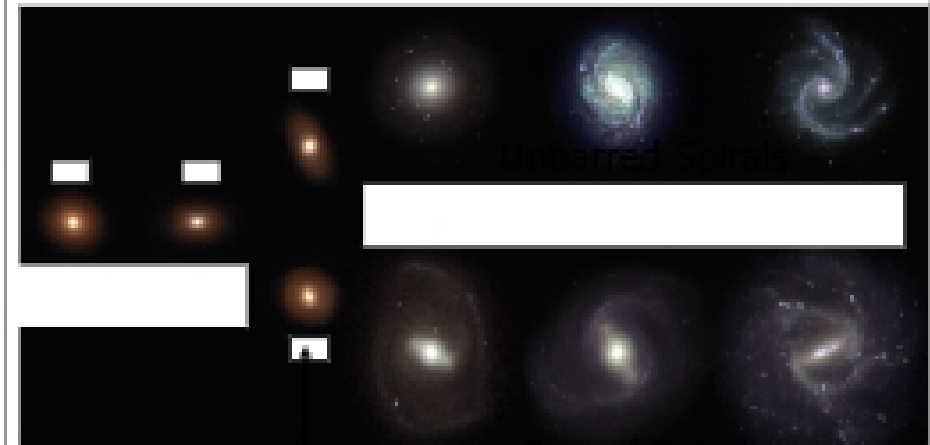


Questions of the Day

- What is the Hubble sequence, and how do the properties of galaxies vary along it?
- What determines the colors of galaxies?
- How can we measure the motions of stars and gas within galaxies?

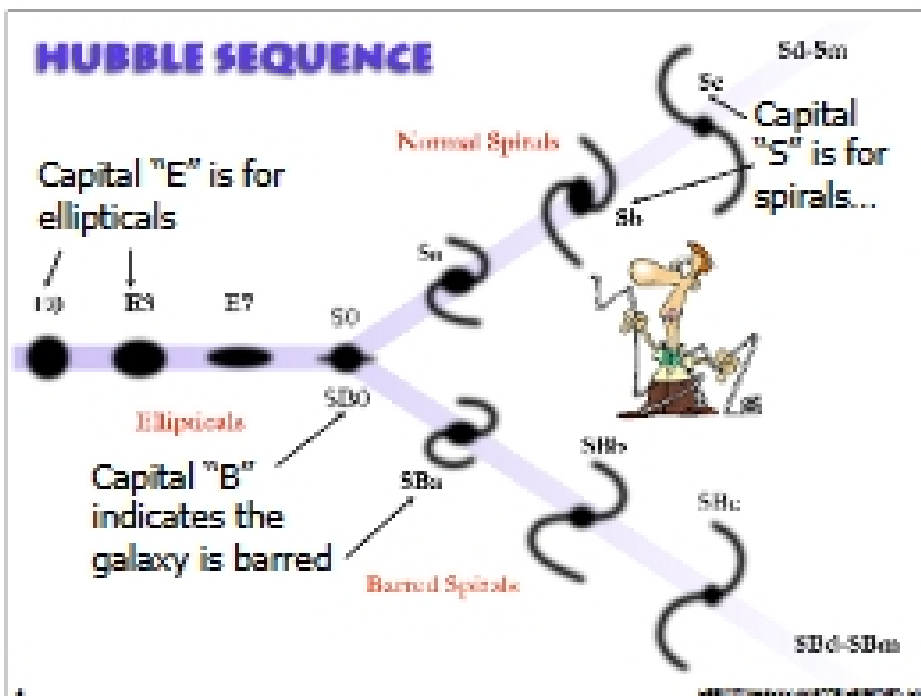
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The galaxy population can be organized into a sequence:

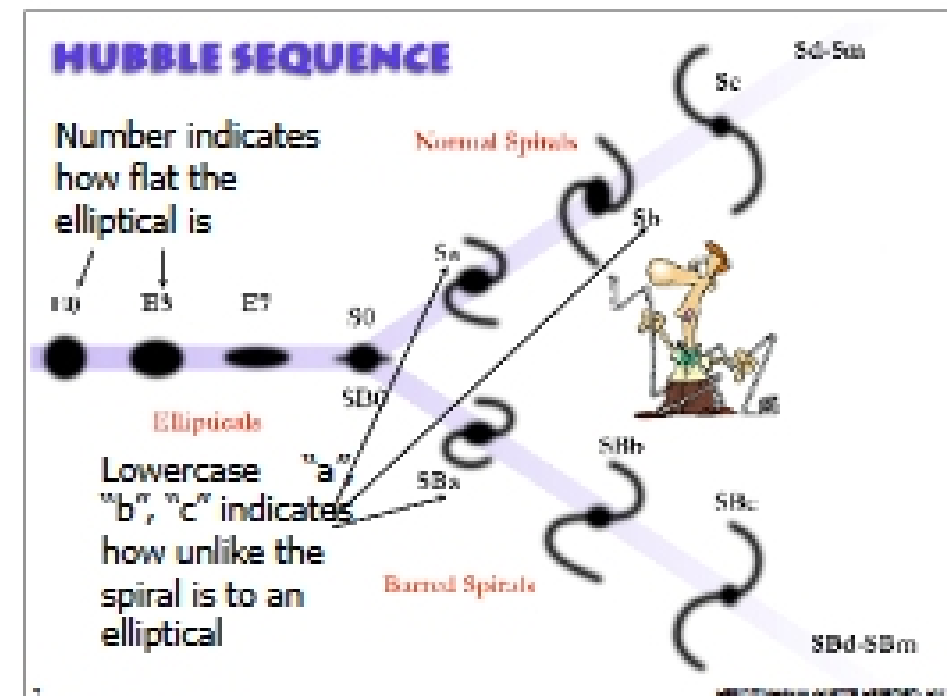


Ellipticals
Lenticulars
Barred Spirals

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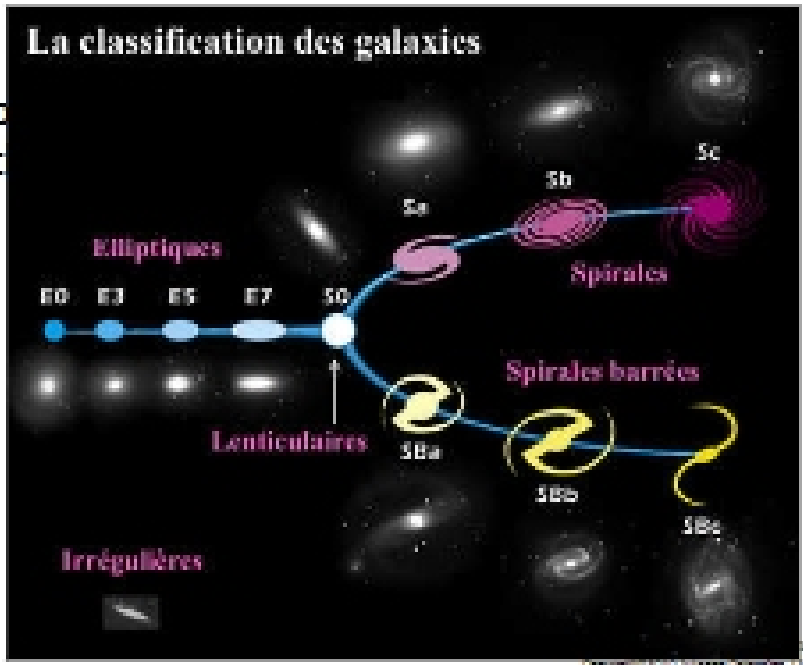
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And of
French

La classification des galaxies



The Hubble Tuning Fork with example galaxy images. The diagram shows a sequence of galaxy images corresponding to the Hubble types: E0, E7, S0, Sa, Sb, Sc, SBa, SBb, and SBc. The images show the morphological changes from smooth elliptical shapes to increasingly prominent and complex spiral structures.

1. "Bulge-to-Disk Ratio"
2. Lumpiness of the spiral arms
3. How tightly the spiral arms are wound

Early Types Late Types

larger bulge, less dusty gas, tighter spiral arms

rounder appearance

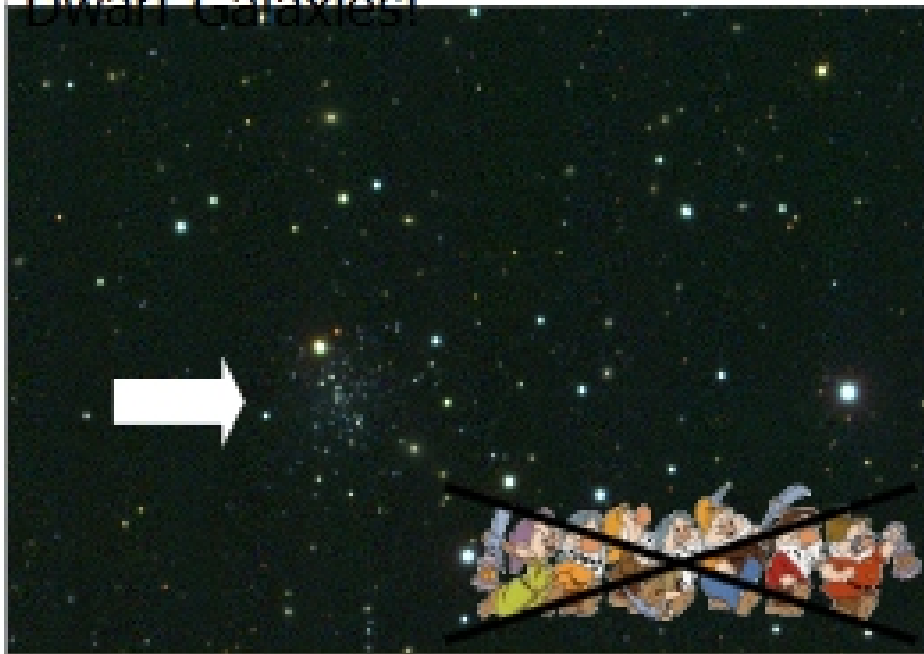
There are galaxies beyond the Hubble Sequence that continue this trend.

larger bulge, less dusty gas, tighter spiral arms

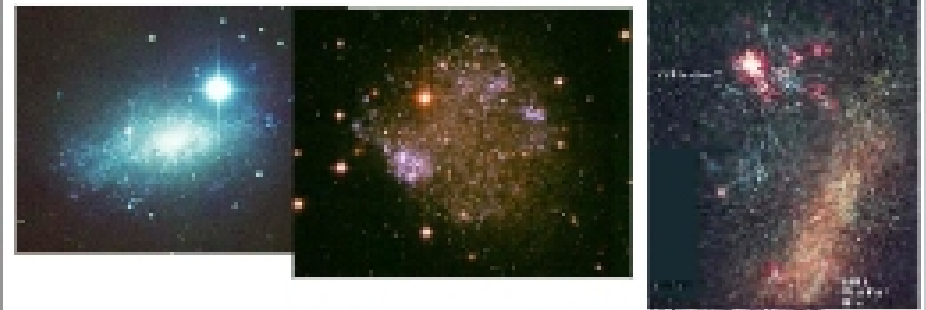
rounder appearance

???

Dwarf Galaxies!



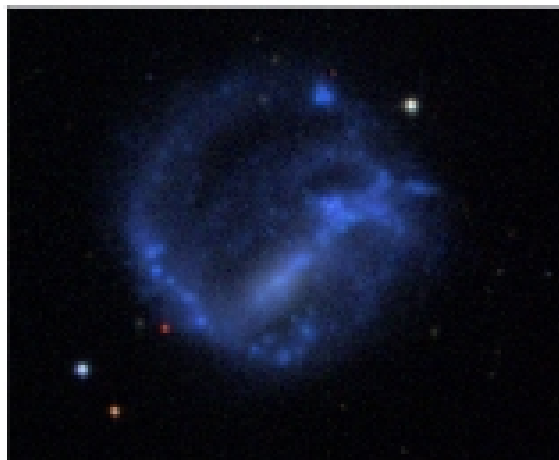
"Dwarf" or "Irregular" galaxies tend to have more chaotic appearances...



- Low mass (10^7 - 10^9 stars, vs 10^{10} for spirals)
- High star formation rates (usually)
- No obvious bulge or spiral patterns.
- Most numerous type of galaxy in the Universe!

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Dwarf galaxies from the Sloan Digital Sky Survey.



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Dwarf galaxies from the Sloan Digital Sky

