Fun Internet Resources and the Galaxy Zoo

http://www.astronomy.ohio-state.edu/~denney/InquiryAstronomyLessons/index.html

Hands-On Activity Resources

- Astronomical Society of the Pacific: http://www.astrosociety.org/education/activities/handson.html
- 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: http://www.astrosociety.org/education/astro/act3/astrology.html

Just for Fun

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

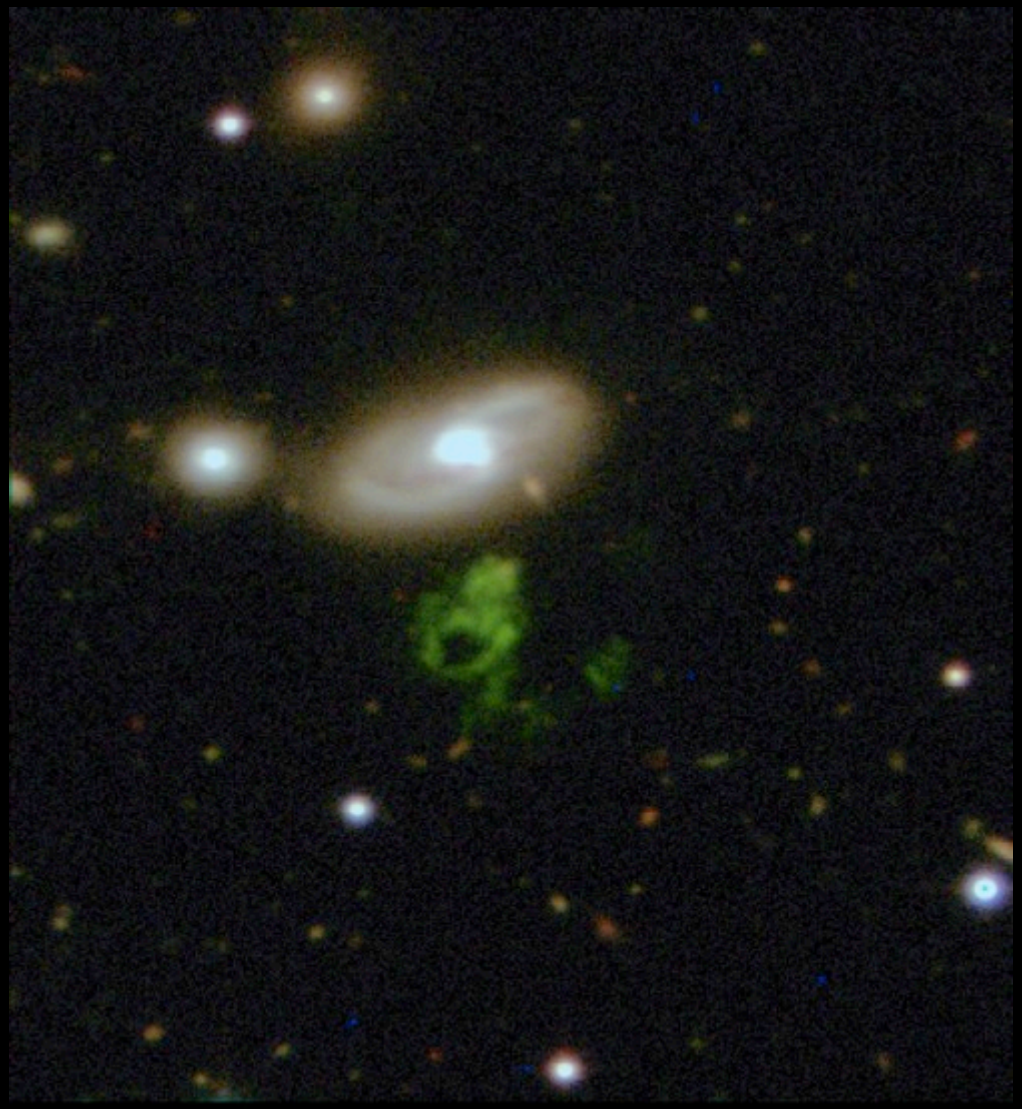
  and tv: http://www.badastronomy.com/bad/tv/index.html

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: http://cas.sdss.org/dr5/en/proj/teachers/
  - Range of grade levels

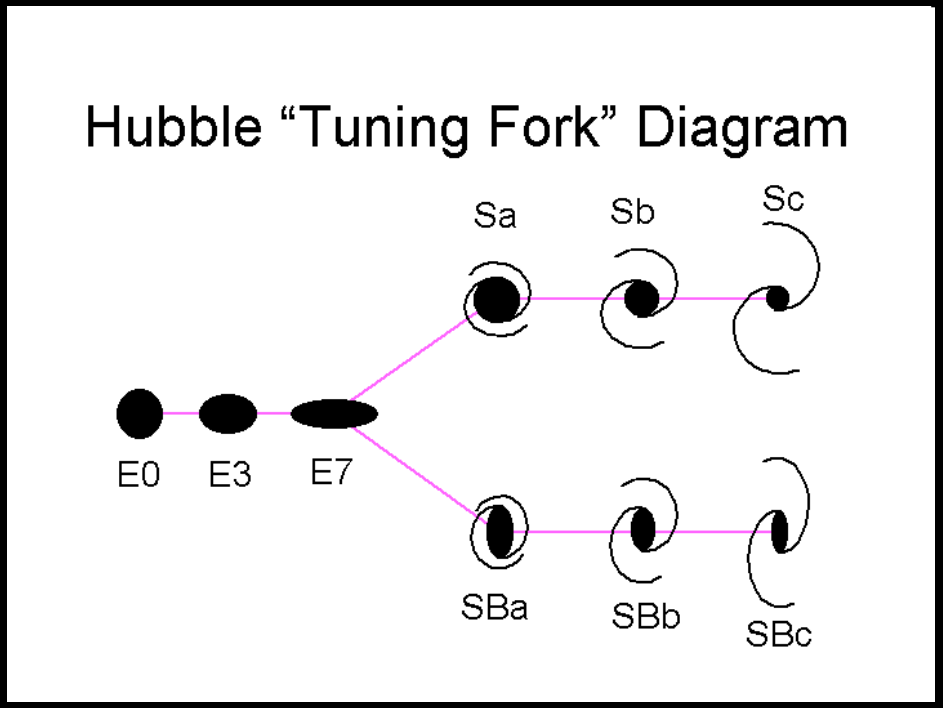
The Galaxy Zoo: Science!

- 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

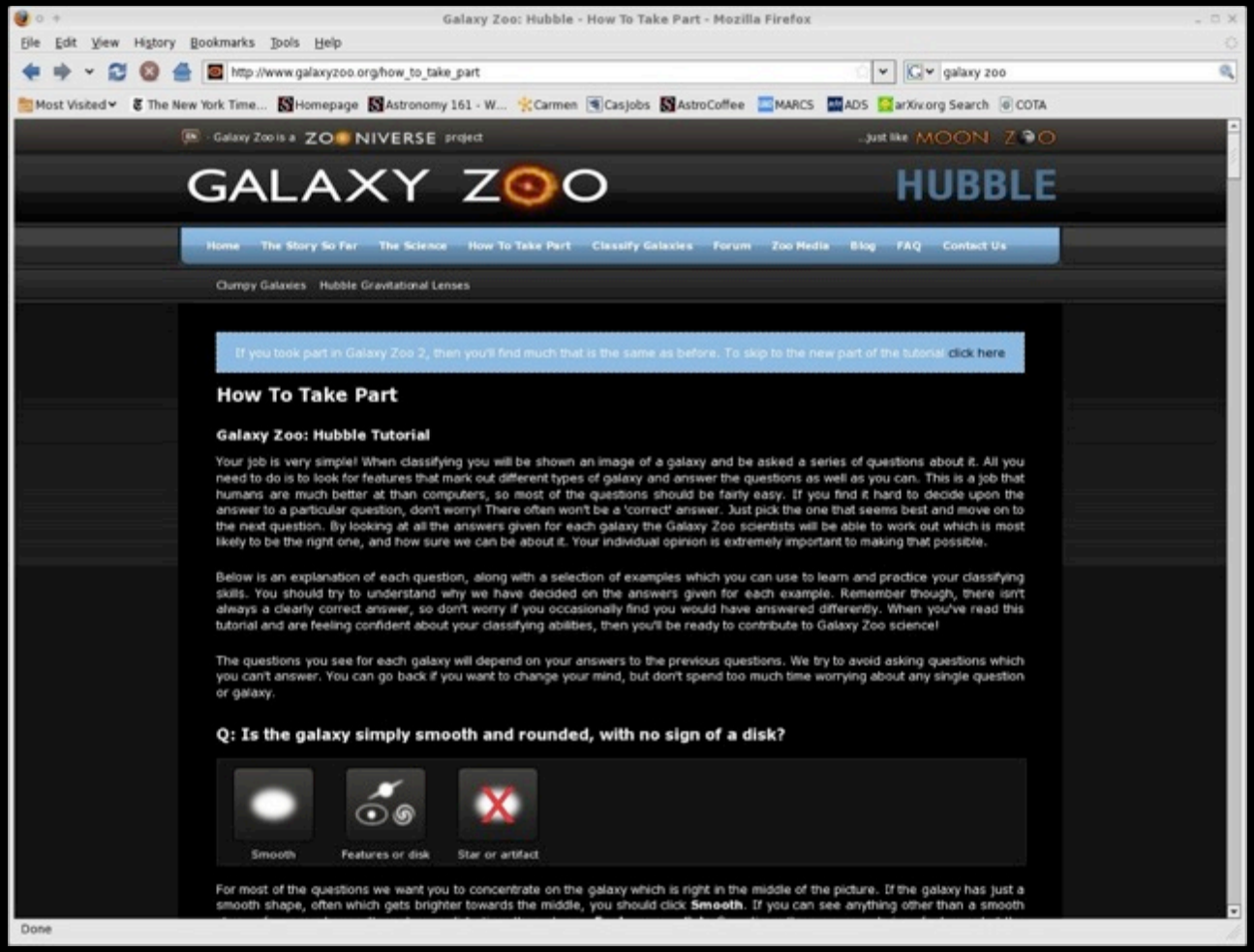
NGC 3351 SBb

LMC Irregular

Classifications

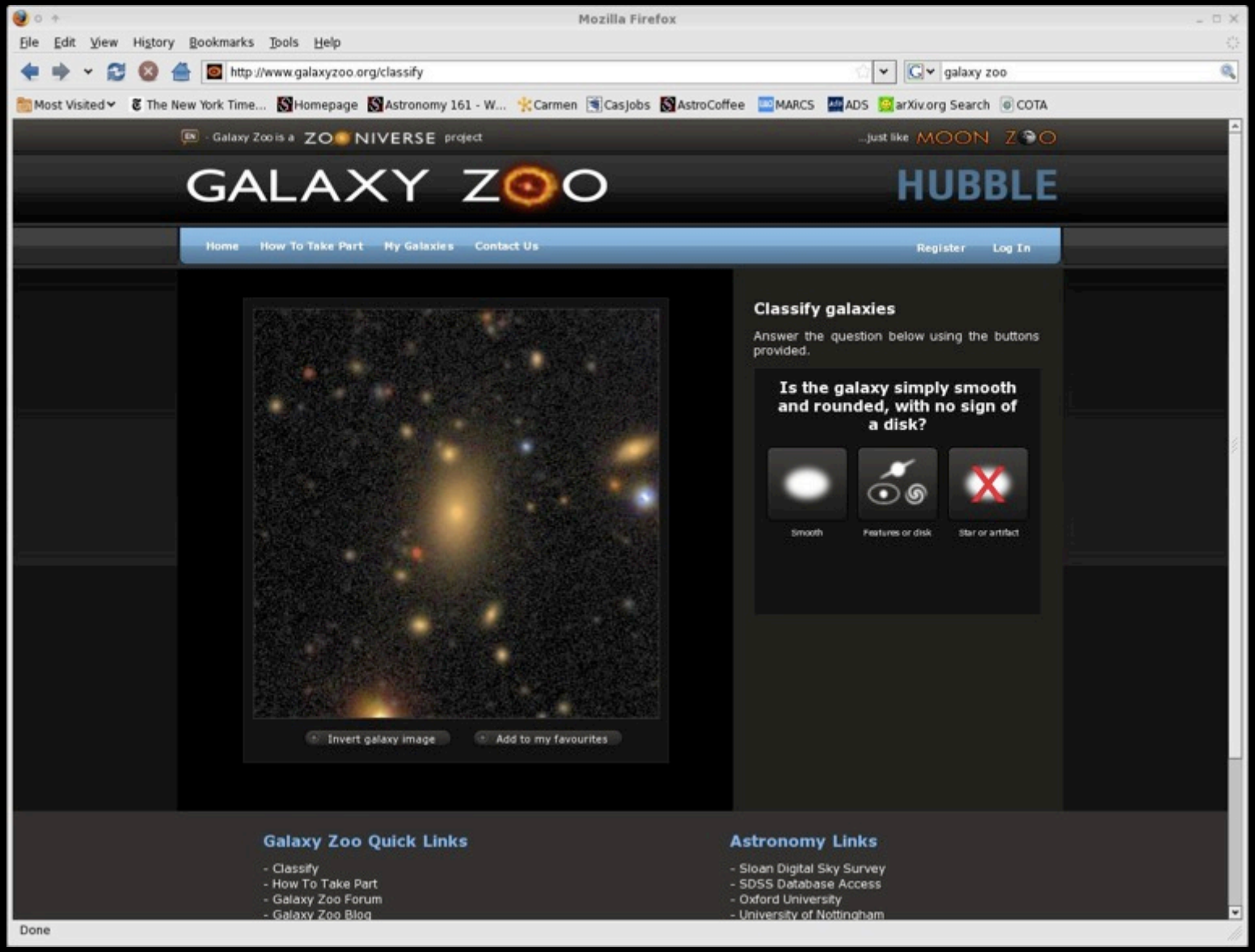
- Shape
  - Smooth or with Features?
  - How Round?
  - Edge on?
  - Bulge at center?
  - Spiral pattern? How tight? Number of Arms?
  - Bar feature through center of galaxy?
  - How prominent is the bulge?
  - Irregularities?
- Color
- Direction of Spiral

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

Classification

Rounded

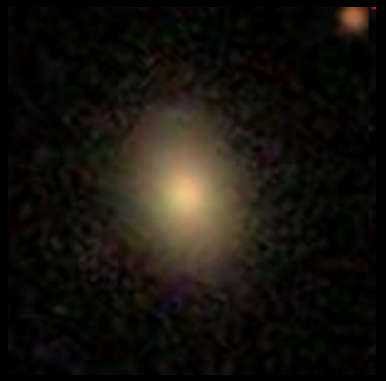
Boxy

No Bulge

Classification – Spiral Pattern?

YES

YES



NO

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!