

Astro 129: week 9

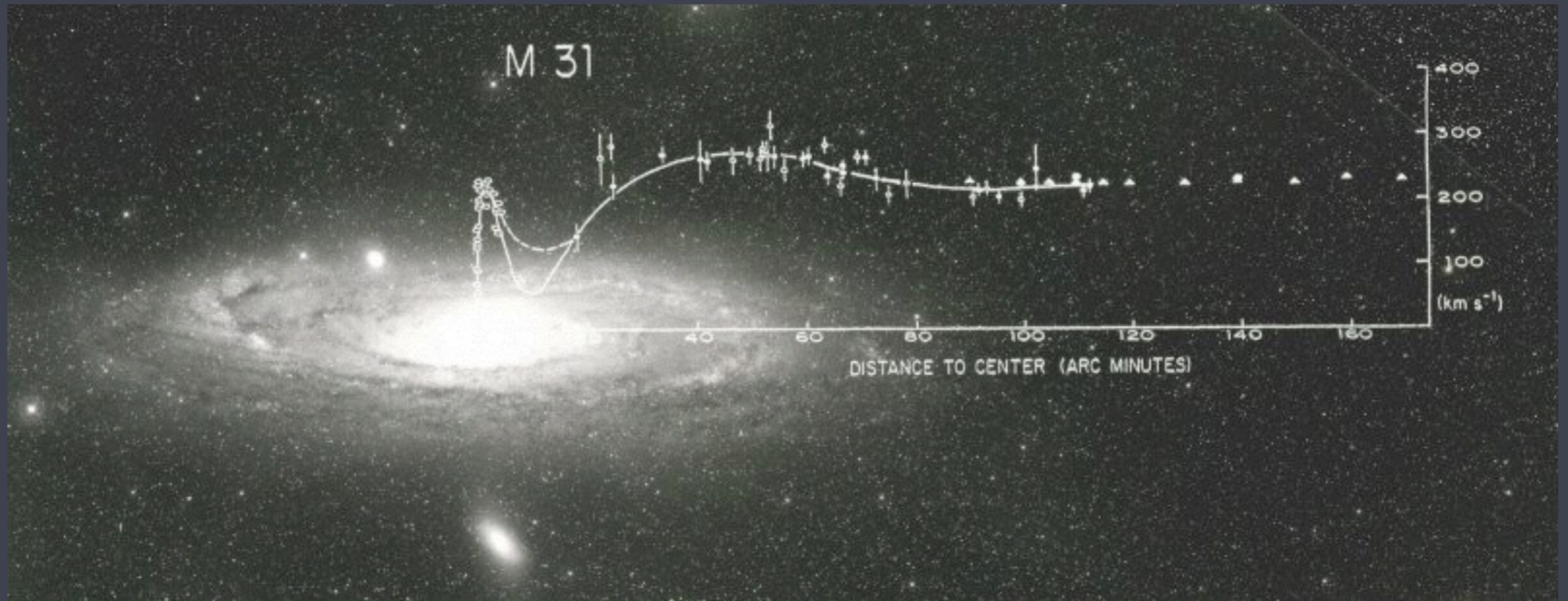
Wednesday, November 5, 2014

our neighbor galaxy Andromeda with a satellite galaxy *orbiting* it



the stars and gas in the galaxy orbit the center of mass in more-or-less circular orbits; the satellites move in the galaxy's gravitational potential, too; that gravitational potential is dominated by dark matter

Andromeda's rotation curve



Virgo cluster: nearest big galaxy cluster

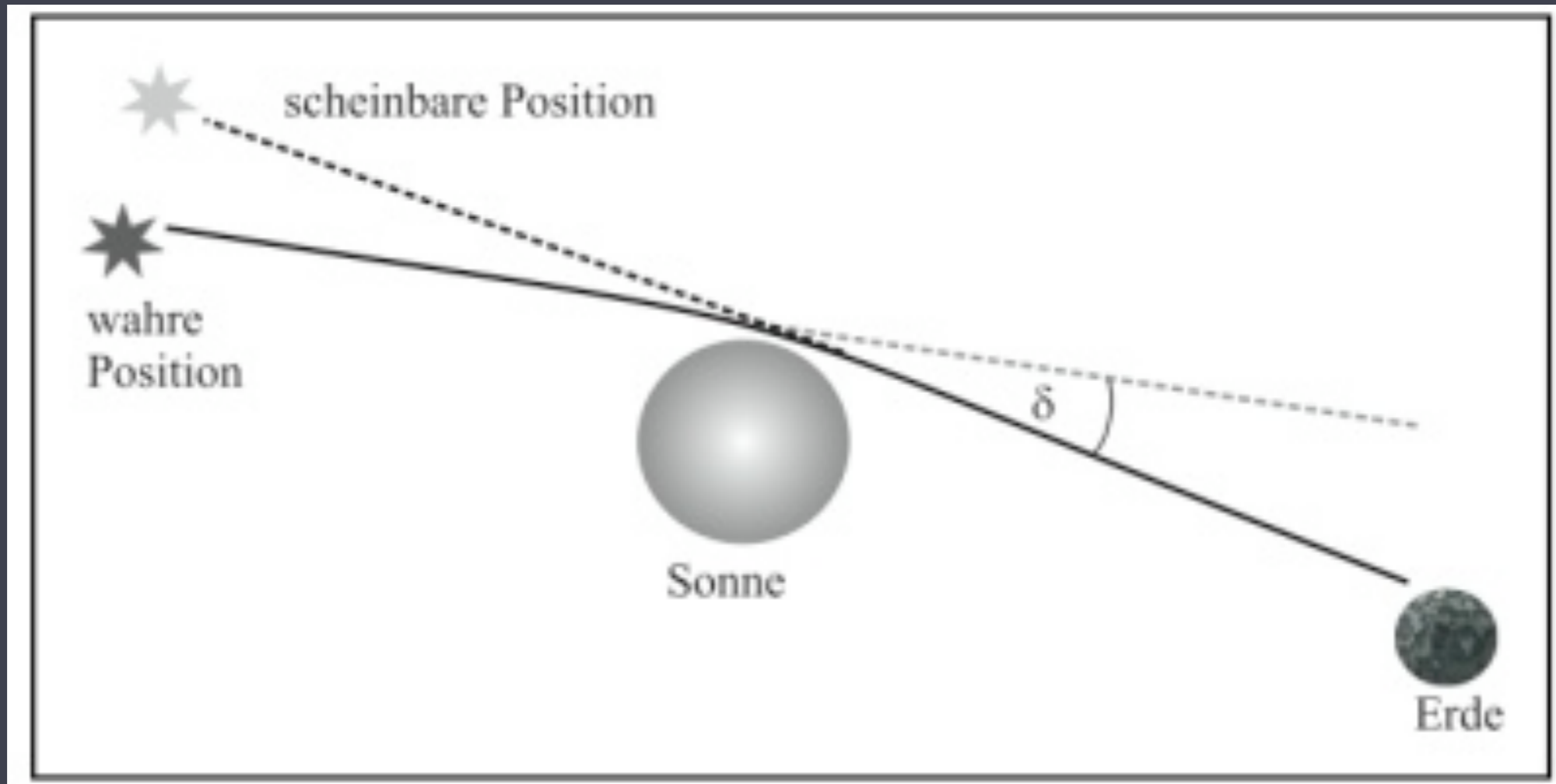


purple is x-ray emission from hot ($>$ million K) gas



most baryonic matter in the universe is this hot, cluster gas

mass (and energy) bends starlight that passes near it



galaxy clusters have a lot of mass...beyond even the
starlight from the visible galaxies



Gravitational Lens in Abell 2218

HST • WFPC2

PF95-14 • ST ScI OPO • April 5, 1995 • W. Couch (UNSW), NASA

the distribution of the mass as well as the total amount of mass can be deduced from the amount of lensing

