Garcia’s research focuses on the petrology and geochronology of Hawaiian volcanoes from their inception on the deep ocean floor (preshield stage) through their second period of volcanism (rejuvenation stage). His studies of Hawaiian volcanoes extend from the youngest to those near the bend in the chain (49 Ma). A holistic approach is used in Garcia’s research combining insights from field, geophysics and geochemistry. He witnessed his first Kīlauea eruption in Dec. 1974, while visiting the islands. In 1976, he returned to take an assistant professor position at the University of Hawai`i and has been working on Hawaiian volcanoes ever since.

Understanding the origin and evolution of lava at Kīlauea volcano is a major focus of Garcia’s research. He has written papers on newest to oldest (240 ka) sampled lavas. The current eruption of Kīlauea volcanic, which began in 1983, is a key element of Garcia’s research. Lava from this voluminous (4.5 km3) eruption has shown a remarkable geochemical variation.