April 17, 2017 Physics 132 Prof. E. F. Redish

- **Theme Music:** Lea Salonga
  Reflection (from Mulan)
- **Cartoon:** Pat Brady
  Rose is Rose

Outline

- Quiz 10
- The ray model of light
- Mirrors
- Puzzles with light

Laser: can you see the beam?

Foothold Ideas 1:
The Physics

- Certain objects (the sun, bulbs,…) give off light.
- Through empty space (or ~air) light travels in straight lines.
- Each point on an object scatters light, spraying it off in all directions.
- A polished surface reflects rays back again according to the rule: *The angle of incidence equals the angle of reflection*.

Foothold Ideas 2:
The Psycho-physiology

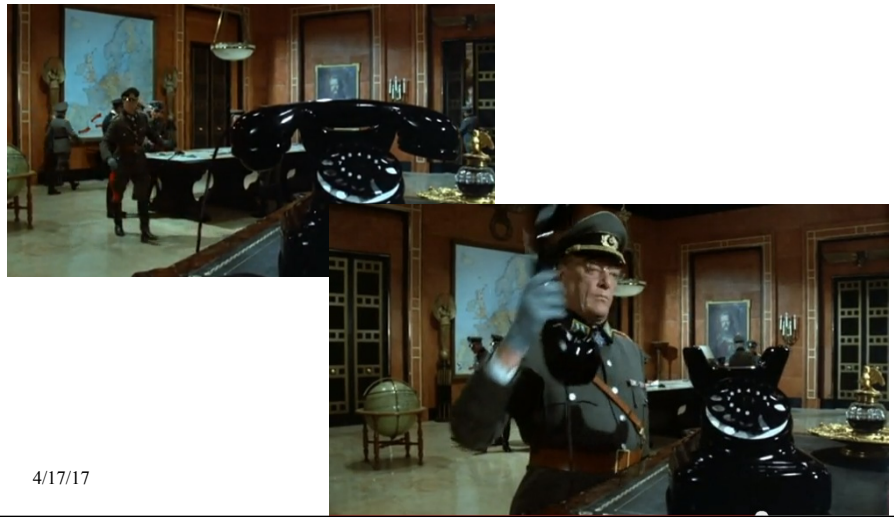
- We only see something when light coming from it enters our eyes.
- Our eyes identify a point as being on an object when rays traced back converge at that point.
  - (We use other clues as well – and some people's brains do not merge binocular vision.)

Implication

- You can't see light!
- If I shine a laser beam at the wall what will you see?

Top Secret

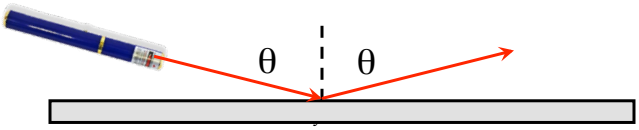
- https://www.youtube.com/watch?v=5SA9aYpTW2g (1 minute into trailer)



Foothold Ideas 3: Mirrors

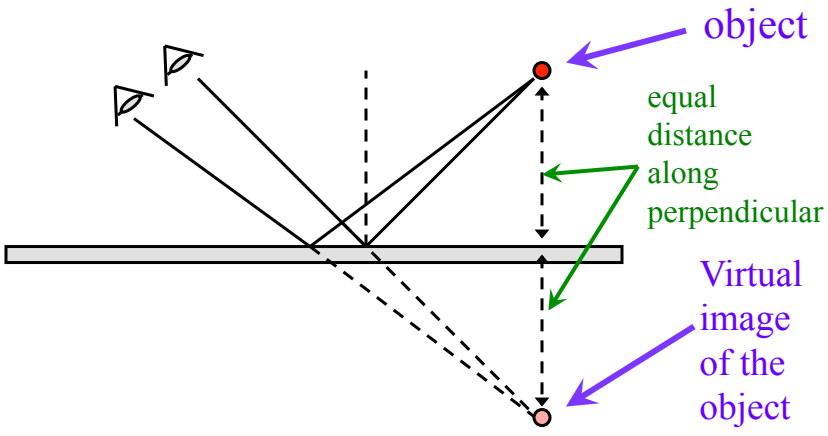
- For most objects, light scatters in all directions. For some objects (mirrors) light scatters from them in controlled directions.

- A polished surface reflects rays back again according to the rule: *The angle of incidence equals the angle of reflection*.



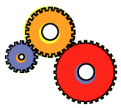
4/17/17 **11**

Where does an object seen in a mirror appear to be?



4/17/17 Physics 132 **12**

Kinds of Images: Virtual



- In the case of the previous slide, the rays seen by the eye do not actually meet at a point – but the brain, only knowing the direction of the ray, assumes it came directly form an object.
- When the rays seen by the eye do not meet, but the brain assumes they do, the image is called *virtual*.
- If a screen is put at the position of the virtual image, there are no rays there so nothing will be seen on the screen.