

Telescopes, an introduction

If you've been reading through the entire blog, you will notice I talk about my family and telescopes. I will try to make the titles very specific, so you will know what you are going to be reading...

Eventually, I will answer the question: "What telescope should I get?" For now I want to talk about various kinds of telescopes. There are really only two types of telescopes. If you're a die-hard astronomer, just wait. This is for beginners. ☐

There are telescopes that use lenses (called refractors) and those that use mirrors (called reflectors). The refractors are the telescopes most people think of. A pirates spyglass, 1/2 of a binocular are examples of refracting telescopes. Reflectors are generally the big boys. Most observatory telescopes are now reflectors of one type or another. The space telescope is a reflector.

Now for some there is a third group of telescopes that combine the mirrors and the lenses. I don't differentiate in that manner. I will admit there are different types of reflectors. Some have corrector lenses somewhere in the light path that correct different deficiencies in the mirrors. More on that in a latter post. Lets just say that all telescope types have there problems, and various ways are used to correct those problems.

Now more on the introduction. The first telescopes were refractors. But the strength of any telescope is how much light it can take in. Refracting telescopes with big front lenses get very big and awkward quickly. And there is also a limit as to how big you can make a piece of glass and only support it on the edge. So some bright people invented reflecting telescopes. Theoretically, there is no limit as to

how big you can cast a mirror because it is supported across the entire back. In practice, once a mirror gets too big, it is very hard to support in something that can move and take in the entire sky. And glass does have a problem with deforming under stress, and big mirrors under gravity are under stress.

The biggest refracting telescope is in the Chicago area at the Yerkes observatory. The main lens is 40 inches across. The largest reflecting telescope in operation is the 11 meter scopes in South Africa. The largest telescope in the United States are the twin 10 meter scopes on Mauna Kea in Hawaii. The largest in the mainland US is the 9.2 meter Hobby-Eberly Telescope in Texas. And finally in Ohio the largest telescope is the the 1 meter (39 inch) at the University of Toledo.

I have a family connection with the telescope in Toledo (and others around the world), my father was a quality control manager at Owens-Illinois and this was one of the mirrors he over saw the production of.

More later