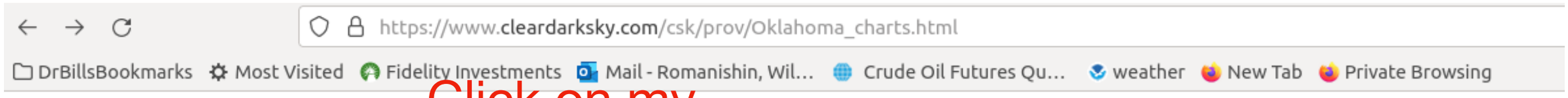
Seeing the Universe with your Own TWO Eyes

Dr. Bill (20361) Romanishin

~14 previous club talks,
starting in 1989 or 1990.
But last one over 5 years ago.
Lots of stories (airplane ride)
First, a story about a big telescope

www.cleardarksky.com Oklahoma cloud charts



Top Oklahoma Sponsors:
William Romanishin
Texas Astronomical Society

Click on my name to get to my webpage

Details | Map (may be slow)

Clear Sky Chart Home -- Danko's Homepage

Sponsored?	Chart	Preview	Light Pollution	Com
	ACT Observatory			An observatory of the Astronomy Club of Tu
	Adams Ranch Dark Sky Site			Observing site of the Tulsa Astronomy Club
	American Horse Lake			A dark site in American Horse Lake State S
	Antique Photons Observatory			A private observatory near Claremore.
	Aubrie Le observatory			A private observatory in Purcell.
	Bartlesville			Home of the Bartlesville Astronomical Socie
	Bixby Creek Observatory			A private observatory.
	Black Kettle National Grasslands			Forecast covers most .
	Blue Moon Astronomical Observatory			An observatory in the Black Fork Mountain
	Boktuklo Trail Head			Start of a trail and forest service road 5 mil
	Broken Arrow			A town in Tulsa county.
★	Cheddar Ranch Observatory			Observatory of the Oklahoma City Astronon

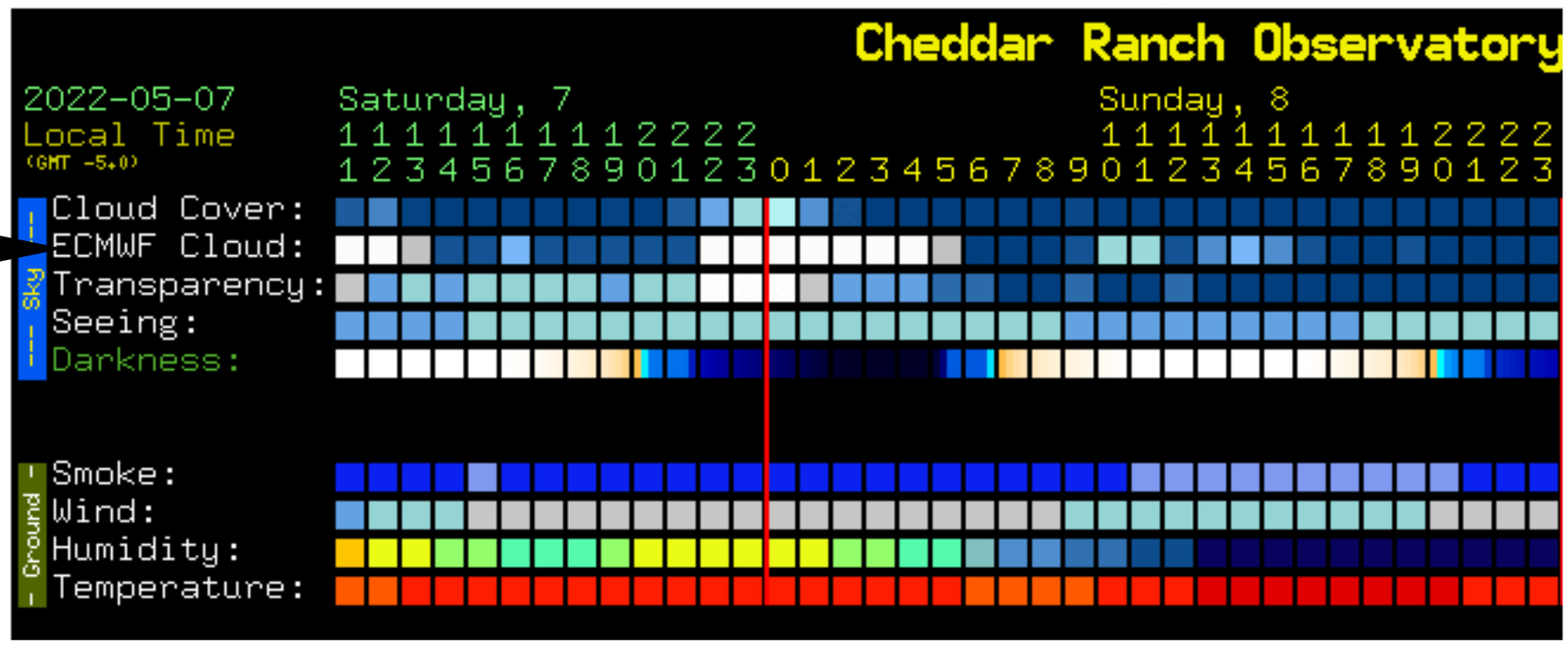
CRO= sponsored ; OU= not sponsored

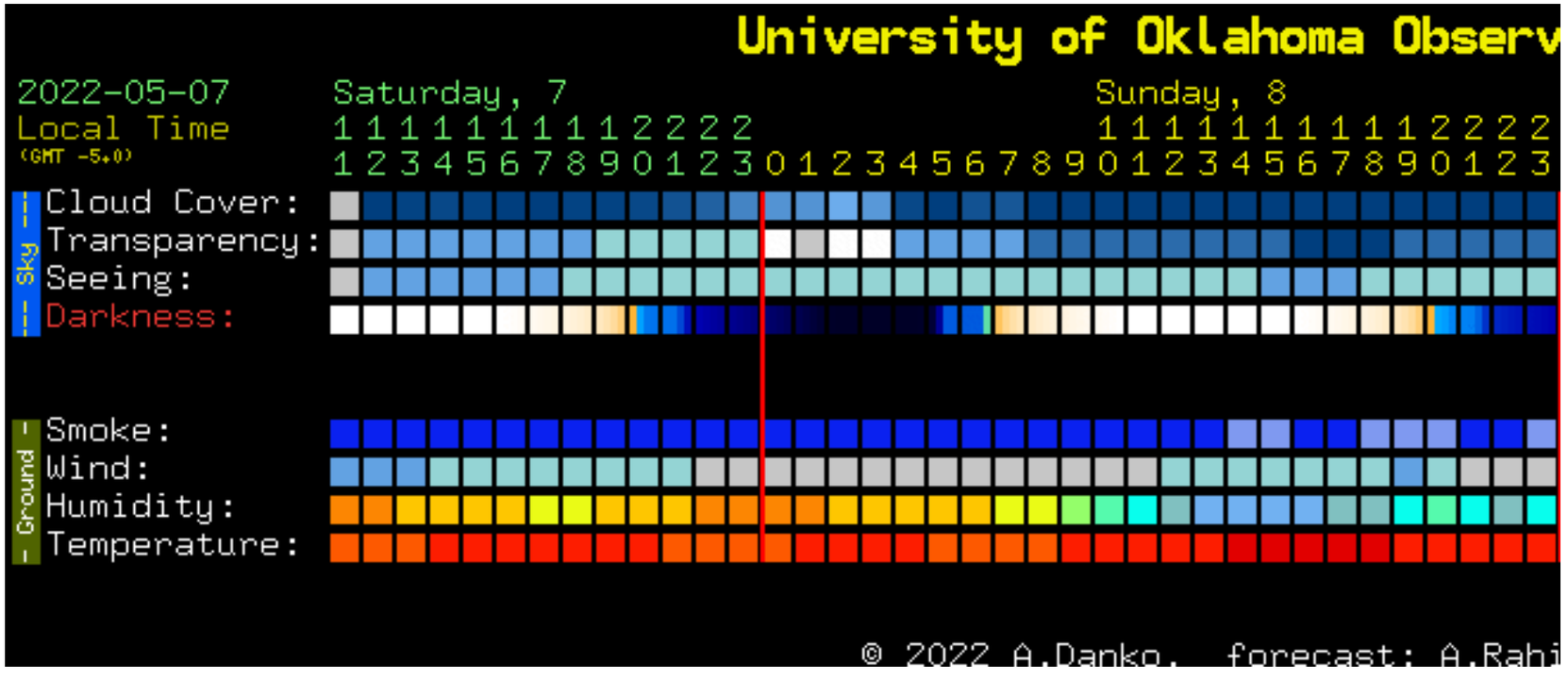
Extra cloud forecast

Sponsored sites Also updated before Non-sponsored

ECMWF better? Science fair Project?

Last updated 2022-05-07 11:13:50. No Image below? Read this. Not showing todays data? Clear your cache.





Me and my MFT (Most Favorite Telescope)

Lowell Discovery Telescope (LDT) 4.3 meter mirror (previously called DCT= Discovery Channel Tel.)
About an hours drive south of Flagstaff, AZ
Altitude= 2360m (7740ft)
First light in 2012

Price tag - If you have to ask, you can't afford it ($53 million)

How does a bum like me get to use this telescope?

Lowell Observatory (Flagstaff AZ)
Private observatory (not run by government or a university)
Pluto discovered there; canals on Mars (that don't exist)
Founded 1894 by Percival Lowell (old money Boston family)
Start of 3rd millennium- had old 1 meter and 2 meter telescopes
Wanted bigger more modern scope to keep up
Discovery Channel (TV) founder gave Lowell $25 million
to build telescope for "Astronomers at Work" (for TV) ##
Lowell folks wanted more- borrowed money (against the
Lowell endowment) and got some "small" donors
(a million $ here, a half million $ there…) and raised
about $25 million more to build DCT/LDT
After that Lowell hurting for cash flow (endowment income
had to go to pay back loan)
Northern Arizona Univ. (NAU- in Flagstaff) partnership- NAU trade cash
for telescope time

NEVER annoy an astronomer at work if the sky is Clear!

Me and Steve Tegler and NAU and LDT

1986 Steve starts grad school at ASU
(Arizona State Univ. in Tempe) where I was working at the time
(Steve's PhD project went down with Challenger)

Mid-1990s Steve on faculty at NAU - I spent several summers at NAU
Steve and I started collaborating on observing KBOs using
Telescopes in AZ, HI and Chile

Early 2010s- NAU buys into DCT/LDT (new NAU President looks
at Jupiter with LDT)

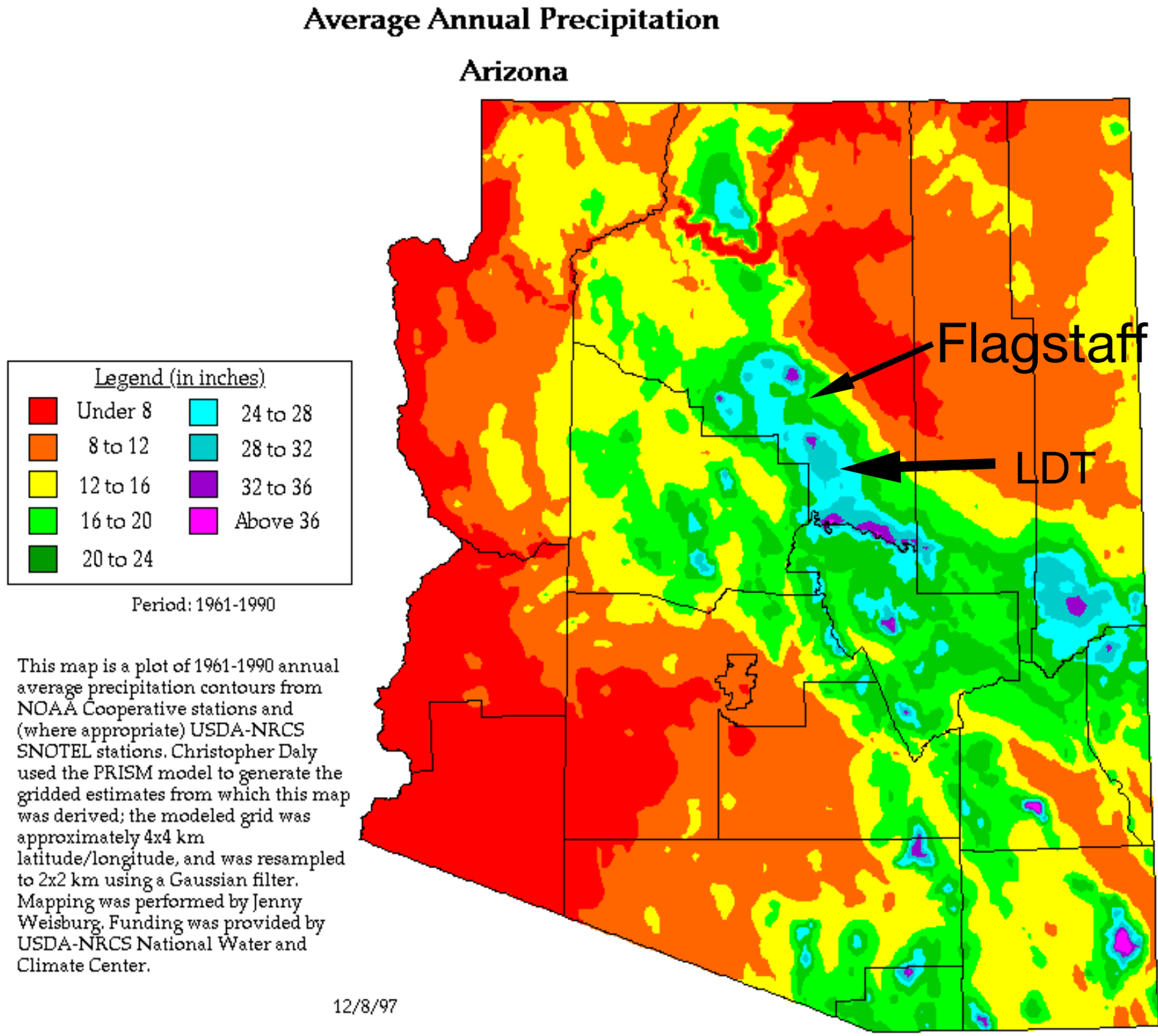
~2014 to Covid- I go to LDT 2-3 times a year
Last 2 years- we use LDT remotely (no Mexican food)

LDT: A World Class Telescope
(optics, drive, computer systems, instruments)

Site: Not so world class

Sits near Mogollon Rim, which acts as a “cloud maker” for moisture coming up from southwest

Not a bad site, but the telescope deserves better!



The Mogollon Rim, illustrating “snow catcher” effect
(picture shows about 35 miles of Mogollon Rim)

Great hiking along Mogollon Rim!

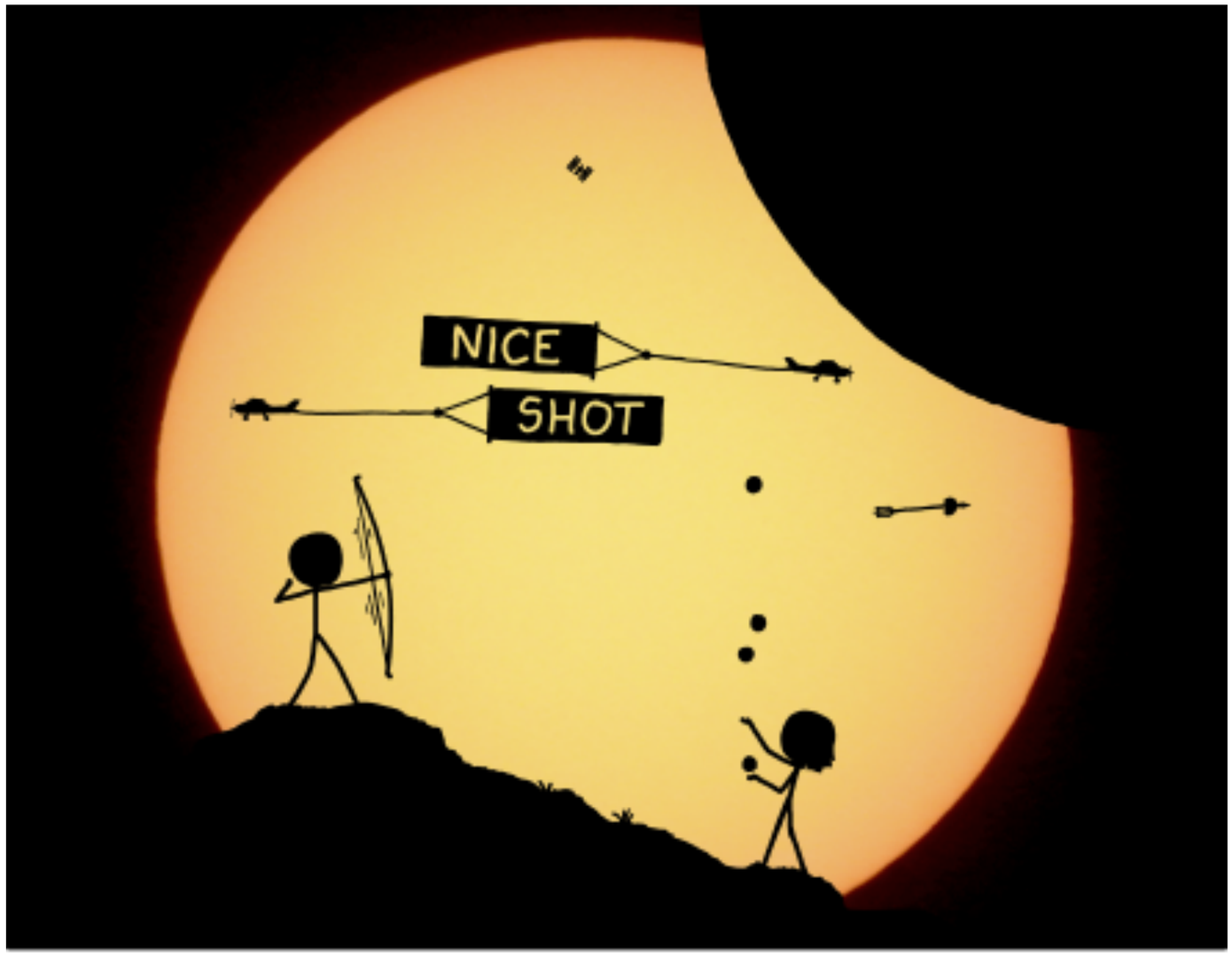
To me , true amateur astronomy is looking at the Universe with one's own eyeballs, NOT at a CCD image on a computer monitor. (M31)

To see a "pretty picture" on computer of the Bubble Nebula I would go to PanSTARRs or Hubble web site.

If someone asked me how to spend big money on their amateur astronomy habit:- Get a super highend small portable telescope and 1st class tickets to Chile and spend several weeks in a small village B&B or a rental travel trailer in the Andes Foothills looking at southern sky!

I'd bet you would remember that trip **FAR** longer than you would remember buying a fancy telescope to take more images!

But if you are interested in doing science, get a 20 inch Planewave and CCD and learn how to make scientific measurements



OUR ASTROPHOTOGRAPHY COMMUNITY'S ONE-UPSMANSHIP IS GETTING OUT OF HAND.

Annoyances with small telescopes used for eyeball observing

Use only one eye (unless get a binocular eyepiece holder)

Mounts often shaky (can buy heavier mount, but then telescope might sit in closet)

Hard to find objects (less true now that many little telescopes have computers, but you still have to set them up properly)
(When I was a boy…..)

^%$#Eyepiece often at uncomfortable position / orientation!&^%$
Difficult for people with limited neck/shoulder mobility
(or in a wheelchair) to use

I wanted to make an observing setup that at least partially solved some of these problems

Big binoculars to use both eyes

Binoculars fixed in position and orientation, use a big tilting flat mirror to reflect sky to binoculars

For now mirror only tilts North-South along meridian.

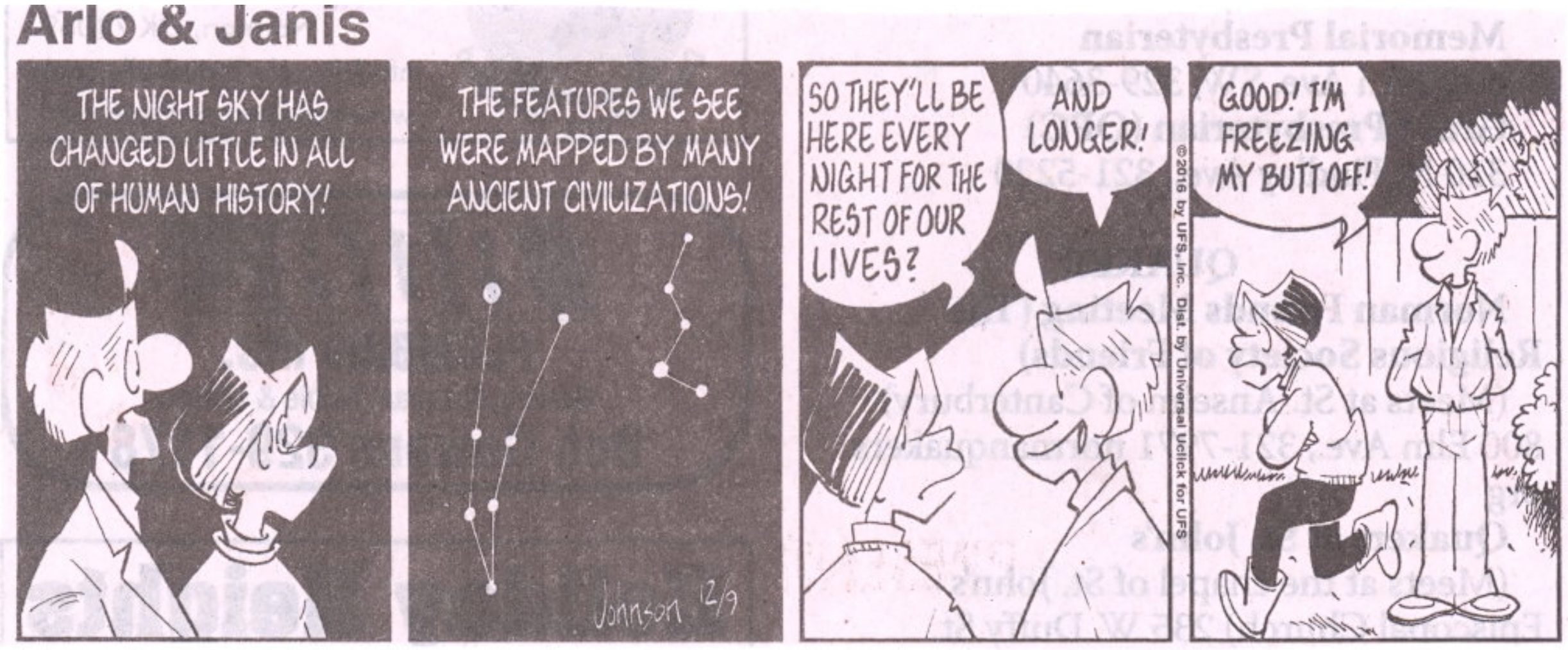
The mirror tilt is controlled by a computer program I wrote. From time and observing position on Earth, the program will tilt mirror so that next object (from prepared “tour” list) will be visible as it crosses meridian.

I am working on a “bright sky tour” (double stars, stars of unusual colors, brighter star clusters) and a “dark sky tour” (globular clusters, nebulae and brighter galaxies)

I will also write a few lines of text describing each object and have the miniMac “say” the words (in whatever kind of voice you want- I like the nice Scottish-English ladies voice) as each object comes into view.

Will be best suited for summer time observing of Milky Way (nice and warm and lots of objects pass meridian in first part of summer nights)

Wintertime, and the Viewing is Freezing..
(to the tune of “Summertime and the living is easy..”)
(apologies to George Gershwin)



Advantages:

Can sit comfortably and look down to see sky- could easily be adapted for someone in a wheelchair

As long as setup is aligned properly, and computer knows correct time and its position (I will add a GPS to get those), all one has to do is:

Turn on computer- check time
Sit down Look through Binocs
Watch objects float by (one every 2 or 3 minutes)
Listen to audio description of object
Can get and keep eyes dark adapted - No need to look at star charts or computer/phone screens (can even put hood over your head to block ambient light)

The field of binocs is 2.4 degrees. Would take =>10 minutes for object to drift completely across field.

Disadvantages:

Only looks at objects as they cross meridian-
Might put in another motor to tilt mirror
At least a little east-west, but that greatly complicates mechanical structure

Need to align mirror pivot axis (defined by piano hinge) to be as close to east-west as possible (not a problem if permanently mounted)

Computer-controlled

Flat mirror mount

Piano hinge (hidden)

11x16in flat mirror

Linear Actuator

LA Controller

MacMini

Li-ion power

Big Binoculars

25x100

25x magnification

Each lens 100mm (4 inches) in diameter - Bigger than a standard Questar!

Weight ~10 lbs

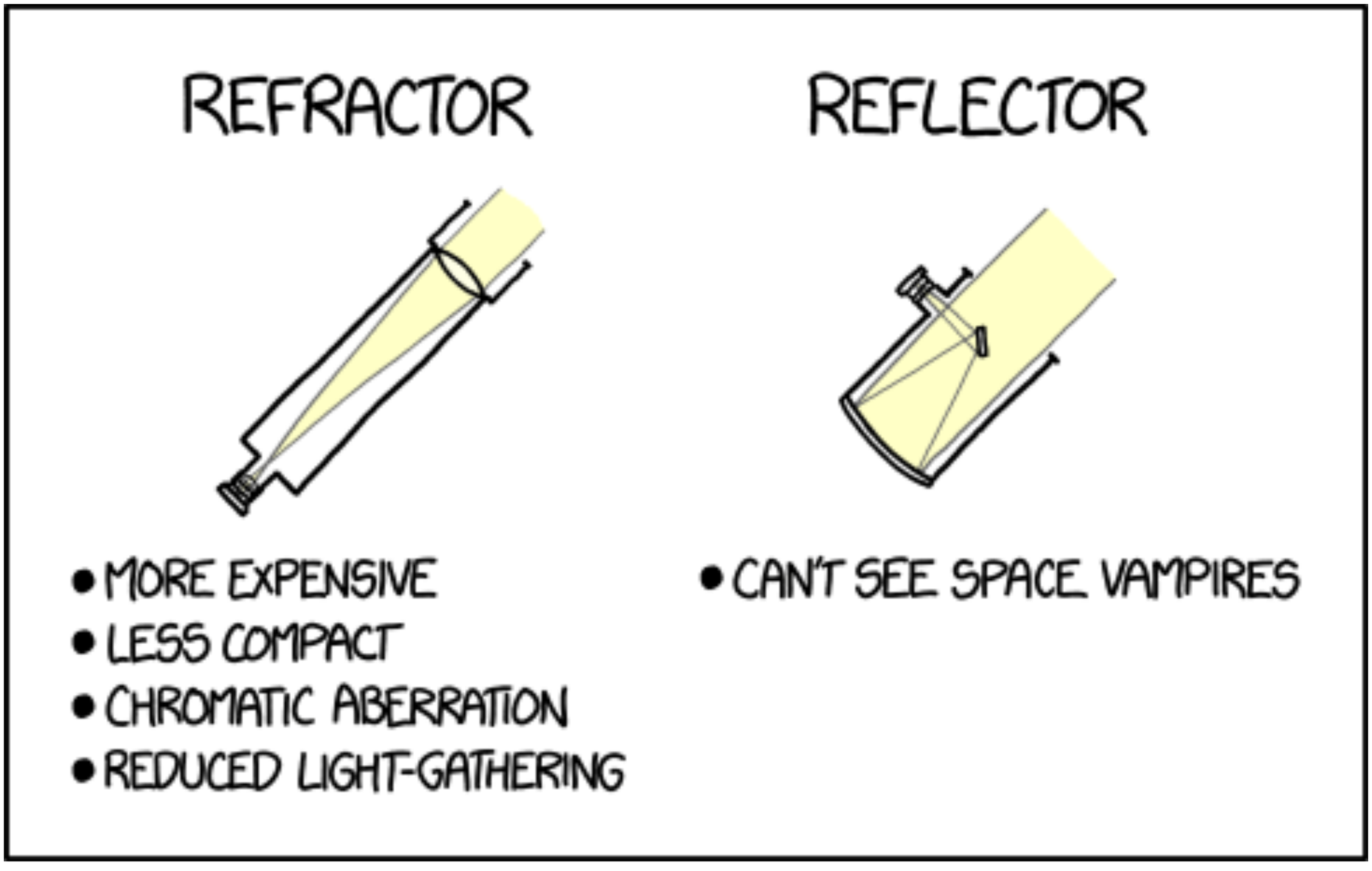
Price List

“Economy” Binocs (25x100)	$500
“Good (but not 1/4 wave)” 11x16 inch mirror	$250
8 inch Linear Actuator with position sensor	$150
Controller for Linear Actuator	$ 50
12 inch piano hinge	$ 10
Used MacMini. (great low cost computer)	$200
Mini monitor.	$ 60
Wireless foldable keyboard	$40
250 Wh Li-ion battery	$200
Total:	$1460

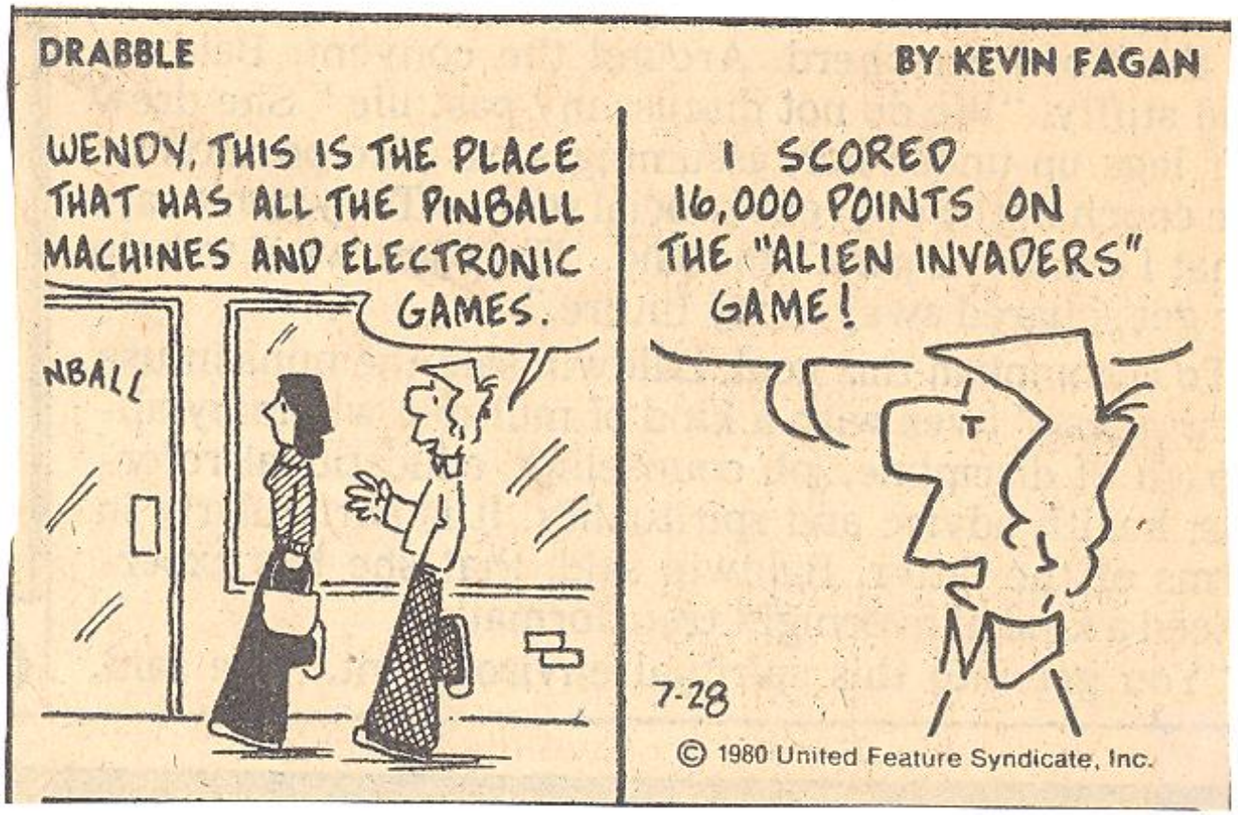
Sources: Binocs: oberwerk.com
Mirror: opticalmirror.com
Used MacMini: owc.com (other world computing)
Linear actuator and controller: pololu.com

Project Status:
Prototype finished- I learned a lot
Computer program to do tilt works - needs a few tweaks
Linear actuator works great
Binocular mount is very sturdy, but inconvenient
A little difficult to align with sky- working on that
(Best would be a permanent mounting of course - maybe at CRO?)
If I do a permanent mount, I'll get my welding-whiz son Robert to make a better binoc mount
Probably needs dew prevention heater for big mirror
Need to really check if mirror and binocs are "good enuf"
Due to travel and other BS projects (Big Science) , won't get back to working on this until July

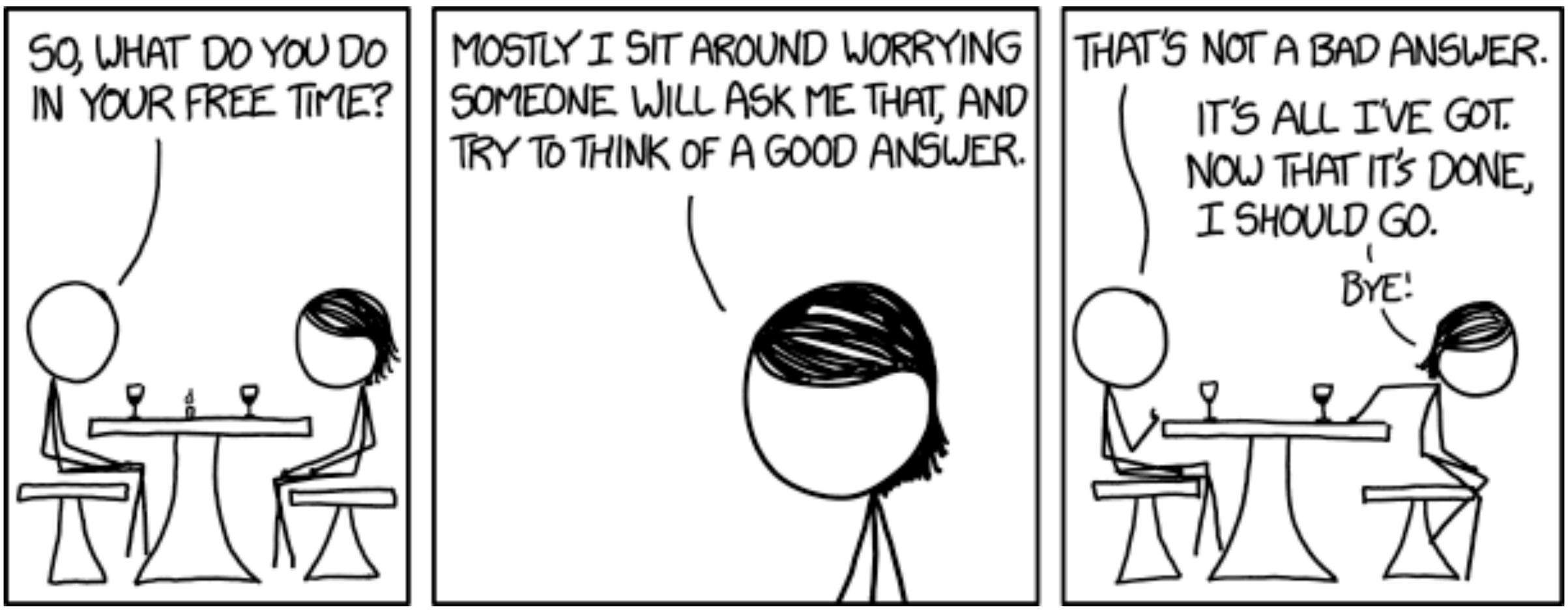
Technical Disadvantages of Refractors and Reflectors

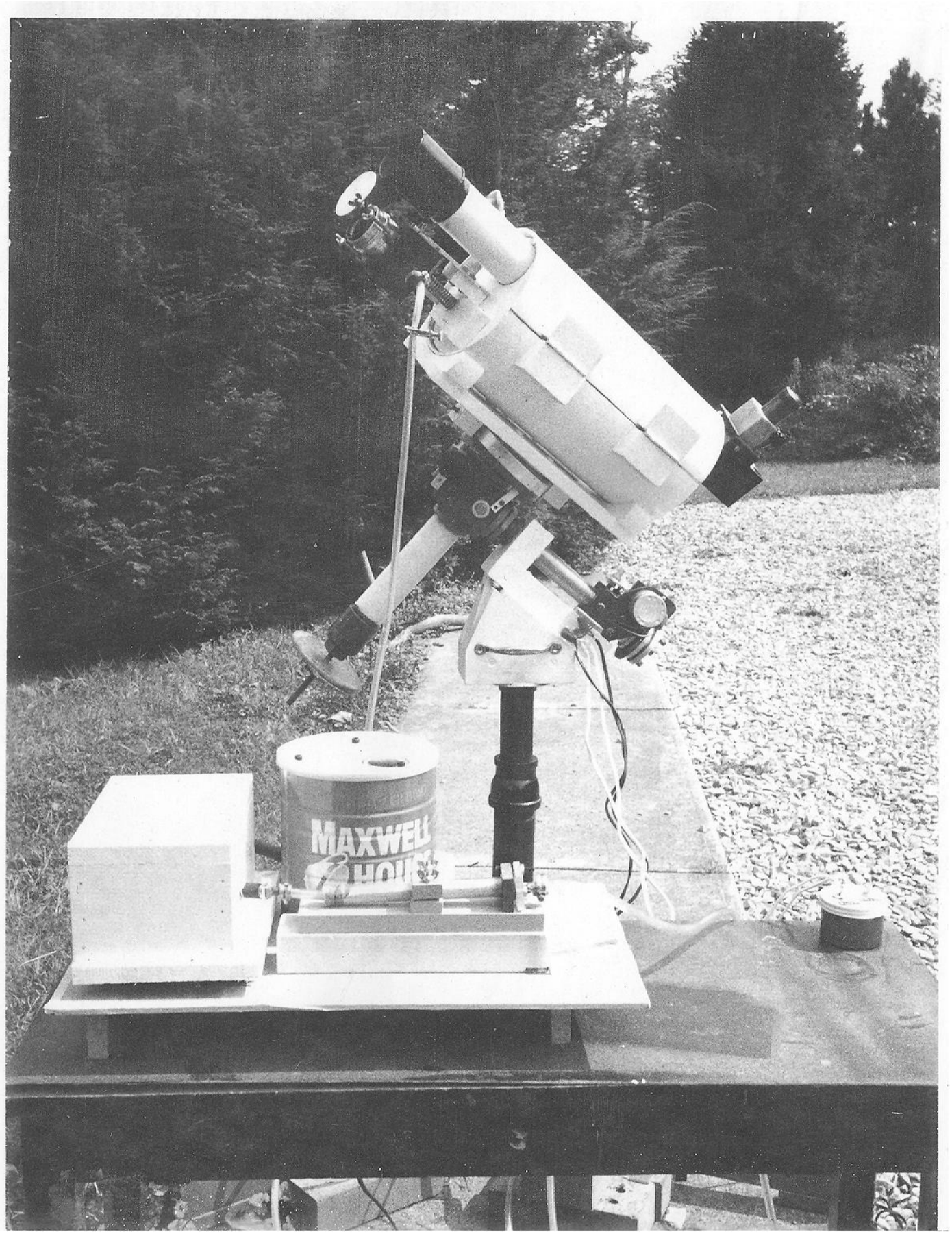


What does it take to impress this woman?



So, what do YOU do in your free time?
(always have a good answer!)

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