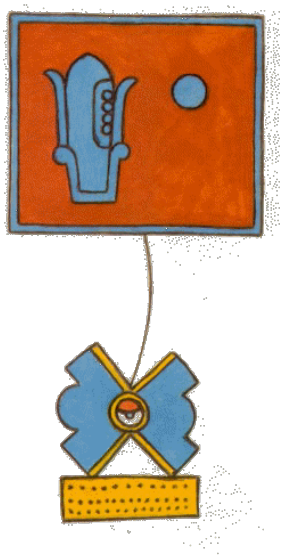
IAMG *Student Chapter*
Freiberg & **Dresden**

TALK ANNOUNCEMENT

The IAMG[1] student chapter Freiberg & Dresden[2] will be hosting a talk.

date:	**Friday**, 30 July 2021, **3:30** p.m.
place:	online meeting room[3]
room:	Big Blue Button[3]
title:	**19th September: a date marked by earthquakes in Mexico City**
presenter:	**Dr. Hortencia Flores Estrella (TU Berlin)**

Mexico City, political and economic center of Mexico, was built above the ruins of Mexico-Tenochtitlan, the capital city of the Aztec Empire, which was founded around 1325 on an island in a lake at more than 2000 m above sea level. Although the distance to the main seismogenic region is around 400 km, the Aztecs were used to earthquake occurrence and their consequences. They believed the world would come to an end when the "fourth sun would be devoured by an earthquake".



After the Spanish conquest, in 1521, the Aztec city was razed and the colonial capital was founded in the same location. Floods and epidemics suggested a need to drain the lakes and this long effort began near 1524. The more the lake was drained, the more the city extended on the former lakebed, building above lacustrine saturated clays, increasing the seismic risk in some areas of the city.
On 19th September 1985, the most destructive earthquake in Mexico occurred on the Pacific Coast of Michoacan, with magnitude Mw 8.1.

In Mexico City, almost 400 km away from the epicenter, more than 350 buildings collapsed and the dead toll was estimated between 10,000 and 30,000. The major factor of damage was the presence of lacustrine saturated soft clays and their impedance contrast with the underlaying limestones, which caused an overall amplification of 100 - 500 times as referred to rock sites near the epicenter. Only four years after, in 1989, the first early alert system was developed and it started working on 1991. Nowadays, this early alarm system works for several cities in Mexico and it gives between 10 and 120 seconds time before the first ground motion is felt. In collaboration with the civil protection authorities, inhabitants have learnt how to act and what to do when they hear this alarm, which has saved thousands of lives. On the 19th September 2017, and short after a macroearthquake drill, a Mw 7.1 intraslab earthquake hit Mexico City at 13:40 hours (local time). The seismological records of the 2017 showed that the ground motion in certain frequencies was anomalously large, and it was reported as the second most destructive earthquake in Mexico City, just after the 1985 event, with 369 casualties. The early alarm system could not give time before the motion arrived, because of the epicenter location.
In this talk the main characteristics of the seismological situation in Mexico City will be addressed, as well as the early alarm system and how the inhabitants have learnt to live with it.

[1] International Association of Mathematical Geosciences (IAMG), https://iamg.org

[2] https://tu-freiberg.de/iamg

[3] https://selfservice.zih.tu-dresden.de/link.php?m=134458&p=27e4fa9b

[3] https://selfservice.zih.tu-dresden.de/l/link.php?m=134458&p=2752af21 (only for participants with ZIH (TU Dresden) login)