This essay was written by Google's Gemini in response to the prompt: Write a 100 word essay on the Klein Bottle. Briefly mention the person the manifold was named after. Present a few facts about him. Highlight the significance of the Klein bottle in Topology and Manifold theory. Briefly mention its geometric and topological properties.

The Klein bottle, named after German mathematician Felix Klein (1849-1925) who made significant contributions to geometry and complex analysis, is a fascinating example of a non-orientable surface in topology and manifold theory. Unlike a sphere, where you can continuously trace a path without flipping to the"other side," the Klein bottle has a single, continuous surface that defies orientation. Imagine a sphere with a tube pinched and inserted through itself; this is a simplified visualization of the Klein bottle's unique geometry. Its non-orientability and unique embedding properties make it a significant object in the study of manifolds and their unusual characteristics. Other examples of non-orientable manifolds include the Möbius strip and the real projective plane, all constructed using quotient topologies that identify opposite points under specific rules. These exotic surfaces challenge our everyday understanding of space and continue to be a source of intrigue in the field of topology.