

## Biography



Reginald DesRoches is a Professor and Associate Chair of Civil and Environmental Engineering at the Georgia Institute of Technology. His primary research interests are design of buildings and critical infrastructure under earthquake engineering, seismic risk assessment of lifeline systems, and application of innovative materials in rehabilitation of structures. He has published over 180 articles in the general area of structural and earthquake engineering. Dr. DesRoches has served as Chair of the ASCE Seismic Effects Committee (2006-2010), and Chair of the executive committee of the Technical Council on Lifeline Earthquake Engineering (2010). He is currently a member of the executive committee of the National Academy of Sciences Disasters Roundtable, and is on the Board for the Earthquake Engineering Research Institute (EERI). Dr. DesRoches has been a key technical leader in the U.S. response to the 2010 Haiti Earthquake. He has taken eight trips to Haiti since the earthquake, including a trip where he led a group of 28 engineers, architects, city planners, and social scientists, to study the impact of the earthquake with the goal of informing the Haitian government on effective ways to rebuild Haiti to be more resilient and sustainable. Dr. DesRoches was a recipient of the 2001 NSF CAREER Award, and the Presidential Early Career Award for Scientists and Engineers (PECASE) in 2002. The PECASE award is the highest honor bestowed upon scientists and engineers in the early stages of their careers. Most recently, he was a recipient of the 2007 ASCE Walter L. Huber Civil Engineering Research Prize, the Georgia Tech Outstanding Doctoral Thesis Advisor Award (2010), and the Georgia Tech ANAK Award (2008) for outstanding research, teaching, and service. The ANAK award is considered the highest honor the undergraduate student body can bestow on a Georgia Tech faculty member. Dr. DesRoches was born in Port-au-Prince, Haiti and grew up in Queens, NY. He earned his Bachelor's of Science in Mechanical Engineering, Master's of Science in Civil Engineering, and PhD in Structural Engineering – all at the University of California, Berkeley.

## The Richard J. Carroll Memorial Lectureship

The Richard J. Carroll Memorial Lectureship in Civil Engineering was established at The Johns Hopkins University to commemorate one of Baltimore's leading structural engineers, Richard J. Carroll, P.E. The lectureship was endowed by the many friends and admirers of Mr. Carroll, who passed away in 1982. The endowment contributes to the ongoing guest seminars in the Department of Civil Engineering and provides for these special lectures.

Richard J. Carroll, P.E. received his bachelor of civil engineering degree from Villanova University in 1955 and studied advanced structural design at The Johns Hopkins University and George Washington University. He was chief structural engineer for the firms of Knoerle, Bender, Stone, and Associates, and Ewell, Bomhardt and Associates and chief field engineer for the Portland Cement Association. In 1964 he founded his own firm, Carroll Engineering, Inc., which grew to 26 employees under his leadership. Mr. Carroll made contributions to the civil engineering profession through his membership in numerous professional societies and he published several papers on concrete use and design with an emphasis on post-tensioned and pre-stressed concrete. He also taught courses in ultimate strength design and plastic design in steel. His untimely death at the age of 49 left a legacy of professionalism, integrity, and vigor.

Donors to the Carroll Memorial Lectureship include:

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## 2011 Richard J. Carroll Memorial Lectureship

# APPLICATION OF SMART MATERIALS IN NATURAL HAZARD MITIGATION

**Reginald DesRoches, PhD**  
Georgia Institute of Technology

Wednesday April 13, 2011  
1:30-2:30 p.m.

The Johns Hopkins University  
Homewood Campus  
Hodson Hall,  
3rd Floor Boardroom

Open to the Public

**JOHNS HOPKINS**  
UNIVERSITY  
WHITING SCHOOL OF ENGINEERING



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**Reginald DesRoches, PhD**

Georgia Institute of Technology



## Application of Smart Materials in Natural Hazard Mitigation

The recent earthquakes in New Zealand and Chile underscore the importance of developing new approaches and technologies to increase the performance of structures during earthquakes. The presentation will highlight the application of a new class of materials, namely shape memory alloys (SMAs), in mitigating the effects of earthquakes in buildings and bridges. Shape memory alloys are a unique metallic alloy which can undergo large deformations while reverting back to their original, undeformed shape. This unique property has led to the development of applications in the biomedical field (arterial stents), aerospace field (adaptive wings), and commercial industry (eyeglass frames). A multi-scale and multi-disciplinary approach is taken to explore the use of SMAs for applications in earthquake engineering. Several large scale applications are tested



including a “smart” steel beam-column connection that uses shape memory alloys, innovative bracing systems, and recentering restraining devices for bridges. The large scale experimental tests and complementary analysis show great potential for the use of shape memory alloys in seismic applications.

### Events at ASCE Meeting

6:00 p.m. Cocktails

7:00 p.m. Dinner

8:00 p.m. After Dinner Seminar  
by **Reginald DesRoches**

The Engineers Club  
11 West Mount Vernon Place  
Baltimore, MD 21201

Register at [asce@esb.org](mailto:asce@esb.org)

## The 2010 Haiti Earthquake:

### Lessons Learned and Opportunities for Rebuilding for Resilience and Sustainability in Haiti



The January 12, 2010 Mw 7.0 Haiti earthquake resulted in one of the most devastating natural disasters in modern times. It is estimated that over 300,000 fatalities, and 300,000 injuries resulted from the earthquake, and over one million people were homeless for months following the earthquake. The

rebuilding community is challenged not only by the scale of the devastation, but also by the very real possibility that Port-au-Prince may face another devastating earthquake within the next one or two decades. The talk will discuss the lessons learned from the Haiti earthquake, highlight the vulnerabilities that exist in Haiti's infrastructure, and opportunities for rebuilding for resilience and sustainability in Haiti.