Remanent magnetism observed within the lunar crust and in Apollo samples indicates that the Moon generated an ancient core dynamo magnetic field. Paleomagnetic measurements suggest the dynamo started no later than 4.25 billion years ago (Ga) and ceased sometime after 2.5 Ga. During the period between approximately 3.85 and 3.56 Ga, the intensity of lunar surface fields rivaled that of the modern terrestrial field. Due to the relatively small size of the Moon and its core, both the intensity of longevity of the lunar dynamo challenge conventional dynamo theory, whereby magnetic fields are generated by thermochemical convection of molten metal within planetary cores. In this presentation, I discuss results from recent paleomagnetism and crustal magnetism studies and discuss how lunar thermal evolution models and magnetohydrodynamics models are providing more insight into possible lunar dynamo generation mechanisms and power sources.