

# 12.221 Field Geophysics

## Instructors

Brad Hager [bhhager@mit.edu](mailto:bhhager@mit.edu)

Tom Herring, [tah@mit.edu](mailto:tah@mit.edu)

Web: <http://geoweb.mit.edu/~tah/12.221>

## Aims of IAP 2008

- Field camp location near Vidal, California.  
Approximate location  
latitude 34.06 N, Longitude 245.46 E  
(-114.54 W)
- Two main objectives
  - Development of sub-surface structure model based on gravity and seismic measurements
  - Relative motions of GPS monuments in the region

## Class Conduct

- Course is pass/fail grading
- Grade will be based on field camp participation and the final project/Oral presentation.
- Group will generate a final report from camp and each member of the class will be responsible for specific parts of the report (details to be decided after return from camp).
- Working as a team is acceptable but contributions of each member in the final report should be clearly specified.
- Don't forget to return contact information form. We need a final count on camping equipment needs.

01/03/11

12.221 IAP Class 1

3

## Items needed for camp

- **Valid picture ID (Drivers License or passport)**
- Tent, Sleeping bag (35 deg nighttime temperatures), ground sheet
- Sturdy boots
- Sturdy water bottle
- Hat for sun protection
- Flashlight (extra batteries)
- Sun block, skin moisturizer
- Field notebook, pens, calculator
- Clothing for 7days (layering). Daytime temperatures will be in 60-70.
- Laptop computer and/or camera and/or GPS hand held receiver (optional)
- See Web page for complete list

01/03/11

12.221 IAP Class 1

4

## Flight Itinerary

**Depart** Logan Airport: US Airways US 506/US2918  
6:10 AM, Thursday Jan 06, 2011, Boston to Phoenix to Palm Springs

Arrive Palm Springs 11:19 am, pick up equipment, drive directly to field camp. Travel time to camp will be about 3.0 hours.

**Meet between Biology (68) and Chemical Engineering (66) on Ames Street at 4:00 am Thursday morning.**

**Return:** US Airways US 2730/221,  
9:07 AM Friday Jan 14, Palm Springs to Phoenix to Boston  
Arrive Boston 8:17 pm.

Thursday Jan 13; COURTYARD PALM SPRINGS  
1300 TAHQUITZ CANYON WAY  
PALM SPRINGS CA 92262  
760-322-6100

01/03/11

12.221 IAP Class 1

5

## Class schedule

- Mon: 10:30 noon; 54-813: Introduction (this material); Introduction to Gravity (Brad Hager)
- Tues: 1:00-2:30 pm; 54-813: Introduction to GPS (Tom Herring)
- Wed: 10:30-noon; 54-813: Planning of gravity measurements to be made at camp.
- Thur: Depart for field camp, return following Friday.
- Meet 10:30 am-noon Wed-Fri Jan 19-21 following camp. Room 54-813. Class may continue into to the following week. Initial presentations on Friday Jan 21. Follow up presentation Wed Jan 26.

01/03/11

12.221 IAP Class 1

6

## Topics to be covered

- Gravity measurements for inferring sub-surface characteristics. Modeling of gravity by analytical/numerical integration. More details starting on Tuesday's class.
- Applications of the global positioning system: We will use
  - “Kinematic” GPS to do ~10 mm positioning of a moving antenna (gravity)
  - “Static” GPS to do sub-mm positioning (tectonics)
- Seismic measurements for subsurface structure (covered at camp).