

The Science Behind Earthquakes ^[1]

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^[3]

Ruins from Puerto Rico's earthquake in 1918.

Two months ago we received 2010 with the news that neighboring **Haiti** was struck with a 7.0 magnitude earthquake. Not recovered from **Haiti's** situation, in the last days of February, **Chile** also experiences an earthquake; this time an 8.8 one and nowadays they are still getting aftershocks. After all these events have you ever asked yourself what causes an earthquake? Can Puerto Rico be struck by an earthquake? Fortunately, the answers to all these questions and the science behind earthquakes are the focus of the research of geologists like [Dr. Daniel Laó Dávila](#) ^[4] and the [Puerto Rico Seismic Network](#) ^[5].

[Dr. Laó Dávila](#) ^[4], a [CienciaPR.org](#) ^[4] member, graduated from the [University of Puerto Rico at Mayaguez](#) ^[6], **Department of Geology**. Later on, he continued post-graduate studies completing a master in geology from [Florida International University](#) ^[7] and a Ph.D. in the same field from the [University of Pittsburgh](#) ^[8]. Currently, he is a [Research Associate](#) at the [Puerto Rico Seismic Network](#) ^[5]. The [Puerto Rico Seismic Network](#) ^[5] is part of the **Department of Geology of the University of Puerto Rico at Mayaguez**. Its mission is to detect, prosecute and investigate the seismic activity in the region of Puerto Rico and to report opportunely the results for purposes of public security, education, engineering and scientific research.

Puerto Rico in the past has been struck by big earthquakes because it is located in the border of the [Caribbean](#) ^[9] and [North American plates](#) ^[10]. On October 11th, 1918 an earthquake with a main-shock epicenter in the **Mona Passage** and a magnitude of 7.3 destroyed buildings in the west of the **Island** and also triggered a devastating tsunami. Thanks to researchers like **Dr. Laó Dávila**, the **Island** seismicity is investigated and monitored.

His research is focused in understanding the tectonic motion between the **Caribbean and the North American** plates that are the responsible for the seismic activity in **Puerto Rico**. The tectonic plates are pieces of the Earth's crust and uppermost mantle. Earthquakes, volcanic activity, mountain-building, and oceanic trench formation occur as the result of tectonic plate interaction. ***Did you know that the Caribbean plate moves approximately 20 mm annually breaking rocks from the north Caribbean?***

From the study of the tectonic motion in Puerto Rico, **Dr. Laó Dávila** has investigated the deformation of different rocks from west Puerto Rico using **paleostress analyses** (the orientation of the forces applied to the rocks through time) and **paleomagnetism** (the record of the Earth's magnetic field preserved in various magnetic minerals through time) along with structural geology techniques applied in the field and lab. These studies have helped improving our knowledge about the tectonic history of our Island and the **Caribbean**. In addition, tectonic faults within the island have been studied using **GPS** systems and seismicity to try to understand the current tectonic framework and to delineate the seismic risk for Puerto Rico.

Thanks to these research efforts we count with a lot of scientific data about earthquakes. **However, to be ready for an earthquake is of everyone's concern and we need to be prepared.** If you would like to know about how to prepare and what to do in case of an earthquake, please go to the Federal Emergency Management Agency (FEMA) [11] or the Red Cross [12] websites for more info. Be aware that this is an unpredictable event and you need to know ahead of time how to prepare for an emergency.

If you would like to know more about earthquakes and Dr. Daniel Laó Dávila's [4] research please visit his profile at CienciaPR.org [4] or the web site of the Puerto Rico Seismic Network [5] that contains detailed information about the seismic events in our Island.

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