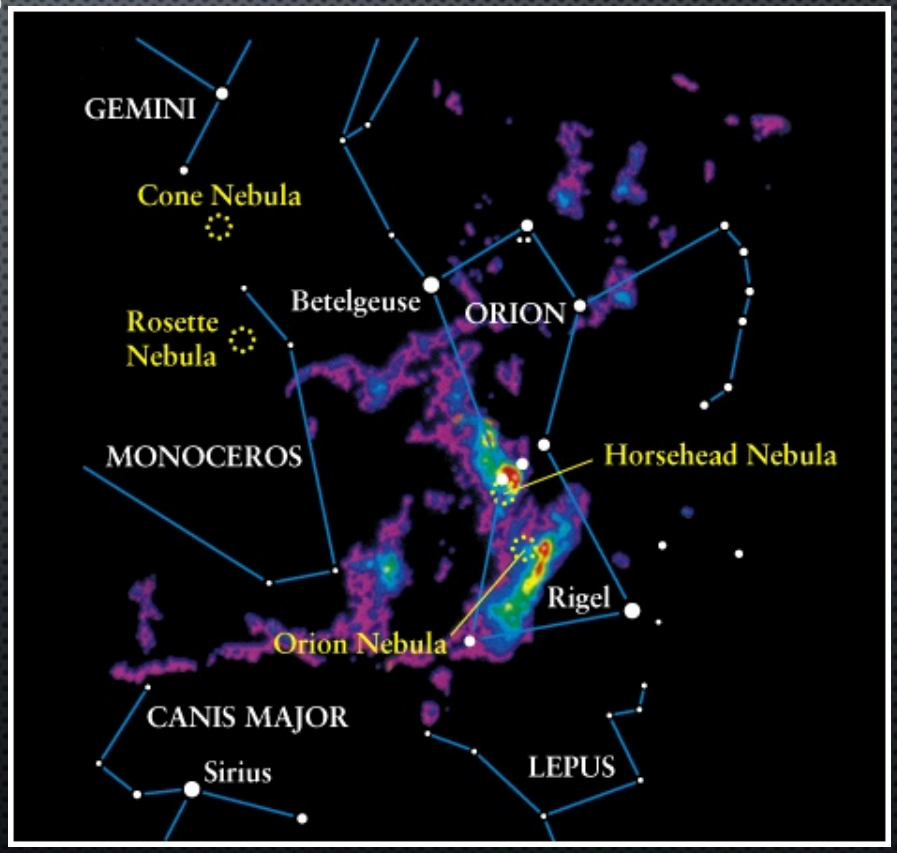
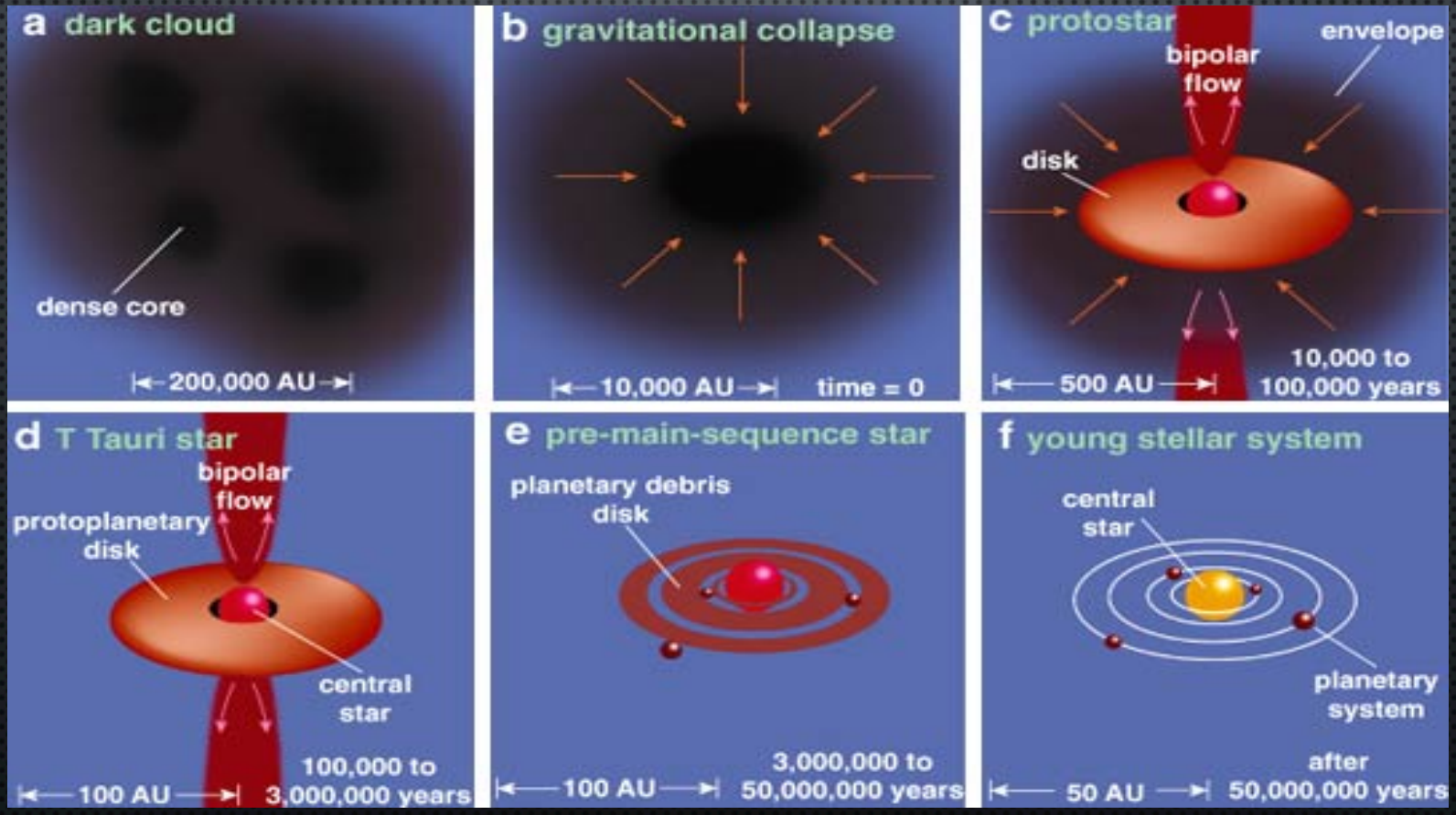
GIANT MOLECULAR CLOUDS

- An enormous, dense and cold cloud of gas and dust
- Mass can range up from 10^3 to 10^7 solar masses
- Within GMCs are regions of high density and low temperature called Lumps → Begin star formation
- Why Orion?
  - Nearest site of massive star formation
  - Most populous within 1400 light years
  - More representative environment



[1]

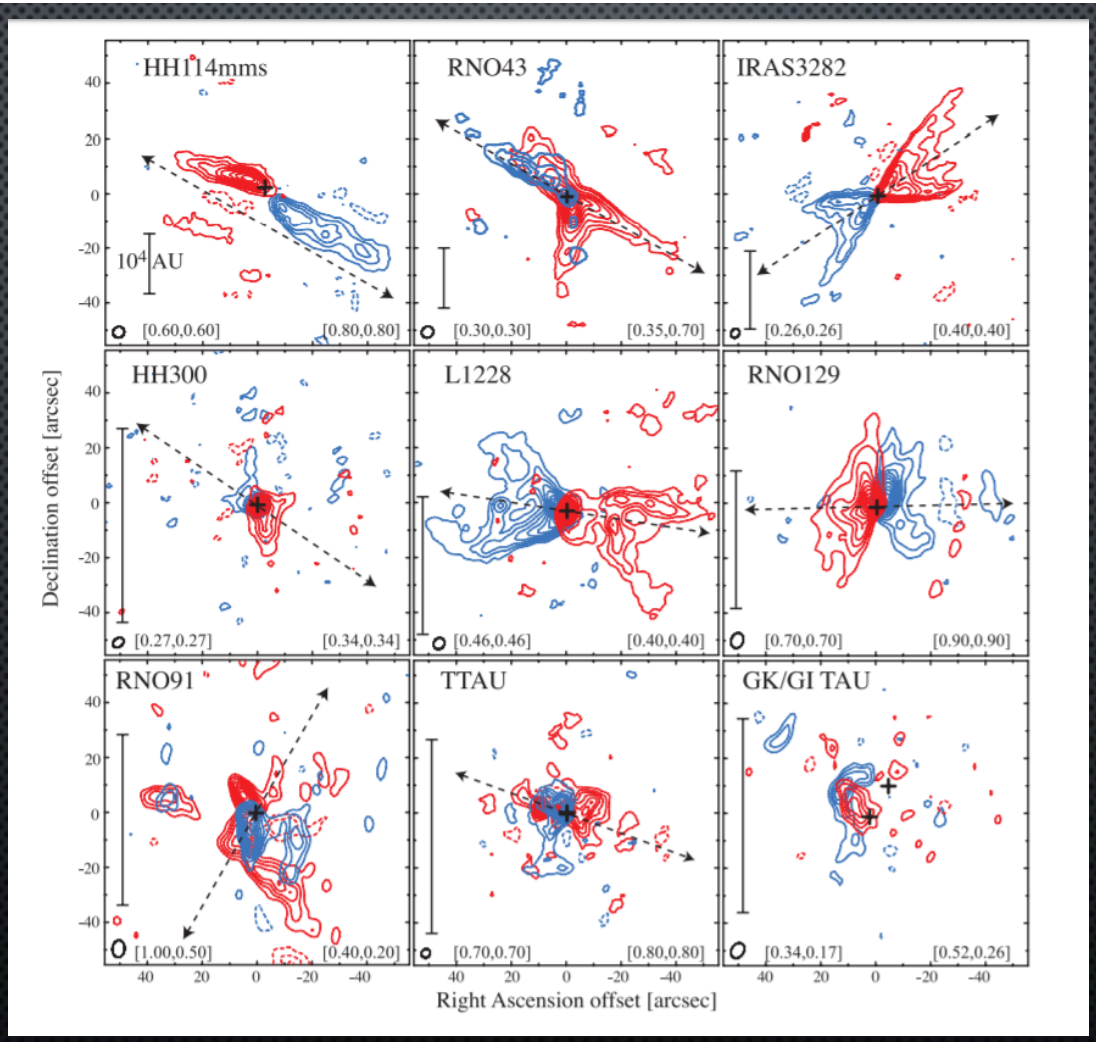
STAR FORMATION



[2]

OBSERVATIONS WITH ALMA

- A survey of 331 Class 0 and I protostars in the Orion A and B clouds at 0.09" (38 AU) resolution
  - Large and relatively unbiased sample with high resolution and sensitivity
- Observe:
  - Dust Continuum - characterize multiplicity and presence of compact, resolved structures
    - Debate on frequency and separation distribution of multiples
  - CO Emission Lines – Trace the compact outflow emission and observe Disk kinematics like rotation


HH114mms
RNO43
IRAS3282
HH300
L1228
RNO129
RNO91
TTAU
GK/GI TAU
10^4 AU
[0.60,0.60]
[0.80,0.80]
[0.30,0.30]
[0.35,0.70]
[0.26,0.26]
[0.40,0.40]
[0.27,0.27]
[0.34,0.34]
[0.46,0.46]
[0.40,0.40]
[0.70,0.70]
[0.90,0.90]
[1.00,0.50]
[0.40,0.20]
[0.70,0.70]
[0.80,0.80]
[0.34,0.17]
[0.52,0.26]
Declination offset [arcsec]
Right Ascension offset [arcsec]
40
20
0
-20
-40

[3]

CONCLUSION

- Data Processing stage using CASA
  - Calibration of raw data
  - Imaging
- After, statistical analysis of disk masses using continuum
  - Disks more massive as younger times?
  - Examine systematic difference in disk mass b/w higher and lower luminosity source

REFERENCES

- http://chandra.harvard.edu/edu/formal/stellar_ev/story/index2.html
- http://elte.prompt.hu/sites/default/files/tananyagok/InfraredAstronomy/ch09.html
- http://adsabs.harvard.edu/abs/2006ApJ...646.1070A