Upstate astronomers getting ready for April 15 lunar eclipse

By Nikki Withington
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Local astronomers are hoping for clear skies in the wee hours of April 15.

The first of a tetrad of eclipses, the April 15 event will be the only one clearly visible to the Upstate.

"The moon is going to go into hiding, but I don't think it's going to evade taxes," said Rick Boozer, Greer resident and astrophysicist.

The Greek word tetrad means a set of four. When referring to celestial activity, the term applies to lunar eclipses. Two total lunar eclipses are this year and two are in 2015, the last on Sept. 28, 2015. There will also be an annular and a partial solar eclipse in 2014.

What makes this tetrad exceptional is the time frame. They all happen within six months.

"There are only going to be eight tetrads this century, but those won't fall within a calendar year," Boozer said. "They'll fall within a year of each other."

At approximately 3:06 a.m. on April 15, space enthusiast and high school senior Mary Alice Schulz will be awake to see the moon reach the totality of the eclipse.

Schulz built a reflecting telescope for her senior project at Brashier Middle College Charter High School.

She chose to build the telescope after a visit to the Roper Mountain Science Center.

"They were talking about how you can make a telescope with just two pieces of glass, and I thought, well that sounds simple," she said.

There are three kinds of telescopes: reflecting, refracting and catadioptric. A reflecting telescope uses mirrors to bend, gather and focus light and project an image. This type of telescope has an aperture mounted to its side.

A refracting telescope is the kind you probably picture when thinking of a telescope. It's a long, thin tube where a user looks into one end and out through the other. A magnifying lens at one end directs light in a straight line to the other end of the tube.

A catadioptric is a modern combination of the refracting and reflecting designs. It is the most versatile kind of telescope, offering the best near-focus capability in addition to deep space viewing.

Of the three, reflecting would be the easiest to construct, but it has its challenges.

It wasn't that simple. It was a learning stretch, Schulz said.

"I've never built a thing in my life," she said. "Trying to talk tools was so hard."

Schulz has always had a love of space. The realization of her project from concept to physical product was motivated by many factors.

"My favorite TV shows are 'Dr. Who,' 'Star Trek' and stuff like that," she said. "I've always liked space and, you know, science fiction-type stuff."

She started with a lot of random parts she found with the help of the Roper Mountain Astronomers Club.

"He helped me get most of the pieces on this telescope," Schulz said. "Everything except the legs on this mount came from the Roper Mountain Astronomers Club."

It's not easy to navigate the skies, and Schulz's mount for her telescope doesn't make it any easier. The mount has a counterweight for balance and is practically an antique, she said.

"I'm in a love-hate relationship with this mount," she said. "The tracking and the controls are great, but positioning it is just hard."

The view of Schulz's telescope is determined geometrically. There are two axes that move in arcs, and the point where the arcs intersect is recorded similarly to a latitude and longitude coordinate on a map.

"Distances between objects are normally measured in degrees, arc minutes and arc seconds," Boozer said.

Schulz said she needs to practice more to feel comfortable enough with the mount for her project presentation.

"Getting it to balance is tricky," she said.

Her project was due April 8, so Schulz may not have it back in time to observe the lunar eclipse, but that's OK.

While completing her project, Schulz recruited Dr. Charles St. Lucas as her mentor. St. Lucas is the chair of the astronomy department and the curator of the Hooper Planetarium at the Roper Mountain Science Center. "A lunar eclipse is best seen with the naked eye," St. Lucas said. "It's just fun to watch the moon turn red."