Amundsen-Scott South Pole Station Medical Team Orientation
Antarctica

- Coldest
- Driest
- Windiest
- Remotest
- Emptiest
Antarctic History

• Ross
• Cook
• Amundsen
• Scott & Wilson
• Shackleton
• Byrd
• Operation Deep Freeze
CAPT James Clark Ross

• Royal Navy veteran of 7 Arctic Expeditions
• Commanded the British Antarctic Expedition (1839 – 1843) to investigate terrestrial magnetism and determine the position of the magnetic South Pole
• HMS Erebus & HMS Terror
Dr. Frederick Albert Cook

- First Physician to winter in Antarctica (1898)
- Expedition surgeon for the Belgian Antarctic Expedition aboard the *Belgica*
- Responsible for saving the lives of the crew when the ship became trapped in ice
Roald Amundsen

• First to reach the geographic South Pole on 14 DEC 1911
• Presaged modern expeditions
  – Careful preparation
  – Good equipment
  – Appropriate clothing
  – A primary task (to reach SP 1st)
  – Understanding of sled dogs
  – Effective use of skis
CAPT Robert Falcon Scott

- Reached the South Pole on 17 JAN 1912
- A doomed expedition
  - Believed man-hauling was noble
  - Relied upon unproven polar technologies – motor sledges & horses
  - Added an extra person to the polar party at the last minute
  - Subsisted on starvation rations
Dr. Edward Wilson

- First Physician to reach the South Pole (1912)
- Expedition surgeon for the British Antarctic Expedition
- Perished near One Ton Depot along with Captain Robert Scott & “Birdie” Bowers
Sir Ernest Shackleton

- Son of a physician
- Accompanied Scott as 3rd Officer on the Discovery Expedition
- Led his own expedition, Nimrod, in 1907
- In January 1909, he & 3 companions came within 97nm of the South Pole
RADM Richard E. Byrd

- Naval aviator & American polar explorer
- Claimed to have flown over North (1926) & South (1929) Poles – South Pole claim generally acknowledged
- 5 expeditions to Antarctica
- Spent 5 winter months alone (1934)
- Commanded Operation Deep Freeze I (1955 – 1956)
Operation Deep Freeze

• Operation Deep Freeze I (1955 – 1956)
• U.S. Navy as Executive Agent to support USAP
• Established permanent stations at McMurdo, South Pole, & Bay of Whales
• Civilian scientists supported by military personnel
Amundsen-Scott South Pole Elevated Station

- The Elevated Station provides 21st Century facilities for polar science
- Experiments in the out buildings can be controlled remotely from the station
Elevated Station Challenges

CHALLENGES THAT FACE SOUTH POLE ARCHITECTURE

WIND
* Constant winds result in snow pile-up on buildings.
  * The new station faces into the wind, and is afoil-shaped.
  * The afoil forces air into a compressed space where it accelerates.
  * The fast wind scourrs out built-up snow.
  * Years later, if snow still builds up, the building can be lifted two more stories on its columns.

ICE FLOW
* The station sits atop a 2-mile deep layer of ice.
  * Each year, the geographic South Pole is marked.
  * Ice (cold water), slowly drips down to the ocean with gravity.
  * The trail of yearly South Pole markers shows that the ice moves 37/yr.

ICE CREEP
* The weight of the building also causes the ice to move locally.
  * Ice compresses and shifts away from sources of pressure.
  * Resulting variable rates of sinking make keeping the building level a challenge.
  * Architectural elements built into the design will help meet that challenge.
South Pole Berthing

• Private staterooms 8’ X 9’
• Medical staff berthing is near the Medical Clinic
• Physician’s stateroom has a window
• Phone & LAN drops in each room, but no wireless
• Temperature control in each room
South Pole Diversions

- Library
- Fitness Center
- Music Room
- One of Three Lounges
- Gymnasium
- Craft Room
- Computer Room
South Pole Outdoor Diversions

Hiking to the original site of Amundsen’s Tent

Geohashing

Camping at -105° Fahrenheit
South Pole Diversions

Astronomy Class

Photography
South Pole Challenges

• Altitude = 11,000 ASL
• Hypoxia
  – Periodic breathing
  – Insomnia
  – Delayed healing
  – Reduced maximal heart rate & cardiac output
• Cold
  – Frostbite
  – Hypothermia
• Humidity = 4% relative
South Pole Challenges

• Confinement – Inside mostly during winter; stay within 1 – 2 km of South Pole for months
• Isolation – Internet only a few hours a day; no broadband; equipment & supplies > what you have is what you have
• Light – Perpetual darkness in winter
• Low acuity – challenge for skills maintenance
South Pole Challenges

• Monotony – Every day is very similar; same food; same faces
• Water – obtained from ice = 2 (2 min) showers & 1 laundry per week
Things To Bring

• Favorite snacks and powdered drinks
• Baby wipes
• Clothes for special occasions
• Linens/pillow/mattress pad
• White Christmas lights for room mood lighting
• Humidifier & spare filters
• Favorite DVDs or movies on external drive
• Personal DVD player
• MP3 Player
• Extra headphones or ear buds
• Personal notebook computer
• Spare computer power supply
• Toothpaste, deodorant, shampoo, toiletries
• Shower caddy
• SLR camera for outdoor photography
• Remote shutter release
• Wide-angle, fast lens for night/astrophotography
• Tripod

• Favorite pictures of family, friends, & things
• Books, CME materials
• Small crafts
• Cards for birthdays & special occasions
• Telephone calling card
• New running shoes
• Gym clothes
• Small backpack
• Favorite condiments
• Popcorn (fresh)
• Mini-speakers
• Pens you like to use
• Jpeg or pdf files of important documents such as power of attorney, medical license, social security card, driver’s license, passport photo page, etc.
• Consider a Kindle, Nook, or other e-book reader loaded with your favorite books