LBTO Site Safety Orientation for Docents

Large Binocular Telescope Observatory
David Carroll, Safety Manager/Engineer
Visitor Safety Brochures

• Visitor safety brochure is available in the LBTO lobby (brochure is included on following 2 slides).

• Information important to Docents and Tour Group Participants:
  • Emergencies and Evacuation
  • General rules
  • High Altitude Health
  • Availability of safety equipment

• Tour group participants are welcome to take a brochure with them.
General Safety Rules

- Stay with your LBT escort at all times.
- Watch for signs of altitude sickness in yourself and others.
- Stay hydrated. Drink plenty of water!
- Report all injuries, illness, and accidents to your escort. LBT has first-aid trained staff.
- Do not touch equipment.
- Do not cross red danger tape.
- Hard hats required if crane is in use.
- Cryo dewars vent - stay >5 feet away.

High Altitude Sickness

LBT Elevation: ~10,500 feet
The LBT is in an amazing place. On a clear day, it is possible to see hundreds of miles in every direction. With this high vantage point comes some risk, mainly in that air pressure is decreased, and the body has a more difficult time taking in oxygen through the lungs. For this reason, some people may experience high altitude sickness while visiting. Always look out for the following symptoms in yourself and in others:

- Mild Shortness of Breath
- Dizziness
- Lightheadedness
- Headaches
- Visual Change
- Palpitations
- Chest Tightness
- Nausea

Report these symptoms to your escort immediately, as more severe conditions can develop. Oxygen (tank) administration, decent to lower elevation, and in rare cases, medical attention may be required.

Visitor Safety Brochure

Welcome to the Large Binocular Telescope Observatory

Base Camp:
1480 W Swift Trail
(SR 366),
Safford, AZ 85546
520-621-8650
mgio.arizona.edu

Observatory:
12500 W Swift Trail
(SR 366),
Safford, AZ 85546
520-626-1466
www.lbto.org

Safety Policy

The Large Binocular Telescope (LBT) is committed to the safety of all who visit, work and stay at the observatory, and we know that without a safe workforce and safely operating telescope, our mission of science and discovery could not be possible.

The LBT strives to:

- Promote a work environment in which all employees are involved and have a sense of ownership in the importance of safe and healthy operations.
- Promote the philosophy that safety is a priority with everything that we do.
- Promote an awareness and mitigation of known risks to people, property and the environment.
- Promote operations that are free of serious recognized safety hazards.
- Integrate safety, health and environmental considerations into project planning, design, construction and operations to minimize harm or loss.
- Enable compliance with University, State, and Federal laws, regulations, and policies regarding health and safety.
- Provide adequate training that addresses the safety and health responsibilities of all personnel.
- Recognize, reward and reinforce our safety, health and environmental achievements, innovations, and behaviors.

While at LBT:

- You must follow all LBT safety and security policies.
- You must always be accompanied by a LBT sponsored escort, unless you have completed the Site Safety Orientation.

At the end of the day...

Everyone goes home safe!
In Case of an Emergency

Please pay attention to emergency signs and maps indicating evacuation routes and assembly areas in the event of an emergency.

In an emergency:
- Notify your escort or an LBT staff member to call 911.
- Ensure your own personal safety.
- Bring the injured to safety only if safe to do so.
- In the event of an evacuation, follow your LBT escort to the nearest exit and outdoor assembly location (x).
- Do not use elevators. Take the stairs.
- In cold weather, assemble in the foyer.
- Blankets and supplies are available.
- MGIO has an emergency evacuation vehicle.
- Safford has the closest medical facility: Mt. Graham Medical Center, 1.5 hours by vehicle.

Evacuation Map:

Safety Equipment

The LBT is equipped with the following:
- First Aid Kits
- Automated External Defibrillators (AEDs)
- Blood Oxygen Finger Meters (in FA kits)
- Oxygen (O2) tanks
- Emergency Evacuation Vehicle
- First-Aid Trained Staff

Chemical Safety

- Flammable, corrosive, and cryogenic chemicals are in use on site.
- Chemical Safety Data Sheets are on Level 1 near the restrooms.
- Do not contact chemicals w/out approval.

While Outside on Summit

While on MGIO site:
- Never cross the yellow ropes or go into the forest. This will result in a hefty fine from the Forest Service.
- Please do not approach or feed wildlife.
- Please do not litter. Be careful with items that could blow away in the strong winds.
- Watch for falling ice around buildings.
- Only MGIO approved drivers are allowed to drive on the site.
- Please turn phones to airplane mode around the SMT to reduce radio interference.

Interesting Factoids...

You will quickly notice that the LBT observatory is a very large place! Here are some important facts related to safety:
- LBT building height: 40 meters
- Telescope height: 25 meters
- LBT elevation: 10,567 feet
- Base camp to summit gain: 7,150 feet
- Highest elevator in Arizona!
- On clear days, half of Arizona is visible.
- LBT uses ~100,000 gallons of fresh water per year. All drinking water is trucked from Safford.
- LBT produces ~100,000 gallons of septage per year. Every gallon of this product is also trucked down the mountain as there are no septic facilities allowed on site.
- LBT will burn about 20,000 gallons of propane a year.
- LBT uses about 4M Kwh of electricity each year. This is enough power to light up 315 average homes in Arizona for a year.
- MGIO custodial services will average 1350 loads of laundry a year to keep up with their 15 dorm rooms.

Important Phone Numbers

<table>
<thead>
<tr>
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<th>Phone Number</th>
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<tbody>
<tr>
<td>LBTO Safety: David Carroll</td>
<td>520-419-3106</td>
</tr>
<tr>
<td>LBTO Director: Christian Veillet</td>
<td>520-349-4576</td>
</tr>
<tr>
<td>MGIO Director: Eric Buckley</td>
<td>928-428-2739</td>
</tr>
<tr>
<td>Discovery Park:</td>
<td>928-428-6260</td>
</tr>
</tbody>
</table>

Go home safe!!!
Where to go/not go in the Building

• It is OK to visit:
  • Level 1 lobby and high bay, level 2 kitchen and control room, level 3U with small groups, level 4 circular walkway only, and level 6 visitors gallery.
  • Access to the bogie floor 3U is ok with smaller groups. We have a lot of unlocked cabinets on that floor. If we allow unrestrained access we need to lock all cabinets.
  • While it is ok to tour the high bay, no clean room access is permitted.

• No access to:
  • Level 3L or the bedrooms on level 2 or the office area and work areas on level 1.
  • No one is allowed on level 5 chamber floor, on the telescope or above level 7 catwalk. These locations introduce the possibility of something ending up on the glass, or someone getting hurt.

• When taking a tour around be aware of people working on and around the telescope. Ask the people working if it is ok to pass by. There maybe dangers there from falling objects or ladders. Please no pictures of workers.

• Any exceptions to these rules must be approved by the LBTO Manager on Duty.

Make the safe choice...
Exceptions
(NEEDING LBTO MANAGEMENT APPROVAL & ESCORT)

• There are occasions when it is possible, with LBTO management approval, to allow people in other parts of the observatory. Please ask the manager to escort you. The following rules apply.

• For approved access to level 5, observing floor:
  • There are several hazards that must be understood by people entering this floor.
  • There is possibly an oil film on the floor making it very slick to some types of shoe soles.
  • The railing around the hatch must be in place.
  • The cable around the telescope must be in place.
  • Limited access to the left/right doghouses, only by invitation of a few people.
  • No climbing on or over any barriers is allowed.
  • Stay clear 5’ from dewars.

Make the safe choice...
Exceptions
(NEEDING LBTO MANAGEMENT APPROVAL & ESCORT)

- **For access onto the telescope:**
  - Smaller escorted group that can be monitored. (Small group is less than 6 people with LBTO staff member.)
  - EL axis lockout.
  - Everyone is aware of Glass Safety Procedures and agrees to obey them.
  - No climbing allowed.
  - No access to the instruments or tree houses.
  - No access to the ladders to level 5½ or the LUCIFER platform.

- **For access to levels above level 7:**
  - Small escorted group that can be monitored. (Small group is less than 6 people with LBTO staff member.)
  - There are several hazards here including steep ladders and fall potential.
  - Weather must be considered when going out on the 10th level porch.
  - No one is allowed on the roof or roof ladder.
  - No one is allowed on the catwalks overlooking the telescope on level 9.

Make the safe choice...
LBTO Manager On Duty

- There is a Manager on Duty at the LBTO except on weekends during summer shutdown (July-Aug).
- Check in with the manager (or front desk reception) upon tour group arrival. Radio them if necessary.
- Verify with the manager which areas can be accessed and which are not available due to current operations.

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observatory Manager</td>
<td>Pat Hartley</td>
</tr>
<tr>
<td>Assistant Observatory Manager</td>
<td>Michael Wagner</td>
</tr>
<tr>
<td>Staff Coverage for Assistant Mountain Managers (may cover shifts as asst. managers)</td>
<td>Bruce Bingham</td>
</tr>
<tr>
<td>Safety Manager/Engineer</td>
<td>David Carroll</td>
</tr>
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Emergencies

- Docents please take the lead in calling for assistance for your tour group participants. Knowing who is on site and in the buildings will help facilitate a speedy response.

- Observatory staff can provide immediate on-site assistance (LBTO, MGIO, UAPD) and can help facilitate communication and meetup with off-site responders (911 fire, ambulance, police).

- All building phones route to Graham County 911 dispatch operator.

- Consider your location when choosing which radio to call for help on: Indoor LBT Radio or MGIO Radio, or both.

- Emergency contact sheets are located by phones (including address and phone numbers).

- 911 dispatch will make the determination as to whether an ambulance and/or helicopter will be sent to the mountain based on the details of the emergency.

- UA Police Officer coverage is part time (40 hours total per week). The officer splits time at base camp and summit. Call sign is “Star One” on the MGIO radio.

Make the safe choice...
Non-Emergency Injuries and Medical

While at the LBTO, please always:

• Notify the LBT manager on duty of any injury, illness, incident or near-miss incident.

• Be responsible for ill or injured tour group members and remain with them until they are safely transported off the mountain.

• Be aware that LBTO (and MGIO) staff are not medically trained and are not medical providers.
  • Staff can assist in good faith as “Good Samaritan” to their level of training and comfort.
  • While staff are trained, we ask that Docents also receive first Aid, CPR/AED training so that they can assist tour group participants if needed.

Make the safe choice...
Emergency Response Document Binders @ LBTO

• LBTO/MGIO Emergency response documents (current versions) are in hard copy binders located:
  • Level 1: Lobby, in the podium
  • Level 2: Kitchen, on the shelf
  • Level 5: Aux Control Room (on shelf by AED)

• What’s included:
  • Phone, Radio, Maps
  • Site Evacuation Plan
  • Forest and Structure Fire Plans
  • MGIO Emergency Response Plan
  • Administering Oxygen Procedure
  • Fall Rescue Plan

Make the safe choice...
Radio Communication

• There are 2 types of radios in use at the LBT:

1. “MGIO Radio” (Outdoors)
   • Each vehicle should carry an MGIO radio.
   • Set to “MGIO RPT” (repeater)
   • Call for uphill/downhill traffic on the access road.
   • Use for emergencies while on the road, SMT, VATT.
   • Does not work reliably inside LBT building. There may not always be LBTO staff able to hear.

1. “LBTO radio” (Indoors)
   • Used once at/inside LBT
   • Set to Ch. 12
   • Used for emergencies while inside LBT
   • Docents should pick up an LBTO radio from the lobby, carry it with them at all times, and return it when leaving the building.

Make the safe choice...
Emergencies on the Road

• Do not put your safety or the safety of others at risk while driving or while involved in an emergency situation.

• Remember, your safety comes before that of the vehicle, the equipment and of wildlife!

• Calling for Help on the Road
  • Attempt to reach someone in this order:
    1. MGIO Radio (via the “MGIO RPT” channel)
    2. Phone: Dial 911 or UAPD: 520-621-8273 (signal strength varies)
    3. Last Resort for Emergencies: On the MGIO Radio, switch the channel to GCSO 1 or 2 and radio for help. This is the Graham County Sheriff’s Office – 911 dispatch.
High Altitude Health

See LBTO Document: M004s00320 “High Altitude Health Information”

• LBT is at 10,500 feet. 70% Oxygen equivalent in the atmosphere due to decrease in pressure.

• Being at altitude can result in Acute Mountain Sickness (altitude sickness).
  • Can vary from person to person, day to day.
  • Even if symptoms are mild, they can turn quickly.
  • Even mild impairment can harm you or others in an industrial setting!

• Recognize these symptoms in yourself and others:
  • Headache, dizziness, tiredness, irritability, reduced mental capacity, impaired exertion tolerance, shortness of breath, vomiting.
  • Conditions are curable → return to lower elevation. If symptoms persist, seek medical help.

Make the safe choice...
High Altitude & Pre-existing Health Conditions

• Working at high altitude can complicate some medical conditions, increasing risk of complications.

• As a precaution, those with medical conditions listed on the MGIO waiver should not come to the site so as to minimize the risk of adverse reactions and possible medical emergencies due to the remote nature of the site and lack of trained medical professionals.
Caution: Liquid Nitrogen Dewars Off-Gassing

• Dewars can off-gas at any time, releasing 22-50 psi of nitrogen gas (depending on the dewar).
• As the nitrogen inside warms and changes phase from a liquid to a gas, it expands.
• Off-gassing occurs via the over-pressure relief vent valves.
• Dewars are typically stored in level 1 high bay, level 5 chamber floor, and level 6 visitor’s gallery.
• Off-gassing dewars:
  • Can startle someone, causing an accident or injury.
  • Can be loud if standing close.
  • Can cause skin impact trauma if standing close.

To avoid injury:

Stay clear 5 feet from dewars at all times!

Make the safe choice...
Nitrogen Asphyxiatiion

• Release of nitrogen in confined areas could cause asphyxiatiion (suffocation).

• Elevator Transport of Liquid Nitrogen
  • No one allowed to ride in elevator with nitrogen dewers.
  • Transport will be pre-announced over radio.
  • If you see Danger Tape and dewers in the elevator, do not enter the elevator.

Make the safe choice...
Overhead Cranes

• Hard hats are required whenever cranes are in use in the following location:
  • Level 1 High Bay
  • Level 5/6/7 Telescope Chamber (including gallery and stairwell).

• Requirement is in affect whenever the sign to the right is in place:
  • Placed outside the high bay level 1
  • Placed in front of the upper elevator on level 4.
  NOTE: when taking stairs to level 5, you must first check to see if the crane sign is out in front of the elevator entrance.

• If you need more hard hats, contact the manager on duty.
• Never walk under a suspended load.

Make the safe choice...