

# Failsafe Roads and Energy Efficient Vehicles



Olivia Graeve

Professor, Department of Mechanical and Aerospace Engineering

## CURRENT RESEARCH

### Creating new materials to maintain existing infrastructure and for energy applications

In August of 2007, the I-35W bridge over the Mississippi River in Minneapolis suddenly collapsed, killing 13 people and injuring 145. Although the Minneapolis Department of Transportation replaced the bridge as quickly as possible, not many measures were taken to diagnose and prevent the failure of other US civil infrastructures. The appropriate maintenance of infrastructure nationwide and advancements in energy technologies are of extreme importance, as one holds the present intact and the other pulls the future closer. Dr. Olivia Graeve, Associate Professor of Mechanical and Aerospace Engineering at the University of California, San Diego, is bridging the two fields by developing a variety of new materials for sensing damage in civil infrastructure as well as for facilitating hydrogen storage. By creating new materials using unconventional methods, Dr. Graeve envisions a brighter future and safe and healthy homes for generations to come.

Dr. Graeve's research focuses on fundamental studies of the synthesis and processing of nanostructured materials, including ceramic and metallic nanomaterials and amorphous/nanocrystalline composites for both structural and functional applications, with a special emphasis on electromagnetic multifunctional materials for sensors and energy applications. A particular highlight in her laboratory has been on creating efficient manufacturing technologies that allow the team to obtain new materials and new mixtures of materials in a few minutes or a few hours at most. The reduction of time also decreases the cost of production, and the team now has a faster system of testing and improving new materials. One of the technologies that the team has been targeting is spark plasma...

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## AFFILIATION

 University of California, San Diego

## EDUCATION

- Ph.D. in Materials Science and Engineering, Department of Chemical Engineering and Materials Science 2001, University of California, Davis
- B.S. in Structural Engineering, Department of Applied Mechanics and Engineering Sciences 1995, University of California, San Diego

## AWARDS

- UCSD Diversity Award, 2014
- Tijuana Walk of Fame, 2014
- International member (Level II) of the Sistema Nacional de Investigadores, Consejo Nacional de Ciencia y Tecnologia, Mexico, January 2013
- B.J. Harrington Lecturer, McGill University, September 2012
- Jaime Oaxaca Award, Society of Hispanic Professional Engineers, 2011

## RESEARCH AREAS

Technology, Materials Science / Physics, Nanotechnology, Empowering Women

## FUNDING REQUEST

Your contributions will support the continued research of Dr. Olivia Graeve and her team at the University of California, San Diego, as they develop new materials for damage sensing in civil infrastructure and refine energy technologies for a healthier environment. Your donations will help fund the \$500K per year required to support personnel, equipment, materials, and supplies as they build efficient processes to advance concepts into commercialization.