Protecting UA telescopes during the winter cold

December 23 2011, By Celeste Barajas

A Mountain Operation technician observes the Catalina Sky Survey telescope and the 32-inch Schulman telescope on Mt. Lemmon. Mountain Operations is the UA team responsible for the maintenance of telescope observatories. During the winter months, the team works to clear away snowfall on and around observatories. Credit: Jay Dee Barryman

(PhysOrg.com) -- Just as property owners are working to protect pipes from bursting during the winter cold, a UA team is working to protect telescope observatories.

While many are preparing for the winter holidays, shopping for last minute gifts and finalizing travel plans, University of Arizona's Mountain Operations is preparing for a long season of protecting telescope observatories from winter weather.

Mountain Operations, a team at UA's Steward Observatory, is in charge of keeping up a wide array of telescope facilities at several main sites – among them, Kitt Peak, Mount Lemmon, Mount Graham and Mount Bigelow at the Catalina Station.

The telescope observatories are open almost every day of the year for researchers and for the public alike, even during the winter holidays.

"In the world of science it's just another day," said Bob Peterson, manager of Mountain Operations. But just another day in science is anything but ordinary.

Every morning, Peterson and his team receive an electronic Trouble Report detailing problems encountered at any of the sites related to computers, instruments, the weather or the telescope.

"If there is a problem and we can see it early we have a team take care of the problem that day," Peterson said. "So, by sunset, the astronomers are viewing the sky with a working telescope and instrument."

Southern view of Kitt Peak from the Steward Observatory Bok telescope. Credit:

Jay Dee Barryman

Working behind the scenes, Mountain Operations do and oversee a little bit of everything, from operating the telescopes to maintaining utility systems.

And each year, the team must prepare for winter.

That involves plowing snow off roadways during winter, operating snow removal equipment like front-end loaders and road graders.

"It's an adventure," Peterson said about working with Mountain Operations.

Sites like Mt. Lemmon can get more than 200 inches of snow, which requires clearing miles of roadways near and around telescope observatories. The team must also ensure thermostats are set, maintaining minimum building heat so pipes do not freeze, Peterson.

Mountain Operations also manages dormitories for research astronomers and maintain access to telescope facilities during and after snow storms. The team must also remove snow that gets on the telescope domes themselves

"We have to make sure that there is no snow or ice that could fall in and hurt the optics," said Joe Hoscheidt, instrumentation specialist for Mountain Operations. "We climb to the top of the domes to push the snow off. We wear a safety harness but it's a little unnerving if the wind is blowing – it can be icy and it's eight stories high off the ground."

"We want to make sure the telescopes are ready for astronomers to use

every night, whatever it takes," Peterson said.

At high altitudes, temperatures can reach as low as zero degrees at many of the observing sites. This allows for long winter seasons, lasting up to seven months from October to April. The team must be ready to face the challenges that come with every cold season.

"Two winters ago," Hoscheidt recalled "we had a really bad snowstorm that came in and we were trying to keep the sites open, plowing snow all day. The weather got worse and a huge tree had blown down across the road. We ended up staying at the sites all night."

"As far as the holidays go, we work based on the needs of the astronomers," Hoscheidt said. "We keep the facilities open so they could do their research, and with them doing their research, we all have a great job. It works well."

Provided by University of Arizona