Workshop on San Gorgonio Pass: Structure, Stress, Slip, and the Likelihood of Through-Going Rupture

PARTICIPANTS: Pablo Ampuero (Caltech), Glenn Biasi (UNR), Kim Blisniuk (BGC/UC Berkeley), Jim Brune (UNR/UCI), Sara Carena (U Munich), Michele Cooke (UMass Amherst), Tim Dawson (CGS), Steve Day (SDSU), Ian Desjarlais (CSUN), Laura Fattaruso (UMass Amherst), Gary Fuis (USGS), Lisa Grant Ludwig (UCI), Egill Hauksson (Caltech), Dick Heermann (CSUN), Justin Herbert (CSUN), Ken Hudnut (USGS), Tran Huynh (USC/SCEC), Tom Jordan (USC/SCEC), Katherine Kendrick (USGS), Vicki Langenheim (USGS), Jack Loveless (Smith), Shuo Ma (SDSU), Jon Matti (USGS), Sally McGill (CSUSB), Brendan Meade (Harvard), Craig Nicholson (UCSB), David Oglesby (UCR), Kim Olsen (SDSU), Nate Onderdonk (CSULB), Mike Oskin (UC Davis), Tom Rockwell (SDSU), Mike Rymer (USGS), Kate Scharer (USGS), Zheqiang Shi (SDSU), Josh Spinler (UAizona), Jennifer Tarnowski (UCR), Jerry Treiman (CGS), Ray Weldon (U Oregon), Chris Wills (CGS), Doug Yule (CSUN)

Image courtesy of M. Oskin
3,000 m of relief!
Sliced and diced!
Continent-continent collision!
Rapid rates of uplift!
Mind-bogglingly complex!
An advanced topics course!
Knowledge gaps

- Ways to merge/integrate shallow and deep features
- What is the geometry of active subsurface faulting within the San Gorgonio Pass?
- What is the earthquake potential in the San Gorgonio Pass region?
- Can earthquakes rupture along the San Andreas fault through the San Gorgonio Pass?
Discussion periods

• Form small groups (optimize participation)
• Make mental notes on 3-4 principal characteristics of deformation
• What do you think and hear?
• Is there something we are missing?
• What are still unresolved/still fundamental controversial issues?
• What experiments can be designed?
Special Fault Study Area

• Complexity (frustration) of SG Pass means it will have certain signals that less complex regions do not – an advantage (?) …there’s more opportunity to learn…

• Integrate and Collaborate!!
FRIDAY, JUNE 1, 2012

09:00   Group Breakfast
        Salon H

10:00   Welcoming Remarks and Perspectives on Special Fault Study Areas (SFSA)
        T. Jordan

10:15   Introduction and Workshop Overview
        D. Yule

Session 1: Structure, Seismology, and Paleoseismology

Views from the Surface

10:30   The Complex Evolution of the San Andreas Fault System
        J. Matti

10:45   Primary Active Faults and Their Paleoseismology
        D. Yule

11:00   Perched Boulders and Constraints on Strong Motion Shaking in the Region
        J. Brune

11:15   Geochronology of Landforms
        K. Kendrick

11:30   Recent Slip Rates Along the San Andreas Fault System
        S. McGill

11:45   Group Discussion

12:00   Group Lunch
        Salon H

Views from Depth

13:00   Active Faults and Crustal Deformation in San Gorgonio Pass: The View from Below and in 3D from Seismicity
        C. Nicholson

13:15   Continuity of the San Andreas fault at San Gorgonio Pass
        S. Carena

13:30   Seismological Tools for Deciphering the San Gorgonio Pass Complexity
        E. Hauksson

13:45   Gravity and Magnetic Data
        V. Langenheim

14:00   Tests of the 'Propeller' SAF: Preliminary results from the Salton Seismic Imaging Project
        G. Fuis

14:15   Group Discussion

14:45   Break
### Session 2: Dynamic, Kinematic, and Mechanical Models

#### Mechanical and GPS Models

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>15:00</td>
<td>Mechanical Models of the San Andreas</td>
<td>M. Cooke</td>
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<td>15:15</td>
<td>Modeling with San Bernardino Mountains GPS Campaign Data</td>
<td>J. Spinler</td>
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<td>15:30</td>
<td>The Role of Fault Complexity and Secondary Faults on Fault Slip</td>
<td>J. Herbert</td>
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<td>15:45</td>
<td>Fault Stressing Rates from GPS Block Models</td>
<td>J. Loveless</td>
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<td>16:00</td>
<td>Group Discussion</td>
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<td>16:30</td>
<td><strong>Break</strong></td>
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#### Rupture Models

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>16:45</td>
<td>San Andreas Rupture Models for Southern California</td>
<td>K. Olsen</td>
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<td>17:00</td>
<td>Dynamic Rupture Simulations in San Gorgonio Pass</td>
<td>Z. Shi</td>
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<td>17:15</td>
<td>Dynamics of Complex Strike-Slip and Thrust Ruptures</td>
<td>D. Oglesby</td>
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<td>17:30</td>
<td>Group Discussion</td>
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<td>18:00-20:00</td>
<td><em>Group Dinner</em></td>
<td><em>Salon H</em></td>
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Session 3: Poster Viewing

20:00
- Shallow Seismic Data (M. Rymer)
- Cosmogenic Radionuclide Age Data from the Pass (R. Heermance)
- U-Series Age Data (K. Blisniuk)
- Continuity of the San Andreas fault at San Gorgonio Pass (S. Carena)
- Depositional Constraints on slip along the San Andreas Fault within the Eastern San Gorgonio Pass region (K. Kendrick)
- Paleoseismology of the Burro Flats Site and San Gorgonio Pass Fault Zone Sites (D. Yule)
- Geologic Map of the San Andreas Fault Zone in San Gorgonio Pass (J. Matti)
- CFM-v4: Continued Upgrades and Improvements to the SCEC Community Fault Model and Its Associated Fault Database (C. Nicholson)
- Does the Dip of the Coachella Valley Segment of the San Andreas Fault Matter? (L. Fattaruso)
- Preliminary results of the Salton Seismic Imaging Project (G. Fuis)
- Precarious Rocks and Shattered Rock Near San Gorgonio Pass (J. Brune)

22:00 Adjourn