

Question	Answer(s)
What is the average down time per year in telescope maintenance?	On average its around 33 nights per telescope, but special needs can drive this number up to over 40 in some years
Is there any data available for the Tac process, things like who puts in submissions to receive time and who is awarded time?	Here's a link to the process to apply for Keck time: https://www2.keck.hawaii.edu/observing/apply.html . The final telescope schedule is also available to the public here: https://www2.keck.hawaii.edu/observing/keckSchedule/keckSchedule.php
Are there still 6 spare mirrors? One of each shape?	yes, 6 spares for each telescope
With the tight tolerances for both maintenance and observation, how does the telescope deal with tremors / earthquakes which must be present on a fairly regular basis?	The telescope design is tollerent to typical amounts of acceleration, with larger amounts we sometimes need to readjust and/or repair things
How many 'spare' mirrors do you have in the storage hall?	We have 6 'spare' mirrors for each telescope
Is the telescope still using all of the original mirror segments? What is the mirror segment change out time, given you have spares of each segment type?	still all original segments, we can change 3 segments on a single day but with many days of prep and follow up
Are there spare mirror segments?	There are 6 spare segments for each telescope
Roughly how many days a year do you miss out on observing due to bad weather? Do you prioritise to allow those people to use the telescope on a later date?	about 15% is lost to weather on average, no reschedule priority
Who / how cleans the telescope, equipment and surroundings? I the inside of the scope building clean-room clean?	Certain sensive equipment is kept in a clean environment but the open dome is subjected to alot of dust, etc. A large staff of technicians and experts keep things clean
What code program do you use? C++?	a lot of differnt languages have been used over the lifetime, C++ is one of them
why do you use thorium and argon to cal, vs. other elements?	These elments have a lot of convenient transtions in their electron states that create known wavelengh signatures on the spectrum
How has the COVID pandemic impacted astronomers' access to the telescopes and instruments?	Remote "At home" obseving (PJ Mode) has been very successful to keep the night obseving going , using the VNC's, etc. (that you pioneered)
Are different instruments calibrated with other gases? Or do all the spectrographs work with Thorium and Argon?	Many other elements are used and optimized for particular instruments, neon, xenon, krypton, etc.
Is the telescope control software still VxWorks running on a microVax?	No, we have a modern system that was upgraded a few years ago

What are some of the shortest and longest projects that got telescope time at Keck?	longest is probably exoplanet studies, hundreds of night, perhaps also redshift surveys of the distance univers. Many short programs that are about 1/2 night
So why does the Keck telescope use flat fielding over twilight flats?	We're going to let John answer this at the end, good question
I was on the summit one night photographing the Milky Way. the laser on the observatory closest to the Subaru was on pretty much all of the time. Why would that be necessary?	John is answering now, laser is used to create a source used to cancel atmospheric turbulence that blurs the image - "Adaptive Optics"
Why are there 2 telescopes? Do they both look at the same object at any given time or are they totally independent.	There was limited use in tandem as an "interferometer" for about 10 years but that that experiment is complete. They're now used independently.
Are the PM segments the adaptive optics?	The AO is separate from the segments, happens on a "deformable mirror"
Have the Google Starlink satellites caused problems? How do you deal with that?	For the most part they're not an issue, They are not in the laser protected class of satellites so we don't need to avoid them
How do you transport such huge data to the base? Optical interface?	yes, fiber optics
How many members or your coding team are there?	on the order of a dozen or so at Keck, but we collaborate with other institutions and share a lot of public domain code
I'd seen news stories about the Starink satellites cause streaks in astronomy images. Does that happen to Keck?	We don't have large field imagers so it's very rare (so far)
What was the instrument to detect cloud motion called?	
The secondary is AO?	We're going to give this question to John to answer at the end
How often do you use fabricated masks with FO links vs using a "slit"	
How do you share the 'fact of existence' of your observed data with others who might need to merge that data with their data? Such as merge a target in your field of view with ultraviolet or IR data of that target from their image?	
I don't see many O2 bottles being used. Do the people working at altitude get along ok?	We provide O2 for our workers and guests
Is there a southern hemisphere counterpart to Keck in Chile? (or elsewhere?) Do you ever do coordinated/simultaneous observations with other observatories?	

What percentage of the Observatory's time is taken up with transient astronomy? Is there a plan to manage transient observations without interrupting normal astronomy?	
Hello! Maybe this has already been answered, but what kind of software is used to process the data after observing? Is it similar to the programmed software used for observations?	
I know scientists are renown for teamwork and sharing....working together, etc. However, Does the Keck team have a rival observatory? Good natured rivalry, of course.	live answered
What degrees of freedom do the mirrors have? How fast can they respond?	Each mirror has 3 actuators that can tip/tilt , controlled at 2Hz
What is the capability of the adaptive optics and the resolution of the telescope sensitive to?	Allows us to measure the super massive black hole, exoplanets, galaxy formation , etc
What is the status of the TMT? That is using PM technology developed at Keck, right?	the primary mirror is similar in that it's segmented, but the segments are smaller and different sensors, etc
Is there ever any satellite interference while observing? Do they get in the way or reflect light back?	occasionally they streak through our view, but not a major issue
How will Keck work in tandem with the next generations of telescopes? :)	independently but complimentary
Does Keck have any observations of the recent merger of two neutron stars that may have formed a Magnetar?	live answered
Do the astronomers at Keck interact directly with equipment and spares suppliers for improvements projects and such?	we use lots of subcontractors to provide much of the new technology and maintenance of older technology
Any thoughts about the loss of Arecibo?	some our solar system work was coordinated with Arecibo so it's a major loss
On a clear night, how often do you recalibrate sensors on the reference star(s)?	
Do you prototype new instruments for proof of concept primarily at Palomar Observatory or bring them directly to Keck	Yes, Palomar, Lick, and other observatories sometimes prototype a technology meant for Keck