

2002 PEER ANNUAL MEETING A LOOK INTO THE METHODOLOGY TESTBEDS

Over 250 people convened in Oakland on January 17 & 18, 2002 for a return engagement to the Oakland Marriott City Center Hotel for the **2002 PEER Annual Meeting**. The meeting, free and open to the public, spanned two days and was attended by both participants in the PEER program as well as other individuals simply interested in learning more about PEER and the recently launched Methodology Testbeds.

Day One began with testbed meetings convened for PEER researchers to discuss ways to maximize the effectiveness of the testbed program. The researchers also planned ways to optimize the integration of the focused investigations into the six methodology testbeds.

The afternoon of Day One was dedicated to **PEER Student Day**, hosted by PEER's Student Leadership Council, and was attended by students involved with PEER research as well as members of the Business and Industry Partnership (BIP) Program. This year's Student Day speakers were BIP members **James Malley** and **Jon Heintz** of Degenkolb Engineers and **Maury Power** of Geomatrix Consultants. An interesting feature of Student Day was that it was not open to PEER faculty or principal investigators (who were attending a separate closed session) in order to allow the students to present their research and interact directly with the BIP members. The event turned out to be an excellent networking opportunity for everyone involved.

Another highlight of the two days was the **Invitational Reception and Banquet for PEER Business and Industry Partners**. The Banquet's popularity this year can be credited to the presentation given by featured speaker **Ronald Hamburger**, Chief Structural Engineer at ABS Consulting. His informative and very interesting presentation on *"The World Trade Center and its Relevance to Performance-Based Engineering"*, had the somber audience rapt with attention as he discussed the engineering reasons behind the towers' collapse.

Day Two was divided into three sessions, the first of which focused on advances in performance-based earthquake engineering. The poster session which followed offered PEER students the chance to discuss their posters and present their research to the other attendees. The final session of the day offered concurrent structural and geotechnical engineering sessions showcasing current research underway at PEER. The presenters' slides from the second day are available online at the PEER website. The presentations may be downloaded and viewed from the meeting website (see this month's *Web Spotlight*): <http://peer.berkeley.edu/2002annualmtg/>



PEER Director Jack Moehle opens the 2002 Annual Meeting



Implementation Advisory Board member Bob Bachman learns about research underway at Stanford University



Professors Bruce Kutter (UC Davis) and Tara Hutchinson (UC Irvine) discuss their PEER research during a poster session



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PEER ANNOUNCES NEW ACTING ASSISTANT DIRECTOR OF EDUCATION UC SAN DIEGO'S SCOTT ASHFORD TO HEAD PROGRAM

PEER is pleased to announce that Professor **Scott Ashford** (UC San Diego) has been selected to assume the duties of PEER's Assistant Director of Education. As of January 1, 2002 Professor **Gerard Pardo** stepped down from this position, in part due to the fact that he is on sabbatical in Europe for the spring semester.

Professor Ashford has been an active member of the PEER Education Committee since its inception in 1998. He has supervised PEER summer interns and actively participates in the NSF-sponsored Research Experience for Undergraduates program. Professor Ashford organized a PEER Undergraduate Scholars Workshop at UCSD, bringing 30 undergraduates from PEER institutions to take an active role in advanced learning in structural engineering. In addition, he serves on UCSD's MASEM (Minority Access to Science, Engineering, and Mathematics)



Advisory Board, providing opportunities for under-represented groups at both the graduate level through Fellowships, and undergraduate level through summer internships.

Another change to the Education program is the departure of PEER's long-time Education Program Assistant, **Gina Ring**. Gina's contributions to the Education Program are too numerous to list here, but are clearly evident in the prosperity the program has enjoyed since its inception. We wish Gina much success in her new position as a Grants Officer for UC Irvine. The program assistant staff position will now be moved to UC San Diego, along with administration of the Education Program.

As a formality, until PEER receives final, official approval from NSF the position is temporarily classified as "Acting". Please join us in congratulating Professor Ashford on his appointment as PEER's new (Acting) Assistant Director of Education, and in thanking Professor Pardo for his exemplary work heading PEER's Education Program as its founding Director. ●●●

PEER METHODOLOGY TESTBEDS UPDATE

Investigations in Years 5 and 6 include collaborative projects to elucidate and exercise PEER's performance-based earthquake engineering (PBEE) methodology using six testbeds: two buildings, two bridges, a highway network, and a campus of buildings. Major objectives of the program include:

- Defining the parameters of PEER's framing equation, developing algorithms to evaluate the equation's conditional distributions, and determining how the integral itself should be evaluated,
- Comparing the methodology and its results with current practice, and
- Identifying additional developmental areas.

A brief report on each testbed follows, with

testbed managers shown in parentheses:

The **Van Nuys building testbed** effort (**Helmut Krawinkler**) focuses on earthquake-induced structural and nonstructural damage, and on the economic and life-safety consequences for a 1960s-era, 7-story hotel building. To date, a conventional hazard analysis has been completed and an initial OpenSees structural model created. Researchers have toured the facility, met with the owner's representative, and determined the financial and occupancy features that relate damage to loss.

Researchers working on the **university laboratory building testbed** (**Mary Comerio**) are focusing on valuable and sensitive building contents. They have completed a conventional hazard analysis, toured the facility,

created an OpenSees structural model, and identified equipment and other components for shake-table fragility testing.

The **I-880 viaduct testbed** (**Gregory Fenves** and **Stephen Mahin**) focuses on a newer bridge, designed with ductility objectives in mind. A conventional hazard analysis has been completed, and a discussion held with Caltrans engineers regarding design and performance decision-making.

The **Humboldt Bay Bridge testbed** (**Ahmed Elgamal**) focuses on older bridges with significant geotechnical considerations. A conventional hazard analysis has been completed, soil and structural model created, and discussions held with Caltrans engineers regarding retrofit decisions for this bridge.

The **highway network testbed** (**Greg Deierlein**) focuses on the performance of the bridges of San Francisco Bay Area highways, considering traffic disruption and economic costs. Current research focuses on improving ground-motion attenuation, amplification and ground-failure models, and enhancing bridge fragility models.

The **campus testbed** is still in its early conceptual phase.

A new website dedicated to the methodology testbed program is now available online at: <http://www.peertestbeds.net/> ●●●

$$E[DV] = \int \int \int \int \int DV \cdot f(DV, DM, EDP, IM) \cdot H(DM) \cdot H(EDP) \cdot H(IM) \cdot \lambda(\lambda) \cdot dDV \cdot dDM \cdot dEDP \cdot dIM \cdot d\lambda$$

$DV =$ decision variable – the parameters of direct interest to facility stakeholders
 $DM =$ damage measure – the physical impacts of the earthquake
 $EDP =$ engineering demand parameter – member forces, deformations, etc.
 $IM =$ intensity measure – measuring shaking, ground failure, and other hazards
 $E[\cdot] =$ expected value
 $p[X|Y] =$ probability density of X given Y
 $\lambda[\cdot] =$ frequency density

The PEER Framing Equation

THE PASSING OF A PIONEER JOHN A. BLUME, 1909–2002

John Blume, founder of the John A. Blume Earthquake Engineering Center at Stanford University, died on March 1 at his home in Hillsborough, California at the age of 92. One of the early pioneers in the field of earthquake engineering, he was a consulting professor in Stanford's Civil and Environmental Engineering Department.

"He will be sorely missed by all those who were privileged to have known him," said **Racquel Hagen**, administrative associate at the Blume Center.

"He was a mentor, he was an inspiration," said Blume Center Director and PEER Participant **Anne Kiremidjian**, who has known Blume for almost 30 years. "He really took me under his guidance."

He founded the Blume Center in 1974 for the advancement of education, research, and practice, in earthquake engineering. Since its inception, the center has functioned as the umbrella for all earthquake-engineering activities at Stanford.



Professor Blume published over 150 papers, articles and books and received several awards, including the American Society of Civil Engineers' Ernest E. Howard and Leon S. Moisseiff awards. ●●●

AWARDS AND HONORS

Scientific Advisory Committee Member **Roger Borcherdt** (USGS) was named as an *Honorary Member* of the Earthquake Engineering Research Institute (EERI) for his distinguished career and contributions to EERI.

Professor **Ross Boulanger** (UC Davis) was awarded the *2001 Shamsheer Prakash Research Award for Excellence in Research in Geotechnical Engineering*, for his contributions to geotechnical earthquake engineering including liquefaction and remediation of soils, and seismic soil pile interaction.

Professor **Stephanie Chang** (University of Washington) was awarded the *2001 Shah Family Innovation Prize* by EERI for her important role in quantifying indirect losses from earthquakes using a comprehensive multi-disciplinary approach.

Professor **Anil Chopra** (UC Berkeley) was awarded the *George W. Housner Medal* by EERI for his contributions to structural dynamics and to the understanding of earthquake response of structures.

Professor **C. Allin Cornell** (Stanford) has been elected a *Fellow* of the American Geophysical Union, and will receive the *2002 Medal of the Seismological Society of America*.

BIP member **William Holmes** (Rutherford & Chekene) was presented the Building Seismic Safety Council's (BSSC) Exceptional Service Award in recognition for his leadership, expertise, and unselfish contributions to the BSSC and National Institute of Building Sciences, and for his work on the 1997 and 2000 editions of the *NEHRP Recommended Provisions for New Buildings and Other Structures*.

Professor **Wilfred Iwan** (Caltech) was awarded the *2002 Alfred E. Alquist Medal for Outstanding Achievement in Earthquake Safety* for his innovations in the field of seismic engineering and the application of theory into life safety in structural design.

Professor **Raymond Seed** (UC Berkeley) was recognized by the California State Mining and Geology Board with a special resolution in September, citing his "outstanding contributions in educating California's practicing engineers and geologists to reduce future earthquake losses in California." ●●●

PEER VISITS SACRAMENTO AN EXHIBIT AT THE CALIFORNIA STATE CAPITOL

On March 6th PEER hosted a demonstration exhibit at the California State Capitol in Sacramento, with logistical assistance from **Bob Anderson**, **Richard McCarthy** and **Henry Sepulveda** of the California State Seismic Safety Commission (CSSC) staff. Representing PEER at the Capitol were Director **Jack Moehle**, UC Davis graduate student researcher **Zhaohui Yang**, as well as staff members **Veronica Padilla** and **Parshaw Vaziri**.



Zhaohui Yang (UC Davis) and Fred Turner (CSSC) discuss PEER's exhibit at the Capitol

The exhibit was aimed at members and staffers of the California Legislature, as well as parents, children and other visitors to the Capitol, in an effort to increase awareness of PEER and the potential danger earthquakes pose. Free reference information was available for anyone interested in earthquake preparedness—including homeowners, chil-

dren, and schools. There was also a simple model demonstrating soil shaking intensity variations using lime jello and cookie dough, sample earthquake emergency kits, videos of earthquake engineering tests, instructional videos, and maps of fault lines and historic earthquakes in the State of California.

Visitors touring the exhibit included a Girl Scout troop, several groups of children and parents from assorted schools. Staff members from Assemblyperson Corbett's and Assemblyperson Liu's offices also visited the exhibit in order to learn more about how PEER's research benefits the state and its constituents.

A second exhibit at the State Capitol is being planned for Summer 2002. Check the PEER website for news on the next exhibit: <http://peer.berkeley.edu/upcoming.html> ●●●



Bob Anderson (CSSC) gives a demonstration to students and teachers from El Sobrante Christian School

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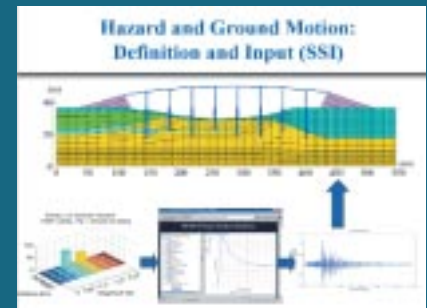
WEB SPOTLIGHT: 2002 ANNUAL MEETING-DAY 2 PRESENTATIONS

As a new regular feature, in each issue of The PEER Review we'll highlight noteworthy additions to the PEER website.

This month's **Web Spotlight** features the speakers' slides from the Day 2 presentations at the 2002 PEER Annual Meeting.

A total of 19 technical presentations were made during Day 2 of the meeting. The morning session's theme was "Progress in PBEE Methodology", while the afternoon offered concurrent sessions with structural and geotechnical emphases.

The slides are in MS PowerPoint Show (.pps) format, a read-only format, and can be downloaded at: <http://peer.berkeley.edu/2002annualmtg/>



NEWS DIGEST

- The next **Methodology Testbeds Coordination Meetings** will be held May 22 & 23, 2002 at PEER Headquarters. The first day will focus on the bridges testbeds, while the second will focus on the building testbeds.
- The Civil Engineering Risk and Reliability Association (CERRA), UC Berkeley, and PEER will co-sponsor the **Ninth International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP9)**, which will be held in San Francisco on July 6-9, 2003 at the Sir Francis Drake Hotel. The first announcement for ICASP9 is due out soon, and more information is available at: <http://icasp9.berkeley.edu/>
- PEER has agreed to be a Financial Sponsor of the **Seventh National Conference on Earthquake Engineering (7NCEE)**, hosted by EERI on July 20-23, 2002 in Boston, Massachusetts. The theme for the 7NCEE is *Urban Earthquake Risk*. For more information please visit: <http://www.eeri.org/news/Meetings/7nceef.html>
- PEER is currently compiling information to include in its **5th Year Progress Report** to NSF, due late this Spring. PEER will make a public version of the report available on its website in early Summer; anyone interested in viewing the public version of PEER's 4th Year Progress Report may do so at: <http://peer.berkeley.edu/yr4annual/>
- The **Asian-Pacific Network of Centers for Earthquake Engineering Research (ANCER)**, a consortium of seven national earthquake engineering research centers of which PEER is a member, was founded in 2001 with the purpose of broadening the impact of the centers' research through cooperative center-to-center activities. ANCER recently announced that it will sponsor the **International Conference on Advances and New Challenges in Earthquake Engineering Research (ICANCEER)** on August 15-20, 2002. The meeting will consist of two consecutive meetings in Harbin and Hong Kong, China. For more details, please refer to: <http://peer.berkeley.edu/icanceer/> ●●●



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