

Class 8 – Feb 18<sup>th</sup>, 2020

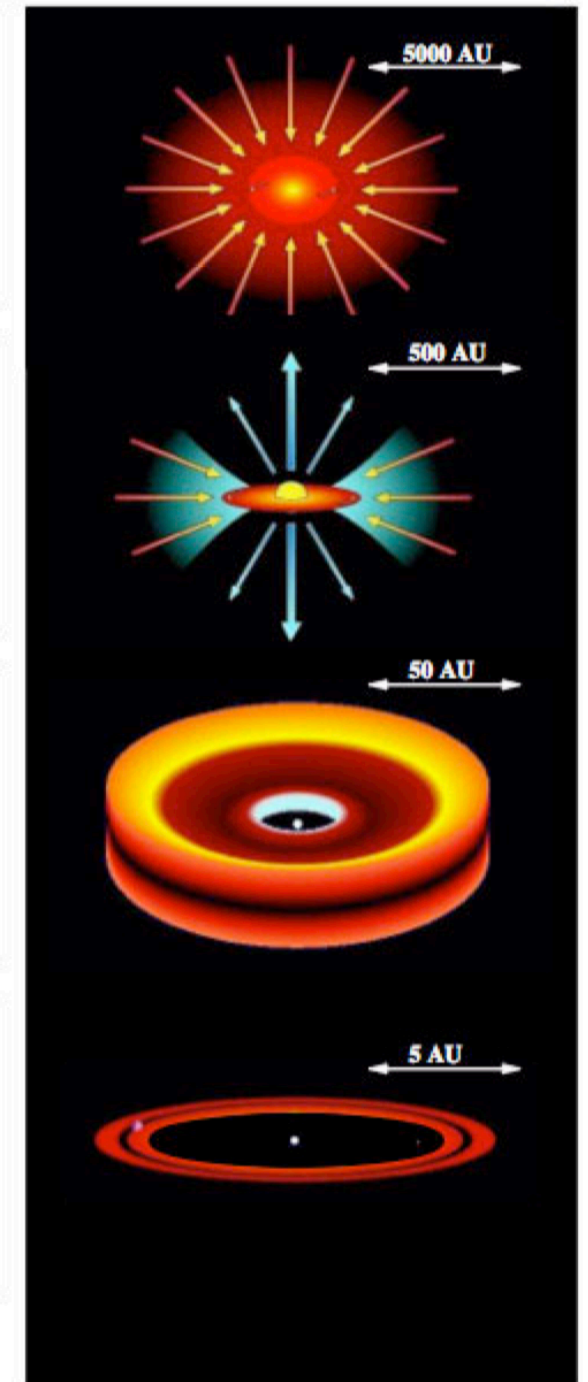
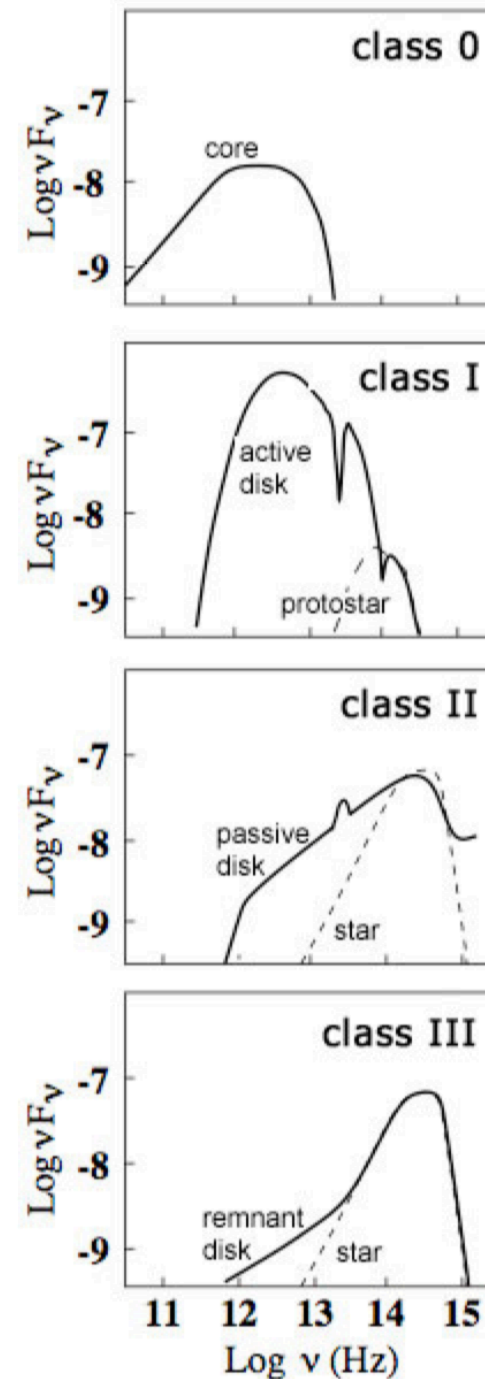
Table 1 Classification of young stellar objects

Class	SED slope	Physical properties	Observational characteristics
0	–	$M_{\text{env}} > M_{\text{star}} > M_{\text{disk}}$	No optical or near-IR emission
I	$\alpha_{\text{IR}} > 0.3$	$M_{\text{star}} > M_{\text{env}} \sim M_{\text{disk}}$	Generally optically obscured
FS	$-0.3 < \alpha_{\text{IR}} < 0.3$		Intermediate between Class I and II
II	$-1.6 < \alpha_{\text{IR}} < -0.3$	$M_{\text{disk}}/M_{\text{star}} \sim 1\%, M_{\text{env}} \sim 0$	Accreting disk; strong H $\alpha$ and UV
III	$\alpha_{\text{IR}} < -1.6$	$M_{\text{disk}}/M_{\text{star}} \ll 1\%, M_{\text{env}} \sim 0$	Passive disk; no or very weak accretion

- IR-based classification:  
Lada & Wilking (1984)
- Class I-II-III
- Spectral slope  
between 2 and 25  $\mu\text{m}$

$$\alpha_{\text{IR}} = \frac{d \log \nu F_{\nu}}{d \log \nu} = \frac{d \log \lambda F_{\lambda}}{d \log \lambda}$$

- Flat spectrum; Class 0
- CTTS / WTTS  
EW(H $\alpha$ )  $\sim 10 \text{ \AA}$



# Disk spectrum in integrated light : combined flux from rings of different temperature

