

A major objective of the Tectonics Observatory (TO) is to develop an Education & 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

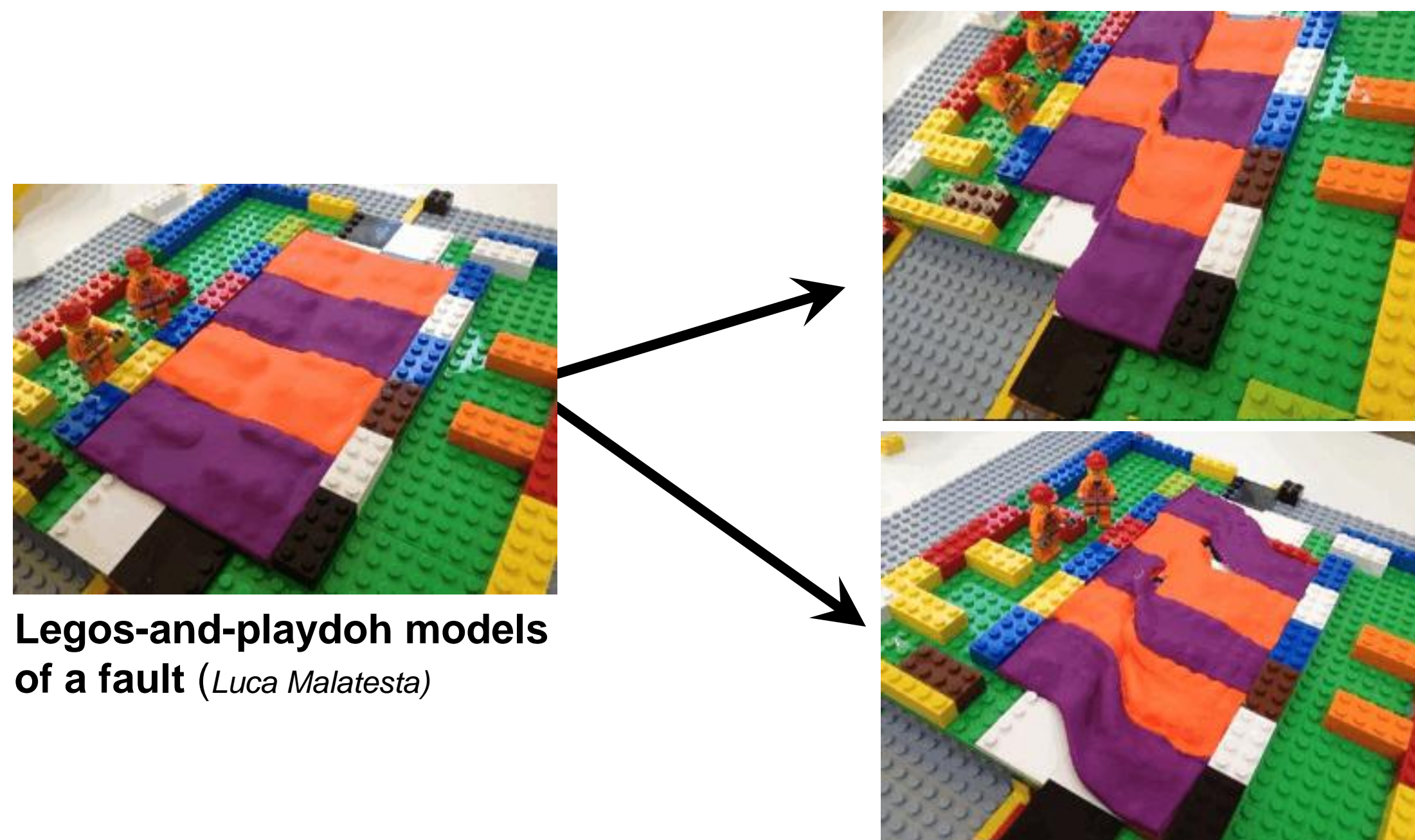
- Divide students into groups so that the ratio of scientists to students ≈ 10
- Partner with local schools
 - Karen Jain, PUSD Science Coordinator
 - James Maloney, Caltech Classroom Connection & Summer Research Connection
- Partner with Caltech outreach program
 - Science Saturday, REEL Science, Watson Lectures
- Partner with GameDesk Institute

Public Lectures this Past Year

- Caltech Science Saturday** (for children 8 years old and up, and their families)
 - Grad Student Ajay Limaye (coming up on April 27, 2013) "Far from a Cold Case: Solving the Riddles of Ice on Planet Earth"
- Caltech Watson Lecture**
 - Professor John Eiler (March 2012) "The Isotope Time Machine"
- Presentations in Nepal at US embassy**
 - Geodesy Specialist John Galetzka (March 2012) "Nepal: Japan-size earthquakes, Haiti-like infrastructure"

Hands-on Outreach Resources

(More in coffee room, 300 N Mudd)



Legos-and-playdoh models of a fault (Luca Malatesta)

On-line Outreach Resources

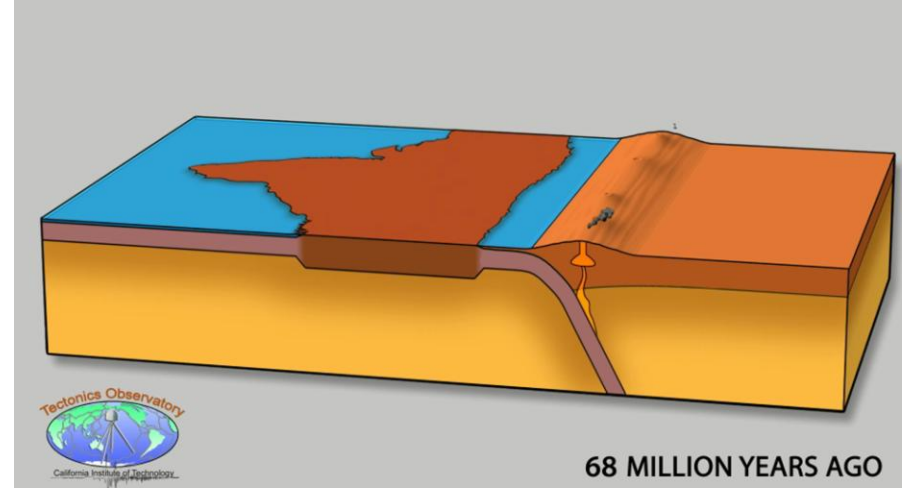
- Descriptions of past outreach activities, with advice by the leaders

Go to "For Members"

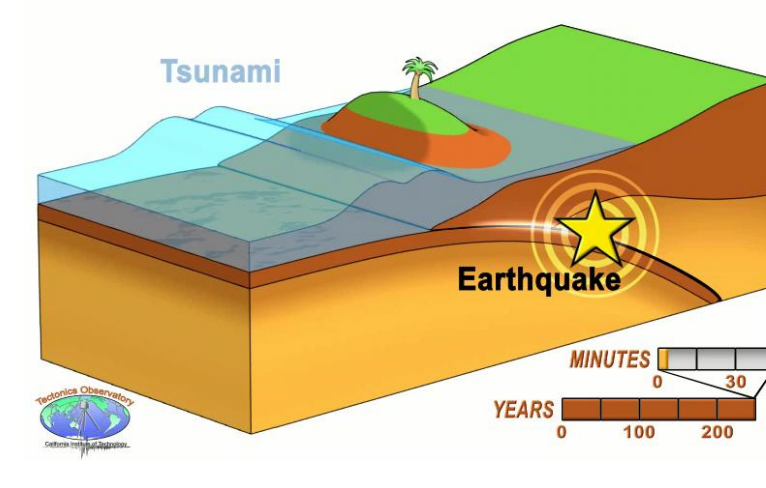
Log in with:
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- Animations and graphics, such as:



Mountain building - Kristel Chanard, Tim Pyle (IPAC)



Subduction zone earthquakes and tsunamis - Tim Pyle (IPAC)

Mentoring high school teacher and students in research

- Caltech's Summer Research Connection program
- Tested a new tool to make 3-D models of geologic field locations from everyday photos
- Mentors:
 - James Hollingsworth
 - Sebastien Leprince
 - Francois Ayoub
 - Luca Malatesta
- The project was so successful, the group was invited back to Caltech in the fall, to give a TO Brownbag Seminar



James Hollingsworth with Alex Day Blattner, Temoc Rodriguez, and Steven Tan, at Vasquez Rocks

Scientists welcomed ~ 350 students (4th - 12th grades) to Caltech

Visiting schools:

- Lycee International de LA (LILA), Tarzana (full day!)
- Hamilton Elementary School (Pasadena Unified)
- St. Bede's School, La Canada Flintridge
- Assumption School, Pasadena
- La Lycee de Los Angeles
- South East High School (Los Angeles Unified)
- Holy Angels School, Arcadia
- Chinese exchange students, program led by Bruce Carter (PCC)
- Clark Magnet High School (Glendale Unified)
- Robotics Club (Pasadena Unified)

Topics included:

- Looking Inside the Earthquake Machine: How we simulate the San Andreas Fault
- Are we children of the stars?
- Looking for the next earthquake in the Himalaya
- Out to Sea
- Rocks and Minerals on the Move
- Exploring Mars
- Making Earthquakes in the Lab
- Puzzled by Glaciers: Understanding these rivers of ice
- Dating bones using Mass Spectrometry
- Creating debris flows in the lab
- Counting Fringes: How geoscientists study deformation while sitting at their desks

Scientists:

- | | | |
|-----------------------|-------------------|-----------------|
| - Thomas Ader | - Ajay Limaye | - Katie Snell |
| - Sylvain Barbot | - Nina Lin | - Katie Stack |
| - Erin Burkett | - Luca Malatesta | - Adam Subhas |
| - Nadaya Cubas | - Jeff Prancevic | - Danielle Sumy |
| - Jen Griffes | - Melissa Rice | - Marion Thomas |
| - Jamshid Hassanzadeh | - Vito Rubino | - Victor Tsai |
| - Junlie Jiang | - Kirsten Siebach | |



Adam Subhas - giving 6th grade students from Holy Angels School a tour of his mass spectrometry lab



Jevv Prancevic and Luca Malatesta showing high school students from Clark Magnet School in Glendale, how they study landslides in the Flume Lab



Victor Tsai, leading a presentation on "Puzzled by Glaciers: exploring these rivers of ice"



Danielle Sumy, leading students from South East High School in LA, in a race of S and P waves



Junlie Jiang with 4th graders from Hamilton Elementary School, experimenting with the earthquake machine



Sylvain Barbot helping students identify geological features on map of California



Katie Stack and Jen Griffes, showing middle school students in Pasadena Unified's Robotics Club some tools geologists use to study Mars



Nadaya Cubas and Marion Thomas leading 5th graders from LILA in a sandbox activity to explore mountain building



Jamshid Hassanzadeh demonstrating how a little acid can release carbon dioxide from the shells of marine organisms



Nina Lin helping 4th graders from Hamilton Elementary School create their own rock collection - photos above show Nina gathering rock samples, and Mark Garcia down-sizing them; Heather Steele and Lisa Christiansen operate the glue guns

Scientists visited 13 classrooms (about 350 students)

Schools visited:

- Blair Middle School (PUSD)
- Gettys Middle School (PCUSD), South Carolina (via Skype, at 5:45AM!)
- Hughes Middle School (Long Beach Unified School District)
- Holy Redeemer Middle School, Montrose
- Larchmont Charter School (LAUSD)
- Washington Middle School (PUSD)

Topics included:

- Reading the Rock Record
- Using paleomagnetism in Antarctica to determine past locations of continents
- Deformation and mountain building using legos, playdoh, and a sandbox
- Observing Earth - following in the footsteps of Wegener

Scientists:

- | | |
|------------------------|--------------------|
| - Jean-Philippe Avouac | - Belle Philbosian |
| - Sylvain Barbot | - Steve Skinner |
| - Kristel Chanard | - Katie Snell |
| - Ajay Limaye | - Philippe Solans |
| - Luca Malatesta | |



Kristel Chanard, leading 6th graders at Washington Middle School (PUSD) in a sandbox experiment to explore mountain building



Steve Skinner and Philippe Solans, leading 6th graders at Washington Middle School (PUSD) in earthquake fault activities using legos, play doh, and the earthquake machine

Working with Teachers

- This year, the local school district (PUSD) is undergoing curriculum revision, as well as embarking on a project-based learning pilot program. We are helping the 6th grade teachers.
 - Laurie Kovalenko
 - Belle Philbosian



Belle Philbosian leading Pangaea puzzle activity at Washington Middle School



Joel Scheingross helping 6th grade students calculate tectonic plate speed at McKinley School

- For the third year in a row, scientists are partnering with a 6th grade teacher at McKinley Middle School (PUSD), making regular visits to the same class
 - Joel Scheingross
 - Jena Johnson
 - David Case
 - Frank Sousa

Other Outreach Activities

- Providing content expertise for the development of educational Earth Science video games:
 - GameDesk Institute, Lucien Vattel
 - Bill Nye (the science guy): "Emphasize: How do you know?"
 - Erin Burkett, Mark Turner, Belle Philbosian, Erika Swanson
- Using GIS for LA Regional Foodbank:
 - Steve Skinner is helping Visiting Professor Ken Pickar use GIS for FoodBank, to make distribution more efficient and to better show the current need
- Serving as judges at local science fair
 - Thomas Ader, Jennifer Buz, Brian Schmandt
- Hiking with teachers in Rubio Canyon and pointing out geological features
 - Janet Harvey
- Restoring PUSD rock collections:
 - Jamshid Hassanzadeh



Erin Burkett and Mark Turner at a GameDesk "super session" with Bill Nye the Science Guy and the Gamedesk team (including Lucien Vattel, Director, and USC Professor Michelle Riconsciente, Assessment)



Jamshid Hassanzadeh, with one of PUSD's rock collections

Upcoming Opportunities

- Visit 6th grade classroom and lead Earth Science activities
 - Flexible dates
- Give a tour of your lab or a presentation to visiting students
 - Students coming in Feb, March, April
- Host a high school student in your lab over the summer
 - as part of either Caltech's Summer Research Connection or the Institute for Educational Advancement
- Lead a Science Saturday or REEL Science presentation

Let me know if you are interested in any of these! (lauriek@gps.caltech.edu)