



Education & Public Outreach

- Opportunities with local schools

Partnering with local schools

- **Karen Jain**
 - PUSD science coordinator
- **James Maloney**
 - Director of two existing Caltech outreach programs:
 - Caltech Classroom Connection
 - Summer Research at Caltech



Talk about your research to 6th graders on a tour of TO

Topics have included:

- How Helium in crystals reveals how long a rock has been on the earth's surface
- How fossils got to the top of Mr. Everest
- Origin of earthquakes and tsunamis in Sumatra

Participants:

Willy Amidon

Jean-Philippe Avouac

Itai Haviv

Aron Meltzner

Michelle Selvans

Carl Tape



"If a rock filled up with helium, after millions and millions of years would it float away?"

"Mount Everest was underwater??"
- *sixth graders*



Interact with small groups of kids and their parents at Family Science Nights

- elementary and middle schools

Topics have included:

- What does it mean to say something took 1 million years?
- What causes earthquakes?
- Locating earthquakes by triangulation
- The Rock Cycle
- How volcanoes bring up rocks from the mantle

Participants:

Jean-Philippe Avouac Laurie Kovalenko

Willy Amidon Nina Lin

Alan Chapman Jason Saleeby

Ravi Kanda Michelle Selvans

Steve Kidder Steve Skinner

Ozgun Konca Wang Yu



“You say these rocks were formed 12 to 18 miles under my feet? How do they float up?”

“You mean this school is moving toward San Francisco?”



Participate in PUSD 6th grade teacher workshops

- 6th grade focuses on Earth Science, plate tectonics
- Answer questions
- Talk about your research
- Demonstrate simple experiments
 - earthquake machine (*Galetzka*)
 - s, p waves with slinky
 - convection with glasses of hot and cold water
 - puzzles on evidence for plate tectonics



Participants:

Jean-Philippe Avouac

Kristel Chanard

Laurie Kovalenko

Belle Philibosian

Michelle Selvans

“Are you sure there isn't something in between the red and blue water?”

-teacher, referring to convection activity with hot (red) and cold (blue) water

Lead field trips through Eaton Canyon

- Trips have included:
 - 6th grade class
 - PUSD teachers
- Pointed out geological features
- Students hammered on rocks
 - revealing fresh surfaces and uncovering hidden garnet



Participants:

Alan Chapman

Janet Harvey

Steve Kidder



"Hiking isn't as interesting without a geologist along"
- chaperone mom

"I didn't know there was an active fault so close."
-teacher, referring to the Sierra Madre fault

Visit a classroom

- Visits have included
 - 4th grade classes
 - 5th grade GATE class
 - 4th grade Science Fair
- Topics
 - slide show and activity sheets on erosion and weathering
 - Earthquakes and tsunamis in Sumatra, with earthquake machine activity



Participants:

Willy Amidon

Laurie Kovalenko

Anthony Sladen



For something completely different - PUSD's rock collection

- PUSD had boxes of unlabeled rocks (about 250)
- Jamshid helped them clean, classify, label, and describe them
- We are now working on videotaping his stories



Thanks also to:

*Mark Garcia, who donated
sample boxes*

Mentor a High School teacher and students on a summer research project

- Alex Copley mentored a High School teacher and two students
 - through Caltech's Summer Research Connection
- Used *GPlates* to produce updated animations of plate motions over the past 140 million years, using the most recently published data



Thanks also to: Mark Turner

"I didn't know scientists felt such passion for their work"

"I knew about earthquakes but I didn't know why they happened"

- high school students

"Right after the shake-out drill, I told the class about the research I did at the TO on the motion of tectonic plates. You could hear a pin drop - such attention does not happen often, if ever, in that class."

- High School Math teacher

Why volunteer?

- Our president said to! *"President Obama addressed the National Academy of Sciences, challenging the scientists and engineers to go back to the classroom and inspire students by telling them about their work and why it is important to others."*
(*Chemical & Engineering News, May 2009*)
- It helps! *"When High School teachers participate in summer research programs, their students' test scores on the NY State Regents science exam increased by 10%."* (Science, Oct 16, 2009)
- It's rewarding! - the kids and teachers are so appreciative



Many ways to contribute!

- Go to a classroom, host a class here, or lead a class field trip
- Spend 20 minutes talking about your research as part of TO tour, or spend two hours at a Family Science Night
- Lead a kids in a hands-on activity, give a demonstration, present a slide show, or talk with a group of teachers and answer their questions
- Partner with 6th grade teacher - help in lab once or twice/month
- Build a demonstration that others can use, such as convection or mountain building; or create an education module for web
- Lead Boy Scout troop on field trip, or create interpretive sign for San Gabriel Fault
- Work with a partner or go it alone
- We have materials, or will get them for you
- **Do you have an idea? Let us know!**

Thank you volunteers!!

Willy Amidon

Jean-Philippe Avouac

Alan Chapman

Kristel Chanard

Alex Copley

John Galetzka

Janet Harvey

Jamshid Hassanzadeh

Itai Haviv

Ravi Kanda

Steve Kidder

Ozgun Konca

Nina Lin

Aron Meltzner

Belle Philibosian

Michelle Selvans

Jason Saleeby

Michelle Selvans

Steve Skinner

Anthony Sladen

Heather Steele

Carl Tape

Wang Yu

Upcoming opportunities

- Eaton Canyon field trips
 - 4th grade class
 - high school AP environmental science class
 - Pair 6th graders with high school students and have them do activities as partners, such as find an igneous rock and describe it, find a mineral, find a fault, and so on
- TO tour March 2nd
- Talk to 4th grade class at TO about rocks
- Visit 2nd grade class to talk about rocks
- Partner with 6th grade teacher - help with lab once or twice a month
- Do you have an idea? Let us know!