What do you observe?

Please write down observations and submit. (Don’t forget your name.)
You’ve just finished the AY5 Galaxy Inquiry!

What are you going to do next?

Friday, June 27, 2008

Ryan Montgomery,
David Lai & Liz McGrath
Random walk through astronomy images…

Using what we learned in the inquiry…
NGC1672

(HST)
Cartwheel Galaxy

Mergers!
Another Merger Movie

(Patrik Jonsson, Greg Novak, UCSC)
Our Milky Way and nearby Andromeda galaxies may look like this in future.
NGC4676: “The Mice” (HST)
NGC 4038 & 4039: “The Antennae” (HST)
Milky Way Interaction

- “Interaction” is a mild form of “merger.”
- Amazingly warping Milky Way disk

(Leo Blitz, UCB; images: sciencedaily.com and astronomy.com)
M87: Typical Elliptical

(SDSS)
M87 and its jet?
Multi-Wavelength Jet
Moving Jet

Time...
another dimension of astronomical imaging.

(John Biretta, Space Telescope Science Center)
Crab Nebula and Pulsar

A pulsar is the end state of a very massive star.

The supernova was visible with the naked eye on Earth, and Chinese astronomers recorded the event on July 4, 1054 AD.

Historical observations are important in astronomy.

(HST and Chandra)
Jets in Motion
What do you see?

(Hubble Heritage)
IC418: Planetary Nebula

- Total misnomer!
- Planetary nebulae are end states of low-mass stars.
  - Like our Sun.
- No formal classification scheme.
Projection Effects

Cat's Eye Nebula

Eskimo Nebula

NGC2346 (Care to name it?)

Hourglass Nebula

(Hubble Heritage)
Ring Nebula

Green is oxygen.

Red is nitrogen.

Colors indicate chemical elements of gas.

Blue is helium.

...and at the very center, the white dwarf, future of our Sun.

(Hubble Heritage)
Eagle Nebula

- Star forming regions
- Dense, cold gas and dust
- These are more like “planetary nebula.”

(Hubble Heritage)
Planetary Disks

- Cold, dense gas and dust shrink
- Get denser, spin faster
- Center forms star
- Remaining material flattens to disk
- Form planets

(APOD; HST)
Simulation of Planetary Disk

(N-Body Shop, U. Washington)
Back to Disks…

… galactic disks!

• **Formation of Milky-Way-like galaxy**

(N-Body Shop, U Washington; YouTube)
1) Galaxies (inquiry)

2) Spirals

3) Mergers
- Major (movie)
- Minor (Cartwheel)

4) Jets
- M87

5) Nebulae
- Birth
- Death
- Supernova
- Pulsar
- Planetary Nebulae
- White dwarf

6) Disks

Evolution (time)