



***Information and Safety Guidelines  
for Visitors to the Mauna Kea Summit***

***89<sup>th</sup> Annual Meeting of AAAS, Pacific Division***

***Field Trip #4***

***Tuesday, June 17, 2008***

Excerpted from the Gemini Observatory document, "Guide for Visitors to the Summit," Melissa Welborn, Safety Operations, Gemini Observatory Northern Operations Center, 670 N. A`ohoku Place, Hilo, HI 96720. 11<sup>th</sup> Edition, July 30, 2004, parts of which were excerpted from "High Altitude Safety Protocol," Mountain Medical Services.

## Field Trip Participants:

For your personal safety, it is important that you read this entire safety document. Initial pages 2 and 3 and then sign page 4, acknowledging that you have read and understand the contents of this document. Fax the entire document to the AAAS, Pacific Division office (541-552-8457) as soon as possible, as your field trip request won't be processed until we have this signed document in hand. Observatories that we plan to visit may have additional forms for you to fill out.

## FOR YOUR PROTECTION

Visiting observatories at the top of Mauna Kea can pose significant risks to the visitor. You may encounter potentially hazardous conditions and situations. The various groups that run the observatories work diligently to maintain a safe environment for workers and visitors, but each person bears responsibility for his/her own safety.

The observatories are located at almost 14,000 feet above sea level. A consequence of this is that your mental capabilities and judgment will be substantially impaired during your visit to the summit due to lack of oxygen. This impairment increases your risk of being injured. The following, while not an exhaustive list, are examples of some of the hazards of which you should be cognizant while at the summit and visiting observatories.

- Some floor areas may be slightly uneven and there may be an occasional temporary electrical cord or hose lying on the floor in traffic areas. Watch your step to avoid tripping.
- During inclement weather, some water may leak inside a facility and freeze on the floor. Watch carefully for ice on floors and also watch your step when descending or climbing any outside stairs to main entrances, etc.
- There are vertical drops that are separated by guardrails or handrails throughout many of the facilities and telescopes. Be watchful and careful in these areas.
- Workers may be working in areas above you. If so, there is a risk of falling tools or materials. You should be aware at all times of what is happening above you.
- Be aware of and stay completely away from pinch points when the telescope is in motion. In the Gemini facility, this is generally in the area of the emergency exit and Platform Lift guardrail at the north side of Level 5. These pinch points can be encountered by standing either on the stationary floor or the rotating telescope floor.

*In the event of a fire or injury, transport down the mountain may take as long as an hour and a half or similar time will elapse before any emergency services can reach the summit because of its remote location.*

**You must always remain with your designated guide and follow his/her instructions at all times throughout the tours.** Safety glasses (required in the vicinity of grinding or drilling activities), hard hats, and closed-toe, sturdy (leather preferred) shoes are required to enter the facilities. Jackets and warm clothes are recommended due to cold temperatures at the summit.

## **GUIDELINES FOR MINIMUM RISK AT THE MAUNA KEA SUMMIT**

1. ***Stay Rested.*** Avoid exhausting tasks/fun and short sleep the day before you are scheduled to travel to the summit. This provides more cardio-respiratory reserves for adjustment to altitude stress.
2. ***Avoid Alcohol*** for at least ten hours prior to ascent. This avoids dehydration and irritation of the arteries of the brain that will be forced to adjust to hypoxia.
3. ***Avoid Marijuana.*** Marijuana stays with an individual for several days and can be an unpredictable, extremely potent constrictive agent for the coronary arteries. It has caused sudden death by unpredictably shutting off the blood supply in the hearts of even young, healthy people without warning.
4. ***Avoid Tobacco Chewing and Smoking.*** Nicotine constricts arteries and further inhibits adjustments to the need for increased blood flow.
5. ***Avoid Dehydration.*** The human body shifts large volumes of body water and dumps some of it to help with short-term adjustments to altitude. Give your body water to work with and to cope with losses into the very dry air. If you start to get a pounding, hang-over type of headache, drink three or four cups of plain water; it often works in 4 – 5 minutes.
6. ***Avoid Heavy Meals.*** Don't eat a big meal before ascent to the summit, since this tends to tie up a significant part of the available blood flow for longer than light meals (of high carbohydrate items such as pasts, rice, or other starch). Avoid skipping meals or eating or drinking nothing but sugared snacks or drinks; sharp changes in blood sugar can trigger increased altitude stress.
7. ***Avoid Unprotected Eye Exposure*** to glare and bright sunlight by wearing dark lenses, preferably UV-coated lenses. This reduces fatigue and will prevent the loss of 50% of night vision for up to two nights after glare exposure of only one hour. It also blocks out the significantly greater ultraviolet exposure that Hawaii's ideal astronomical conditions permit, possibly leading to early cataracts. You may wish to wear sunscreen, as the sun can burn even in cold temperatures.

## IMPORTANT MEDICAL ALERT

Because the observatories we are visiting are situated at approximately 14,000 feet above sea level, ascent to the summit exposes you to a reduction in atmospheric pressure, which can result in a variety of medical conditions. In certain cases, severe illness and even death can result.

Visitors to the summit may suffer headaches, tiredness, irritability, lack of appetite, insomnia, reduced intellectual capacity, impaired exercise/exertion tolerance, and possible vomiting. It is also possible to develop one or more of the more severe mountain sicknesses, pulmonary or cerebral edema, both of which can be fatal. The altitude may also aggravate pre-existing disease, particularly cardiovascular, diabetes, and respiratory diseases. Individuals with these conditions are advised to seriously consider the advisability of proceeding.

AAAS, Pacific Division *strongly* urges all visitors to bring the above information to the attention of his/her medical practitioner and to seek medical advice and clearance before visiting the summit.

AAAS, Pacific Division does not undertake a duty properly to warn or otherwise to relinquish its rights, immunities or other protections under Hawaii Revised Statutes, Chapter 520. This WARNING is given freely *without* legal obligation. Under NO circumstances will AAAS, Pacific Division allow visitors under the age of sixteen (16) years of age to participate in this field trip. Minors between the ages of sixteen (16) and eighteen (18) years of age require parental permission to visit the site.

**AAAS, Pacific Division does not accept any liability for visitors to the summit of Mauna Kea with respect to the potential adverse effects of altitude or for any adverse effects from the administration of oxygen, if required. If you intend to participate in this trip, you are required to sign the declaration provided. You therefore assume all risks.**

*ACCEPTANCE: I have read and understand these Safety Guidelines and further agree to abide by all safety regulations and the instructions of my guide. I have read and understand the Medical Alert provided by AAAS, Pacific Division concerning the potential harmful effects of altitude. I have been recommended to seek medical advice before proceeding. Further, I give my consent for personnel to administer oxygen to me in the event I should require it and from that action, I agree to hold harmless AAAS, Pacific Division. I accept that AAAS, Pacific Division shall not be held responsible for any adverse effects to me resulting from exposure to high altitude.*

**PRINT NAME AND ADDRESS:**

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Name \_\_\_\_\_ Address \_\_\_\_\_ City/State/Zip \_\_\_\_\_

**SIGNATURE:** \_\_\_\_\_ **DATE:** \_\_\_\_\_