Pluto and Its Neighbors

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Current Tools
Current Tools
The Science (or Art) of Astronomy

- Unraveling the mysteries of distant objects
- What would it be like to be on Pluto?
- What else is out there?
Discovery Techniques

- The human eye
- Photography
- Electronic detectors
- Computers
Jan 23, 1930
Jan 29, 1930
Searching for NH target
Searching for NH target
Searching for NH target
Best Images of Pluto
Current Best Map
Earth-Moon
Pluto-Charon
NEWS ITEM: ASTRONOMY PANEL VOTES TO KEEP PLUTO ON PLANET LIST...
What Is A Planet?

- Too small to burn like a star
- Enough gravity to make it spherical
What Is A Double Planet?

- Two planets in orbit around each other.
- Center-of-gravity located outside the surface of both bodies.
What Is A Double Planet?
The Interior of Pluto

Rock
Ice (mostly $H_2O$)
Skin of $N_2$, $CH_4$, dirt and tar
Surface of Pluto

- Bright
- Mostly $N_2$ (nitrogen frost)
- Methane ($CH_4$) frost
- Carbon monoxide (CO) frost
- Frozen water ($H_2O$)
- Dark red stuff (frozen-smog)
Atmosphere of Pluto

- Very thin (million times less than Earth)
- Extended because of Pluto’s low gravity
- Mostly $N_2$ (nitrogen, just like Earth)
- Some methane ($CH_4$)
- Possible thin haze
Atmosphere comparison

**Earth**
- 1 bar
- N₂, O₂, CO₂, H₂O
- 300K
- Locally Dynamic
- Stable

**Pluto**
- 0.000001 bar
- N₂, CH₄, CO
- 40K
- Globally Dynamic
- Unstable
Sun from Earth and Pluto
Family portrait (revised)
Seasons on Pluto

- 240 year orbit around the Sun
- Distance to Sun changes dramatically
- Rotational axis tipped over
- Atmosphere may collapse in winter
Seasons on Pluto
Triton
Triton
New Horizons

- First visit to the Pluto system
- Visit beyond to a more distant Kuiper Belt object
- Launch 2006
- Arrival at Pluto in 2015
Primary Mission Goals

- Characterize the global geology and morphology of Pluto and Charon
- Map surface composition of Pluto and Charon
- Characterize the neutral atmosphere of Pluto and its escape rate