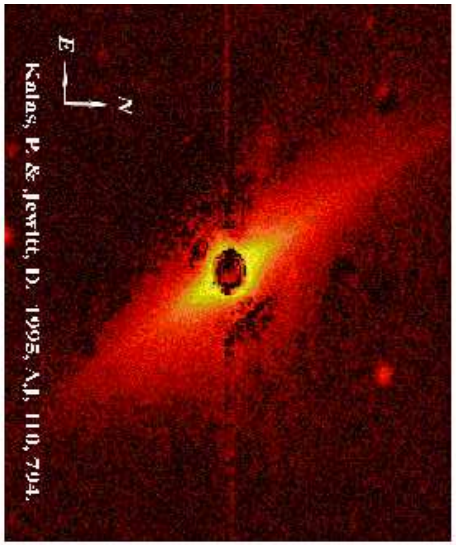
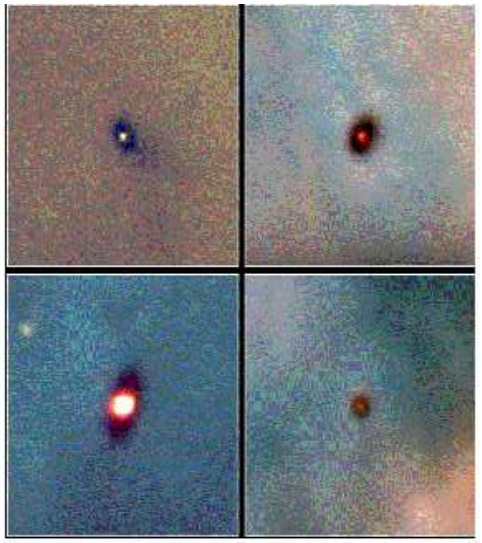


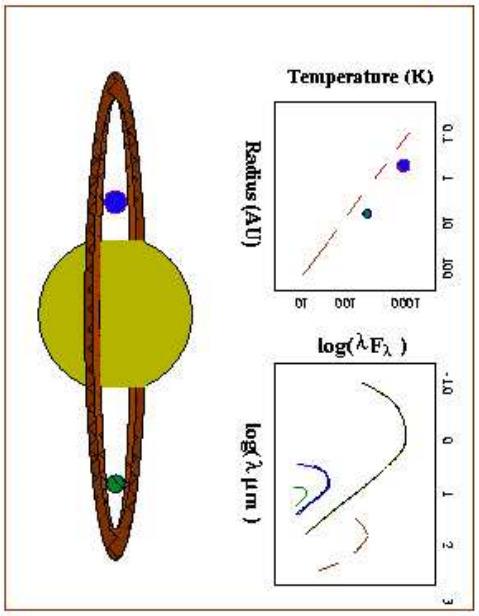


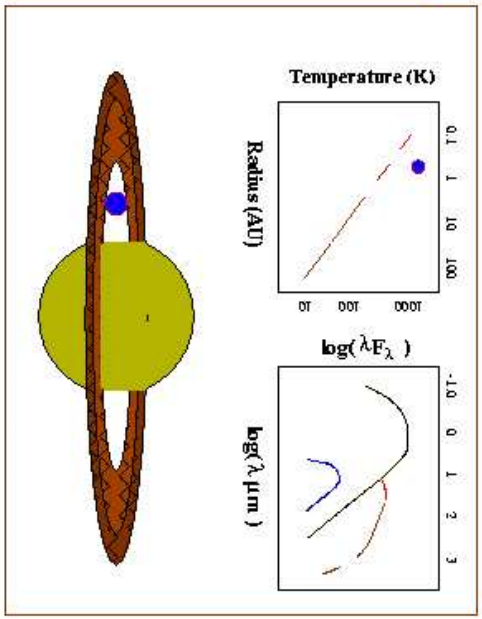
10.0 9.0 8.0 log(age) 7.0 6.0 5.0

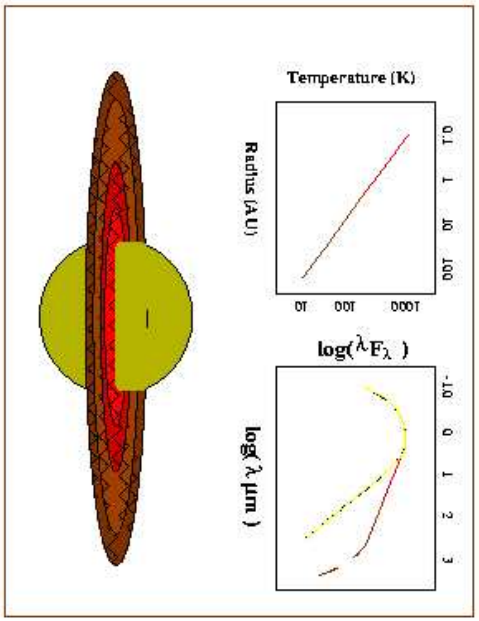
ACCRETION PHASE

gas giant formation

terrestrial planet formation







Questions: Evolution of Disks

What fraction of young stars *may* form planets?

$\Rightarrow$ measure distribution of disk masses

$\Rightarrow$ $f(M_*, environment)$

What fraction of stars form planetary systems?

$\Rightarrow$ radial velocity, astrometric, photometric surveys

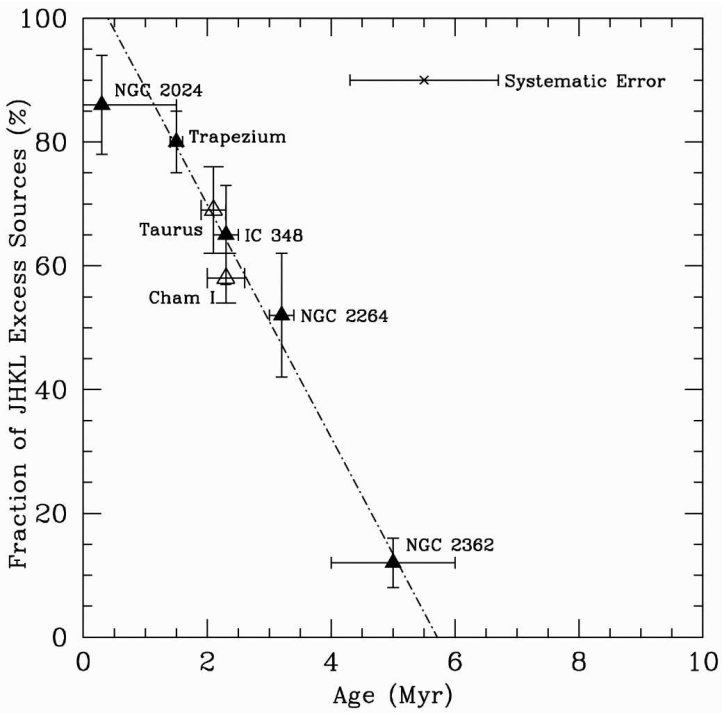
$\Rightarrow$ debris disks (indirectly)

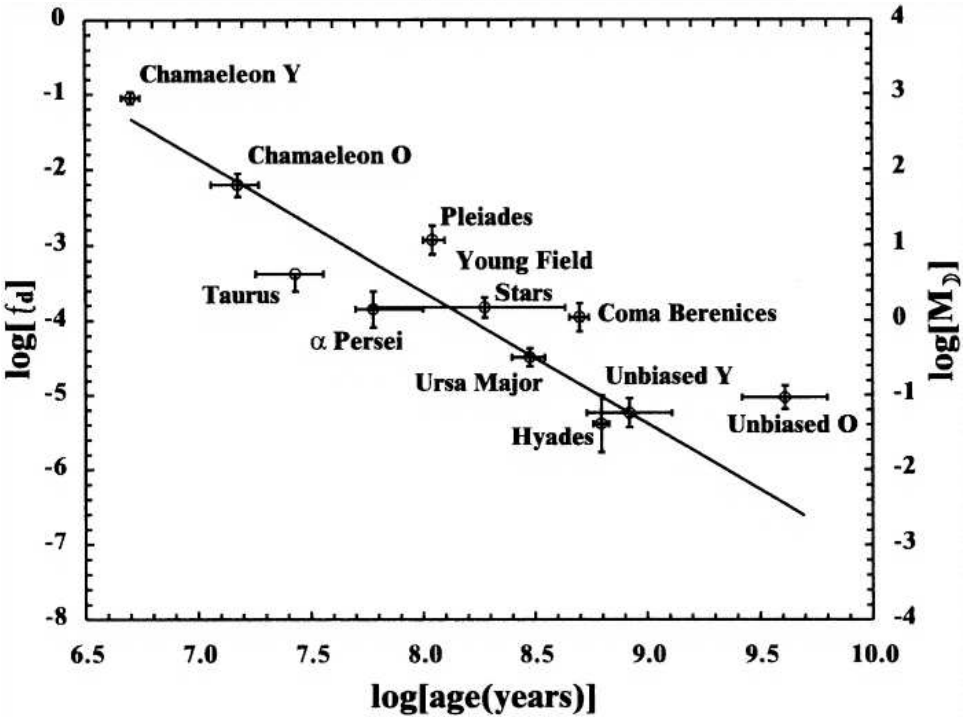
What are the timescales for disk evolution?

$\Rightarrow$ disk masses as a function of time

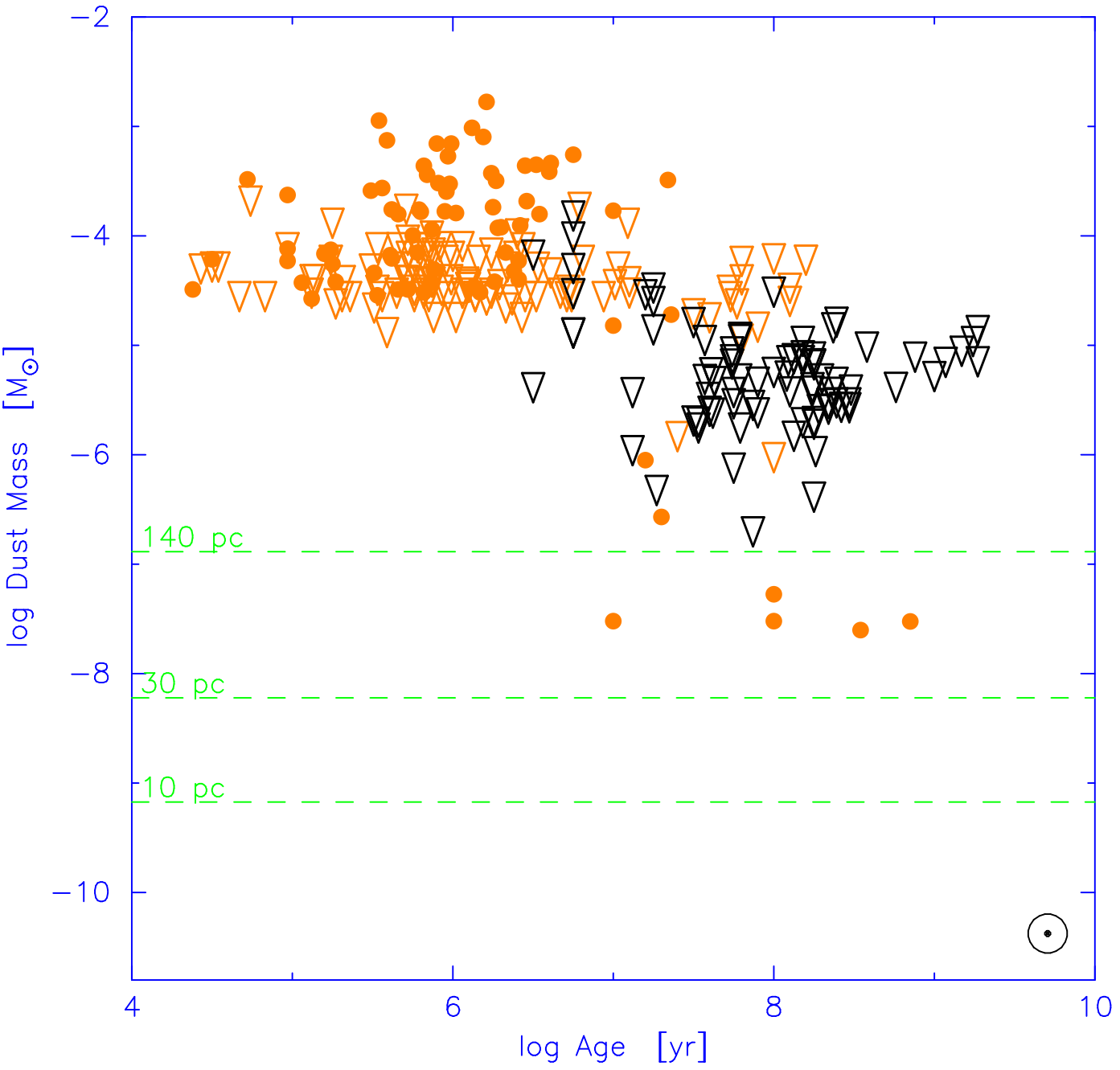
$\Rightarrow$ distinguish between dust and gas masses

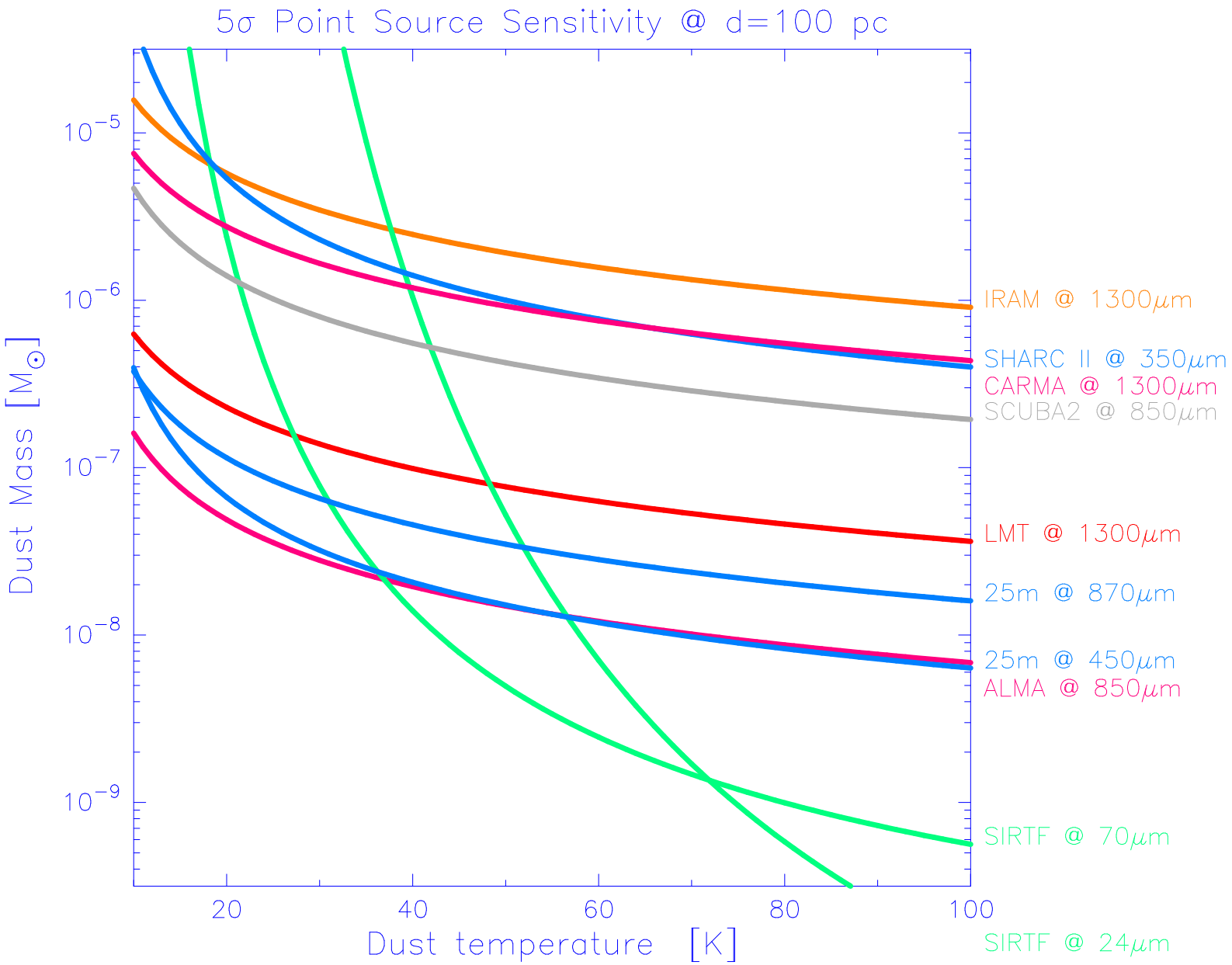
Evolution of Dust Mass: Infrared



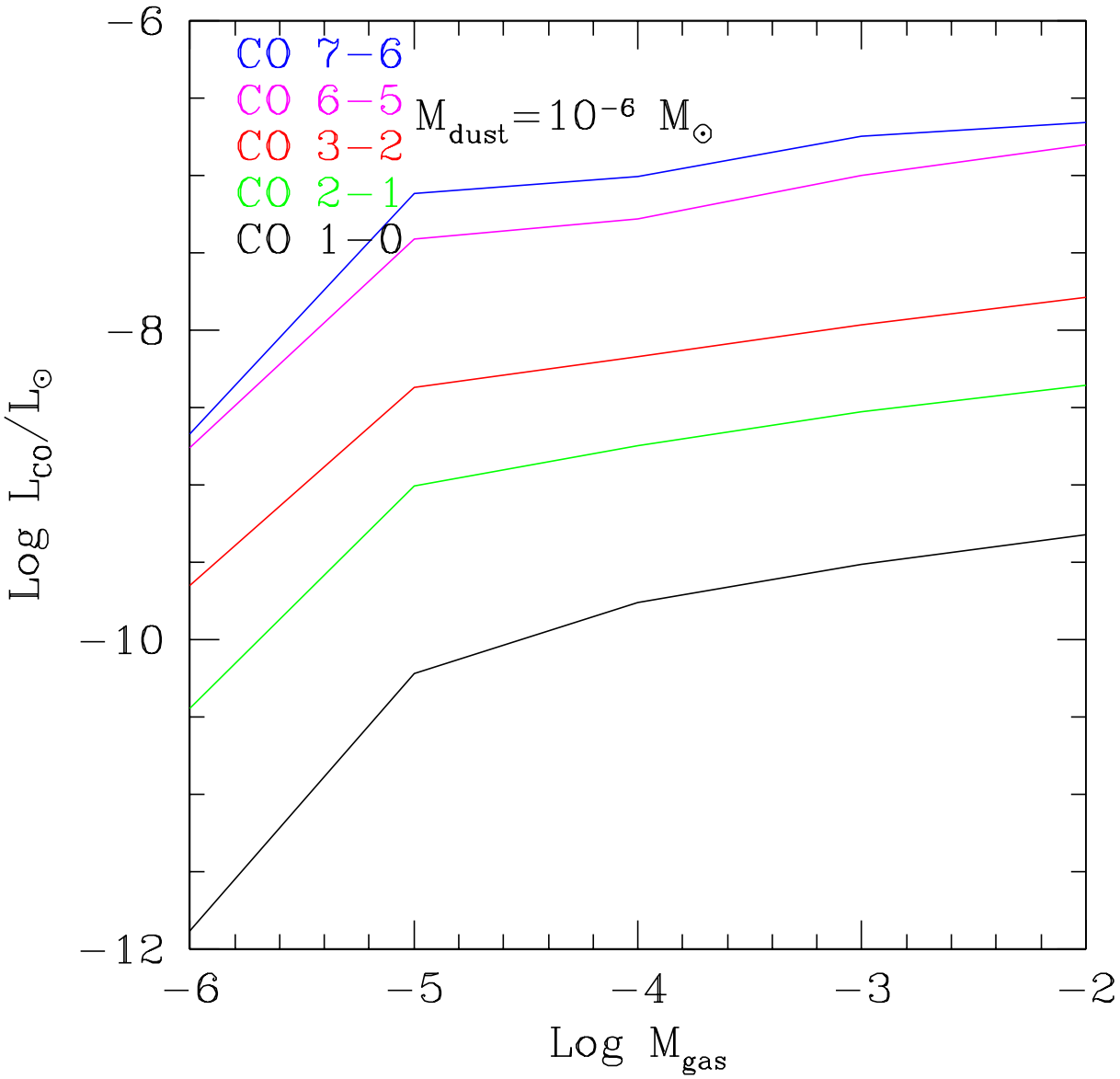


Evolution of Dust Mass : Millimeter




5σ Point Source Sensitivity @ d=100 pc
Dust Mass [M⊙]
10^-5
10^-6
10^-7
10^-8
10^-9
20
40
60
80
100
Dust temperature [K]
IRAM @ 1300μm
SHARC II @ 350μm
CARMA @ 1300μm
SCUBA2 @ 850μm
LMT @ 1300μm
25m @ 870μm
25m @ 450μm
ALMA @ 850μm
SIRTF @ 70μm
SIRTF @ 24μm

Gaseous Disks



Surveys with the 25m

Protostars and Accretion Disks

— Multiwavelength continuum surveys of molecular clouds

— Establish relative number of prestellar cores/protostars/disks

⇒ establish timescales of various phases

⇒ establish dispersion in masses

mapping-speed/resolution are critical

Post-Accretion Phase (3-10 Myr)

— Survey for gas and dust

— Clusters and field stars

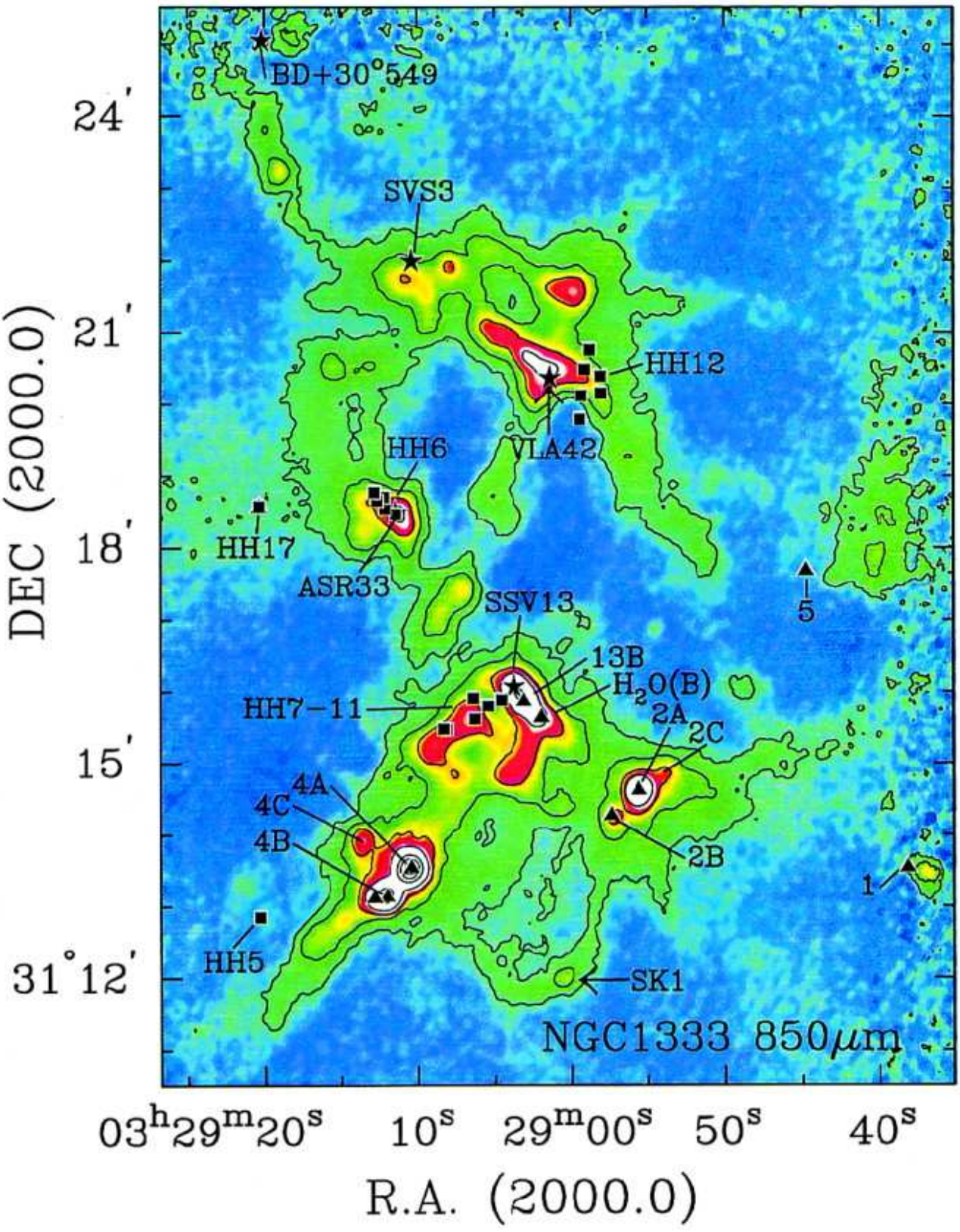
Debris disks

— Survey for gas and dust

— Mainly field stars

mapping speed is not critical,

but resolution needed to resolve disks


BD+30°549
SVS3
HH12
VLA42
HH6
HH17
ASR33
SSV13
13B
H2O(B)
HH7−11
2A
2C
4A
4C
4B
2B
1
5
HH5
SK1
NGC1333 850μm
24′
21′
18′
15′
31°12′
DEC (2000.0)
03h29m20s
10s
29m00s
50s
40s
R.A. (2000.0)