

# A Tale of Supercontinents in Earth's History

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A supercontinent is a large landmass encompassing almost all continental blocks in a period in Earth's history. So far, only three supercontinents in Earth's history have been widely accepted by earth scientists, i.e., ~1.8 billion years (Ga) old Columbia (Nuna), ~1.0 Ga Rodinia and ~0.25 Ga Pangea. Probably as the first supercontinent in Earth's history, Columbia (Nuna) formed by global-scale continent-continent collisional events at 2.0-1.8 Ga. Following its final assembly at 1.8 Ga, supercontinent Columbia

underwent long-lived outgrowth in the period 1.8-1.3 Ga, followed by partial breakup at 1.3-1.2 Ga. The broken-up fragments drifted away from each other and then collided together again at 1.0 Ga to form another supercontinent, named Rodinia. The breakup of the Rodinia supercontinent occurred 0.75 Ga ago, following the opening of the Iapetus, Uralian, Rheic and Paleo-Asian oceans, which broke up Rodinia into two continental fragment groups, with one group comprising those continental blocks in southern hemisphere (present-day's) and another group with those in northern hemisphere (present-day's). At about 0.60-0.55 Ga, those continental fragments in the south joined together to form Gondwana, whereas those in the north amalgamated each other to form Laurasia by Caledonian and Variscan orogenies with the closure of the Iapetus and Uralian oceans. Finally, the closure of the Rheic and Paleo-Asian oceans led to the amalgamation of the Gondwana and Laurasia to form Pangea, a youngest supercontinent in Earth's history. It is still unknown why continental blocks meet together to form a supercontinent every other 0.8-0.7 Ga. A future supercontinent is expected to form about 0.5 Ga later, though no one has a chance to testify it.

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