

MMT Observatory Weather Closure Policy

Original: February 5, 2010

Updated: May 11, 2021

Updated: August 24, 2021

Updated: October 26, 2023

Updated: November 22, 2023

The weather can change suddenly on the summit of Mount Hopkins and therefore conditions must be checked before opening the telescope enclosure and monitored throughout the night. The Telescope Operator has the responsibility for determining when the environmental and weather conditions are such that it is safe to have the chamber open. The Operator may determine that it is necessary to close the facility at any time because of current or imminent weather or other situations such as power failure, equipment failure, injury, fire or other emergency. This policy serves as a guideline; however, the Operator has the final authority in the decision to open or close. This policy replaces all previous policies and all future revisions will require approval by the Director of the MMT.

The following are the criteria for which the chamber should be closed:

- A. **Precipitation:** There is an imminent threat of precipitation or melting snow from the roof entering the telescope chamber. Borderline conditions may be assessed from the chamber by opening the chamber approximately two meters with the mirror cover closed to determine if water is entering the chamber. The roof heaters can be used to keep the roof temperature above the dew point.
- B. **Lightning:** There is an imminent threat of lightning.
- C. **Wind:**
 - a. For the f/5 and f/9 secondaries, sustained winds exceeding 40 mph or gusts exceeding 50 mph
 - b. For the f/15 secondary, sustained winds exceeding 35 mph and gusts exceeding 40 mph.
- D. **Particulates:** Wind-blown dust, ash, or smoke can damage the coatings on the MMT optics if they accumulate and react with the water vapor in the air. Currently measurements are made with a Lighthouse Handheld model 3016 and data for particulate sizes of 0.3, 0.5, 1.0, 2.5, 5.0, and 10.0 microns is obtained. The telescope enclosure should be closed (both the front and rear shutters) when a one minute measurement of 1.0

micron sized particles exceeds 7500 per cubic feet. There are currently no closure criteria for smaller particle sizes since they tend to stay aloft. This limit is not seeing dependent, i.e. it does not change based on the local seeing conditions.

- E. **Condensation:** The average front plate temperature of the primary is less than 1.5 C above the chamber dew point temperature.
- F. **Relative Humidity:** Relative humidity and particularly, the trend in relative humidity, is a good indicator for when to be most alert. The chamber should not be open when the outside relative humidity is at or above 90%.
- G. **Temperature:** Whenever the Hectospec/chelle fiber positioner is mounted on the telescope, the ambient air temperature must be above -6.7 C (20°F) to operate the instrument robots or to move the telescope in elevation.
- H. **Other:** The Operator will note in the operator log any other specific weather related conditions that result in closure.

To appeal any aspect of this policy, feel free to contact the MMT Director.

PLEASE DO NOT ARGUE WITH THE TELESCOPE OPERATOR. If you disagree with a closure decision, please make a note in your observer's report, or contact the observatory Director.