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The Hunt for Exomoons[1]

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Over the past two decades astronomers have become adept at discovering planets orbiting other stars, so-called exoplanets, revealing a rich and surprising diversity. As we push down to ever smaller planet detections, a natural question to ask is whether moons of these planets can also be discovered - so-called exomoons. Within the Solar System, large (0.2-0.4 Earth radius) satellites appear to have formed via at least three independent pathways around planets of greatly different masses, suggesting they should be common elsewhere. In contrast, the vast majority of exoplanets found to date orbit interior to the orbit of the Earth, where moons are notably devoid in the Solar System. Understanding the exomoon population promises to illuminate the formation and evolution processes sculpting alien systems, as well as providing potentially an alternative class of habitable world to study. Ill discuss how recent work has revealed the occurrence of moons, including analogs to the Galilean-system, and what implications this imposes on formation models. Ill explore the potential of upcoming and planned observatories to open the exomoon floodgates and the types of future constraints possible in such an era.

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