



**ASCE** | EARTH & SPACE CONFERENCE  
MARCH 14 – 17, 2010



**12th International Conference on Engineering, Science, Construction,  
and Operations in Challenging Environments**

**PRELIMINARY PROGRAM**

**Sheraton Waikiki Hotel  
Honolulu, HI**



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**Hosted by the Aerospace Division of the  
American Society of Civil Engineers**



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**PRELIMINARY SCHEDULE-AT-A-GLANCE**
*(subject to change)*
**SUNDAY, MARCH 14**

- 4:00 – 7:00 p.m. **REGISTRATION**
- 4:00 – 9:00 p.m. **Student Space Elevator Competition Team Information Session**
- 8:00 – 11:00 a.m. **Committee Meetings**
- 9:30 a.m. – 4:30 p.m. **Improve Undergraduate Engineering Teaching Using Emerging Technology—A Faculty Expertise Development Workshop**  
*(by invitation only)*

**MONDAY, MARCH 15**

- 7:00 a.m. – 4:00 p.m. **REGISTRATION**
- 8:00 – 9:15 a.m. **Welcome**  
by **Gangbing Song Ph.D., A.M.ASCE**,  
*Conference General Chair*
- Opening Remarks**  
by **Blaine D. Leonard, P.E., D.GE., F.ASCE**,  
*ASCE 2010 President*
- Plenary/Keynote Lecture**  
*Seismic Hazard Mitigation of the Transportation Infrastructures*  
**W. Phillip Yen, Ph.D., P.E.**  
*Wenchun Earthquake – Perspective from a Structural Engineer*  
**Hong-nan Li, Ph.D.**
- 9:30 – 10:45 a.m. **CONCURRENT SESSIONS**
- 9:30 a.m. – 5:00 p.m. **Student Vibration Control Competition**
- 9:30 a.m. – 5:00 p.m. **Student Space Elevator Competition**
- 10:45 – 11:00 a.m. Refreshment Break
- 10:45 a.m. – 12:15 p.m. **CONCURRENT SESSIONS**
- 12:15 – 1:30 p.m. Lunch Break (on own)
- 1:30 – 3:30 p.m. **CONCURRENT SESSIONS**
- 3:30 – 3:45 p.m. Refreshment Break
- 3:45 – 5:30 p.m. **CONCURRENT SESSIONS**
- 6:00 – 8:00 p.m. **Ice Breaker Reception**

**TUESDAY, MARCH 16**

- 7:00 a.m. – 4:00 p.m. **REGISTRATION**
- 8:00 – 9:15 a.m. **Plenary/Keynote Lecture**  
*State of the Art of Offshore Wind Energy*  
**Su Su Wang, Ph.D.**  
*State of the Art of Structural Health Monitoring*  
**Hui Li, Ph.D.**

**TUESDAY, MARCH 16** *(continued)*

- 9:30 – 10:45 a.m. **CONCURRENT SESSIONS**
- 9:30 a.m. – 5:00 p.m. **Student Vibration Control Competition**
- 9:30 a.m. – 5:00 p.m. **Student Space Elevator Competition**
- 10:45 – 11:00 a.m. Refreshment Break
- 10:45 a.m. – 12:15 p.m. **CONCURRENT SESSIONS**
- 12:15 – 1:30 p.m. Lunch Break (on own)
- 1:30 – 3:30 p.m. **CONCURRENT SESSIONS**
- 3:30 – 3:45 p.m. Refreshment Break
- 3:45 – 5:30 p.m. **CONCURRENT SESSIONS**
- 6:30 – 8:30 p.m. **ASD Banquet and Awards Ceremony**  
*Why Settle the Moon?*  
**Jeffrey Taylor, Ph.D.**  
*Lunar Science and Energy Resources—2010*  
**Harrison H. Schmitt, Ph.D., A.M.ASCE**

**WEDNESDAY, MARCH 17**

- 7:00 a.m. – 4:00 p.m. **REGISTRATION**
- 8:00 – 9:15 a.m. **Plenary/Keynote Lectures**  
*Applications of Nanotechnology in Multifunctional Nanocomposites and Renewable Energy Productions and Storage Devices*  
**Mehrdad N. Ghasemi Nejhad, Ph.D.**  
*Inflatable Plug for Protection of Underwater Rail Tunnels*  
**Julio F. Davalos, Ph.D.**
- 9:30 – 10:30 a.m. **CONCURRENT SESSIONS**
- 9:30 a.m. – 5:00 p.m. **Student Vibration Control Competition**
- 9:30 a.m. – 5:00 p.m. **Student Space Elevator Competition**
- 10:30 – 10:45 a.m. Refreshment Break
- 10:45 a.m. – 12:15 p.m. **CONCURRENT SESSIONS**
- 12:15 – 1:30 p.m. Lunch Break (on own)
- 1:30 – 3:30 p.m. **CONCURRENT SESSIONS**
- 3:30 – 3:45 p.m. Refreshment Break
- 3:45 – 5:30 p.m. **CONCURRENT SESSIONS**

**THURSDAY, MARCH 18**

- 8:00 a.m. – 5:00 p.m. **Lunar Geology Trip to Big Island—Lunar Analog Site**

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 Dalian University of Technology  
[www.dlut.edu.cn](http://www.dlut.edu.cn)

 Harbin Institute of Technology  
[www.hit.edu.cn](http://www.hit.edu.cn)

 University of Houston  
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 University of Texas  
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 Wuhan University of Science and Technology  
[www.wust.edu.cn/wust\\_en/index.html](http://www.wust.edu.cn/wust_en/index.html)

**Stellar Networking Opportunities**

**Student Robotics Competition**

**Student Control Design Competition**

**LEARN ABOUT:**

*Current Industry Practices*

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**Share the latest advancements and current thinking on these topics...**

- Structures ♦ Structural Vibrations ♦ Dynamics and Controls ♦
- Smart Structures ♦ Intelligent Sensors and Actuators ♦
- Exploration and Utilization of Extraterrestrial Bodies ♦
- Advanced Materials for Sustainable Development ♦
- Advanced Issues and Challenges in Control of Aerospace Vehicles and Structures ♦ Advanced Topics in Offshore Wind Turbine Research ♦ Fluid Dynamics and Heat Transfer in Challenging Environment ♦ Innovative Techniques in Structural Health Monitoring ♦ Nano Technology in Active Materials ♦ Advanced Technology in Composite Material Processing ♦ Disaster Mitigation ♦ Earthquake Engineering ♦
- New Development and Challenging Issues in 21st Engineering Education in Dynamics, Controls, and Structures ♦
- Field Sensing and Robotics ♦ Space Engineering and Construction ♦ In-Situ Resource Utilization and Development ♦ Human Exploration and Development of Space ♦
- Advanced Space Transportation Systems ♦ Space Environment ♦ Terrestrial and Space Architecture in Challenging Environments ♦
- Space Power Systems ♦ Engineering and Science in Earth-based Extreme Regions

**INVITATION FROM THE GENERAL AND SYMPOSIUM CHAIRS**

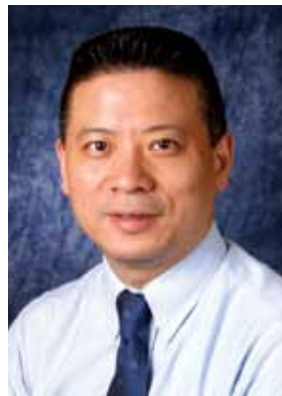
**O**n behalf of the Conference Organizing Committees and the symposia Chairs, I would like to invite you to Earth & Space 2010: the 12th International Conference on Engineering, Science, Construction and Operations in Challenging Environments to be held during March 14–17, 2010 in Honolulu, Hawaii.

This Conference will provide a unique forum to share knowledge and information on engineering and science related to Space and extreme environments and conditions on earth. The Conference Organizing Committees have been working very hard to create a multidisciplinary program uniquely designed to encourage technology transfer and sharing knowledge between those conducting research and development and those practicing engineering in the real world.

This year's Conference will focus on the theme "East meets West for Sustainable and Advanced Development," and will highlight and foster international collaboration between Asia and the Western World. As in the previous two Earth & Space conferences, The 4th NASA/ASCE Workshop on Granular Materials in Lunar and Martian Explorations will be held together as part of this conference.

Every day, at the Conference, an impressive list of subject areas in engineering and science will be discussed. Topics will include presentations from close to four hundred (400) individual papers in the frontiers of technology areas through eight parallel sessions at any given time. Researchers from academia, government agencies and industry from several countries will share their important discoveries.

Prominent individuals from government agencies, industries, and academia will offer keynote lectures every morning. This year, there will be two student competitions—namely, the Student Vibration Control Design competition and the Student Robotics Competition. These competitions will include students from several universities and will showcase their engineering ingenuity by designing, fabricating, and operating small scaled models to solve real-life engineering problem and challenge.



Come enjoy the weather, scenery and beaches of Hawaii. Be prepared to meet colleagues from all over the world and share information with them. Participate in many sessions focusing on cutting edge technology and see top researchers presenting their work. Take advantage of this unique opportunity to network with people in your field of expertise.

We look forward to seeing you at the Earth & Space 2010 Conference in Honolulu, Hawaii in March 14–17!

**Gangbing Song, Ph.D., A.M.ASCE**  
*Conference General Chair*

**CONFERENCE STEERING COMMITTEE**

**CONFERENCE GENERAL CHAIR**

**Gangbing Song, Ph.D., A.M.ASCE**  
*University of Houston*

**SPONSORSHIP & EXHIBITS CHAIR**

**Li Sun, University of Houston**

**LOCAL CHAIR**

**David Ma, Ph.D., Aff.M.ASCE,**  
*University of Hawaii-Manoa*

**STUDENT ACTIVITIES CHAIR**

**Philip Metzger, Ph.D., A.M.ASCE,**  
*NASA Kennedy Space Center*

**STUDENT SPACE ELEVATOR SYSTEM COMPETITION CHAIR**

**Ahad Nasab, Ph.D.,**  
*Middle Tennessee State University*

**STUDENT VIBRATION COMPETITION CHAIR**

**Gangbing Song, Ph.D., A.M.ASCE,**  
*University of Houston*

**ASCE AEROSPACE DIVISION EXECUTIVE COMMITTEE (EXCOM) CONTACT**

**Larry Toups, M.ASCE, NASA Johnson Space Center**

**POST CONFERENCE TOUR CONTACT(S)**

**Kris Zacny, Ph.D., M.ASCE,**  
*Honeybee Robotics Spacecraft Mechanism Corporation*

**Robert Fox, Ph.D., University of Hawaii**

**COMMITTEE MEMBERS**

**Juan Agui, Ph.D., NASA Glenn Research Center**

**Wieslaw Binienda, Ph.D., F.ASCE,**  
*University of Akron*

**Franco Bontempi, D.Eng, P.E., A.M.ASCE,**  
*University of Rome*

**Brad Griffin, M.ASCE, Gray Research**

**Tai Sik Lee, Ph.D., P.E., F.ASCE,**  
*Hanyang University*

**Hui Li, Ph.D.,**  
*Harbin University of Technology*

**Hongnan Li, Ph.D., A.M.ASCE,**  
*Dalian University of Technology*

**Arup Maji, Ph.D., P.E., F.ASCE,**  
*University of New Mexico*

**Ramesh B. Malla, Ph.D., M.ASCE,**  
*University of Connecticut*

**Y.L. Mo, Ph.D., University of Houston**

**Pizhong Qiao, Ph.D., P.E., F.ASCE,**  
*Washington State University*

**Bin Xu, Ph.D., M.ASCE, Hunan University**

**CONFERENCE MANAGER**

**Robin Crawford, CMP,**  
*American Society of Civil Engineers*

CONFERENCE OVERVIEW

## CONFERENCE TRACKS

The Conference schedule provides seven track sessions during a three day period consisting of 14 symposia based on a range of topics. Each day attendees will collaborate on issues facing construction and operations in challenging environments, space exploration, and sustainable development on Earth, in space, and other planetary bodies.

### SYMPOSIUM 1

#### 4th NASA/ASCE Workshop on Granular Materials in Lunar and Martian Exploration

Planetary regolith (soil) plays a central role in solar system exploration. The granular nature of planetary regolith raises fundamental questions about the properties and flow behavior of these materials, while posing challenges its utilization. With a firm fundamental basis, reliable and efficient methods can be developed to land, drive, excavate and construct on planetary regolith. We will study the geological and physical features of regolith to unravel the history of our solar system and to pursue its future exploration.

Co-Chairs: **Juan Agui, Ph.D.**, NASA Glenn Research Center;  
**Phillip Metzger, Ph.D., A.M.ASCE**, NASA Glenn Research Center

### SYMPOSIUM 2

#### Advanced Materials for Sustainable Development

The objective of this symposium is to present and disseminate recent research in advanced materials and structures for sustainable development of civil infrastructure, particularly for hydraulic structures. Recent advances in new structural systems and analysis techniques, high performance concrete, and composites are presented. In particular, a significant emphasis is put forth for advanced hydraulic materials and structural systems for sustainable development of hydrology-water resources and hydraulic engineering in China.

Co-Chairs: **Julio F. Davalos, Ph.D.**, West Virginia University;  
**Tongchun Li, Ph.D.**, Hohai University; **Sihong Liu, Ph.D.**, Hohai University;  
**Pizhong Qiao, Ph.D., P.E., F.ASCE**, Washington State University

### SYMPOSIUM 3

#### Exploration and Utilization of Extraterrestrial Bodies

The symposium on "Exploration and Utilization of Extraterrestrial Bodies" will be focused on methodologies, techniques, instruments, concepts and system level designs associated with robotic and human exploration of the Moon, Mars and other planetary bodies. The majority of speakers will represent NASA, academia, Department of Defense, and industry and we will also have a privilege to learn of developments across both oceans – oversees speakers will come from Europe (ESA), Japan (JAXA), Korea, China, and India. There will be 12 sessions with up to six presentations per session.

Co-Chairs: **Robert Mueller, Ph.D.**, NASA Kennedy Space Center;  
**Kris Zacny, Ph.D., M.ASCE**, Honeybee Robotics Spacecraft Mechanism Corp.

### SYMPOSIUM 4

#### Intelligent Sensors and Actuators

Integration of sensors into structural and material systems enables performance to be more effective and allows space and terrestrial systems to be remotely evaluated and controlled. Such sensors can be based on optical, acoustic or energy-coupled phenomena such as piezo-electric or magnetostrictive effects. Actuators that respond to artificial or human intelligence allow sensory information to be effectively used for remote operation, autonomous control, mitigation of shock and vibration, enhanced durability and capability. This symposium comprises of papers from interdisciplinary fields that encompass the broad array of topics described here.

Co-Chairs: **Arup Maji, Ph.D., P.E., F.ASCE**, University of New Mexico;  
**Ramesh Malla, Ph.D., M.ASCE**, University of Connecticut

### SYMPOSIUM 5

#### Advanced Issues and Challenges in Control of Aerospace Vehicles and Structures

The primary aim of the symposium is to provide a forum for investigating the application of the advanced control theory to the control design of aerospace vehicles and structures. Topics covered include flight dynamics, flight control systems, modeling and flight simulation, fault diagnosis and fault tolerant control, orbit design and trajectory optimization, formation flight and target clustering.

This symposium aims to achieve the following objective: covering different issues and new development related to the control of aerospace vehicles and structures, and exploring challenges, limitations and possible improvements.

Chair: **Zhang Ren, Ph.D.**, School of Automatic Control, Beijing Aeronautics

### SYMPOSIUM 6

#### Advanced Topics in Offshore Wind Turbine Research

Offshore Wind Turbines (OWT) plays a special role in a world with strong attention to energy resources and global sustainability. The objective of the Symposium is to present important aspects related with these complex challenging structural systems, covering both design concepts and analysis methods, with special attention to interaction phenomena and a strong focus on demanding technological characteristics, experimental activities and real applications.

Chair: **Franco Bontempi, Ph.D., D.Eng., P.E., A.M.ASCE**, University of Rome La Sapienza

### SYMPOSIUM 7

#### Fluid Dynamics and Heat Transfer in Challenging Environment

Symposium 7 "Fluid Dynamics and Heat Transfer in Challenging Environment" aims at providing a platform for communications between scholars from the research fields of thermal fluid dynamics and civil engineering. The latest study results upon turbulence, micro fluidics, wind engineering, fluid machinery, flow-induced vibration, and so on will be presented, and all the attendee from different fields will have a chance to exchange their innovative and interdisciplinary ideas in this symposium.

Co-Chairs: **Tomoaki Kunugi, Ph.D.**, Kyoto University;  
**Fengchen Li, Ph.D.**, Harbin Institute of Technology

### SYMPOSIUM 8

#### Innovative Techniques in Structural Health Monitoring

The Innovative Techniques in Structural Health Monitoring Symposium will present the new concepts, techniques and case studies, which appear in recent years. It will provide a chance for researchers, young students and engineers in order to discuss recent advances and share innovative ideas in SHM field. It will involve wireless sensing system, smart sensors, signal processing and interpretation, damage detection, system identification and so on.

Chair: **Hui Li, Ph.D.**, Harbin Institute of Technology

## CONFERENCE TRACKS

Interested in learning more about each track? Please visit:  
[content.asce.org/conferences/earthspace2010/index.html](http://content.asce.org/conferences/earthspace2010/index.html)

### SYMPOSIUM 9

#### Disaster Mitigation

After a strict review process, a total of 59 papers regarding to the analytical and experimental studies on the performance of materials and structures under different hazardous environments and man-made disasters and the monitoring, evaluation, rehabilitation, retrofitting and strengthening with smart materials and composites have been accepted in the symposium 10 of Disaster Mitigation. The symposium will become a major platform for academic exchanges among domestic and oversea researchers, engineers working in the related fields.

Co-Chairs: **YL Mo, Ph.D.**, *University of Houston*;  
**Bin Xu, Ph.D., M.ASCE**, *Hunan University*

### SYMPOSIUM 10

#### Structural Vibration Control

The symposium of structural vibration control provides a forum to share the recent achievements of researchers in the field of structural vibration control, including theory, experiment, and application in seismic base isolation, structural control via passive, semi-active, active and smart approaches. Special attention will be devoted to civil and infrastructure engineering applications, and related fields, such as aerospace and ocean systems, will be covered.

An objective of the symposium is to not only share ideas but also create opportunities of cooperation for researchers in the future.

Co-Chairs: **HN Li, Ph.D.**, *Dalian University of Technology*;  
**Y Shi, Ph.D.**, *Shenyang Architecture and Civil Engineering University*

### SYMPOSIUM 11

#### Nano Technology in Active Materials

This symposium will provide a communication platform for researchers in broad areas of nanotechnology and active materials to stimulate collaborative efforts in developing novel approaches and device concepts related to Earth and Space applications. Symposium topics include carbon nanomaterial based active polymer composites, ferroelectric thin film growth and device development, functionalized nanomaterials, nanosensor devices and structure health monitoring, and nanotechnology for energy.

Co-Chairs: **CL Chen, Ph.D.**, *University of Texas–San Antonio*;  
**Li Sun, Ph.D.**, *University of Houston*

### SYMPOSIUM 12

#### Advanced Construction Materials

Symposium 12 aims at improving the research and application of the advanced construction materials. Under this objective, the symposium will provide a good opportunity for the scholars to show their latest research progress on construction materials. The performance of traditional concrete in severe conditions, new construction materials, new structures and new technology in studying the construction materials are all covered by this symposium.

Co-Chairs: **Xianlin Gu, Ph.D.**, *Tongji University*;  
**Xianyu Jin, Ph.D.**, *Zhejiang University*

### SYMPOSIUM 13

#### Advanced Technology in Composite Material Processing

Advanced composite materials have been developed with new matrix materials and reinforcements for high performance and lightweight applications. The use of innovative constituent materials presents significant challenges in composites processing. This symposium addresses the advancement of process fundamentals and manufacturing processes of advanced composite materials for a wide range of applications such as aerospace, space, transportation, energy, marine, sporting goods, and infrastructure.

Co-Chairs: **J. Gou, Ph.D.**, *University of Central Florida*;  
**BM Zhang, Ph.D.**, *Beijing Aeronautics and Astronautics University and Harbin Institute of Technology*

### SYMPOSIUM 14

#### New Development and Challenging Issues in 21st Engineering Education in Dynamics, Controls, and Structures

Emerging technologies, such as Internet, have provided additional tools for engineering education. This symposium will provide a unique opportunity for educators and researchers to discuss the current challenging issues in engineering education and how to use emerging technology to improve engineering education, especially in the areas of Dynamics, Controls, and Structures.

Co-Chairs: **XM Chen, Ph.D.**, *Texas Southern University*;  
**Gangbing Song, Ph.D., A.M.ASCE**, *University of Houston*



## KEYNOTE LECTURES

### Monday, March 15

8:00 – 9:15 a.m.

#### Seismic Hazard Mitigation of the Transportation Infrastructures

Presenter: **W. Phillip Yen, Ph.D., P.E.**, *Seismic Research Program Manager, Federal Highway Administration*

#### Wenchun Earthquake – Perspective from a Structural Engineer

Presenter: **Hong-nan Li, Ph.D.**, *Changjiang Professor, Dean, School of Civil Engineering, Dalian University of Technology*

### Tuesday, March 16

8:00 – 9:15 a.m.

#### State of the Art of Offshore Wind Energy

Presenter: **Su Su Wang, Ph.D.**, *University Distinguished Professor Director, National Offshore Wind Research Center, University of Houston*

#### State of the Art of Structural Health Monitoring

Presenter: **Hui Li, Ph.D.**, *Changjiang Professor, Harbin Institute of Technology*

### Wednesday, March 17

8:00 – 9:15 a.m.

#### Applications of Nanotechnology in Multifunctional Nanocomposites and Renewable Energy Production and Storage Devices

Presenter: **Mehrdad N. Ghasemi Nejhad, Ph.D.**, *Director: Composites, Smart Structures & Nanotechnology Labs, University of Hawaii*

#### Inflatable Plug for Protection of Underwater Rail Tunnels

Presenter: **Julio F. Davalos, Ph.D.**, *Professor, Civil and Environmental Engineering, Benedum Distinguished Teaching Professor, College of Engineering and Mineral Resources, West Virginia University*



## SPECIAL EVENTS

**D**on't miss out when the Aerospace Division of ASCE touches down in Honolulu. Visit [content.asce.org/conferences/earthspace2010](http://content.asce.org/conferences/earthspace2010) and click on Special Events to keep up with the excitement.

### Monday, March 15

#### ICE BREAKER RECEPTION

6:00 – 8:00 p.m.

The Ice Breaker is a great opportunity to network and form alliances, initiate new acquaintances and strengthen old friendships and business relationships from around the planet! Trade your ideas and share your insights for lively conversation, over refreshing beverages and light hors d'oeuvres.

*The Ice Breaker Reception is included for all Full, Student/Full, Guest Package and Monday – Daily Registrants.*

**Additional Ticket Fee: EB: \$60, ADV \$75, ONS \$85**

### Tuesday, March 16

#### ASD BANQUET AND AWARDS CEREMONY

6:30 – 8:30 p.m.

Join the Aerospace Division of the American Society of Engineers for a wondrous, not to be missed evening of tantalizing food, good spirits, and excellent company. During the event, the Aerospace Division will present several awards, including Outstanding Professional Service Awards, the Best Paper Award of the Journal of Aerospace Engineering and the prestigious Columbia Medal. The winning team in the Student Space Elevator Competition will receive the Fluor-Daniel Trophy.

#### KEYNOTE SPEAKERS:

##### Why Settle the Moon?

**Jeffrey Taylor, Ph.D.**, *University of Hawaii*

##### Lunar Science and Energy Resources – 2010

**Harrison H. Schmitt, Ph.D., A.M.ASCE**

**Additional Ticket Fee: EB \$95, ADV \$105, ONS \$115**

### Thursday, March 18

#### POST-CONFERENCE TOUR

##### Lunar Geology Field Trip to Big Island Lunar Analog Site

8:00 a.m. – 5:00 p.m. (tentative)

Mauna Kea on the Big Island of Hawaii is home to the Mauna Kea Observatories at the summit, and the Pacific International Space Center for Exploration Systems (PISCES) Lunar Analog Test Site at the 9,200 foot level. Each is said to be the pre-eminent site in its field and seeing them is a not-to-be-missed opportunity for those who come to Hawaii.

On Thursday, March 18th, ASCE, in conjunction with the Pacific International Space Center for Exploration Systems (PISCES) will host a lunar geology field trip to the analog site on the lower slopes of Mauna Kea.

**This one day field trip is limited to the first 20 paid attendees.**

Please indicate your interest by selecting the tour when you register. In order to participate, tour must be booked and paid. No on-site registrations will take place.

**Additional Ticket Fee: EB \$100, ADV \$115, ONS \$125**

Airfare is not included in the price of the tour and tour attendees are responsible for booking their own flights at their cost. Do not book your flights until you receive a tour confirmation.



**STUDENT COMPETITIONS**

**Student Space Elevator Competition**

Sunday, March 14	4:00 – 9:00 p.m.	Technical Presentations
Monday, March 15	9:30 a.m. – 5:00 p.m.	Teams Compete
Tuesday, March 16	9:30 a.m. – 5:00 p.m.	Teams Compete
	6:30 – 8:30 p.m.	ASD Awards Banquet & Awards Ceremony

**Objective:** To design and build a climber that would climb a 30-foot vertical ribbon solely under radiative power received from a light source at the base of the ribbon.

Space travel using a space elevator system is a fairly recent and quite innovative concept supported by many government agencies, industry, and universities. In this concept, a motorized climber utilizes ground-based beamed power to climb a thin ribbon at moderate speeds covering several thousand miles. The concept will help to carry payloads to various orbits at a very cost-effective way. Please refer to other literature about the concept and its possible uses and limitations. You may also contact [www.elevator2010.org](http://www.elevator2010.org) for information on other similar activities and competitions.

The purpose of this year's Student Robotics Competition is to design and build a climber which is able to climb a ribbon with ground-based beamed power carrying a limited payload. Complete rules of this competition can be found at [www.mtsu.edu/~anasab/spaceelevator.htm](http://www.mtsu.edu/~anasab/spaceelevator.htm).

Student teams from high schools, 2- and 4-year colleges are encouraged to participate in this exciting competition. This competition requires a multidisciplinary team of students to contribute to various components of the climber. However, the project does not have a significant financial requirement.

The payload – detachable and provided by the teams – are to represent either the various components carried to space or, in the case of a moon-based space elevator, the payload would represent the components of command module to be established on the moon surface.

To sign up for this student competition please contact:



**Student Space Elevator Competition Chair**  
**Ahad Nasab, Ph.D.**  
Middle Tennessee State University  
[anasab@mtsu.edu](mailto:anasab@mtsu.edu)

**Active Vibration Control Student Design Competition**

Monday, March 15	9:30 a.m. – 5:00 p.m.	System Identification
Tuesday, March 16	9:30 a.m. – 5:00 p.m.	Control Design Verification
Wed., March 17	9:30 a.m. – 5:00 p.m.	Competition Day

**Objective:** The control design objective is to design a controller to suppress the induced vibration of the flexible beam in the presence of disturbance, such as sensor noise and uncertainty, such as changing mass or stiffness, by using the piezoceramic actuator and the piezoceramic sensor.

**Description of the Competition Platform:** This experiment was made possible by an NSF award. The piezoceramic sensor will sense the vibration of the beam, and the piezoceramic actuator will generate control action to counteract the beam vibration if the controller is properly designed. A PC with a dSPACE data acquisition and real time control system, along with Matlab/Simulink, will be provided. Detailed information of this system will be provided online soon.

**Competition Procedure:** **Day 1:** each team will be given a fixed amount of time for system identification. **Day 2:** each team will be given a fixed amount of time for control design verification. **Day 3:** the actual competition – each team's controller will run under three cases to suppress induced vibration: 1) no sensor noise and no uncertainty; 2) with sensor noise; and 3) with both sensor noise and uncertainties, such as added mass or changed stiffness with the help shape memory alloy wire actuators.

A comprehensive evaluation matrix will be used to rank each controller's performance. A committee of professors and researchers specialized in vibration control or smart structures will be formed and oversee this student competition.

To sign up for this student competition please contact:



**Student Vibration Competition Chair**  
**Gangbing Song, Ph.D., A.M.ASCE**  
University of Houston  
[gsong@central.uh.edu](mailto:gsong@central.uh.edu)

**STUDENT CONTACT LIST**

The purpose of the Student Contact List is to help find roommates to share their guest rooms and/or to enhance the overall conference experience by encouraging students to meet others in similar research fields or from other universities and countries.

Students who register for the conference and who would like to meet other students are encouraged to send an e-mail with their contact information to **Philip T. Metzger, Ph.D.**, email: [philip.t.metzger@nasa.gov](mailto:philip.t.metzger@nasa.gov). Please include your name, e-mail address, university, major field of study, and research or technical areas of interest. The contact information will be put onto a list that will be distributed only to the students who are also on the list.



## GENERAL INFORMATION

### ADA Compliance

The Sheraton Waikiki is fully accessible to the physically challenged with volume control pay phones, TDD, assistive listening devices, and automatic doors. If you require special assistance at the conference, please submit a written description of your requirements with your registration form or email [registrations@asce.org](mailto:registrations@asce.org) **BEFORE February 15, 2010**. While ASCE will make every effort to meet the needs of the disabled, accommodations cannot be guaranteed without prior notification.

### Attendee Packets

Early-bird and Advance registrants will receive their name badges and any tickets ordered at the ASCE Registration Desk during registration hours. Early-bird and Advance registrants should present the official ASCE registration receipt to on-site registration staff to obtain conference materials. If you submit a registration form via fax or postal mail one week prior to or after the registration cut-off date, please be sure to bring a copy of your fax or postal confirmation (as well as your email confirmation if you have received one), along with the original registration form paperwork to ensure ASCE on-site registration staff can process your registration. Due to the time constraints near and after the registration cut-off date, the appropriate paperwork may not have been forwarded to the on-site staff before their departure.

### Attire

The dress code for the Conference is business casual (i.e. slacks, casual dresses) to business attire (i.e. neckties, business suits). Meeting room temperatures will vary, so wear layered clothing to ensure your personal comfort. We also recommend attendees wear comfortable shoes. Please note that certain events may have specific details on attire, and you should refer to the event for more information.

### City Information

For more information on Honolulu, Hawaii or the surrounding area please contact the Hawaii Visitors & Convention Bureau directly or visit the destination page on the Earth & Space 2010 Web site.

#### Hawaii Visitors & Convention Bureau

2270 Kalakaua Avenue, Suite 801

Honolulu, HI 96815

From U.S. And Canada: **1-800-GoHawaii (1-800-464-2924)**

Email: [info@hvcb.org](mailto:info@hvcb.org)

[www.gohawaii.com/oahu](http://www.gohawaii.com/oahu)

### Meeting Room Overcrowding

ASCE will make every effort to schedule popular events in rooms large enough to accommodate anticipated attendance. Since many events are extremely popular, it is wise to select alternative events as you plan your conference schedule. ASCE and the [Insert Hotel Name] are REQUIRED to follow local fire regulations and may ask participants in rooms filled to capacity to choose another event.

### No Smoking Policy

ASCE supports a "No Smoking" policy. Smoking is prohibited in the Sheraton Waikiki Hotel and all venues hosting ASCE events.

### Professional Development Hours (PDHs)

You may earn PDHs, which are nationally recognized units of record, by attending conference concurrent sessions and short courses. Please note there are differences from state to state in continuing education requirements for professional engineering licensure. Each state licensing board has the final authority to approve course, credits, PDHs, and other methods of earning credits in that state. ASCE strongly recommends that individuals regularly check with their state licensing boards for specific continuing education requirements in their jurisdictions that affect professional engineering licensure and the ability to renew licensure. Attend and earn up to **18 Professional Development Hours**.

### Release/Waiver/Special Assistance\*

**Photograph Release:** By submitting the Registration form, I hereby release any photographs that may be incidentally taken of me during these events by ASCE to be used for any purpose.

**Liability Waiver:** I agree and acknowledge that I am undertaking participation in ASCE events and activities at my own free and intentional act, and I am fully aware that possible physical injury might occur to me as a result of my participation. I give this acknowledgement freely and knowingly that I am, as a result, able to participate in ASCE events, and I do hereby assume responsibility for my own well being. I also agree not to allow any other individual to participate in my place.

### Weather

Average temperatures range from a high of 86 degrees during the day to around 68 degrees in the evening hours.

## REGISTRATION INFORMATION

### Receive Member Rates

Not a member of ASCE? Join today and save on your Earth & Space Conference registration. Simply visit [www.asce.org/join](http://www.asce.org/join) or call **800-548-ASCE (2723)** to request an application and/or register for the conference. For more information on member benefits, go to [www.asce.org/membership](http://www.asce.org/membership). NOTE: You must be a member in good standing to qualify for the member rates.

### Early-bird Registration Discount (EB)

Don't miss out! Register early and receive the best savings. The deadline for Early-bird registration is **Tuesday, January 26, 2010**. Registration forms, including complete payment information, must be RECEIVED by this date to qualify for the Early-bird registration discount.

### Advance Registration Discount (ADV)

ASCE invites registrants to take advantage of an advance registration discount. The deadline for advance registration is **March 2, 2010**. Registration forms, including complete payment information, must be RECEIVED by this date to qualify for the advance registration discount.

### On-site Registration (ONS)

Registration forms received **AFTER March 9, 2010** will not be processed. After this date On-site registration will be necessary. Please be prepared to complete an On-site Registration Form at the Earth & Space 2010 Registration desk. A form in PDF format is available online for your convenience.

### Guest Registration

Guest Registration includes the Plenary Sessions, the Closing General Session Breakfast and ASCE's Ice Breaker Reception. Tours require an extra fee.

### Confirmation of Registration

A confirmation will be e-mailed to all advance registrants within one week of registering for the conference. Early-bird and Advance registrants will receive their name badges and any tickets ordered at the on-site Earth & Space 2010 Registration desk during Registration hours. If you do not receive confirmation within one week, please contact Earth & Space registration at **800-548-2723** and ask to speak with Customer Service, or email [registrations@asce.org](mailto:registrations@asce.org). Please reference Earth & Space 2010 in the subject line.

### Program and Session Cancellation

ASCE reserves the right to cancel programs and/or sessions because of low registration. In the unlikely event of a cancellation, all registrants will be notified and will receive a full refund, if applicable. Programs and Sessions are subject to change, and ASCE reserves the right to substitute a program, session, and/or speaker of equal caliber to fulfill the educational requirements.

### Payment Information

Acceptable forms of payment include:

- **CHECK:** payable to Earth & Space 2010 (In U.S. dollars, drawn on a U.S. bank—you must include attendee's name in the memo area of the check)
- **CREDIT CARD:** VISA, MasterCard, American Express, Diners Club, and Discover
- **PURCHASE ORDER:** P.O. #, company name & address or other billing address (This includes Government PO use)

Mail registrations to: **Earth & Space 2010**  
**P.O. Box 79668 • Baltimore, MD 21279-0668**

OR you may register online.

Full payment MUST accompany all registration forms. Forms will not be processed without payment or copy of purchase order.

### Cancellations/Refunds

Cancellations must be sent in writing or via email. A refund will be issued, minus a \$65 processing fee, if the cancellation notice is received by ASCE **by Tuesday, February 23, 2010**. No refunds will be made for cancellations received after the three-week deadline of Wednesday, February 23, 2010. Send cancellations to [registrations@asce.org](mailto:registrations@asce.org) or fax to **703-295-6144**.

### Recording of Sessions

Video or audio recording of any educational session is strictly prohibited without prior written permission from both ASCE and the session presenter(s).

### Instructions for Wire Transfers to ASCE

Please be aware that SunTrust bank levies a \$25 charge on all wire transfers; therefore the amount that you submit to your bank will be increased to include the SunTrust \$25 charge.

For questions regarding wire transfer instructions, please contact the Registration Department via e-mail at [registrations@asce.org](mailto:registrations@asce.org) or via telephone at (800) 548-2723.

# ASCE | EARTH & SPACE CONFERENCE MARCH 14 – 17, 2010

Please complete the Registration Form, including signature and payment information. Use one Registration Form per person. Registrations will not be processed without full payment and registrant's full name. By submitting the Registration Form, the individual agrees to all registration policies cited in the program and on the Conference Web site.

## CONTACT INFORMATION

\*First Name \_\_\_\_\_ MI \_\_\_\_\_ \*Last Name \_\_\_\_\_  
 Credentials \_\_\_\_\_ Badge Nickname \_\_\_\_\_  
 \*Company/Organization/University \_\_\_\_\_  
 \*Street Address/PO Box \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ \*Postal Code \_\_\_\_\_ Country \_\_\_\_\_  
 \*Work Phone \_\_\_\_\_ Home Phone \_\_\_\_\_ Cell Phone \_\_\_\_\_  
 Fax \_\_\_\_\_ \*Email \_\_\_\_\_  
 ASCE Member Number \_\_\_\_\_ CoOp or Foundry Name Organization \_\_\_\_\_ State \_\_\_\_\_ \*Postal Code \_\_\_\_\_ Country \_\_\_\_\_  
 \* Indicates Required Information

Fax: **703-295-6144**  
 Phone: **800-548-2723 (US)**  
 Phone: **703-295-6300 (International)**  
 Mail: **ASCE Earth & Space 2010  
 PO Box 79668  
 Baltimore, MD 21279-0668 USA**

### Join ASCE Today & Save!

Simply visit **www.asce.org/join**  
 or call **800-548-2723**  
 to request an application.

For more details please visit the  
**Earth & Space 2010 Web site.**

### Register by January 26, 2010 and Save!

For complete Conference  
 information and to register, visit:  
**content.asce.org/  
 conferences/earthspace2010/  
 index.html**

For additional information, please  
 contact: **registrations@asce.org**  
 or dial: **800-548-2723**

## Please answer these questions so we may serve you better:

- 1 The organization I work for is:  Private  Government  Education  Military  Other  
 2 My position is:  Partner/Principal  Senior Manager  Middle Manager  Technical/Professional Manager  
 Faculty  Student  Retiree  
 3 How many previous ASCE Conferences have you attended, including this one?  0  1  2  3 or more  
 4 My age group:  Under 25  25-34  35-49  50-65  Over 65



- Check here if you require:  Vegetarian  Lacto-Vegetarian  Octo-Vegetarian  Vegan  
 Check here if you have allergies to the following:  Peanuts  Tree nuts  Seafood  Other \_\_\_\_\_  
 Check here if you require specific aids or services:  
 Deaf or Hearing Impaired  Blind or Visually Impaired  Wheelchair Bound  
 Other \_\_\_\_\_

## FULL REGISTRATION

Registration Categories	EB EARLY-BIRD By 01/26/10	ADV ADVANCE By 03/01/10	ONS ONSITE After 03/01/10
ASCE Member	<input type="checkbox"/> \$ 595	<input type="checkbox"/> \$ 695	<input type="checkbox"/> \$ 795
Foundry Member/Coop	<input type="checkbox"/> \$ 595	<input type="checkbox"/> \$ 695	<input type="checkbox"/> \$ 795
Non-Member	<input type="checkbox"/> \$ 695	<input type="checkbox"/> \$ 795	<input type="checkbox"/> \$ 895
Student/Full*	<input type="checkbox"/> \$ 225	<input type="checkbox"/> \$ 250	<input type="checkbox"/> \$ 275
Student/Basic*	<input type="checkbox"/> \$ 115	<input type="checkbox"/> \$ 140	<input type="checkbox"/> \$ 165
Guest	<input type="checkbox"/> \$ 95	<input type="checkbox"/> \$ 115	<input type="checkbox"/> \$ 135
Speaker Member	<input type="checkbox"/> \$ 595	<input type="checkbox"/> \$ 695	<input type="checkbox"/> \$ 795
Speaker Non-Member	<input type="checkbox"/> \$ 695	<input type="checkbox"/> \$ 795	<input type="checkbox"/> \$ 895
Moderator Member	<input type="checkbox"/> \$ 595	<input type="checkbox"/> \$ 695	<input type="checkbox"/> \$ 795
Moderator Non-Member	<input type="checkbox"/> \$ 695	<input type="checkbox"/> \$ 795	<input type="checkbox"/> \$ 895

\*Full-time Students must submit a valid ID when registration form is submitted

Please check if you plan to attend the Icebreaker Reception.  
 Yes, I will attend  No

## DAILY REGISTRATION

Registration Categories	EB By 01/26/10	ADV By 03/01/10	ONS After 03/01/10
ASCE Member	<input type="checkbox"/> \$ 325	<input type="checkbox"/> \$ 425	<input type="checkbox"/> \$ 525
Foundry Member/Coop	<input type="checkbox"/> \$ 325	<input type="checkbox"/> \$ 425	<input type="checkbox"/> \$ 525
Non-Member	<input type="checkbox"/> \$ 400	<input type="checkbox"/> \$ 500	<input type="checkbox"/> \$ 600
Speaker Member	<input type="checkbox"/> \$ 325	<input type="checkbox"/> \$ 425	<input type="checkbox"/> \$ 525
Speaker Non-Member	<input type="checkbox"/> \$ 400	<input type="checkbox"/> \$ 500	<input type="checkbox"/> \$ 600
Moderator Member	<input type="checkbox"/> \$ 325	<input type="checkbox"/> \$ 425	<input type="checkbox"/> \$ 525
Moderator Non-Member	<input type="checkbox"/> \$ 400	<input type="checkbox"/> \$ 500	<input type="checkbox"/> \$ 600

Select Registration Day:  MON.  TUES.  WED.

## SPECIAL EVENTS – Additional Tickets Only

	EB	ADV	ONS	QTY
<b>MONDAY, MARCH 15</b>				
Ice Breaker Reception	<input type="checkbox"/> \$ 60	<input type="checkbox"/> \$ 75	<input type="checkbox"/> \$ 85	_____
<b>TUESDAY, MARCH 16</b>				
ASD Awards Banquet	<input type="checkbox"/> \$ 95	<input type="checkbox"/> \$ 105	<input type="checkbox"/> \$ 115	_____
<b>THURSDAY, MARCH 18</b>				
Tour: Lunar Analog Site	<input type="checkbox"/> \$ 100	<input type="checkbox"/> \$ 115	<input type="checkbox"/> \$ 125	_____
Proceedings	<input type="checkbox"/> \$ 125	<input type="checkbox"/> \$ 125	<input type="checkbox"/> \$ 140	_____

## CANCELLATIONS/REFUNDS

Cancellations must be sent in writing or via email. A refund will be issued, minus a \$65 processing fee, if the cancellation notice is received by ASCE by **Tuesday, February 23, 2010**. No refunds will be made for cancellations received after the three-week deadline of **Tuesday, February 23, 2010**. Send cancellations to **registrations@asce.org** or Fax to **703-295-6144**.

## WHAT YOUR REGISTRATION INCLUDES

	Plenary Sessions	Concurrent Sessions	Ice Breaker Reception	Proceedings	ASD Awards Banquet
Full Registration	x	x	x	x	separate ticket required
Student/Full	x	x	x	x	
Student/Basic	x	x			
Guest	x		x		
Daily Registration					
Monday	x	x	x		
Tuesday	x	x			
Wednesday	x	x			

## PAYMENT INFORMATION

Full payment **MUST** accompany all registration forms. Forms will not be processed without payment or copy of purchase order.  
**No REFUNDS granted for cancellations after February 23, 2010**

Full Registration	\$ _____
Daily Registration	\$ _____
Tours	\$ _____
Special Events	\$ _____
Conference Activities	\$ _____
Post Conference Activities	\$ _____
<b>Grand Total (pay this amount)</b>	<b>\$ _____</b>

**CHECK** Payable to ASCE Earth & Space 2010. Checks must be issued in US dollars, drawn on US banks. You must include the attendee's name in the memo area of the check. To pay registration fee by check, postmark your registration by the deadlines indicated above to:  
**ASCE Earth & Space 2010  
 PO Box 79668  
 Baltimore, MD 21279-0668 USA**

**CREDIT CARD**  
 AMEX  VISA  MC  DISC  DINERS  
 Card Number \_\_\_\_\_  
 Security Number (on back of card) \_\_\_\_\_  
 Expiration Date (MM/YY) \_\_\_\_\_  
 Cardholder Name \_\_\_\_\_  
**Total to be Charged** \_\_\_\_\_

**Purchase Order #** \_\_\_\_\_  
 (Provide copy of PO Form with your Registration Form)

REGISTRATION FORM

Oahu is nicknamed “the Gathering Place,” Oahu certainly lives up to its name. The third largest island is home to the majority of Hawaii’s diverse population, a fusion of East and West cultures rooted in the values and traditions of the native Hawaiian people.

This is an island of activity. Whether you’re learning to surf in legendary Waikiki, hiking through the rich rainforests of Waimea Valley, or watching the brilliant pastels of dusk fade off of Sunset Beach, you’ll find variety at every turn on Oahu.

### HOUSING INFORMATION

Sheraton Waikiki Hotel  
 2255 Kalakaua Avenue  
 Honolulu, Hawaii 96815

Reservation Cutoff Date: February 23, 2010

Reservation Rate: Single/Double: \$170

The Sheraton Waikiki Hotel and Resort is a modern monument to traditional Hawaiian hospitality. Waikiki is one of the world’s liveliest resort destinations because there is so much to do. The ocean welcomes with its warm, clear waters and myriad of water sports. With the pleasant weather of Hawaii, guests may enjoy beautiful scenery and unlimited recreational activities such as daily Fun Runs, aerobics, Taichi lessons, tennis, and golf.

To book your reservation at the Sheraton Waikiki, visit:

[www.starwoodmeeting.com/Book/smasce](http://www.starwoodmeeting.com/Book/smasce)

Currently a 12.962% sales tax per room, per night is applicable to the quoted room rates. Taxes are subject to change without notice.

**Check-in time is 3:00 p.m. Check-out time is 11:00 a.m.**

### HOTEL SERVICES

- ◆ Fitness Facility
- ◆ Outdoor Pools
- ◆ Aerobic Classes
- ◆ Snorkeling Lessons
- ◆ Multilingual Staff
- ◆ Children’s Program
- ◆ Golf Courses Nearby
- ◆ Beach Access
- ◆ Snorkeling
- ◆ Resort Wear Store
- ◆ Sheraton Travel Desk

Fees on certain facilities/services may apply

Pets are not allowed.

This is a smoke free hotel.

### PARKING INFORMATION AT THE HOTEL

For parking at the hotel there are two options available for guests. You may either self-park for \$25.00 per day or valet park for \$33.00 per day.

### TRANSPORTATION

#### Airport Information

Honolulu International Airport (airport code HNL) is approximately 8.9 miles from Sheraton Waikiki Hotel.

Find Honolulu International flight information, transit service provided, flight time and mileage to help make your planning a breeze.

Visit: [www.hawaii.gov/dot/airports/hnl/index.htm](http://www.hawaii.gov/dot/airports/hnl/index.htm) or call **808-836-6411** for the airport information operator.

### AIRLINE GROUND TRANSPORTATION INFORMATION

#### Airport Waikiki Express

The Waikiki Express offers transportation from the airport to any hotel on the island. The service runs 24 hours and 7 days a week.

#### Fares:

<b>Adults (one-way)</b>	<b>\$9.00</b>
<b>Adults (round-trip)</b>	<b>\$15.00</b>
<b>Children (3 years old and below)</b>	<b>Free</b>
<b>Baggage—two (2) bags per person, plus one (1) carry-on</b>	<b>No charge</b>

To make a reservation, please call: **808-831-1555**

For wheel chair accessible vehicle pickup, please email Tina Scott at [HATS@robertshawaii.com](mailto:HATS@robertshawaii.com).

### LOCAL TRANSPORTATION

#### Taxi

AMPCO Express is the managing contractor of the Airport’s Open Taxi System at Honolulu International Airport. Taxi Service is available on the center median fronting the terminal baggage claim areas. See the taxi dispatchers (green shirts with black lettering, and the wording “TAXI DISPATCHER”) for service. The fare from the airport to Waikiki during non-rush hour periods is approximately \$35.00-\$40.00.

#### To travel from the hotel to Downtown Honolulu

There are several bus options to reach Downtown Honolulu. Taking the #19 or #20 bus in the opposite direction with the destination of Airport will work. You may also take the #2 (Middle St), #13 (Liliha), #42 (EWA Beach). The ride will take approximately 30 minutes.

