

Meeting Minutes 9/18/2020

- General Club Announcements
 - ATOMM
 - Tutoring for physics, astronomy, and math by experienced graduate students (over Zoom!)
 - M (2-4 pm) Yujing Qin
 - T (noon - 2 pm) Ryan Keenan
 - W (1-2 pm) Ryan
 - Th (2-3 pm) Yujing
 - Become an active member! Join the zoom meetings and fill out the poll to be listed.
 - Club Outreach Opportunity
 - 2nd Graders (about 70 students)
 - Interactive Activities (At least as much as we can through Zoom) to be determined
 - Looking for volunteers who are interested in helping lead/guide an activity possibly through breakout rooms in Zoom
 - If Interested please fill out poll in chat
https://docs.google.com/forms/d/e/1FAIpQLScbCsjqBIWFqLRkKnsRaddZOIXusQgtKsjTSvUhPY07EVn-kA/viewform?usp=sf_link
 - Club climate survey - will be closed by the time you read this
 - Anonymous, data for club, faculty and verit astronomy program
 - Game Night! Next Friday night 9/25/2020 at 5pm right after the meeting!
 - Will be hosted on the discord server like over the summer
 - We'll probably be playing Jackbox games
- TIMESTEP with Dr. Eifler
 - https://www.dropbox.com/s/awxnelkvfcusua1/Advert_Sept%2023%2030%2020200.pdf?dl=0
 - ext meeting: Scientific Coding: Research and Examples Part 1 and 2
 - Led by Dr. Tim Eifler
 - When/Where: Wednesday, September 23rd and 30th over Zoom at 5 pm
 - You must register your UA email in advance to receive the Zoom link
 - For experience coders to know what kinds of supercomputers are out there, repositories out there, how to get involved in high performance computing, machine learning
 - Will cover resources to do with machine learning and artificial intelligence
 - Stop by and ask questions!
 - Abstract concepts
 - You can attend one part and not the other
- Astronomy Question of the Week with Don
 - Sunset after last friday's club meeting



- Two pictures of the moon, what phases are they in?
 - One hour between when the pictures were taken
 - So the same phase, both crescent moons
 - Almost simultaneously taken from two different locations on the planet
 - Copenhagen, Denmark vs Curitiba, Brazil, the ecliptic is at a different angle!
 - Stellarium simulations
- Answer to Pres. Eisenhower's question
 - Almost everyone in the US astonished when USSR won the first round of the space race by launching sputnik
 - Area of concern related to the potential mass of the payload
 - President Eisenhower: "All we know for certain about Sputnik is its altitude and orbital speed. From that information can you calculate Sputnik's mass?"
 - Can't find it using conservation of energy or balancing forces.
- Nellie Knowitall says the gasoline in an automobile's gas tank is only about $\frac{1}{4}$ the amount of fuel that runs the engine.
 - Oxygen also takes part
 - Car could be a hybrid ;P
 - For fuel-air mixture: 1 part fuel to 14 parts air in a combustion engine. 1 part fuel, 3 part oxygen. Lots of oxygen used.
- Solar Cycle #25 slowly ramping up. What's going on here?
 - Plane messing up the image of the Sun
- Andromeda Galaxy at Arm's Length - tilt shift method creates a depth of view effect
- Go outside tonight at 6:45pm, you'll see the ISS pass overhead in Tucson.

- Autumnal Equinox coming up on Tuesday, the 22nd!!! Sun will rise due east, set due west. Great photo opportunity!
- Give Don some ideas for question of the day!
- Astro News of the Week with Savannah
 - Molecule phosphene found in Venus's atmosphere
 - This molecule is made by life in some circumstances.
 - Phosphene has a small lifetime, so there has to be a fresh maker of the molecule to find so much in Venus's atmosphere.
 - Could be volcanoes. Could be something about Venus's atmosphere we don't know. Could be life. We just don't know, which is very cool!
 - Pay more attention to Venus!
 - Life on Venus? (Discussion)
- Real Observatory Hours with Harry
 - Vera C. Rubin Observatory
 - Formerly the large synoptic survey telescope
 - Renamed after Vera Rubin because of her impact on the field
 - American cosmologist and astronomer
 - 1976 - Rubin-Ford effect - apparent anisotropy on 100Mlyr scales due to nonhomogenous galaxy distribution
 - 70s - Galaxy Rotation Problem - large survey found most galaxies did not follow keplerian motion, first evidence for Dark Matter
 - Discovered some stars, gas rotated opposite to rest of the galaxy
 - Evidence of galaxy mergers and initial formation
 - Also look up Fritz Zwicky
 - <https://astrobit.es.org/2016/12/27/how-one-person-discovered-the-majority-of-the-universe-the-work-of-vera-rubin/>
 - Telescope currently being built in the Coquimbo region of North Chile
 - Conceived in 2001, construction in 2014, with first light in 2021 and beginning 10yr survey in 2022
 - Mission: take full survey of all available night sky every few nights - great for transient and apparent motion astronomy
 - Optics
 - 8.4m primary mirror made here in the mirror lab at UArizona
 - 3.5 degree diameter field of view
 - 3 mirror anastigmat
 - 10.31m overall focal length
 - Bands u, g, r, i, z, Y cover 320-1060 nm (UV to NIR)
 - Camera
 - The VRO will house the largest digital camera ever created! It was made by SLAC.
 - It is about the size of a small SUV, weighing 2.8 tons with dimensions of 1.65 x 3 m
 - Its sensitivity ranges from the near ultraviolet to near infrared with a 3.5 degree FOV

- 189 16 MP sensors to make a 3.2GP camera. Each pixel is 10 microns wide.
 - The VRO team recently announced the first photos taken with the sensor, that of a broccoli-like plant and a picture of Vera Rubin.
 - The focal plane is flat to within a tenth of the width of a human hair.
 - The FOV can capture 40 moons.
 - It would take 378 4K TVs to display one full image.
- What Up Astronomy Club with Yancy
 - Jupiter and Saturn are up in the Southern sky
 - Starting Thursday, the waxing gibbous moon will pass near the two gas giants
 - Good time to see Mars, the red planet, in the constellation Pisces
 - Mars is currently near Mira, a variable star in the constellation Cetus that goes from being invisible to the naked eye to being one of the brightest stars in the sky
 - Mars is in retrograde this month
 - Webcam stargazing
 - Canada
 - +59 degrees latitude
 - Churchill Webcam
 - Really a webcam to look at polar bears, but also to look at the Aurora Borealis!!!
 - Really fast movements within the Aurora
 - Can see the big dipper and Arcturus
 - Northern Light powered by Explore.com
- Thanks for attending! Stick around afterwards to see Sai's astrophotography!