Assesing geological hazards due to dry granular flows with Molecular Dynamics simulations

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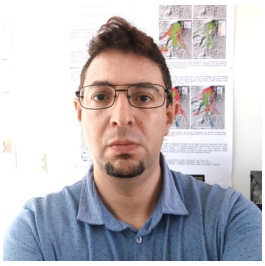
Dry granular flows in geological environments may pose a risk for human life and property. Even though this type of flows are commonly treated as continuum fluids, disregarding the physics of individual particles may lead to overlooking granular-physics phenomena such as segregation and high-speed ejection of particles. In this talk I will show applications of Molecular Dynamics (MD) simulations in the study of geological granular flows, such as pyroclastic density currents and rock avalanches. I will also show how MD simulations can be used to extract information of interest to geologists, from a length scale of grain size. The results of these simulations can be applied in assesing hazard maps in risk-prone sites with a higher accuracy than that obtained from continuum models.



I am a physicist from Universidad Autónoma de San Luis Potosí, graduated in 2006. I have a Master's degree (2015) and a Ph. D. degree (2017) in Physics, also from UASLP. I worked as a collaborator in the National Laboratory of Out-of-Equilibrium matter in San Luis Potosí (2017), as a postdoctoral fellow at the University of Guanajuato (2018). Starting in 2018, I have been working as a research fellow in the program "Investigadores por México", Secihti, at the Institute of Geosciencies, National Autonomous University of Mexico.

My research lines are Molecular Dynamics simulations of geological granular flows in volcanic environments, small and medium scale experiments and simulations of dry granular flows in confined chanels, Molecular Dynamics simulations of quasi-2D granular gases.