spiral galaxy example: ![NGC 6503](image1)

Milky Way: ![Milky Way](image2)

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**NGC 6503**

- **Halo**: The dotted line represents the halo component.
- **Disk**: The dashed line represents the disk component.
- **Gas**: The dotted-dashed line represents the gas component.

**Milky Way**

- **Halo**: The dotted line represents the halo component.
- **Disk**: The dashed line represents the disk component.
- **Bulge**: The dotted-dashed line represents the bulge component.

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Inner slope for sample of LSB galaxies:

\[ \rho \propto r^\alpha \]

constant density core

“NFW” profile, supported by numerical simulations

High mass-to-light ratios for dwarf galaxies:

**Figure 15.** Total mass-to-light ratios (in solar units) as a function of absolute magnitude for Local Group dwarf spheroidals. The red symbols represent the ultra-faint dwarfs from this paper (including Leo T, which is not really a dSph, and UMa II, which may be tidally disrupted, as an open red circle in the upper left). The open black squares represent all of the dSphs with previously-published kinematic data, including satellites of M31 as well as the Milky Way. The dashed gray lines are curves of constant dark matter halo mass ($1, 2, 4, 8 \times 10^7 M_\odot$ from bottom to top), assuming a stellar mass-to-light ratio of $2.5 M_\odot/L_{\odot, V}$. For the previously-known Milky Way dwarfs, we recomputed
COMA CLUSTER looks different in visible light (left) and in x-rays (right). In visible light, it appears to be just an assemblage of galaxies. But in x-rays, it is a gargantuan ball of hot gas some five million light-years across.
Gravitational lensing

Image credit: NASM, NASA (from LSST webpage)
The bullet cluster in visible light and in X-ray (red):

X-ray image along with gravitational potential (determined by gravitational lensing)