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Exoplanets: Interiors, Atmospheres, and the Search for Habitable Worlds

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For centuries people have wondered, "Are we alone?" With over 250 exoplanets known to orbit nearby stars, this question has moved from science fiction to mainstream study. Now that the existence of exoplanets is firmly established, a new era of "exoplanet characterization" has begun. A subset of exoplanets–called transiting planets–pass in front of their stars as seen from Earth. Transiting planets have opened a whole new opportunity for exoplanets, because their physical properties, including average density and basic atmospheric properties, can now be routinely measured. The race to find habitable exoplanets has accelerated with the realization that big Earths orbiting small stars can be both discovered and characterized with current technology. These ideas will lead us down a path to the ultimate goal of space-based discovery and characterization of Earth analogs.