The story of Earth is a 4.5-billion-year saga of dramatic transformations, driven by physical, chemical, and biological processes. Sequential changes of terrestrial planets and moons are best preserved in their rich mineral record. Earth’s “mineral evolution,” began with a score of different mineral species that formed in the cooling envelopes of exploding stars. Dust and gas from those stars clumped together to form our stellar nebula, the nebula formed the Sun and countless planetesimals, and alteration of planetesimals by water and heat resulted in the 300 minerals found today in meteorites that fall to Earth. Earth’s evolution progressed by a sequence of chemical and physical processes, which ultimately led to the origin-of-life. Once life emerged, mineralogy and biology co-evolved, as changes in the chemistry of oceans, the atmosphere, and the crust dramatically increased Earth’s mineral diversity to the more than 5700 species known today.