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 ingenious 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!

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