

Life in Hanle

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Hanle is a village in the south eastern part of Ladakh Union Territory of India which is an extension of the Himalayan plateau. Hanle is certainly one of the best observing sites around the globe or we can say astronomer's paradise. The observatories are normally built in very remote places to avoid light pollution; in addition to that Hanle is blessed with Higher Altitude – 4270 meters, less turbulent air and over ~260 nights of clear sky in a year making it most conducive for astronomy related activities. City dwellers hardly notice the night sky as it is dull to catch one's attention, while the breathtaking view from Hanle of Countless sparkling stars in the backdrop of vast dark sky is something that takes everyone by surprise and amusement.

Apart from astronomy, Hanle has historic importance too, it is home to the 17th century Monastery of the Drukpa Kagyu branch of Tibetan Buddhism. Village also had significance in the past being on an ancient Ladakh-Tibet Trade and pilgrimage route. Wildlife is another treasure of this region where many endangered and rare species are found like the Pallas cat, black neck crane, Tibetan Gazelle and many more.

The residents of Hanle are basically pastoral nomads who rear a variety of livestock including horse, yak, sheep and goat for a range of products and services. One of the finest products of livestock from this region is the cashmere wool or pashmina which is famous around the world. The inhabitants who were nomads once had started to settle down in the villages due to changing lifestyles, shrinking grazing land and attraction towards other easier sources of income from tourists and employment in the infrastructure projects happening in and around this region. In the past three decades, six permanent base-settlements have been established in the valley namely Pungug, Khaldu, Naga, Shadey, Bug and Zhingsoma.

The MACE telescope lies in the north west of the village at the foothills of Mt. Sarasvati (Digpa-Ratsa Ri). In the south of the telescope are the wetland/ Pastureland (Grass) and barley fields which offer a magnificent Landscape while hillocks are spread over in other directions of the telescope. MACE telescope is operational throughout the year on moonless nights even during the extreme winter when temperature dips to as low as -25 degree Celsius. The observation period and timings change continuously with the season and the moon phases. On average, the telescope remains operational for 18 days in a month.

One can hardly imagine what it takes to run a telescope at an altitude of 14000 ft where oxygen is around 65% of what is

available at sea level along with extreme coldness, aridity, high radiation and strong winds. The biggest adjustment to life at Hanle is being semi nocturnal. Mostly our day starts around 12:30 hours when we freshen up to get ready for hot tea and meals. Not very often that all colleagues take a meal at the same time as some prefer to wake up early while few prefer to sleep late in the day. After the meal, it is time to check mails in the control station room and respond to a query if any related to past night observation. The weather decides the course of the observation, it is always useful to check the weather forecast on a reliable website and relate with the weather station at site as to prepare in advance. After a short spell of work, mostly we prefer to take a nap late in the noon mostly during 3-4 pm for 1 hour or so, which makes us fresh and further boosts our energy for the upcoming night. Any amount of sleep in the day time is always a boon for staying focused during the night. The engineer-in-charge conveys the Observation timings on daily basis through internet to all the officials at Hanle, duly all the officials gather in control station room by the start time. The Control station room is a warm cozy place from where all the telescope operations are done, it houses the Operator Console system, data archival system, weather station, Satellite Link and Telescope control unit (Remote Access). The telescope system comprises a complex electrical, electronic and mechanical system, it is quite natural to encounter faults in any of the systems. Depending upon the severity, the problems are consulted with concerned divisions at BARC, Mumbai and are attended in the day time. Efforts are made to minimize the down time of Telescope during the observation window.

The observer team at Hanle consists mostly of two engineers, a technician and an assistant on all the normal days of observation, everyone has specific role to play however it's also true that everyone has knowhow of all the systems of the telescope which is very helpful when working in such an isolated atmosphere.

At the start of evening, preparation for the night observation begins by switching on the power supply of the camera and Telescope control unit followed by physical inspection of the wheel & track, drive systems and camera lid. The observation schedule along with a list of sources and related experimental & system configuration files are received by site on daily basis



PASTURELAND with herds of sheep and goat grazing. The MACE telescope facility can be seen in the background.

from the scientists at BARC, Mumbai which are then loaded on the operator console system. Once the prerequisites are ready, the preheating of the Camera is started prior to the onset of dark period. The preheating is done to bring the camera equipment to optimal temperature for the best performance during which no real time data is collected. The pre-heating run period varies in summer and winter while it is 30 to 60 minutes during summer and 120 minutes during winter. Nights are longer in winter and shorter in summer but realizing it at the telescope is a whole different experience as it governs the observation schedule and so does our day to day life.

As the preheating run completes, the lid of the camera opens and the telescope is ready for data collection once put in tracking of source. At the beginning, one person stays outside to monitor the opening of camera lid and movement of camera in and out of camera parking shelter though telescope operations are fully automated equipped with every system safety aspect still then the alacrity and response of humans is always helpful. The Real time data acquisition starts with tracking of source and start of source observation run in the scheduler. The data collection rates and other system parameters on the screen of operator console are monitored continuously through the observation period, irregularities if any noticed are corrected thereof. There are a series of observations queued in the schedule when it is a long night. From time to time during the night observation, we leave the comfort of the control room to check the sky condition and telescope movements during source change and parking.

The time outside the control room is also often spent watching the spectacular clear night sky with our naked own eye which never stops to amaze us. It is always fascinating to figure out and acknowledge the constellations, stars and Milky Way galaxy with a naked eye. The Sky of Hanle is such a perfect sensation that people often confuse the Milky Way with cloud patches when seeing for the first time. When everything goes well for the night, the observation stops before twilight on full night and on other days, it depends on moon rise or set time. Once the observation ends, it is time to pack up and go to bed for a sound sleep.

Whenever time permits during the day, we never miss to go on a short hikes or walk into village experiencing the calmness of the Valley and beauty of nature to refresh oneself and get lots of sun which we normally miss to catch on. The work environment at site is very conducive where everyone cooperates and help each other in every aspect of day to day life, it's a home away from home. Each colleague discharges duty at every extent possible in their own capacities. Observing can be exhausting, exciting, frustrating and awe inspiring all at once though the outcome of the science from the telescope outweighs every thick and thin. Not only the officials at observatories bear a good bond, but we also share friendly relations with the villagers, which is much needed in such an isolated and tough location.

The impression that Science flowing out of the telescope is one big motivation to work tirelessly and devotedly. The best

ANY amount of sleep during the day time for the scientists and engineers working at the site is a boon as it would help them to stay focused during the night.

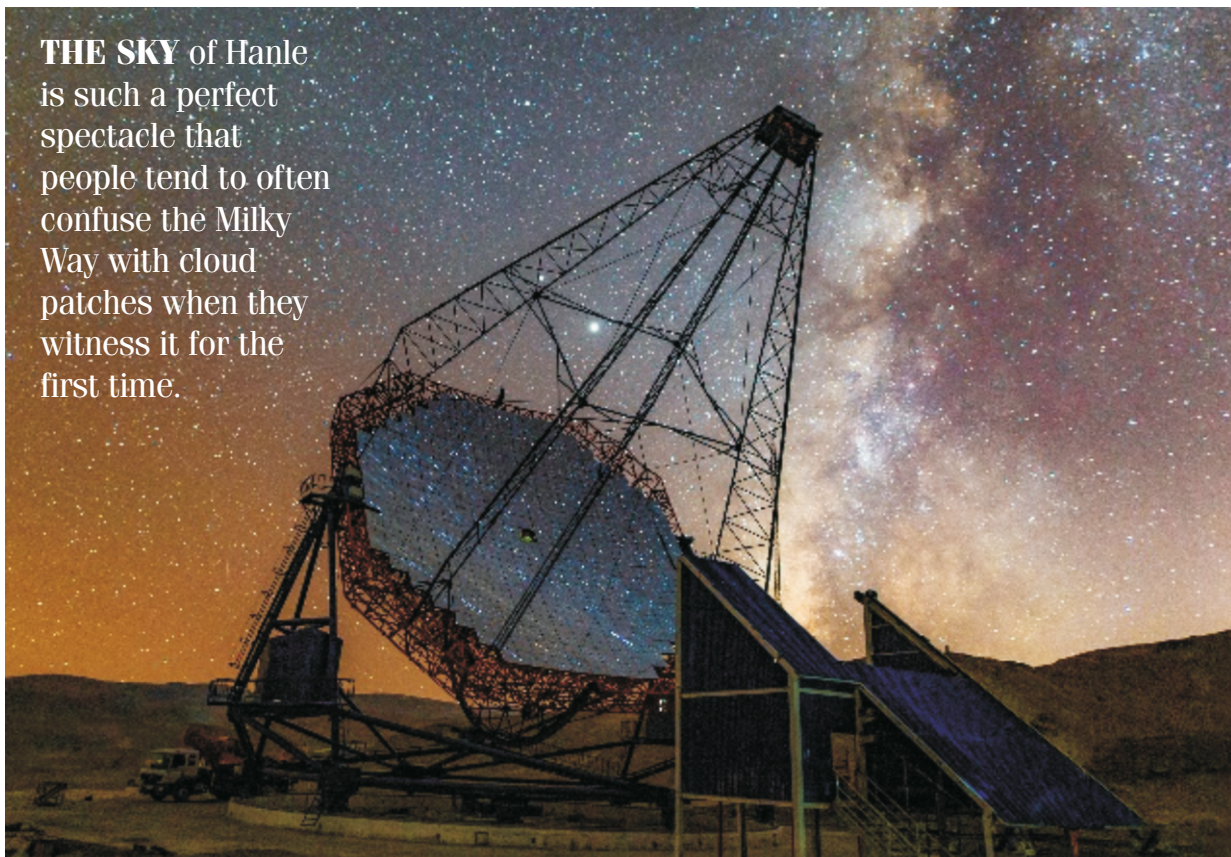
part about life at Hanle is that we explore the extreme depth of the physical universe outwards at night while the serene environment at site in the daytime offers ample opportunity for introspecting deep inside oneself to understand the true nature of self. This duality strikes a perfect balance and evolves us to be better humans.



THE HANLE monastery during winter season (1).

HERD of sheep and goat returning to their base camp after grazing at the high plains (2).

A VIEW of Hanle Monastery during snowfall conditions (3).



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