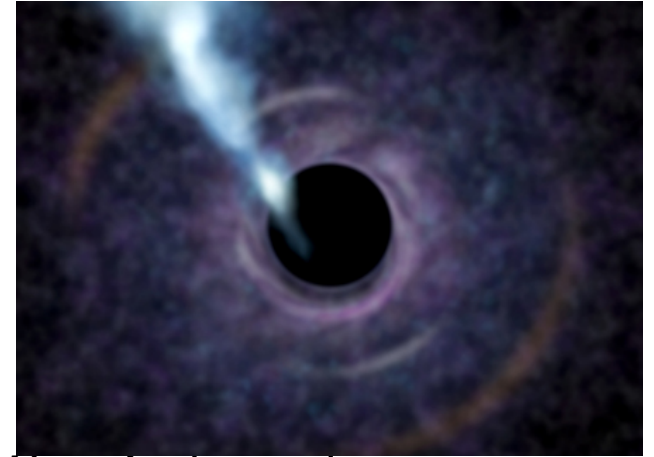
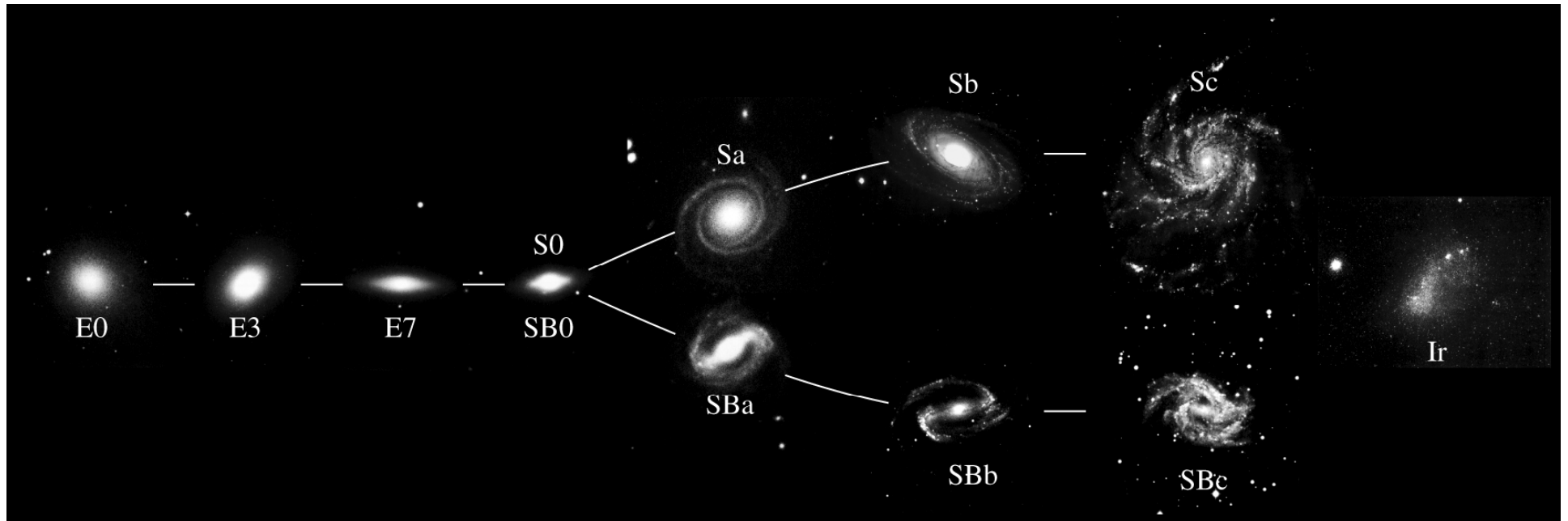


# What about the other galaxies?



- 3 major types:
  - Spiral (with and without central “bar”) - Milky Way, Andromeda,...
    - mostly larger ( $10^9 - 10^{12} M_{\text{sun}}$ , 5 - 100 kpc)
  - Irregular (similar, but not much structure) - Large Magellanic Cloud...
  - Elliptical (see next slide)
  - Probably all have central black holes

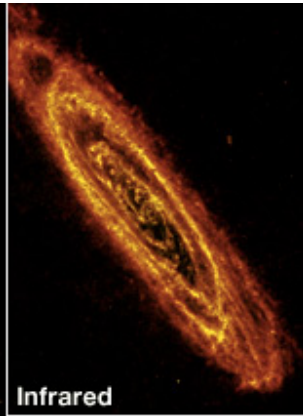




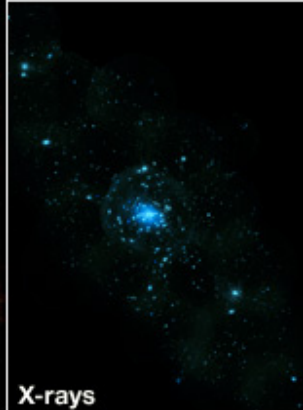
Visible



Infrared & X-rays



Infrared

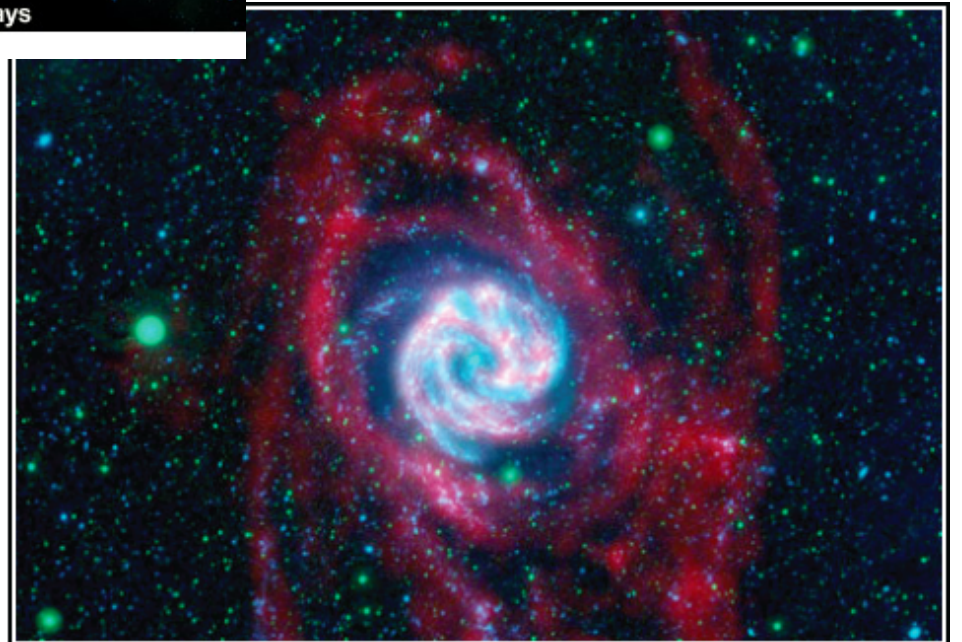


X-rays



Composite

Source: ESA/Herschel/PACS/SPIRE/J.Fritz,Ugent/XMM-Newton/EPIC/OM/W.Pietsch/MPE



# Elliptical galaxies

- Mostly structure-less, range from humongous (100's of kpc,  $10^{13} M_{\text{sun}}$ ) to tiny (globular cluster size; those are the most frequent)
- Tend to contain “older stars” (and therefore may be older themselves)
- Some gas and dust, but less than spirals
- Star motion mostly random, little correlated rotation
- “True” eccentricity can't be established easily - the most eccentric **observed** has  $\varepsilon = 0.7$  (but any given galaxy could be more eccentric than it appears)

