Mirror Reflection
Goals

• Be prepared to implement mirror-reflective surfaces in the ray tracing framework.
Diffuse Reflection

• Quite physically accurate for Lambertian surfaces

• Many surfaces are (close to) Lambertian

• Many others aren't!
Let's talk shinies.
Let's talk shinies.

How does a mirror interact with light?
Mirror Reflection

What does a camera see when it looks at a mirror?
Mirror Reflection

What does a camera see when it looks at a mirror?
Mirror Reflection

What does a camera see when it looks at a mirror?

Can we do this using the tools we already have?
Mirror Reflection

What does a camera see when it looks at a mirror?

Calculate $\vec{r}$:

$$\vec{r} = -\vec{v} + 2(\vec{v} \cdot \vec{n})\vec{n}$$

```
mirr_ray.origin = x
mirr_ray.direction = r
```
Mirror Reflection

What does a camera see when it looks at a mirror?

Calculate \( \vec{r} \):

\[
\vec{r} = -\vec{v} + 2(\vec{v} \cdot \vec{n})\vec{n}
\]

```python
mirr_ray.origin = x
mirr_ray.direction = r
color = traceray(scene, mirr_ray):
```
function traceray(ray, scene):
    t, rec = find_intersection(ray, scene)
    if rec.obj is a mirror:
        compute $r$, the reflection direction
        mirror_ray = Ray(rec.x, r)
        return traceray(mirror_ray, scene)
    # other cases, ...