

SCHEDULE

ADVANCED ASTRONOMY CAMP

June 22-30, 2024

Julian Dates 2460484.375 to 2460492.250

"We cannot solve problems with the same level of thinking we used when we created them."

Albert Einstein

JUNE 22 (Saturday)

Sidereal time at midnight: 17:44:14

"Imagination is more important than knowledge."
(Einstein)

2 pm	Opening (Aloft Hotel; Tactic Room) welcome and introductions water bottles	
3	Drive to Mt. Lemmon	
5	Move into dorms dorm orientation dress warmly for the night bring your flashlight	(Don, Kailey)
6-6:30	Dinner & cleanup	
7	Walk as a group to observe sunset prepare telescopes for observing	
7:32	Watch and record sunset start tracking exact location of sunset Green Flash, Earth's shadow, Belt of Venus, first stars	
8	Dark adaption at the 32" telescope safety orientations <i>"Music of the Night"</i> (Phantom of the Opera) -- Andrew Lloyd Webber	
8:30	Observe the night sky on Mt. Lemmon calibrate your fist's angular diameter observe with 8, 24, 32" telescopes naked eye & binoculars, DSLR & cellphone imaging evening assignments: find NSEW directions on your own. watch the sky move and learn UT, RA, DEC, LST, HA	
8:45	Watch moonrise	
9:12	End of astronomical twilight	
midnight	Snack and sleep be sure Campers know when/where to meet in morning	
3:40	Start of astronomical twilight	
3:46	Orbital pass of the International Space Station (V=-2.7)	
5:19	Sunrise	

JUNE 23 (Sunday)

Sidereal time at midnight: 17:48:10

Moon passes 1 deg north of Ceres

“Anyone who has never made a mistake has never tried anything new.”
(Einstein)

5:19 am	Sunrise	
8	Wakeup	
8:30	Breakfast in the Learning Center	
9:15	Quick overview of Camp projects	
	mountain safety; Camp learning style, ...	
	distribute resources: Notebook, Handbook, flashlight, ruler	
	Question of the Day	(Don)
	Research Projects and Proposals	(Don)
	Computing Technologies and Policies at Camp	(Austin)
	Chromebooks, laptops, Goggle, data archiving, cellphones	
	SMT Radio Research	(Samantha)
	Journaling & Blogging	(Wayne)
	“Relating to the Stars in our Sky”	(Kailey & Austin)
	“Supernova Lightcurves”	(Gottbrath Zoom)
	“The Mass of Jupiter”	(Don)
	Camp’s Observing Challenge	
	Schedules: Cooking/cleaning, daily blog, ...	
10:30	Walking tour of the mountain	
	En route do two activities: Fist angle & solar observing	
11:30	“Observe the Sun”	
12 pm	Lunch	
	staff meeting	
1	“Light, Energy, and the Electromagnetic Spectrum”	(Don)
	then apply light concepts with Round Robin experiments:	
	reflection (Austin & Meredith), refraction (Ryan & Samantha)	
	inverse-square law (Don & Hanga), spectra (Carl & Jeniveve)	
3:15	“Radio Astronomy: Detecting Molecules in Space!”	(Samantha)
4:30	Group rotations:	
	planetarium (2 groups)	(Wayne)
	be sure to master concept of “sidereal time”	
	Camp Project	(teams)
	3D telescope assembly	(Austin)
5:30	Begin remote radio observing with 12 m telescope (to 9:30 am)	
	dress <u>warmly</u> for an evening of observing	
6	Dinner & cleanup	
	staff meeting	
7	Walk as a group to observe sunset	
	prepare telescopes for observing	
7:32	Watch and record sunset	
8	Dark adaption	

8:30	Observing rotation in 4 groups at two sites
	Lemmon:
	24" for a long-term lightcurve
	simultaneous digital imaging with new finderscope
	32" for naked-eye and celestial coordinates, etc.
	Bigelow:
	61" for spectroscopy
	8" for spectroscopy and/or Hyper-Star imaging
9:12	End of astronomical twilight
9:35	Watch moonrise
11	Snack and switch groups at 61" telescope
2 am	Sleep
	be sure Campers know when/where to meet in morning
2:57	Orbital pass of the International Space Station (V=-2.6)
3:40	Start of astronomical twilight
5:20	Sunrise

JUNE 24 (Monday)

Sidereal time at midnight: 17:52:07

***"The important thing is not to stop questioning. Curiosity has its own reason for existing."
(Einstein)***

5:20 am	Sunrise	
9:30 am	End remote radio observing	
10:30	wakeup	
11	Brunch & cleanup	
12 pm	Daily briefing	
12:30	Solar observing experiments	
1:30	<i>"Stellar Spectroscopy"</i>	(Don & Tracie)
2:30	Research Teams: Work on ...	
	Camp Project	
	reduce data from last night	
	3D telescope construction	
4	<i>"Stars are Like People"</i> (gym)	(Don & Carl)
	related demos and activities	
5	<i>"Basics of Digital Imaging & Calibration"</i>	(Austin)
6	Dinner & cleanup	
7	Walk as a group to observe sunset	
	prepare telescopes for observing	
7:33	Watch and record sunset	
8	Dark adaption	
8:30	Observing rotation in 4 groups at two sites	
	Lemmon:	
	24" for long-term lightcurve; finder - digital imaging	
	32" for naked-eye and celestial coordinates, etc.	
	Bigelow:	

	61" for spectroscopy
	3D telescope observing
	8" for Hyper-Star wide-field imaging
9:12	End of astronomical twilight
10:18	Watch moonrise
11	Snack and switch groups at 61" telescope
3 am	Sleep
	be sure Campers know when/where to meet in morning
3:40	Start of astronomical twilight
5:20	Sunrise

JUNE 25 (Tuesday)

Sidereal time at midnight: 17:56:03

"I have no special talents. I am only passionately curious."

10:30 am	Wakeup
11	Brunch & cleanup
12 pm	Daily briefing
	"Tomorrow's Trip to Mt. Graham"
	Mirror Lab (video); LBT & GMT
12:30	Planning new observing proposals for Telescope Allocation Committee
2	"A Zoo of Exoplanets" (Ryan)
	activity with NASA Exoplanet archive
	incorporate our exoplanet system scale models
3-4	Research Teams: Work on ...
	Camp Project
	reduce data from last night
	3D telescope construction
4	Hike Solar System and nearby stars to scale
	TAC meets to consider telescope proposals and nightly schedule
6	Dinner & cleanup
7:30	Watch sunset
8	Dark adaption
8:30	Observing with only 2 groups at Lemmon and Bigelow
	Lemmon
	24" and 32" telescopes
	Bigelow
	61" spectroscopy
	3D telescope observing
10:55	Watch moonrise
12 am	Midnight snack
	Sleep
	be sure Campers know when/where to meet in morning
5:20 am	Sunrise

JUNE 26 (Wednesday)

Sidereal time at midnight: 18:00:00

***“The most beautiful thing we can experience is the mysterious.”
(Einstein)***

5:20 am	Sunrise
8:30	Wakeup
9	Breakfast & cleanup daily briefing
10	Drive to Mt. Graham International Observatory
1 pm	Rest stop and picnic lunch in Texas Canyon
3:30	Bathroom stop near base camp Glen Meadows Park. <u>3001 S 14th Ave, Safford, AZ 85546</u> Brief stop at Mt. Graham base camp get radios and permits put cellphones into airplane mode
5:30	Arrive at Large Binocular Telescope (LBT) dress & prepare for nighttime observing
6	Start radio observing at SMT in research teams
7:30	Tour the observing floor of LBT
7:32	Sunset
8	Dinner Briefing: Prepare for “College Experience & Career Choices”
8:30	Nighttime activities: throughout the night student teams rotate to SMT every 90 minutes remote observing with 24” and 32” telescopes stargazing by naked eye, binoculars, and portable telescopes ongoing: Camp Project and research projects
9:12	End of astronomical twilight
11:28	Moonrise
12 am	Midnight snack Sleep in shifts
3:41	Start of astronomical twilight
4	Sleep
5:21	Sunrise

JUNE 27 (Thursday)

Sidereal time at midnight: 18:03:57

Moon is at perigee and 0.08 deg north of Saturn

***“The whole of science is nothing more than a refinement of everyday thinking.”
(Einstein)***

5:21 am	Sunrise
6	Official end of SMT radio observing
8:30	Wakeup, pack, and start cleaning

9	Breakfast
9-10	Possible options: observe the Moon occult Saturn (107 deg W of Sun) pending tour of the Vatican Advanced Technology Telescope (VATT)
11	Depart for Tucson
12 pm	Lunch at Hospital Flats
2:30	Rest stop & refuel at QT in Wilcox
5	Arrive at Steward tour campus, Astronomy building, and Mirror Lab
5:45	Dinner in room N305
7	Drive to Mt. Lemmon stop at Safeway for groceries and individual snack items
7:33	Sunset
9	Observing at 61” telescope Ongoing: “ Relating to the Stars in our Sky ”, data reduction (team leaders)
9:12	End of astronomical twilight
11	Observing rotations on Mt. Lemmon and Bigelow
11:58	Watch moonrise
midnight	Snack
3:31	International Space Station orbital passage ($V=-2.6$) SSE -> ENE
3:42	Start of astronomical twilight
4	Sleep be sure Campers know when/where to meet in morning
5:21	Sunrise

JUNE 28 (Friday)

Sidereal time at midnight: 18:07:53

Last Quarter Moon

Moon passes 0.3 deg north of Neptune

***"Everything should be made as simple as possible, but not simpler."
(Einstein)***

10:30	Wakeup	
11	Brunch & cleanup	
12 pm	Daily briefing	
12:15	Solar observing activities	
	possible solar oven cooking	
1	<i>“What is Cosmological Redshift?”</i>	(Don)
1:30	<i>“Galaxies and the James Webb Space Telescope (JWST)”</i>	(Meredith)
2:30	Continue work on Camp Project & research projects	
4:45	Seminar: “The College Experience & Career Choices” (everyone) with “Alternatives to Professional Research Astronomy”	
6	Dinner & cleanup	
7:30	Watch sunset	
8	Dark adaption	

8:30	Observing rotation in 4 groups
12 am	Midnight snack
0:28	Moonrise
3:30	Sleep
	be sure Campers know when/where to meet in morning
3:40	Possibly watch Jupiter rise

June 29 (Saturday)

Sidereal time at midnight: 18:11:50

5:22 am	Sunrise
10:30	Wakeup
	begin cleaning your dorm rooms and packing
11	Brunch & cleanup
12 pm	Daily briefing
	submit personal journals
12:15	Finalize analysis and presentations
2	Group presentations of Camp Project and all research projects
4	Handout Camp T-shirts
	pack belongings and vacuum rooms, etc.
5	Launch LN2 cannon
6	Dinner & cleanup
7:30	Watch sunset
8	LN2 dessert & celebration
9	Naked-eye observing at summit and possibly at the 61"
12 am	Midnight snack
0:37	Titan transits Saturn (ends 5:22 am)
	Sleep
	be sure Campers know when/where to meet in morning
0:59	Moonrise

June 30 (Sunday)

Sidereal time at midnight: 17:49:07

5:22 am	Sunrise
7	Wakeup
	FINISH CLEANING & PACKING UP EVERYTHING!!!
	You must have a counselor check you out of your room before breakfast.
8	Breakfast & cleanup
9	<u>MUST</u> leave for Tucson
** 11	Graduation ceremony (Aloft Hotel; Tactic Room)
	graduation is open to all families.
12 pm	Leave for homes and Tucson airport
	Lunch: You pay!

** Graduation is open to all families. It will begin at approximately 11-11:30 am.