

# ***SCEC Annual Meeting***

**Palm Springs, California  
11-14 September 2016**



an NSF+USGS center

# *Welcome to Palm Springs!*

Sun



106° 73°

Mon



99° 67°

Tue



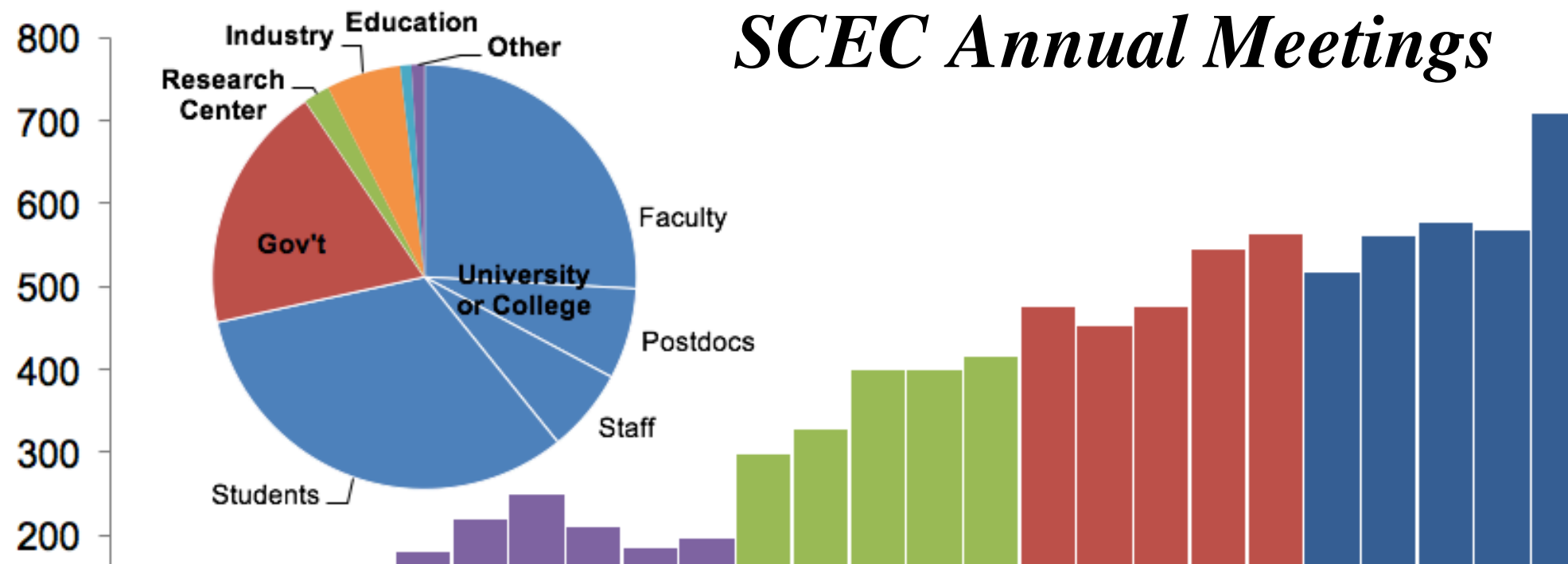
92° 65°

Wed



97° 69°

# *SCEC Annual Meetings*



- 707 pre-registrants
- 347 poster abstracts
- 211 first-time attendees  
(145 students/postdocs)
- 395 early-career attendees
  - 234 students

**We request that session chairs and speakers make a special effort to encourage the participation of students and early-career scientists in all discussions!**

**We also request from students and early-career scientists your suggestions about how to best enhance your participation and satisfaction with the meeting.**

# *SCEC4 Core Institutions (Sept 1, 2016)*



**USC**  
Tom Jordan



**Caltech**  
Nadia Lapusta



**CGS**  
Chris Wills



**Columbia**  
Bruce Shaw



**Harvard**  
Jim Rice



**MIT**  
Tom Herring



**SDSU**  
Tom Rockwell



**Stanford**  
Paul Segall



**Texas A&M**  
Patrick Fulton



**UC Los Angeles**  
Peter Bird



**UC Riverside**  
David Oglesby



**UC San Diego**  
Yuri Fialko



**UC Santa Barbara**  
Ralph Archuleta



**UC Santa Cruz**  
Emily Brodsky



**UNR**  
Glenn Biasi



**USGS Golden**  
Jill McCarthy















































**USGS Menlo Park**  
Ruth Harris



**USGS Pasadena**  
Rob Graves

**Core institutions: 18**

# SCEC4 Participating Institutions (Sept 1, 2016)

 <b>Appalachian State</b> Scott Marshall	 <b>Arizona State</b> J Ramon Arrowsmith	 <b>Boston University</b> Christine Regalla	 <b>Brown</b> Terry Tullis
 <b>Cal Poly Pomona</b> Jascha Polet	 <b>CSU Fullerton</b> David Bowman	 <b>CSU Long Beach</b> Nate Onderdonk	 <b>CSU Northridge</b> Doug Yule
 <b>CSU Sacramento</b> Steve Skinner	 <b>CSU San Bernardino</b> Sally McGill	 <b>Carnegie Mellon</b> Jacobco Bielak	 <b>Colorado Sch Mines</b> Edwin Nissen
 <b>Cornell</b> Rowena Lohman	 <b>Georgia Tech</b> Zhigang Peng	 <b>Indiana</b> Kaj Johnson	 <b>JPL</b> Andrea Donnellan
 <b>Lawrence Livermore National Laboratory</b> Arben Pitarka	 <b>Marquette University</b> Ting Lin	 <b>Oregon State</b> Andrew Meigs	 <b>Penn State</b> Eric Kirby
 <b>Portland State</b> Brittany Erickson	 <b>Purdue</b> Andrew Freed	 <b>Smith</b> John Loveless	 <b>SMU</b> M. Beatrice Magnani
 <b>SUNY at Stony Brook</b> William Holt	 <b>Tufts</b> Robert Viesca	 <b>U Alaska Fairbanks</b> Carl Tape	 <b>UC Berkeley</b> Roland Bürgmann
 <b>UC Davis</b> Michael Oskin	 <b>UC Irvine</b> Lisa Grant Ludwig	 <b>U Cincinnati</b> Lewis Owen	 <b>U Illinois</b> Karin Dahmen
 <b>U Kentucky</b> Sean Bemis	 <b>U Massachusetts</b> Michele Cooke	 <b>U Michigan Ann Arbor</b> Eric Hetland	 <b>U New Hampshire</b> Margaret Boettcher
 <b>U Oregon</b> Ray Weldon	 <b>U Texas El Paso</b> Bridget Smith-Konter	 <b>U Texas Austin</b> Whitney Behr	 <b>U Wisconsin Madison</b> Clifford Thurber
 <b>URS Corporation</b> Paul Somerville	 <b>Utah State</b> Susanne Janecke	 <b>Utah Valley</b> Nathan Toke	 <b>WHOI</b> Jeff McGuire

Domestic institutions: 44

# ***SCEC4 Participating Institutions (Sept 1, 2016)***



**Academia Sinica**  
Taiwan



**CICESE**  
Mexico



**DPRI Kyoto**  
Japan



**ERI Tokyo**  
Japan



**ETH Zurich**  
Switzerland



**GNS Science**  
New Zealand



**Nat'l Central U**  
Taiwan



**Nat'l Taiwan University**  
Taiwan



**U of Bristol**  
UK, Max Werner



**U of Canterbury**  
NZ, Brendon Bradley



**University of Otago**  
NZ, Mark Stirling



**Western University**  
Canada

**Foreign institutions: 12**

## *Call for SCEC5 Participating Institutions*

- All SCEC4 participating institutions, as well as institutions that would like to join the Center, are requested to apply for institutional membership in SCEC5 before December 31, 2016.
- The process is simple: *Submit a letter from a cognizant official (e.g., your department chair or dean) that requests participating institution status and appoints an institutional representative who will act as the point-of-contact with the Center.*
- Please send your request to John McRaney <mcraney@usc.edu>.



# Southern California Earthquake Center

## Board of Directors



**USC, Lead**  
Tom Jordan, *Chair*



**Stanford**  
Paul Segall



**UNR**  
Glenn Biasi



**Caltech**  
Nadia Lapusta, *Vice-Chair*



**Texas A&M**  
Patrick Fulton



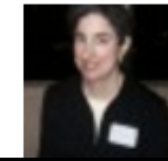
**USGS, Golden**  
Jill McCarthy (*liaison, non-voting*)



**CGS**  
Chris Wills



**UCLA**  
Peter Bird



**USGS, Menlo Park**  
Ruth Harris (*liaison, non-voting*)

***Nominations are now open for the at-large members of the  
SCEC5 Board***



**Harvard**  
Jim Rice



**UCSD**  
Yuri Fialko



**USGS, Pasadena**  
Rob Graves (*liaison, non-voting*)



**MIT**  
Tom Herring



**UCSB**  
Ralph Archuleta



**Member-At-Large**  
Roland Bürgmann



**SDSU**  
Tom Rockwell



**UCSC**  
Emily Brodsky



**Member-At-Large**  
Michele Cooke



# *Southern California Earthquake Center*

## **External Advisory Council**



**Gail Atkinson, Chair**  
*Western University*



**Norm Abrahamson**  
*PG&E*



**Roger Bilham**  
*UC Boulder*



**Donna Eberhart-Phillips**  
*UC Davis*



**Kate Long**  
*CalOES*



**Warner Marzocchi**  
*INGV Rome*



**M. Meghan Miller**  
*UNAVCO*



**Farzad Naeim**  
*Farzad Naeim, Inc.*



**Tim Sellnow**  
*University of Kentucky*



**John Vidale**  
*U of Washington*



**Andrew Whittaker**  
*U at Buffalo*

## **CEO Planning Committee**



**Tim Sellnow, UCF**  
*Chair*



**Jacobo Bielak, CMU**  
*Implementation Interface*



**Sally McGill, CSUSB**  
*Experiential Learning & Career Advanvement*



**Danielle Sumy, IRIS**  
*K-14 Education*

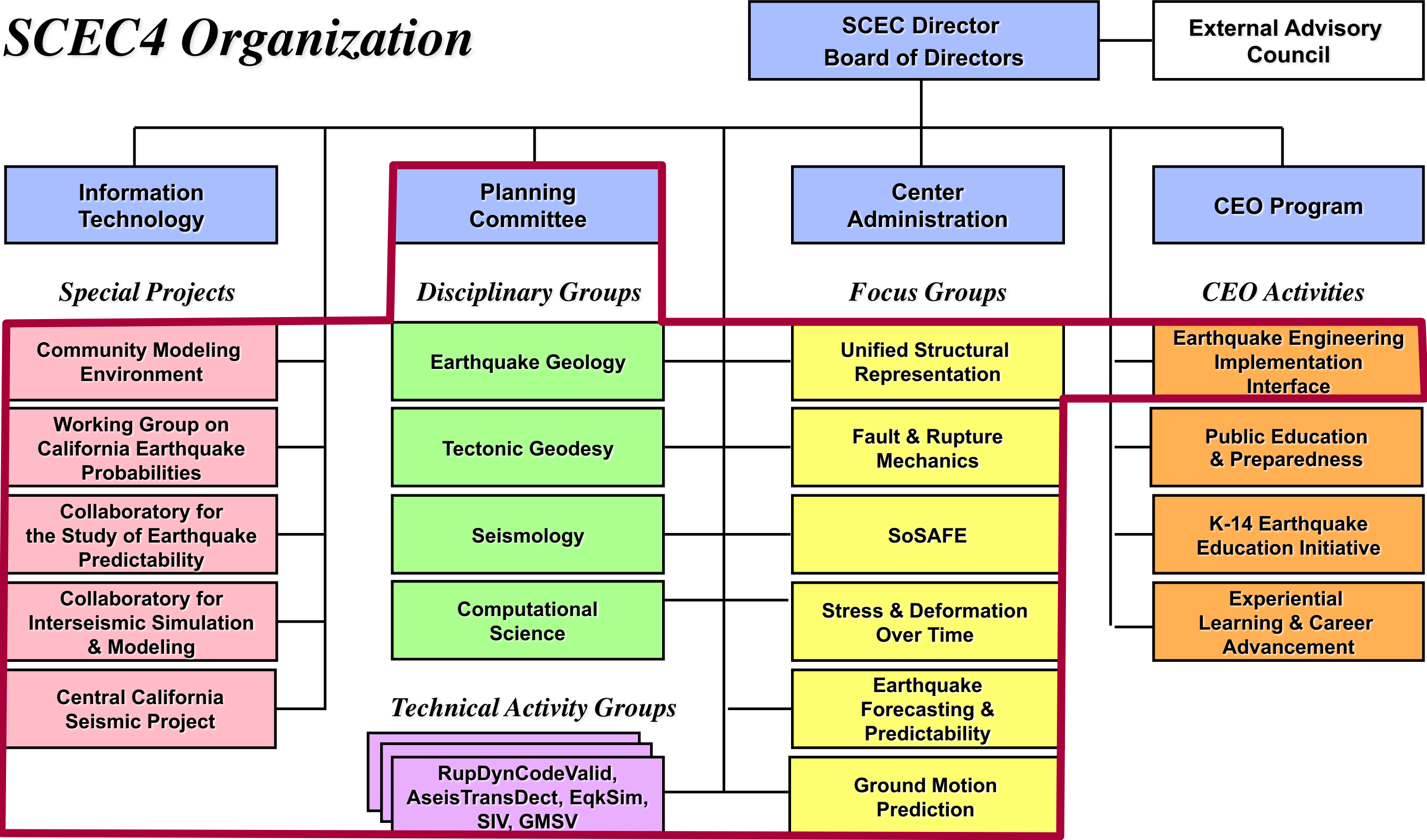


**Kate Long, CalOES**  
*Public Education & Preparedness*



**Chris Wills, CGS**  
*Implementation Interface*

# SCEC4 Organization



# Southern California Earthquake Center

## Science Working Groups & Planning Committee



### Disciplinary Committees



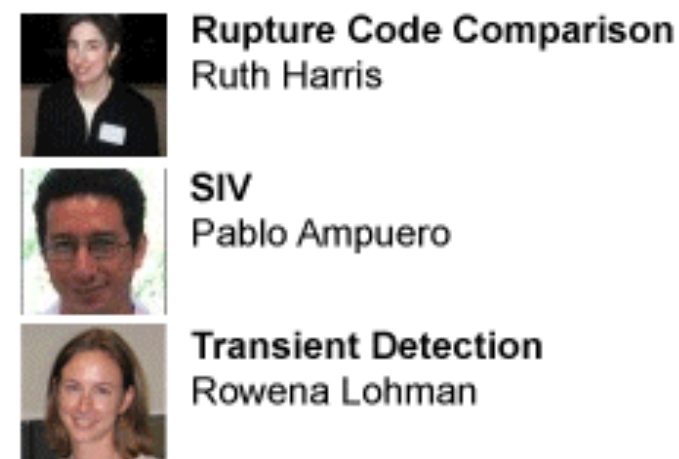
### Special Projects



### Interdisciplinary Focus Groups



### Technical Activity Groups





# *The Super-PC*





# Southern California Earthquake Center

## Management and Staff



**Director**  
Tom Jordan



**Co-Director**  
Greg Beroza



**Exec Science Director Special Projects**  
Christine Goulet

### Center Administration



**Associate Director**  
John McRaney



**Special Projects and Events**  
Tran Huynh



**Contracts and Grants**  
Karen Young



**Admin Coordinator**  
Deborah Gormley



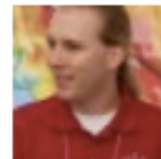
### Communication, Education, and Outreach



**Associate Director**  
Mark Benthien



**Strategic Partnerships**  
Sharon Sandow



**Digital Products**  
John Marquis



**Communications Specialist**  
Jason Ballmann

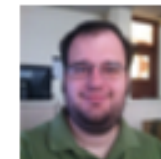
### Information Technology



**Associate Director**  
Phil Maechling



**Research Programmer**  
Scott Callaghan



**Research Programmer**  
David Gill



**Research Programmer**  
Masha Liukis



**Research Programmer**  
Kevin Milner



**Research Programmer**  
Edric Pauk



**Research Programmer**  
Fabio Silva



**Systems Programmer**  
John Yu

# *SCEC5 Proposal*

- **Science Plan developed by the non-USGS members of the SCEC Planning Committee and Board of Directors**
  - Extensive input from tiger-team white papers and the community at large
  - BoD-PC committee abstracted a strategic framework for prioritizing SCEC5 research objectives
  - Cast in terms of 5 basic questions of earthquake science
  - Questions addressed through an interdisciplinary program addressing 14 topics in 4 thematic areas
    - Modeling the fault system
    - Understanding earthquake processes
    - Characterizing seismic hazards
    - Reducing earthquake risk

## ***Basic Questions of Earthquake Science***

- Q1. How are faults loaded across different temporal and spatial scales?
- Q2. What is the role of off-fault inelastic deformation on strain accumulation, dynamic rupture, and radiated seismic energy?
- Q3. How do the evolving structure, composition and physical properties of fault zones and surrounding rock affect shear resistance to seismic and aseismic slip?
- Q4. How do strong ground motions depend on the complexities and nonlinearities of dynamic earthquake systems?
- Q5. In what ways can system-specific studies enhance the general understanding of earthquake predictability?

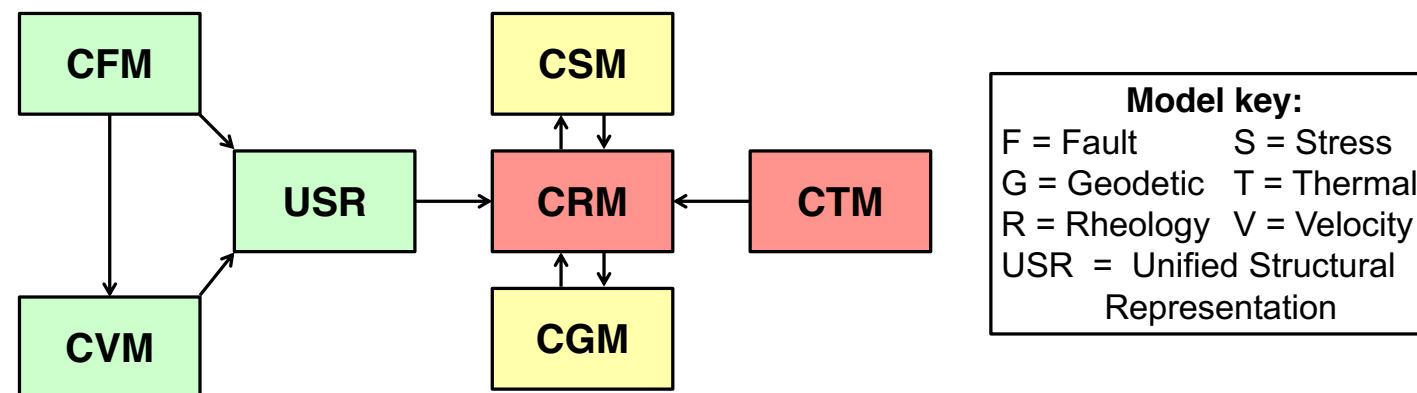


# SCEC5 Proposal

## Selected Science Topics

- **Special Fault Study Areas – Focus on Earthquake Gates**
  - “Earthquake gates” are regions of fault complexity conjectured to inhibit propagating ruptures, owing to dynamic conditions set up by proximal fault geometry, distributed deformation, and earthquake history. We will test the hypothesis that earthquake gates control the probability of large, multisegment and multifault ruptures.
- **Beyond Elasticity**
  - We will test hypotheses about inelastic fault system behavior against geologic, geodetic, and seismic data, refine them through dynamic modeling across a wide range of spatiotemporal scales, and assess their implications for seismic hazard analysis.
- **Community Models**
  - We will enhance the accessibility of the SCEC Community Models, including the model uncertainties. Community thermal and rheological models will be developed.

**Figure 3.5.** Schema of the SCEC Community Models, showing the main directions of information flow among the models. The colors indicate the development status: mature (green), youthful (yellow), in utero (red).



# SCEC5 Proposal

- Proposal requests \$20.9M from NSF and \$8.1M from USGS, a 34% increase over SCEC4 funding

## *Funding Request by Category (Year 1)*

Budget Category	NSF	USGS	Total
Science and Infrastructure	2,224K	1,236K	3,460K
Information Technology Infrastructure	300K	130K	430K
Center Management	500K	115K	615K
Communication, Education, Outreach	500K	115K	615K
Undergrad Intern Program (SURE)	50K	0K	50K
Annual/Leadership Meetings	350K	0K	350K
Director's Reserve	140K	0K	140K
Total Request (in \$ million) =	\$4.064M	\$1.596M	\$5.660M

# *Comments from the Review Panel Reports*

- **NSF Panel:**

- “SCEC has developed an extraordinarily effective scientific culture under this system... SCEC may be unique in the U.S. geoscientific research community in the scale of formally collaborative effort and the breadth of multi-institutional and multi-disciplinary activity .”

- **USGS Panel:**

- “The panel found the science questions articulated in the SCEC5 proposal to be exciting, ambitious, well justified, and clearly set out... The SCEC philosophy emphasizes community building and coordination that facilitates interdisciplinary, multi-institutional earthquake system science; this approach to making progress on science questions that have been prioritized by the community has proven highly effective.”

## ***SCEC5 Proposal***

- **SCEC5 proposal was developed with broad input from the SCEC community and submitted to the NSF and USGS on Oct 1, 2015**
  - Mail reviews were received in December 21, 2015
  - Site review was conducted by separate NSF and USGS review panels on Jan 12-14, 2016
- **Agency response was received on May 31, 2016**
  - USGS recommended funding at the proposed 1<sup>st</sup>-year amount of \$1.596M
  - NSF recommended flat funding at \$3.0M, a significant cut from our 1<sup>st</sup>-year request of \$4.064M (owing to EAR budgetary limitations)
- **Revised work plan, budget, and milestones must be submitted to the agencies by Oct 15, 2016**

# ***SCEC5 Proposal***

**USGS letter requested SCEC's consideration of several EHP priorities, which include:**

- **Priority on community model development that will serve broader research needs and stimulate model developments elsewhere in the country**
- **Coordination requirements on EEW and induced seismicity research**
- **Clarification on how SCEC's earthquake response planning and activities will be coordinated with the USGS and with the California Clearinghouse**
- **Partnership with the USGS in earthquake engineering implementation and in interactions with code committees and design teams**

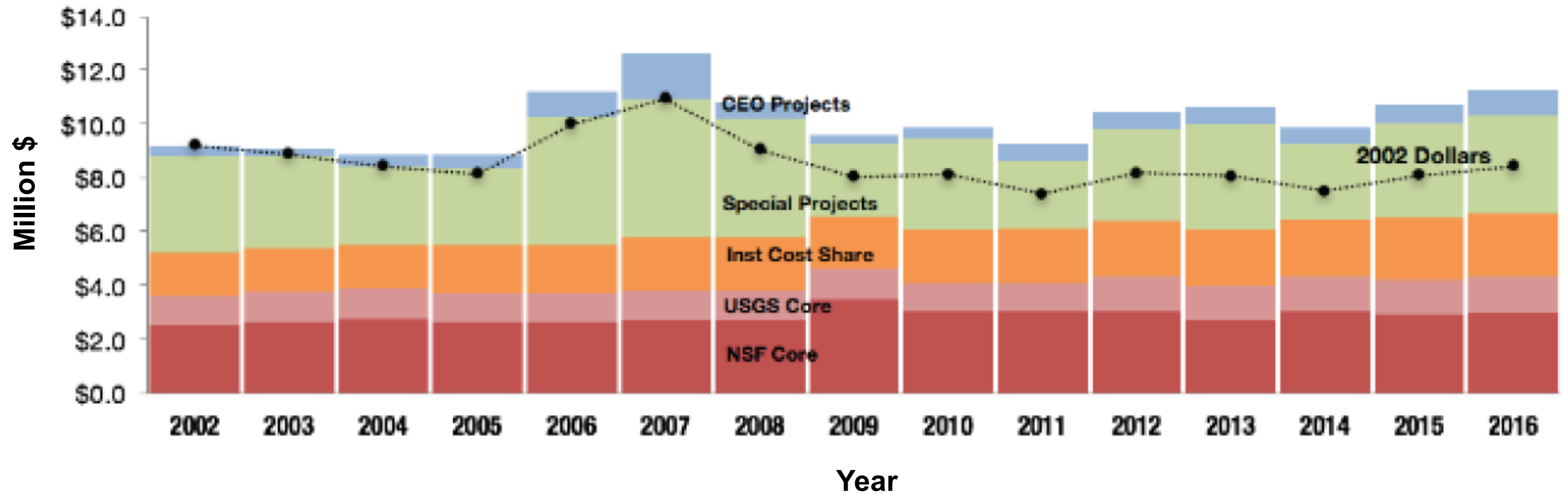
**Explicitly encouraged efforts to translate SCEC results into earthquake system science, hazards assessment, and engineering practice outside of Southern California**

## Requested Funding Increments by Category

SCEC5 improvements to science and infrastructure		Year 1	5 Years
✗	A \$300K/yr increase for science research budget (returning to 2012 level)	300K	1,500K
✓	A Software Engineer for CSEP operations (75% salary, USGS request only)	200K	1,000K
?	An increase to 6 months effort per year for SCEC AD for Information Technology	60K	300K
?	A new SCEC Community Models Manager (100% salary)	212K	1,060K
?	Additional support for SCEC Co-Director and PC Vice-Chair	60K	300K
?	A new SCEC Community Information System Manager (50% salary)	115K	575K
Engagement and diversification of the SCEC5 community		Year 1	5 Years
✗	A \$100K/yr increase for Communication, Education, and Outreach (CEO) program activities	100K	500K
✗	A new SCEC Diversity Transitions Program (NSF request only)	150K	750K
✗	An increase of 8 students (to 16/yr for SURE undergraduate intern program)	25K	125K
?	Additional support for the SCEC Annual Meeting	100K	500K
✗	Average 3% inflation increase of SCEC programs	130K	650K



# Total SCEC Funding

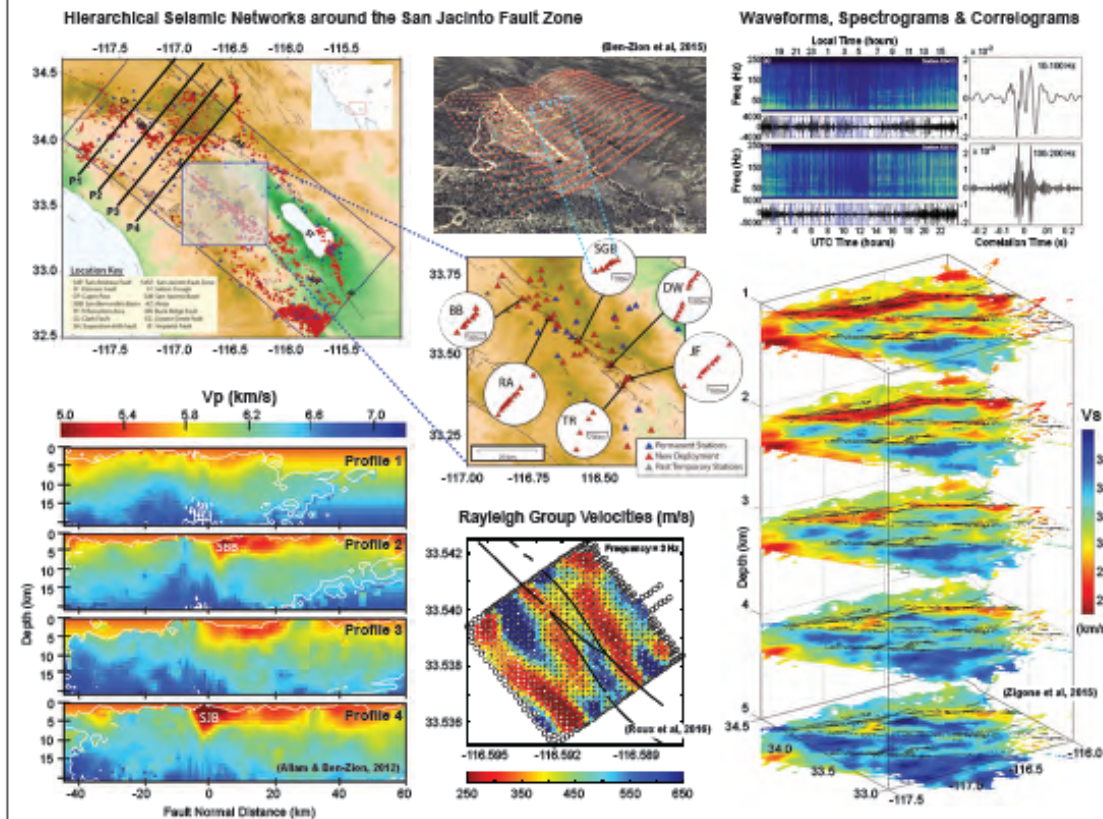


## *SCEC Leadership Transition*

- **USC Department of Earth Sciences has reinitiated an international search to hire the next SCEC Director**
  - USC has also initiated two additional faculty searches in earthquake science and global geodynamics
- **Goal is to recruit new director by Summer/Fall of 2017**
  - Transition process to take place between Fall 2017 and Summer 2018
  - I am committed to work with new Director on succession issues through end of SCEC5
- **John McRaney plans to retire by December 2018**
  - New administrative structure discussions to include new Director

Southern California Earthquake Center  
**ANNUAL MEETING**

**2016**



**Available at:**

**<https://www.scec.org/meetings/2016/am>**

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# ***Monday Morning Agenda***

## **08:00 - 10:00 Session 1: The State of SCEC in Horizon Ballroom**

08:00 Welcome and State of the Center (Tom Jordan)

08:30 Agency Reports

- National Science Foundation (Greg Anderson/Carol Frost)
- U.S. Geological Survey (Bill Leith)

09:00 Communication, Education, & Outreach (Mark Benthien)

09:20 SCEC Science Accomplishments (Greg Beroza)

09:50 SCEC Special Projects (Christine Goulet)

## **10:00 - 10:30 Break**

## **10:30 - 12:30 Session 2: Modeling Fault Systems – Supercycles**

Moderators: Mike Oskin, Kate Scharer

10:30 Open Intervals, Clusters and Supercycles: 1100 years of Moment Release in the Southern San Andreas Fault System: Are we Ready for the Century of Earthquakes? (Tom Rockwell)

11:00 The bridge from earthquake geology to earthquake seismology (Dave Jackson)

12:00 Discussion

## **12:30 - 14:00 Lunch at Hilton Restaurant, Tapestry Room, and Poolside**

*End*