Paper : "Transit Light-Curve Signatures of Artificial Objects"

Abstract (short summary): Arnold explores how *non-spherical artificial objects*—like triangular shapes, two-screen systems, or six-panel "louvers"—could create transit light-curves distinguishable from those of natural planets. Multiple such objects transiting in deliberate sequences could serve as attention-getting signals for SETI (Search for Extraterrestrial Intellligence), rivaling laser pulses in sky coverage.

Paper : "Searching for GEMS: Confirmation of TOI-5573 b, a Cool, Saturn-like Planet Orbiting an M Dwarf"

(short summary): The paper reports the discovery and confirmation of TOI-5573 b, a Saturn-sized exoplanet orbiting an early M-dwarf star every 8.79 days. Initially detected by TESS, it was confirmed with ground-based photometry and precise radial velocity measurements. The planet has about one-third Jupiter's mass, nearly Saturn's size, and a low density (~0.66 g/cm³). With an equilibrium temperature of ~528 K, it is among the coolest known giant planets around M-dwarfs. Its metal-rich host star supports theories that such planets form more easily in metal-rich environments, making TOI-5573 b a valuable target for studying planet formation and atmospheres of cool gas giants.

Paper : "**Parallax Effect in Microlensing Events Due to Free-floating planets**"

Summary: The parallax effect in microlensing refers to slight distortions in a light curve caused by observing a gravitational lensing event from two different vantage points, such as Earth and a satellite (e.g., Spitzer or Kepler). In the context of free-floating planets—planets not bound to any star—this effect is especially useful because these microlensing events are very short in duration, sometimes lasting only hours or days. By measuring the parallax signal, astronomers can more precisely determine the lens's distance and mass, helping confirm whether the lensing object is truly a planet and not a low-mass star or brown dwarf. Parallax observations thus play a critical role in identifying and characterizing free-floating planets, which provide unique insights into planet formation and the dynamical history of planetary systems.

Paper : "Earth as an Exoplanet: Investigating the Effects of Cloud Variability on the Direct-imaging of Atmospheres"

Summary: This study examines how Earth's changing cloud cover affects its appearance when observed as if it were an exoplanet via direct imaging. By using satellite data and models, the researchers simulate how variations in cloud patterns impact the reflected light and spectra measured over time. They find that clouds can significantly alter both the brightness and spectral features of Earth, sometimes masking or mimicking atmospheric signatures such as water vapor or oxygen. These results highlight that cloud variability is a major challenge for interpreting future direct images of Earth-like exoplanets and must be carefully accounted for to accurately characterize their atmospheres and potential habitability**.**

So in conclusion the paper "Transit Light-Curve Signatures of Artificial Objects" explores a method that could attract the extraterrestrial intelligence by createing distinguishable transit ligh-curves from those spherical natural planets.