

Ligia Pérez-Cruz

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email:

HISTORY OF EMPLOYMENT

Chair Oceanographic Research Vessel, UNAM. April 2017-Present.

Senior Research Scientist. Institute of Geophysics, UNAM. 2004-Present.

Chair Department of Geomagnetism and Exploration, UNAM 2013-2017

Researcher. Mexican Petroleum Research Institute. Exploration Division. 2002-2004

Research Associate. Mexican Petroleum Research Institute. Exploration Division. 1993-1997

Chair Laboratory of Electron Microscope and X-ray Analysis. Mexican Petroleum Research Institute. Geosciences Division. 1994-1997

Research Associate. Mexican Petroleum Research Institute. Exploration Division. 1992-1993.

DEGREES

Ph.D. Ocean Sciences (Geological Oceanography) 2000- *Graduated summa cum laude* UNAM (National University of Mexico)

M.Sc. Ocean Sciences (Biological Oceanography) 1989- *Graduated summa cum laude* UNAM (National University of Mexico)

B Sc Biology- Faculty of Sciences UNAM (National University of Mexico)

RESEARCH EXPERIENCE

I study climate and ocean variability, mechanisms, processes and, teleconnections, mass extinctions and life evolution.

My research focuses on the paleoclimate reconstructions for the Tropical Pacific Ocean, Gulf of California, for the past thousand years. My research is inter- and multidisciplinary, since I use different tools of micropaleontology, geochemistry, isotopes, sedimentology, magnetic properties, electronic microscopy and modeling.

I have been studying the Gulf of California for several years, investigating climate and ocean variability, processes, mechanisms and teleconnections.

These investigations are important for understanding the role that Tropics play in the Global Climate System. One of the best examples is El Niño Southern Oscillation phenomenon (ENSO), teleconnections, among other factors and processes.

My projects focus on the marginal and axial basins, drilling and coring, looking at the water column and doing bathymetric surveys.

In 2019, I participated in the IODP Expedition 385 in the JOIDES Resolution that represent a great opportunity for studying and understanding the Guaymas Basin -the evolution, processes and dynamics of the Gulf and the tropical Pacific. I feel fortunate to be part of the drilling expedition. International drilling programs open interesting opportunities and this one was a no-brainer for me.

I am participating in the IODP and ICDP drilling projects, Expedition 364 and working on the Chicxulub impact crater, Yucatan platform, and mass extinctions. They cover a wide range of themes, including studies of the Paleocene-Eocene Thermal Maximum and other

hyperthermal events during the Cenozoic Era. The significance of these studies is to understand how the life was recovered after a mass extinction and the consequences of global warming.

KEY PUBLICATIONS

- D. A. Kring, S. M. Tikoo, M. Schmieder, U. Riller, M., ..., **L. Pérez-Cruz**, A. E. Pickersgill, M. H. Poelchau, A. S. P. Rae, C. Rasmussen, H. Sato, J. Smit, N. Tomioka, J. Urrutia-Fucugauchi, M. T. Whalen, L. Xiao, K. E. Yamaguchi, Probing the hydrothermal system of the Chicxulub impact crater. *Sci. Adv.* **6**, eaaz3053 (2020).
- Zhao, J., Xiao, L., Gulick, S.P.S., Morgan, J.V., Kring, D., Urrutia-Fucugauchi, J., Schmieder, M., de Graaff, S. J., Wittmann, A., Ross, C.H., Claeys, P., Pickersgill, A., Kaskes, P., Goderis, S., Rasmussen, C., Vajda, V., Ferrière, L., Feignon, J.G., Chenot, E., **Pérez-Cruz, L.**, Sato, H., Yamaguchi, K., IODP-ICDP Expedition 364 scientist. 2020. Geochemistry, geochronology and petrogenesis of Maya Block granitoids and dykes from the Chicxulub Impact Crater, Gulf of México: Implications for the assembly of Pangea. *Gondwana Research*, 82: 128 – 150. DOI: [10.1016/j.gr.2019.12.003](https://doi.org/10.1016/j.gr.2019.12.003).
- Choumiline K, **Pérez-Cruz L**, Gray AB, Bates SM and Lyons TW (2019) Scenarios of Deoxygenation of the Eastern Tropical North Pacific During the Past Millennium as a Window into the Future of Oxygen Minimum Zones. *Front. Earth Sci.* 7:237. Impact Factor: 3.070. doi: [10.3389/feart.2019.00237](https://doi.org/10.3389/feart.2019.00237).
- Gulick, S.P.S., Bralower, T. J. et al., 2019. The first day of the Cenozoic. *Proceedings of the National Academy of Sciences*, 116 (39): 1-10. DOI: [10.1073/pnas.1909479116](https://doi.org/10.1073/pnas.1909479116).
- Urrutia-Fucugauchi, J., **Pérez-Cruz, L.**, Morgan, J., Gulick, S., Wittmann, A., Lofi, J. and IODP-ICDP Expedition 364 Science Party. 2019. Peering inside the peak ring of the Chicxulub Impact Crater its nature and formation mechanism. *Geology Today*, 35 (2): 68- 72. DOI: [10.1111/gto.12261](https://doi.org/10.1111/gto.12261).
- Riller, U., Poelchau, M.H., Rae, A.S.P., Schulte, F.M., ... **Pérez-Cruz, L.**, Pickersgill, A.E., Rae, A.S.P., Rasmussen, C., Rebolledo-Vieyra, M., Sato, H., Smit, J., Tikoo, S.M., Tomioka, N., Whalen, M.T., Wittmann, A., Yamaguchi, K., Urrutia-Fucugauchi, J., Bralower, T.J.). 2018. Rock fluidization during peak-ring formation of large impact structures. *Nature*, 562 (7728): 511-518. DOI: [10.1038/s41586-018-0607-z](https://doi.org/10.1038/s41586-018-0607-z).
- Lowery, C., Bralower, T., Owens, J., Rodríguez-Tovar, F., Jones, H., ... **Pérez-Cruz, L.**, Pickersgill, A., Poelchau, M., Rae, A., Rasmussen, C., Rebolledo-Vieyra, M., Riller, U., Sato, H., Smit, J., Tikoo, S.M., Tomioka, N., Urrutia-Fucugauchi, J., Wittmann, A., Xiao, L., Yamaguchi, K., Zylberman, W. 2018. Rapid recovery of life at ground zero of the end-Cretaceous mass extinction. *Nature*, 558: 288–291. Impact Factor: 41.577. DOI: [10.1038/s41586-018-0163-6](https://doi.org/10.1038/s41586-018-0163-6).
- Pérez-Cruz, L.**, Urrutia-Fucugauchi, J. 2018. Magnetic mineral diagenesis in anoxic laminated sediments from the southern Gulf of California. *Studia Geophysica et Geodaetica*, 62 (1):115-138. Impact Factor: 9.70. DOI: [10.1007/s11200-016-0443-2](https://doi.org/10.1007/s11200-016-0443-2). ISSN: 1573-1626.
- Morgan, J.V., Gulick, S.P.S., Bralower, T.,... **Pérez-Cruz, L.**, Pickersgill, A., Poelchau, M., Rae, A., Rasmussen, C., Rebolledo-Vieyra, M., Riller, U., Sato, H., Schmitt, D.R., Smit, J., Tikoo, S., Tomioka, N., Urrutia-Fucugauchi, J., Whalen, M., Wittmann, A., Yamaguchi, K. E., Zylberman, W. 2016. The formation of peak rings in large impact craters. *Science* 354 (6314), 878-882. [doi: [10.1126/science.aah6561](https://doi.org/10.1126/science.aah6561)] (November 17, 2016). Impact Factor 34.661. ISSN: 0036-8075
- Urrutia-Fucugauchi, J., **Pérez-Cruz, L.** 2016. Chicxulub Asteroid Impact: An Extreme Event at the Cretaceous/Paleogene Boundary. En: Chávez, M., Ghil, M., Urrutia-Fucugauchi (eds). *Extreme Events: Observations, Modeling, and Economics*. AGU Geophysical Monograph 214. John Wiley & Sons, Inc. 93-111.
- Pérez-Cruz, L.**, 2013. Hydrological changes and paleoproductivity in the Gulf of California during middle and late Holocene and their relationship with ITCZ and North American Monsoon variability. *Quaternary Research*, 79(2):138-151. DOI: [10.1016/j.yqres.2012.11.007](https://doi.org/10.1016/j.yqres.2012.11.007).
- Urrutia-Fucugauchi, J., **Pérez-Cruz, L.**, Camargo-Zanoguera, A., 2013. Oil exploration in the Southern Gulf of Mexico and the Chicxulub impact. *Geology Today*, 29(5): 182-189
- Pérez-Cruz, L.**, Urrutia-Fucugauchi, J., 2010. Holocene laminated sediments from the southern Gulf of California – Geochemical, Mineral Magnetic and Microfossil Study. *Journal of Quaternary Science*, 25(6): 989-1000. DOI: [10.1002/jqs.1386](https://doi.org/10.1002/jqs.1386).
- Urrutia-Fucugauchi J., **Pérez-Cruz, L.**, 2009. Multiring-forming large bolide impacts and evolution of planetary surfaces. *International Geology Review* 51:1079-1102. DOI: [10.1080/00206810902867161](https://doi.org/10.1080/00206810902867161).
- Urrutia-Fucugauchi, J., Chavez-Aguirre, J.M., **Pérez-Cruz, L.**, De la Rosa, J.L., 2008. Impact Ejecta and Carbonate Sequence in the Eastern Sector of Chicxulub Crater. *Comptes Rendus Geosciences*, 340: 801-810. DOI: [10.1016/j.crte.2008.09.001](https://doi.org/10.1016/j.crte.2008.09.001)
- Urrutia-Fucugauchi, J., **Pérez-Cruz, L.**, Morales-Puente, P., Escobar-Sánchez, J.E., 2008. Stratigraphy of the Basal Paleocene Carbonate Sequence and the Impact Breccia–Carbonate Contact in the Chicxulub Crater: Stable Isotope Study of the Santa Elena Borehole Rocks. *International Geology Review*, 50: 75-83. DOI: [10.2747/0020-6814.50.1.75](https://doi.org/10.2747/0020-6814.50.1.75).
- Pérez-Cruz, L.**, 2006. Climate and ocean variability during middle and late Holocene recorded in laminated sediments from Alfonso Basin, Gulf of California, Mexico. *Quaternary Research*, 65: 401-410. DOI: [10.1016/j.yqres.2006.02.003](https://doi.org/10.1016/j.yqres.2006.02.003) ISSN: 00335894.
- Molina-Cruz, A., **Pérez-Cruz, L.**, Monreal-Gómez, M.A., 2002. Laminated sediments in Bay of La Paz, Gulf of California: a depositional cycle regulated by pluvial flux. *Sedimentology*, 49(6): 1401-1410. ISSN: 00370746.

Pérez-Cruz, L., Machain Castillo, M.L., 1990. Benthic foraminifera of the oxygen minimum zone, continental shelf of the Gulf of Tehuantepec, Mexico. *Journal of Foraminiferal Research* 20(4): 312-325. ISSN: 00961191.

HONORS

Premio Nacional de Periodismo (National Journalism Prize Science Communication) 2018

Sor Juan Inés de la Cruz Medal for outstanding academic performance UNAM 2015

Alfonso Caso Medal for outstanding academic student performance UNAM 2000

PROFESSIONAL SCIENCE MEMBERSHIP

Mexican Geophysical Union (UGM), American Geophysical Union (AGU)

Mexican Union for Quaternary Studies, Fellow of the Organization for Women in Science for Developing World (OWS), European Geoscience Union (EGU, Mexican Physics Society (SMF).