

IRIS Undergraduate Internship Orientation Week
May 24 – May 30, 2015
New Mexico Tech v2.0

Staff:

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Orientation Assistant:

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Special thanks to...

New Mexico Tech, Eileen Ryan (MRO), and the staff of the IRIS PASSCAL Instrument Center (Eric Mararewicz, Carlos Marrero & Greg Chavez)

Pre-Orientation Assignments

- Intro to UNIX - Please complete the following assignments prior to the orientation. The assignments can be found at the URL below. Log in credentials have been emailed to you directly. <http://moodle.glg.muohio.edu/ghgmoodle/login/index.php>
 - o UNIX Tutorials 1-2: Basics Quiz
 - o UNIX Tutorials 3-4: Basics (continued) Quiz
 - o UNIX Tutorials 5-6: Text Editing, Shell Scripts

Day 1; Sunday, May 24

Arrival in Socorro: See shuttle schedule

Sedillo Park Picnic Area – Walking distance from Baca Hall

6:00pm Introductions and Welcome Dinner - We have reserved the pavilion near the Fire Station. [See the map provided.](#)

Welcome and Introductions/Overview of IRIS Intern Program (MH, RA, SB)

- Introductory activities
- IRIS overview
- Brief history of IRIS Internship Program

Day 2; Monday, May 25

7:15 BREAKFAST @ Fidel Student Services Center

8:00 Vans depart for PIC

IRIS PASSCAL Conference Room

8:15 A Broad Overview of Seismology, Seismometry, & Cutting-edge Research Topics (SB)

9:00 Broadband station overview (DT)

Test Hill Behind PIC

9:30 Station installations in three teams (RA, DT, MP, SB)

1:00 LUNCH @ Fidel Student Services Center

IRIS PASSCAL Conference Room

2:00 PASSCAL Tour (SB)

2:45 Intro to earth structure (SB)

- seismic waves
- reflection, refraction
- travel time plots & interpretation
- gross earth structure

4:00 BREAK

4:15 From IRIS Intern to ABD (RA)

- 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

5:15 FREE TIME

MSEC 202 Conference Room

6:30 DINNER & Evening Lecture – Signal in the Noise: Using Microseisms to Investigate Climate Change in Antarctica and Beyond (RA)

Day 3; Tuesday, May 26

7:30 BREAKFAST @ Fidel Student Services Center

8:15 Shuttle leaves for Morning Field Trip - *Earth is made of Rocks* (DL)

- Socorro Fault
- Quebradas Hike and lunch (3 Miles Easy)

12:00 LUNCH @ windmill

SPEARE Rm 116

2:00 Staying connected during the internship (MH)

- Logging into IRIS.edu
- Message boards
- Blogs

2:30 Earthquakes (SB)

- Location
- Magnitude
- Seismic moment
- Moment tensors
- Elastic rebound
- Relation to plate tectonics
- Focal mechanisms

3:45 BREAK

4:00 Basic Signal Processing w/MatLab (RA)

- Introduction to Matlab
- Introduction to spectral analysis and filtering

5:00 BREAK

5:30 Vans Depart from Baca for DINNER at "M" Mountain Club along with knocking a few balls at the driving-range.

Day 4; Wednesday, May 27 - Mountain Day. Students need modest hiking gear, jackets.
(BM, GS, RG)

7:30 BREAKFAST @ Fidel Student Services Center

8:30 Shuttles leave cafeteria for MRO Tour and Magdalena Mountains Hike

9:15 Magdalena Ridge Observatory Visit (ER)

10:15 Regional Volcanism and Rifting – A Overview from the Magdalena Crest (WM)

11:15 Depart for Copper Canyon Trail

11:30 Out-n-back hike on Copper Canyon Trail

12:30 LUNCH (packed lunch along) and turn back

2:00 Return to NMT

SPEARE Rm 116

3:30 Lecture – Real-time GPS integration in earthquake early warning systems (RG)

4:30 FREE TIME IN COMPUTER LAB

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 28 -

7:30 BREAKFAST @ Fidel Student Services Center

SPEARE Rm 116

8:30 Seismogram of the Day (SS)

8:45 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 Computing tools and tricks (RG)

12:00 Staying connected during the internship (MH)

12:15 LUNCH @ Fidel Student Services Center

SPEARE Rm 116

1:00 An Overview of Common Seismological Techniques (JS)

- Waveform cross correlation
- Subspace analysis
- Tomography
- Shear-wave splitting
- Receiver functions

2:00 BREAK

2:15 Depart for Field Experiment at Loma Blanca fault site in the Sevilleta (SS, PIC, LW, PM)
Sunset: 8:11 PM

8:00 DINNER at (Socorro Springs)

9:00 - 11:00 Games, etc.

Day 6; Friday, May 29

7:30 BREAKFAST @ Fidel Student Services Center

SPEARE Rm 116

8:15 Seismogram of the Day (LW)

8:30 Introduction to Exploration Seismic Processing (LW)

- Shot gather
- Static shifts
- Sort by CMP
- Semblance
- Normal Move Out
- Brute Stack
- Migration
- Depth conversion
- Brute Stack

10:00 Break

10:00 Staying connected during the internship (MH)

10:30 Composition of a Seismogram: Processing BB data in Matlab (RA)

- Source function
- Elastic response function (green's function)
- Instrument response
- Activity
 - o Quietest BB installation
 - o Estimate magnitude of an earthquake

12:00 Lunch @ Fidel Student Services Center

SPEARE Rm 116

1:00 Workup of Reflection Data (LW, MP)

3:00 Break

3:15 Maximizing your internship experience (RA/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

5:00 BREAK

San Lorenzo Canyon

5:30 Depart For Evening cookout, bonfire and party (All Invited)

6:30 Career Panel/Dinner

Lindsay Lowe Worthington - UNM
Nedra Bonal – Sandia National Lab
Sandra Saldana – Noble Energy
Ronni Grapethin - NMT

Day 7; Saturday, May 30 – Breakfast and Depart

Airport runs - TBA

Post Orientation Survey - Sent via email