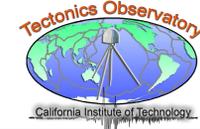




# Outreach Activities – Highlights over past year and upcoming opportunities

Laurie Kovalenko and the TO team



A major objective of the Tectonics Observatory (TO) is to develop an Education and Public Outreach (EPO) program.

## Goals

- Educate the public about TO discoveries
- Inspire kids to learn science
- Provide TO grad students & postdocs with opportunities for outreach in local schools

## Approaches

- Partner with local schools
  - Karen Jain, PUSD Science Coordinator
  - James Maloney, Caltech Classroom Connection and Summer Research at Caltech
- Partner with Caltech outreach programs
  - Science Saturday, REEL Science, Watson Lectures
- Partner with National Association of Geoscience Teachers (NAGT)

## Public Lectures

- Watson Lectures**
  - Jean-Philippe Avouac (October 2010) Rising Mountains and Sinking Oceans: Earthquakes That Shape the Earth
  - Brian Wernicke (April 2010) The Ancient California River and how it Carved the Grand Canyon in the Age of T. Rex
- Pasadena Public Library's One City, One Story**
  - Joann Stock (March 2010) Earthquakes: the Human Story A Public conversation with author of *Gardens of Water*
- Public Panel Discussion at Beckman Auditorium**
  - included Mark Simons and Anthony Sladen (March 2010) Modern Methods of Observing Earthquakes: What We Have Learned About Haiti and Chile using Seismology and Space Observations
- National Association for Geoscience Teachers (NAGT) Conference**
  - Jason Saleeby (October 2010) Keynote speaker and co-leader of two field trips to the foothills of the Sierra Nevada, one to view the suturing of oceanic crust to the continental crust and the other to view anomalous subsidence and relate it to mantle dynamics
- Presentations in Nepal on earthquake science and safety**
  - John Galetzka (Spring 2010)
    - schools
    - United Nations teams
    - Nepali government officials
    - US embassy staff
    - International Committee of Red Cross



## Upcoming Public Lectures

- Watson Lecture - Jennifer Jackson** (coming April 2011) Good Vibrations Inside the Earth
- Caltech Science Saturday and REEL Science programs** - TO students will lead 4 of this year's 11 events

CALIFORNIA INSTITUTE OF TECHNOLOGY  
CAMPUS AND COMMUNITY RELATIONS

Science Saturdays - Matinees for All Ages

Wild Weather - Heat: Kana Takematsu, Beckman Auditorium, 2:00 PM, Saturday, July 10th

Life: Primates: Andrea Choe, Beckman Auditorium, 2:00 PM, Saturday, October 23rd

Earth Story: Michelle Selvans, Beckman Auditorium, 2:00 PM, Saturday, December 4th

Hyperspeed: Siddhartha (Sid) Pathak, Beckman Auditorium, 2:00 PM, Saturday, February 12th

The Roachmobile: Aidy Gonzalez-Serricchio, Beckman Auditorium, 2:00 PM, Saturday, March 26th

The Grand Canyon: Steve Kidder, Beckman Auditorium, 2:00 PM, Saturday, April 9th

The Wave That Shook the World: Nina Lin, Beckman Auditorium, 2:00 PM, Saturday, May 21st

Reel Science - School Group Events

Weird Connections: How Sticky Is Your Gecko?, Beckman Auditorium, 10:00 AM, Friday, October 29th

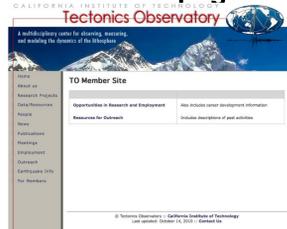
Inside Planet Earth: Beckman Auditorium, 10:00 AM, Friday, February 4th

The Human Body: Pushing the Limits - Slight, Beckman Auditorium, 10:00 AM, Friday, March 25th

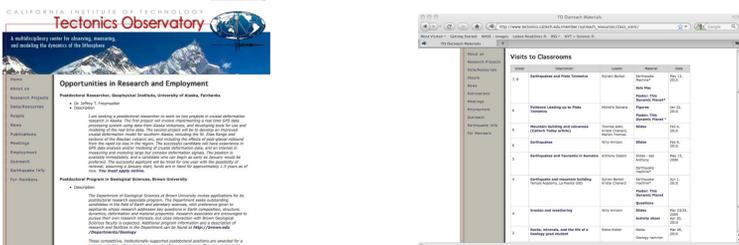
Solar Energy: Saved By the Sun, Beckman Auditorium, 10:00 AM, Friday, May 6th

## Employment Opportunities & Outreach Resources

### -new web pages

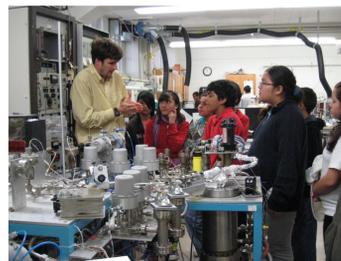


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## Outreach in Local Schools

- TO tours**
  - 6th graders from Hamilton Elementary
  - Caltech's Take Your Child to Work Day
  - Topics included:
    - How Helium trapped in crystals can tell how long a rock has been on the earth's surface
    - How the Himalayan mountains formed
    - Origin of earthquakes and tsunamis in Sumatra
  - Willy Amidon, John Galetzka, Anthony Sladen, Itai Haviv, Aron Meltzner



## Family Science Nights at local schools



- TO grad students and faculty presented hands-on activities at family science nights at
  - Hamilton Elementary
  - Willard Elementary
- Topics included:
  - how mountains are built
  - how plate motions cause earthquakes
  - locating earthquakes by triangulation
  - patterns in mid-ocean ridges
  - what volcanic eruptions tell us about the mantle
- Sylvain Barbot, Nina Lin, Wang Yu, Steve Skinner, Jean-Philippe Avouac, Laurie Kovalenko, Joel Scheingross, Jamshid Hassanzadeh

## Classroom presentations

- TO scientists visited local schools
  - Burbank elementary
  - Blair Magnet IB
  - Marshall Fundamental
  - High Point Academy
  - Temple Academy
  - Washington Accelerated
  - Willard Elementary
  - Pasadena High School
- Presentations included
  - slide show of erosion and weathering
  - Earthquakes and tsunamis in Sumatra
  - earthquake machine (John Galetzka)



Kristel Chanard, Marion Thomas, Thomas Ader, Steve Kidder, Michelle Selvans, Sylvain Barbot, Willy Amidon, Jamshid Hassanzadeh

## Field trips through Eaton Canyon



- TO grad students led field trips through Eaton Canyon
  - 4th graders
  - Boy scouts
  - Combined 6th grade and High School (challenging!)

Alan Chapman, Janet Harvey, Jeff Thompson, Kristel Chanard, Jamshid Hassanzadeh, Joel Scheingross

## Judging at science fairs

- TO scientists served as judges at local science fairs
  - St Phillips Middle School
  - Washington Elementary 5th grade

Tim Raub, Joel Scheingross, Janet Harvey, Sylvain Barbot

## Summer research for High School teachers and students

- Nadaya Cubas and Kristel Chanard mentored two high school students and a teacher for a month of research
  - As part of Caltech's Summer Research Connection

- They designed and built a sandbox experiment to study the effect of friction on mountain building
  - Jura Mountains of France



## Working with teachers

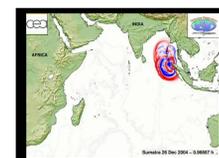
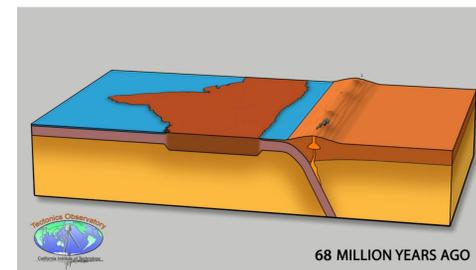


- Participated in PUSD workshops for 6th grade and high school teachers
  - simple experiments: tectonics puzzles, convection
  - talked about research
  - answered questions
- 6th grade teacher Roger Gray gave brownbag seminar
  - how to engage kids
- Restored PUSD's rock and mineral collection
- Partnering with 6th grade middle school teachers
- Upcoming: Joann Stock will lead a workshop on Plate Tectonics of SoCal
  - will be videotaped
- Michelle Selvans, Joel Scheingross, Laurie Kovalenko, Erin Burkett, Jamshid Hassanzadeh, Joann Stock

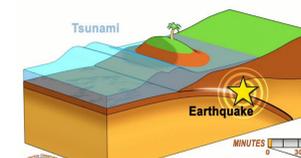
## Animations and Graphics

(http://tectonics.caltech.edu/outreach/animations/)

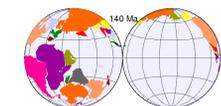
- Animations:** Mountain Building - Tim Pyle



Tsunami propagation - Anthony Sladen



Subduction - Tim Pyle



Plate, Ashley Kennard, Jessica Kim motion - Alex Copley, Mark Turner, Lindsey Stanciffl

## Upcoming Outreach Opportunities

- Partner with local High School Earth Science teacher (who is a Caltech alum!)
  - to help with experiments
- Lead tour of the TO for 6th grade classes
  - Huntington Middle School, San Marino
    - Tuesday Jan. 4 at 10:00 am and 11:00 am
    - Thursday Jan 6 at 10:00 am and 11:00 am
    - Tuesday Feb 1 at 10:00 am and 11:00 am
    - Thursday Feb 3 at 10:00 am and 11:00 am
  - American Martyrs Catholic School, Manhattan Beach
    - May 3 & May 5 at 10:00 am
  - Sierra Canyon School, Chatsworth
    - Jan 6 - two tours, not scheduled yet

## The TO will be hosting the upcoming spring meeting of the National Association of Geoscience Teachers (NAGT)

- Weekend of March 25 - 27**
  - About 100 participants, mostly community college and four-year college teachers, some high school teachers
- Goal**
  - For teachers to learn/experience current research
  - and in turn share this with their students
- Typical Schedule:**
  - Friday night socialize, displays, and keynote speaker
  - Saturday all day field trips and workshops followed by banquet with second keynote speaker
  - Sunday half day of field trips, workshops, tours



Jason Saleeby co-lead two field trips and was keynote speaker at Fall 2010 NAGT meeting

- Workshops so far:**
  - Brian Wernicke, John Eiler, Ken Farley (Low-T thermometry and thermochronometry and applications)
  - Elisabeth Nadin, UA Fairbanks (Historical Earthquakes and Uplift/Subsidence of Sumatra from Coral Growth Rings)
  - Joann Stock (workshop TBD)
  - Tom Heaton/Rob Clayton group (community seismometers workshop/display)
  - Tanya Atwater, UCSB (Transverse Ranges rotation)
- Field trips so far:**
  - Mike Lamb (Erosion and sediment transport in steep mountain terrain, demo and/or field trip)
  - Elisabeth Nadin, UA Fairbanks (Topanga Cyn or Vazquez Rocks)
  - Bruce Carter, PCC (San Gabriel Anorthosite)
  - Rhea Presiado, PCC (Cabrillo)
- Tours/displays so far:**
  - Margaret Vinci (Seismo Lab tour)
  - Bob Degroot, (SEEC display Friday night)

- Thank you**
  - Jeff Grover - co-organizer
  - Heather - for volunteering to help with banquet and meals
  - Lisa - for volunteering to compile the conference Guidebook

Let me know if you have more ideas or would like to volunteer!

Funded by the Gordon and Betty Moore Foundation