Phong

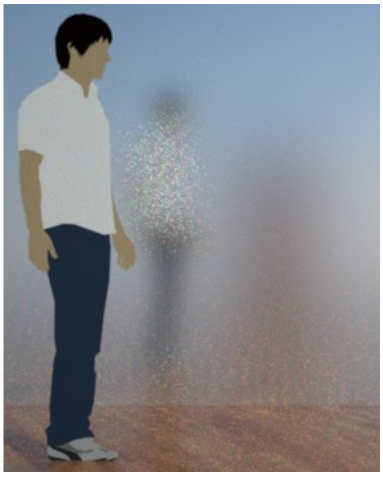
The majority of surfaces around us have some shine on them, just some more than others. If you look around, nearly every object you see has some sort of reflection or a highlight. If your render is looking like a bunch of cardboard cut-outs, it's time to make things shiny!

The most common way of doing this is using the **Phong** material type because it adds reflections and highlights to a surface. There are two important controls when using Phong: **Exponent** and **IOR (Index of refraction).** The **exponent** controls how rough a surface is (or how sharp the reflection is, if you want to look at it that way): a mirror is very smooth with a sharp reflection so has a very high exponent, and a painted wood door is quite rough with a very blurred reflection so has a low exponent.

The **IOR** controls how much light is reflected by the surface, so again a mirror reflects a lot of light and so has a high IOR, while the door is quite low.

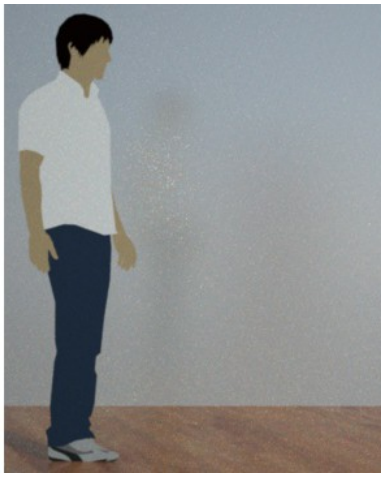
Here are 4 examples modelled on the wall behind John.

Exp: 100,000 IOR: 20



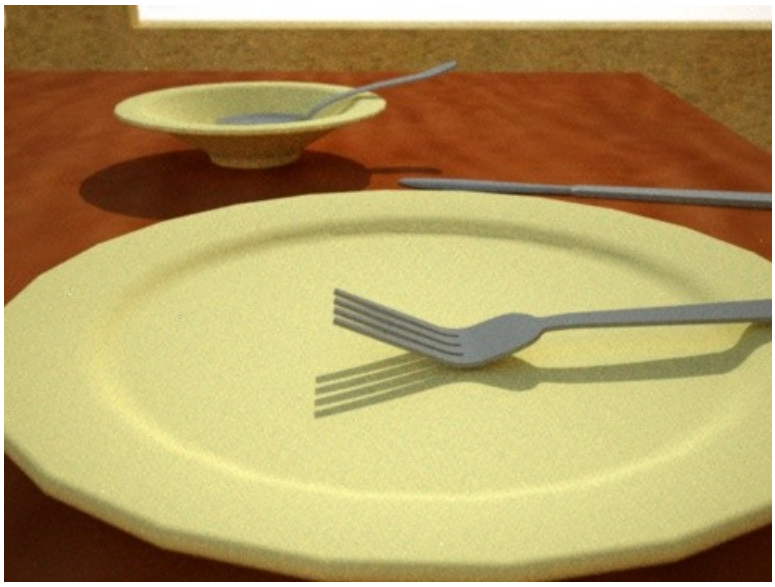
Exp: 500 IOR: 20

Exp: 100,000 IOR: 3



Exp: 500 IOR: 3

Now to put that into practical terms, here is an example:



All materials are default diffuse.

Phong'd up

Notice the highlights and reflections on most materials. Even the table has a soft reflection because it is varnished wood, with a low IOR and exponent. The plates on the other hand have a high exponent, giving the sharp highlight, but a low IOR because they don't give off a lot of light. The cutlery is metal which has a sharp highlight and reflects a lot of light so has a high exponent and mid IOR.