IRIS Undergraduate Internship Orientation Week
May 26 – June 1, 2013
New Mexico Tech

Staff:
Rick Aster (NMT)
Greg Chavez (PIC)
Gary Axen (NMT)
Katie Foster (U. of Wyoming & Program Alumnus)
Michael Hubenthal (IRIS)
Hunter Knox (Sandia National Lab)
Maureen Long (Yale University)
William McIntosh (NM Bureau of Geology)
Sandra Saldaña (Noble Energy)
Dave Thomas (PIC)

Orientation Assistant:
Rob Anthony (PhD Student at NMT & Program Alumnus)

Special thanks to…
New Mexico Tech, the Staff of the IRIS PASSCAL Instrument Center, and special guests Eileen Ryan and Paul Harden

Day 1; Sunday, May 26

Arrival in Socorro:
TBD - Individual student meetings with evaluator

7:00pm Introductions and Welcome Dinner @ 1207 Vista Drive (walking distance from campus)
Welcome and Introductions/Overview of IRIS Intern Program (MH, RA).
• Introductory activities
• IRIS overview
• Brief history of IRIS Internship Program

Day 2; Monday, May 27

7:30 Breakfast @ Fidel Student Services Center
8:00 Vans depart for PIC

IRIS PASSCAL Conference Room
8:15 Broadband station overview (??)

Test Hill
9:00 Station installations in three teams (DT, Rob A., KF)

12:00 Lunch @ Fidel Student Services Center

**IRIS PASSCAL Conference Room**
1:00 Seismograms of the Day – (RA)

1:15 A Broad Overview of Seismology, Seismometry, and Some Cutting-edge Research Topics (RA)

2:00 PASSCAL Tour

2:45 BREAK

3:00 Intro to earth structure (ML)
  • seismic waves
  • reflection, refraction
  • travel time plots & interpretation
  • gross earth structure

4:15 BREAK

4:30 From IRIS Intern to Qualifying Exams (KF)
  • Realities of research: both as an intern and graduate student
  • Selecting a graduate school
  • Your brain pays: applying for scholarships and fellowships
  • The mental leap from undergraduate to graduate life
  • Growing an IRIS internship experience into a PhD

5:30 Free Time

**MSEC 202 Conference Room**
6:30 Evening Lecture – INSERT TITLE HERE (ML)

**Day 3; Tuesday, May 28**

7:30 Breakfast @ Fidel Student Services Center

8:15 Shuttle leaves for Morning Field Trip - *Earth is made of Rocks* (GA, RA)
  • Socorro Fault
  • Quebradas Hike and lunch (2 Miles Easy)

**SPEARE Rm 116**
1:30 Seismogram of the Day (ML)

1:45 Earthquakes (ML)
• Location
• Magnitude
• Seismic moment
• Moment tensors
• Elastic rebound
• Relation to plate tectonics
• Focal mechanisms

3:15 Break

3:30 Making Models from Data -- Geophysical Inverse Theory Introduction (RA)
  • Linear algebra,
  • Least square line fitting as an inverse problem
  • Tomography as an inverse problem

4:30 Introduction to Unix (Rob A.)
  • http://www.ee.surrey.ac.uk/Teaching/Unix/

5:45 Free time

6:15 Vans Depart from Baca for Dinner at "M" Mountain Club along with knocking a few balls at the driving range.

Day 4; Wednesday, May 29 - Mountain Day. Students need modest hiking gear, jackets. (BM, RA, GA)

7:30 Breakfast @ Fidel Student Services Center

8:15 – Shuttles leave cafeteria for PASSCAL tour and then Magdalena Mountains Hike (7 miles, mostly downhill).

10:30 Magdalena Ridge Observatory Visit and Geology of Rifting Overview on the Magdalena Crest

12:30 Lunch on the Magdalena Crest

2:30 Arrival at Hop Canyon (Magdalena). Van pickup.
  • Magdalena Fault

4:00 Return to NMT; Free Time

5:45 Dinner at the Fidel Center

MSEC 202 Conference Room
6:30 Evening Lecture: The Assumptions of Exploration the Salt Problem + What Industry is Looking for in a Geoscientist (SS)
Day 5; Thursday, May 30 -
7:30 Breakfast @ Fidel Student Services Center

SPEARE Rm 116
8:30 General Reflection Theory (SS)
   - Define wavefront & ray
   - Snell’s law
   - Law of reflection
   - Rays in velocity model
   - How we design acquisitions
   - Resolution

10:00 Break

10:15 Seismograms of the Day (KF)

10:30 Basic Signal Processing w/MatLab (Rob A.)
   - Introduction to Matlab
   - Introduction to spectral analysis and filtering

12:00 Lunch @ Fidel Student Services Center

SPEARE Rm 116
1:00 Staying connected during the internship (MH)
   - Logging into IRIS.edu
   - Message boards
   - Blogs

1:45 Intro to GMT (HK)
   - Intro to a c-shell
   - Basic plots
   - Filtering data

3:30 Break

4:00 Field Experiment (SS, GA, PIC)

7:30 Dinner at (Socorro Springs)

9:00 - 11:00 Games, etc.

Day 6; Friday, May 31

7:30 Breakfast @ Fidel Student Services Center
8:15 Seismic Section of the Day (SS)

8:30 Introduction to Exploration Seismic Processing (SS)
- Shot gather
- Static shifts
- Sort by CMP
- Semblance
- Normal Move Out
- Brute Stack
- Migration
- Depth conversion
- Brute Stack

10:00 Break

10:30 Composition of a Seismogram: Processing BB data in Matlab (KF)
- Source function,
- Elastic response function (green's function)
- Instrument response

12:00 Lunch @ Fidel Student Services Center

1:00 Workup of Reflection Data (SS, GA)

2:30 Making Models from Data (Part II) (RA)

3:00 Break

3:15 Maximizing your internship experience (KF/MH)
- Be self-reflective; Develop a plan of action, Maintain & monitor the plan, Evaluate the plan
- Viewing the short-term and long-term benefits of the IRIS internship
- Common pitfalls in research experiences
- Tips for a productive internship
- Presenting your research clearly

4:30 Career Panel
 Rick Aster, NMT
 Other Academic -
 Darren Hart – Sandia National Lab
 Hunter Knox – Sandia National Lab
 Sandra Saldana – Noble Energy
 Geotechnical professional outside of the energy sector -
5:30 Complete Orientation Evaluation

**San Lorenzo Canyon**
6:00 Evening cookout, bonfire and party *(All Invited)*
Guest Speaker – Paul Harden *(local historian)*

**Day 7; Saturday, June 1 – Breakfast and Depart**

Airport runs - TBA