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# Uranus and Neptune: from origin to current-state structure

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## Abstract

Uranus and Neptune contain crucial information about the formation of the solar system, and they also serve as calibrators for the large number of exoplanets with similar masses/compositions.

However, in contrast to their importance, the knowledge of their origin, evolution, and current-structure is incomplete. According to standard planet formation theories, the masses of Uranus and Neptune lie in a regime where planets are expected to accrete gas rapidly and become giant planets. Therefore, the termination of gas accretion at the mass of the ice giants needs to be explained. I will present various formation and evolutionary paths that can explain their observed properties. I will also briefly discuss the possibility and outcomes of giant impacts on Uranus and Neptune and the connection to their differences in tilt, heat flux, moment of inertia, and satellite system. Finally, I will present non-standard internal structure models of the planets, suggesting that they could have non-adiabatic interiors, no-distinct layers, and even be rock-dominated.

**Keywords:** Formation, origin, interior, composition

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