



AVVISO DI SEMINARIO

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Martedì 16 Luglio 2024
ore 16:30-17:45

presso l'Aula 17
Via Eudossiana 18, Chiostro della Facoltà
terrà un seminario dal titolo:

The Mission to Apophis

We will present the case for our one great shot to meet asteroid Apophis in 2029. In 2004, an asteroid the size of 5 football fields was discovered and thought to be on a path to impact Earth. It was named Apophis, after the god of Chaos, for its potential to cause widespread global devastation. Subsequent observations have shown that Apophis will barely miss hitting Earth, but on April 13, 2029, it will come so close to Earth's surface that more than a billion people will see it shining as brightly as a star moving rapidly across the sky with the naked eye. The event will make the closest Earth flyby of an asteroid in recorded history. While some billion will witness this once-in-a-millennium event, our mission has set sight on harnessing the opportunity to conduct a rare science expedition that would map the surface and interior of Apophis to return data critical to the Earth's planetary defense. This type of science experiment is only possible once in a lifetime when (1) the subject of observation has been identified early enough for response, (2) is an object of great interest due to its size and trajectory in relation to Earth, and (3) most importantly, coming close enough for our constellation of spacecraft to launch in time to rendezvous with it. Our mission will return data on Apophis's interior structure, changes in its surface formation, and a photo of the asteroid with Earth in the background.

The mitigation of a future threat is a global issue that requires immense advanced coordination and activation. A rendezvous with Apophis will be a defining moment in our collective history as a small team of scientists, technologists, explorers, and risk takers prepare humanity to meet Chaos on our own terms by demonstrating that we are equipped to defend our planet against future asteroids that threaten our existence.

With the world watching, are we prepared to meet the moment?



Asteroid (99942) Apophis (source ESA)



José E. Andrade is the George W. Housner Professor of Civil and Mechanical Engineering and the former Cecil and Sally Drinkward Leadership Chair of the Department of Mechanical and Civil Engineering at Caltech. Also, Dr. Andrade served as Vice President of Innovation and Civil Engineering at Energy Vault, Inc. (NRGV), the creator of green energy storage solutions at grid scale, including its proprietary gravity energy storage system (GESS) solution. Dr. Andrade's led the effort to productize NRGV's next-generation technologies and enable flawless deployment to customers worldwide. He is the co-inventor of Energy Skyscrapers, combining GESS with tall buildings, transforming skyscrapers into CO₂ sinks.

His research interests lie in complex systems mechanics with application to problems at the interface of physics and mechanics to develop predictive analytical and numerical models for granular, porous, and discontinuous systems (e.g., soils, regolith, batteries), with especial application to energy applications and space missions by NASA. Prof. Andrade is the recipient of several honors and awards including the 2006 Zienkiewicz Medal in computational mechanics, the 2010 NSF CAREER Award, the 2010 Young Investigator Award from the U.S. AFOSR, the 2011 Arthur Casagrande Career Development Award from ASCE, the 2011 Rocafuerte Medal for Scientific and Technological Advancements from the Republic of Ecuador, the 2017 Thomas Hughes Young Investigator Award from ASME, the 2018 Huber Research Prize from ASCE. A Fellow of ASME, Andrade also served on the Science Team for the NASA's InSight Mission to Mars. He is on the editorial board for some of the leading journals in the field and Associate Editor of the ASME's Applied Mechanics Reviews. Andrade's work is currently funded by NSF, ARO, and NASA.