



Earth's Oldest-Known Rocks

[Source: TH](#)

A [volcanic rock](#) belt in **Quebec's (Canada) Nuvvuagittuq Greenstone Belt**, dated to be **4.16 billion years old**, has been identified as the **oldest-known rock on Earth**, originating from the [Hadean eon](#) (4.5-4.03 billion years ago), when **Earth** itself was **formed** about **4.6 billion years ago**.

- The rocks are [metamorphosed](#) **volcanic basalt**, formed when **magma solidified underground**, and provide clues about **Earth's early crust, primordial oceans**, and the **environment where life may have begun**.
- Two [radioactive dating](#) methods (**samarium-neodymium decay**) confirmed the **age**, making them the **oldest-known intact rocks**.
- **Zircon crystals** from **Australia (4.4 billion years old)** remain the **oldest mineral fragments**, but the **Quebec rocks** are the **oldest intact geological formations**.
- The **Hadean eon (4.5-4.03 billion years ago)** was previously thought to be a **molten hellscape (extremely harsh, hostile, or dangerous to life)**, but evidence suggests a **cooling crust, shallow oceans**, and an **early atmosphere**.

Geologic Time Scale

Eon	Era	Period	Epoch	MYA	Life Forms
Phanerozoic	Cenozoic (CZ)	Quaternary (Q)	Holocene (H)	0.01	Extinction of large mammals and birds Modern humans
			Pleistocene (PE)		
		Neogene (N)		2.6	Spread of grassy ecosystems
			Pliocene (PL)		
			Miocene (MI)	5.3	
		Paleogene (PG)	Oligocene (OL)	23.0	Early primates
			Eocene (E)	33.9	
			Paleocene (EP)	56.0	
				66.0	Mass extinction
	Mesozoic (MZ)	Cretaceous (K)			Placental mammals
				145.0	Early flowering plants
		Jurassic (J)			Dinosaurs diverse and abundant
				201.3	Mass extinction First dinosaurs; first mammals Flying reptiles
		Triassic (TR)		251.9	Mass extinction
	Paleozoic (PZ)	Permian (P)			Age of Amphibians
		Pennsylvanian (PN)		298.9	
		Mississippian (M)		323.2	Coal-forming swamps Sharks abundant First reptiles
		Devonian (D)		358.9	Mass extinction First amphibians First forests (evergreens)
		Silurian (S)		419.2	Fishes
		Ordovician (O)		443.8	
		Cambrian (C)		485.4	
				541.0	Marine Invertebrates Early shelled organisms
Proterozoic					Complex multicelled organisms
Archean	Precambrian (PC, W, X, Y, Z)			2500	Simple multicelled organisms
				4000	Early bacteria and algae (stromatolites)
					Origin of life
Hadean				4600	Formation of the Earth

Read More: [Earth's Mantle and Evolution of Life](#)

