The Otter Creek Astronomical Observatory

The Observer

July 2007 (#9)

WE'RE OPEN AGAIN! On July 1, 2006 the observatory closed for overhaul and installation of new equipment. We removed our 10-inch Meade SCT and its mount and replaced it with a 6-inch refracting telescope with a custom-fabricated mount. The observatory re-opened for Daytime (Solar) programs in October 2006. Night programs were not offered while the work continued, both for the safety of our visitors and for the safety of equipment. We closed again completely in May and June of 2007 to make a final push to finish this project. Now the project is done and as of July 1, 2007 the observatory is back in action, offering both day and night programs, with all telescopes operational!

Evening Programs:

July 7, August 18, September 15, October 20

Join the observatory staff for a tour of what is visible in the night sky, including the moon, stars, and planets. *All evening programs are "weather permitting"--if the sky is not clear enough for celestial objects to be visible the observatory will not be open. Evening programs begin at sunset.*

Daytime (solar) Programs:

July 28, September 8, October 6

Daytime programs are "open house" at the observatory. Come safely observe of the Sun, with its prominences and sunspots. Walk the model solar system trail and get a sense of the size of things in space. Check out our telescopes and learn about the observatory -- after all, you can't really see what's in the observatory when it is dark. *Daytime programs are held "rain or shine"--the observatory is open regardless of weather. Daytime programs begin at 11 AM Eastern Time.*

Visit the Otter Creek Observatory web page at

www.ottercreekpark.org

The refractor telescopes at the Jefferson Community & Technical College & Otter Creek Park Astronomical Observatory were complete and saw "first light" on June 26, 2007, with observations of Venus, the Moon, and Jupiter.

Some highlights of the refractors:

- ☑ The telescope system consists of a 6-inch[*] f18[†] refracting[‡] telescope with a 4-inch f15 refracting telescope mounted alongside it. The paired telescopes are designed to give members of the public side-by-side views of celestial objects at both higher and lower magnifications.

- ☑ The telescope system was constructed "from scratch", using resources of both Jefferson Community & Technical College and Otter Creek Park. The only commercially produced parts in the telescopes are the lenses and the focusing mechanisms.

- ☑ The mount mechanism was constructed by a team of mechanical engineering students from the University of Kentucky who built it as their senior design project. The team leader was Jefferson Community & Technical College alumnus Mark Bennett. It was built entirely of scrap material. Additional work on the mount was done by Samtec engineer Henry Sipes who volunteered his time and expertise to the project and by Jefferson physics professor Chris Graney.

- ☑ The hexagonal wooden tube for the f18 telescope was constructed with the aid of Grant Gamble of Jefferson's wood products program, using wood products program equipment. The rest of the f18 was constructed by engineering professor Mark Wright of Jefferson, Otter Creek Park Naturalist Bryan Lewis, and Chris Graney.

- ☑ The f15 telescope and its mounting rings were constructed by Bryan Lewis and Chris Graney.

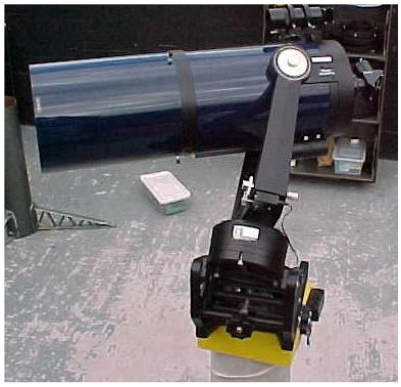
- ☑ Additional work on the project came from numerous volunteers, including Jefferson faculty members Paul Drake, Doug Larson, Orlando Gonzalez, and Sam Arslanian; Otter Creek Park maintenance staff; Graney family members;

---

[*] 6-inch refers to the aperture of the telescope -- the width of the lens (or mirror in many cases) which receives light from the sky.
[†] f18 means the telescope is 18 times longer than the lens is wide.
[‡] "Refracting" means the telescope uses only lenses – no mirrors. The refracting telescope is the oldest of telescope designs, being the design used by Galileo Galilei in the early 1600's. The "refractor" design is still viewed as the premier design for modest-sized telescopes thanks to its simplicity and durability, and performance.

curious members of the public who stopped by while work was in progress and ending up lending a hand; and others.

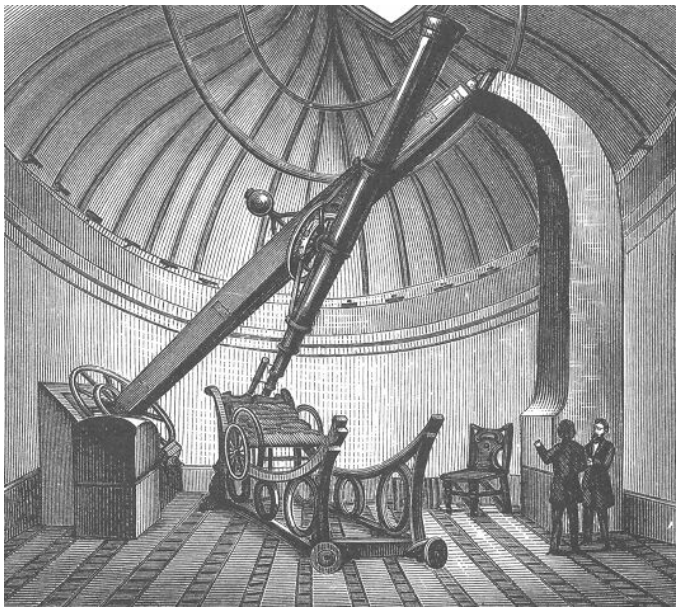
- ☑ The total cost of the telescope system was not much more than a telescope available at a mall nature or camera store. The low price is due to all the volunteer labor and brainpower and the use of existing Jefferson and Otter Creek Resources. f18 telescopes are not commercially available – the only way to buy a system comparable to this one would be to have a system custom made (at extraordinarily high cost). As a loose comparison, preliminary tests show that the f18 performs better than the observatory's commercially produced Meade Instruments Corporation 16-inch f10, one of the larger and more expensive commercially produced telescopes available. Furthermore, the Otter Creek refractors were built under budget, so no corners needed to be cut for cost purposes. They are as good as they can be. They are designed to last a lifetime, and to be able to withstand some abuse and neglect and still remain functional.



The 10-inch Meade SCT that the refractors replaced. It had a larger aperture than the refractors but was much more compact in overall size.

So why did we replace a "larger" telescope (the 10-inch Meade SCT) with a "smaller" telescope (the 6-inch and 4-inch refractors)? Here "larger" and "smaller" refers to the aperture of the telescope, which theoretically should be the characteristic of the telescope which is most important.

The answer to that question is that we wanted to improve our ability to obtain clear views of the moon and planets, we wanted to have a more durable instrument, and we wanted to have a better-looking main instrument.



The moon and planets are the objects that have the most impact on and appeal to many visitors to the observatory (especially younger visitors who come with an educational group). Long-focus refractors have a reputation for outstanding views.

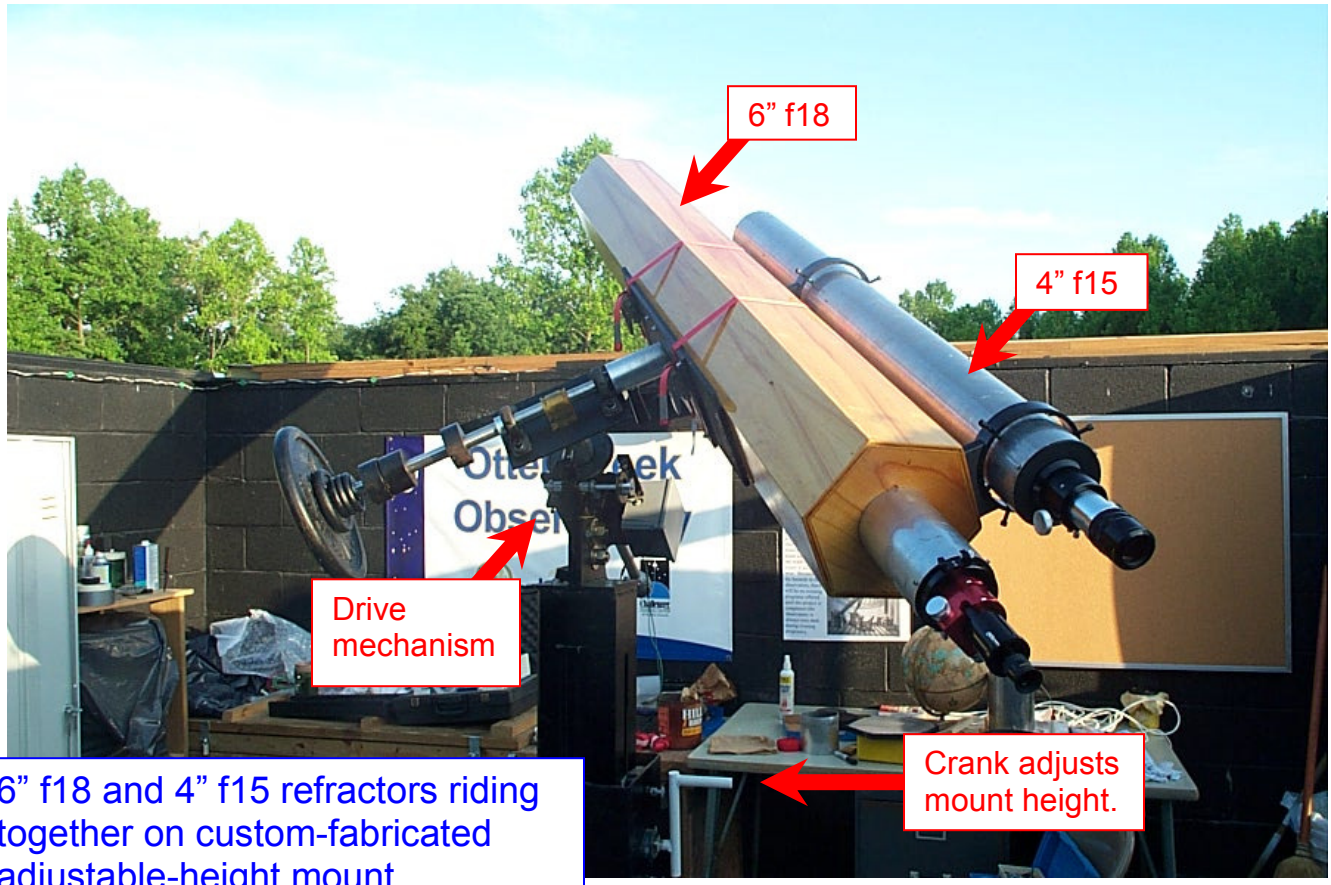
They also have a level of quality and durability not present in an ordinary SCT[§]. The loss of light-gathering power

[§] SCT: Schmidt-Cassegrain Telescope, a type of telescope that uses both lenses and mirrors and which is very popular with commercial telescope manufacturers such as Meade or Celestron.

that comes with smaller aperture is not that important when it comes to bright objects like the moon and planets, and thanks to the turbulence of the Earth's atmosphere, larger aperture does not correspond to greater resolving power past a certain point. Long focal ratios are very forgiving in terms of reaching focus, in terms of producing good magnification comfortably, and in other areas of use.

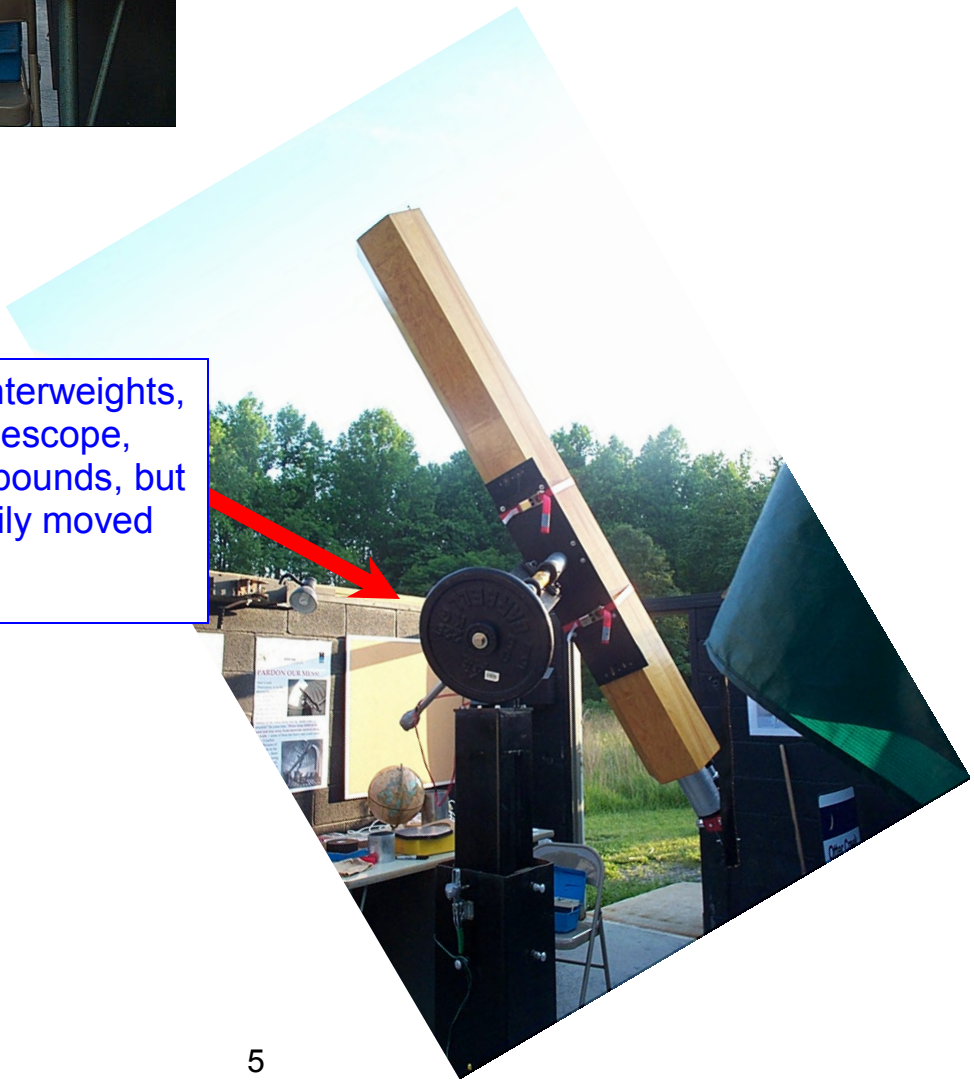
And finally, to many people, a long-focus refractor is a very dramatic instrument that "looks like a telescope". Part of what Otter Creek Observatory is all about is reaching out to the public and stirring people's imagination and their interest in astronomy. Nothing stirs interest like a cool-looking telescope.

Chris Graney----------*
Professor of Physics, Jefferson Community & Technical College
Park Astronomer, Otter Creek Park

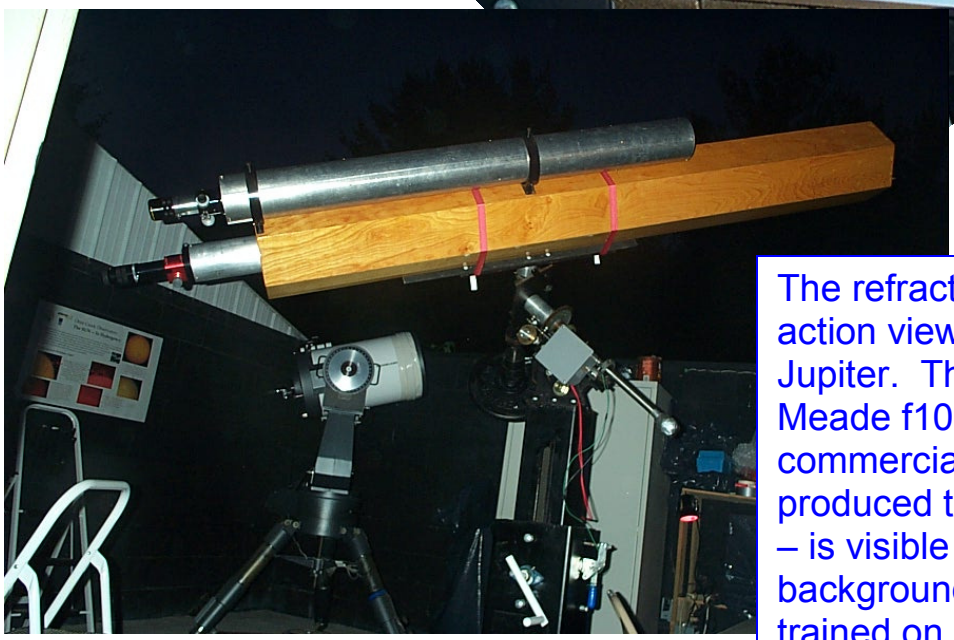


6" f18 and 4" f15 refractors riding together on custom-fabricated adjustable-height mount.

The telescopes with Prof. Chris Graney of Jefferson Community & Technical College for size comparison.



The telescopes' counterweights, which balance the telescope, weigh more than 60 pounds, but the instrument is easily moved by a gentle push.



The refractors in action viewing Jupiter. The 16” Meade f10 – a commercially produced telescope – is visible in the background (also trained on Jupiter).