Fun Internet Resources and the Galaxy Zoo

Hands-On Activity Resources


• Nebraska Astronomy Applet Project (fun online experiments) http://astro.unl.edu/naap/
Educational Resources

• Astronomical Society of the Pacific: http://www.astrosociety.org/education/resources/resources.html
• Ask an Astrophysicist: http://imagine.gsfc.nasa.gov/docs/ask_astro/ask_an_astronomer.html
• NASA Quest challenges (web based interactive projects): http://quest.arc.nasa.gov/
• Astronomy Picture of the Day: http://antwrp.gsfc.nasa.gov/apod/
NASA Educators Page

• Teaching materials broken down by grade level
• Fun images
• Kids’ Club
• http://www.nasa.gov/audience/foreducators/index.html
Minorities in Science

• The Faces of Science: African Americans in the Sciences:
  https://webfiles.uci.edu/mcbrown/display/faces.html
• Minorities in Science: Guide to Reference Resources:
  http://www.lib.lsu.edu/hum/mlk/srs119.html
Women in Astronomy

• A resource guide to prominent women in astronomy in the past and present (requires some legwork): http://www.astrosociety.org/education/resources/womenast_bib.html

• Brief biographies of some prominent female astronomers: http://astro.berkeley.edu/~gmarcy/women/history.html
Astronomy vs. Astrology

• Astronomers do not study horoscopes!
• Discussing the difference between the two fields can be useful for explaining the scientific method
• A fun and clear website explaining the difference between astrology and astronomy:
Just for Fun

• A discussion of misleading science in movies:
  http://www.badastronomy.com/bad/movies/index.html

and tv:
  http://www.badastronomy.com/bad/tv/index.html
The Galaxy Zoo

• Over a million galaxies
• Sloan Digital Sky Survey (SDSS)
  – 2.5m Robotic telescope in New Mexico
• http://www.galaxyzoo.org/how_to_take_part
• Other projects related to SDSS:
  – Range of grade levels
The Galaxy Zoo: Science!

- World’s largest database of galaxy shapes
  - Shifted astronomer’s assumptions of color and shape
- Determined that there is no preferred direction for galaxy spirals
- Bizarre and unexplained objects!
  - Hanny’s Voorwerp
Types of Galaxies

• Elliptical
  – E0 (circular) to E7 (flattened)
• Spiral
  – Bulge, disk, halo
  – Ordinary (S) vs. Barred (SB)
• S0 between E7 and Sa
  – Have bulge, disk, no spiral structure
• Irregular
Types of Galaxies

M87 E1

M100 Sc
Types of Galaxies

NGC 3351 SBb

LMC Irregular
Classifications

- Shape
  - Smooth or with Features?
  - How Round?
  - Edge on?
  - Bulge at center?
  - Spiral pattern? How tight? Number of Arms?
  - Bar feature through center of galaxy?
  - How prominent is the bulge?
  - Irregularities?

- Color

- Direction of Spiral
Getting Started

- http://www.galaxyzoo.org
- http://www.galaxyzoo.org/how_to_take_part
Getting Started
Classifications

Smooth

Features

Star or Artifact
Classification

Round

In Between

Cigar
Classification – Edge On?

YES

NO

YES

YES
Classification

- Rounded
- Boxy
- No Bulge
Classification – Spiral Pattern?

YES

YES

NO

YES
Classification – Tightly Wound?

Loose

Tight

Medium

Medium

Loose
Classification
Classification – Central Bar?

Bar

No Bar

No Bar
Classification – Bulge Prominence

Just Noticeable

No Bulge

Obvious

Dominant
Classification – Odd Features

Merger

Ring

Irregular

Lens / Arc
Experiment and Explore!