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The Hunt for Habitable Exoplanets

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Fifteen years after the discovery of planets around other stars, the discovery of rocky, 1 Earth-mass, 1 Earth-radius planets around other stars is imminent. Of particular interest are planets that receive similar amounts of stellar radiation as the Earth, as they could support liquid water, probably the most critical requirement for habitability. Current technology favors the discovery of these planets around low-mass stars, about one-tenth the mass of the sun. In that case, habitable planets need to orbit about ten times closer to these cooler star. Such proximity introduces hazards that are of negligible importance for life on Earth: increased exposure to (time-varying) short wavelength radiation, stronger magnetic fields, tidal effects, and atmospheric removal by the stellar wind. Nevertheless, there are no obvious reasons to presume these planets are sterile. I discuss observational campaigns to discover rocky exoplanets, theoretical methods to predict their potential habitability, and prospects for the remote detection of life.