

## PROJECT SUMMARY

The Pacific Earthquake Engineering Research Center (PEER) is an Earthquake Engineering Research Center administered under the National Science Foundation Engineering Research Center Program. The mission of PEER is to develop and disseminate technology for design and construction of buildings and infrastructure to meet the diverse seismic performance needs of owners and society. Current approaches to seismic design are indirect in their use of information on earthquakes, system response to earthquakes, and owner and societal needs. These current approaches produce buildings and infrastructure whose performance is highly variable and may not meet the needs of owners and society. The PEER program aims to develop a performance-based earthquake engineering approach that can be used to produce systems of predictable and appropriate seismic performance.

To accomplish its mission, PEER has organized a program built around research, education, and technology transfer. The research program merges engineering seismology, engineering, and socio-economic sciences in coordinated studies to develop fundamental data, tools, and methodologies that are tested and refined using testbeds in collaboration with practicing professionals. Primary emphases of the research program at this time are on older and new concrete buildings, bridges and highways, and electric power distribution and transmission systems. The education program promotes engineering awareness in the general public and attracts and trains undergraduate and graduate students to conduct research and implement research findings. The technology transfer program involves practicing earthquake professionals, government agencies, and specific industry sectors in PEER programs to promote implementation of appropriate new technologies. Technology transfer is enhanced through a formal outreach program.

The *intellectual merit* of the proposed program lies in the multi-disciplinary challenge of understanding performance metrics for complex systems and how they can be simulated and controlled. This requires collaborative, cross-disciplinary research among earth scientists, engineers, and social scientists.

The *broader impacts* of the proposed program are extensive. The research program tackles an important and challenging problem, the pursuit of which will advance discovery and understanding of earthquake engineering. Integration of research and education components demonstrates a commitment to teaching, training, and learning at multiple educational levels. The project has a diverse group of PIs and constitutes a multi-disciplinary research partnership that did not exist before. The education program will expose a diverse population of undergraduates to the program and promote top candidates into graduate research. The project contributes to NSF's Network for Earthquake Engineering Simulation. Results are disseminated in several ways, including: involvement of a broad spectrum of faculty, students, and government and industry partners; dissemination through print and Internet means; and broadly used databases and software. By better understanding performance of the built environment under earthquake effects, this project also contribute to knowledge on vulnerability and toughening of infrastructure against effects of explosive and impact hazards.

## PEER PERSONNEL

Key personnel and participating principal investigators are identified below. Participating principal investigators include those who have received funds in the current reporting period or are scheduled to receive funds in the next period. Names with an ASTERISK\* denote investigators not funded in Year 7, but funded in the previous year and whose projects were granted no-cost extensions that lasted into Year 7. Bio sketches are not provided for investigators marked with an asterisk.

## KEY PERSONNEL:

**Jack Moehle**, *Director and Thrust Area Leader*, University of California, Berkeley

**Gregory Deierlein**, *Deputy Director for Research*, Stanford University

**Darlene Wright**, *Administrative Director*, University of California, Berkeley

**Scott Ashford**, *Assistant Director for Education Programs*, University of California, San Diego

**Yousef Bozorgnia**, *Assoc. Director for Sponsored Projects*, University of California, Berkeley

**Parshaw Vaziri**, *Director of Public Relations and Outreach*, University of California, Berkeley

**Ross Boulanger**, *Co-Thrust Area Leader*, University of California, Davis

**Mary Comerio**, *Co-Thrust Area Leader*, University of California, Berkeley

**Ahmed Elgamal**, *Co-Thrust Area Leader*, University of California, San Diego

**Gregory Fenves**, *Co-Thrust Area Leader*, University of California, Berkeley

**Helmut Krawinkler**, *Co-Thrust Area Leader*, Stanford University

**Stephen Mahin**, *Co-Thrust Area Leader*, University of California, Berkeley

**Peter May**, *Research Committee Member*, University of Washington

## FUNDED INVESTIGATORS:

(Names in **BOLDFACE** denote Directors; names in *ITALICS* denote Thrust Leaders; names with an ASTERISK\* denote investigators not funded in Year 7, but funded in the previous year and whose projects were granted no-cost extensions that lasted into Year 7.)

### UNIVERSITY OF CALIFORNIA, BERKELEY (LEAD)

*Department of Civil & Environmental Engineering*

**Jack Moehle** (*Director/Thrust Leader*)

*Gregory Fenves* (*Co-Thrust Leader*)

*Stephen Mahin* (*Co-Thrust Leader*)

Jonathan Bray

Armen Der Kiureghian

Filip Filippou

Nicos Makris\*

Khalid Mosalam

Michael Riemer

Raymond Seed

Nicolas Sitar\*

Bozidar Stojadinovic

*Department of Architecture*

*Mary Comerio* (*Co-Thrust Leader*)

*Department of Geology & Geophysics*

Douglas Dreger

### CALIFORNIA INSTITUTE OF TECHNOLOGY

*Division of Applied Science and Civil Engineering*

James Beck

Keith Porter

### STANFORD UNIVERSITY

*Department of Civil and Environmental Engineering*

**Gregory Deierlein** (*Deputy Director for Research*)

*Helmut Krawinkler* (*Co-Thrust Leader*)

Sarah Billington

C. Allin Cornell

Anne Kiremidjian

Kincho Law\*

Charles Menun\*

Eduardo Miranda

*Department of Geophysics*

Gregory Beroza\*

UNIVERSITY OF CALIFORNIA, DAVIS  
*Department of Civil & Environmental Engineering*  
*Ross Boulanger (Co-Thrust Leader)*  
Yue-Yue Fan  
Boris Jeremic  
Sashi Kunnath  
Bruce Kutter

UNIVERSITY OF CALIFORNIA, IRVINE  
*Department of Civil & Environmental Engineering*  
Tara Hutchinson  
Gerard Pardoen\*  
Roberto Villaverde\*

UNIVERSITY OF CALIFORNIA, LOS ANGELES  
*Department of Civil & Environmental Engineering*  
Jonathan Stewart  
Ertugrul Taciroglu  
John Wallace\*  
  
*School of Public Health*  
Kimberly Shoaf

UNIVERSITY OF CALIFORNIA, SAN DIEGO  
*Department Structural Engineering*  
**Scott Ashford (Education Director)**  
*Ahmed Elgamal (Co-Thrust Leader)*  
Joel Conte  
José Restrepo  
Chia-Ming Uang  
  
*San Diego Supercomputing Center*  
Michael Bailey

UNIVERSITY OF SOUTHERN CALIFORNIA  
*Department of Civil Engineering*  
Geoffrey Martin  
Robert Nigbor\*  
  
*Department of Industrial & Systems Engineering*  
James Moore II  
  
*Southern California Earthquake Center*  
Thomas Jordan

UNIVERSITY OF WASHINGTON  
*Department of Political Science*  
*Peter May (Research Committee)*  
  
*Business Program*  
Jacqueline Meszaros  
Ufuk Ince

UNIVERSITY OF WASHINGTON (continued)  
*Department of Civil & Environmental Engineering*  
Pedro Arduino  
Marc Eberhard  
Steve Kramer  
Dawn Lehman  
Laura Lowes  
John Stanton  
  
*Geography Department*  
Stephanie Chang\*

## OUTREACH ORGANIZATIONS

ABS CONSULTING  
Hope Seligson

AIR WORLDWIDE, INC.  
Paolo Bazzurro\*  
Nicolas Luco\*

APPLIED TECHNOLOGY COUNCIL  
Christopher Rojahn\*

CALIFORNIA GEOLOGICAL SURVEY  
Chris Wills

CONSORTIUM OF ORGANIZATIONS FOR  
STRONG-MOTION OBSERVATION SYSTEMS  
J. Carl Stepp

DEGENKOLB ENGINEERS  
Jon Heintz\*  
James Malley

DENNIS OSTROM  
Dennis Ostrom\*

GEOMATRIX CONSULTANTS  
Maurice Power  
Z.L. Wang  
Robert Youngs

IMBSEN AND ASSOCIATES, INC.  
Roy Imbsen\*

LAN ENGINEERING  
Mohan Char\*  
William Nascimento\*

OPAC ENGINEERS  
Mark Ketchum\*

PACIFIC ENGINEERING AND ANALYSIS  
Walter Silva

RUTHERFORD & CHEKENE  
Joe Maffei\*

SAN DIEGO STATE UNIVERSITY  
*Department of Geological Sciences*  
Steven Day

UNITED STATES GEOLOGICAL SURVEY  
David Boore\*  
Robert Kayen  
Paul Spudich

UNIVERSITY OF TEXAS AT AUSTIN  
*Department of Civil Engineering*  
Kenneth Stokoe II\*

URS CORPORATION  
Nancy Collins  
Robert Graves  
Paul Somerville  
Ivan Wong

**PEER EXTERNAL ADVISORY COMMITTEES AND MEMBERS:**

*Scientific Advisory Committee*

<b>Member</b>	<b>Title</b>	<b>Affiliation</b>
<b>Ron Hamburger, Chair</b>	<i>Principal</i>	Simpson Gumpertz & Heger, Inc.
<b>Don Anderson</b>	<i>Principal Geotechnical Engineer</i>	CH2M Hill
<b>Jacobo Bielak</b>	<i>Professor</i>	Carnegie Mellon University
<b>Roger Borchardt</b>	<i>Engineering Seismologist</i>	US Geological Survey
<b>Raymond Burby</b>	<i>Professor</i>	Univ. of North Carolina, Chapel Hill
<b>James Jirsa</b>	<i>Professor</i>	University of Texas at Austin
<b>Tom Jordan</b>	<i>Professor</i>	Southern California Earthquake Center
<b>Ronald Mayes</b>	<i>Staff Consultant</i>	Simpson Gumpertz & Heger, Inc.

*Implementation Advisory Board*

<b>Member</b>	<b>Title</b>	<b>Affiliation</b>
<b>James Malley, Chair</b>	<i>Vice President and Senior Principal</i>	Degenkolb Engineers
<b>Fadel Alameddine</b>	<i>Senior Bridge Engineer</i>	California Dept. of Transportation
<b>Robert Bachman</b>	<i>Consultant</i>	Private Sector
<b>David Chambers</b>	<i>Associate Engineering Geologist</i>	California Energy Commission
<b>Lloyd Cluff</b>	<i>Manager, Geosciences Dept.</i>	Pacific Gas & Electric Company
<b>John Hooper</b>	<i>Director of Earthquake Engineering</i>	Skilling, Ward, Magnusson, Barkshire
<b>Karl Kirker</b>	<i>Structural Design Unit Manager</i>	Washington Dept. of Transportation
<b>Clifford Roblee</b>	<i>Senior Research Engineer</i>	California Dept. of Transportation
<b>Christopher Rojahn</b>	<i>Executive Director</i>	Applied Technology Council

**LIST OF CURRENT INDUSTRIAL/PRACTITIONER MEMBERS:**

<b>Firm Name</b>	<b>Location</b>	<b>Representative</b>
<b>AIR Worldwide, Inc.</b>	<i>San Francisco, CA</i>	Paolo Bazzurro
<b>Bechtel Corporation</b>	<i>San Francisco, CA</i>	Joe Litehiser
<b>Comartin-Reis</b>	<i>Stockton, CA</i>	Craig Comartin
<b>Degenkolb Engineers</b>	<i>San Francisco, CA</i>	James Malley
<b>Earth Mechanics</b>	<i>Fountain Valley, CA</i>	Po Lam
<b>Forell/Elsesser Engineers, Inc.</b>	<i>San Francisco, CA</i>	David Friedman
<b>Geomatrix Consultants</b>	<i>Oakland, CA</i>	Maury Power
<b>Magnusson Klemencic Associates</b>	<i>Seattle, WA</i>	John Hooper
<b>The St. Paul Companies</b>	<i>Fairfield, CA</i>	Nesrin Basoz
<b>URS Corporation</b>	<i>Pasadena, CA</i>	Paul Somerville
<b>Wiss Janney Elstner Associates</b>	<i>Emeryville, CA</i>	Kent Sasaki

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