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NASA Exoplanet Archive Adds Four New Worlds, 21 Transmission Spectra, and False-Positive Curation

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In its November 2026 catalog release, the NASA Exoplanet Archive -- maintained by the NASA Exoplanet Science Institute (NExScI) at Caltech -- expanded its vetted census of extrasolar worlds and atmospheric datasets with the addition of four newly confirmed planets and 21 new transmission spectra . The update brings newly vetted discoveries spanning transit photometry, gravitational microlensing , and low-mass stellar hosts into the archive's standardized Planetary Systems and Atmospheric Spectroscopy Tables, while simultaneously updating multi-planet ephemerides and removing a retracted candidate from the confirmed ledger.

Because demographic occurrence rates and space-telescope scheduling depend on homogeneous, peer-reviewed parameter tables, incremental archive releases serve a dual role: ingesting new physical measurements while enforcing strict curation against false positives. In this release, the addition of RX J0534 b , TOI-2535 b , OGLE-2013-BLG-1125L b , and OGLE-2015-BLG-1395L b is paired with revised solutions for Men b, c, and d , HD 48948 b, c, and d , KMT-2019-BLG-0253L b , and WASP-13 b , as well as the formal reclassification of Gl 48 b as a False Positive Planet (FPP) following the withdrawal of its discovery paper.

Detection Regimes Across the Four Newly Confirmed Planets

The four new entries span complementary observational regimes that probe distinct regions of planet-formation parameter space. RX J0534 b stands out as a giant planet orbiting a low-mass star, a configuration that remains a critical stress test for planet-formation theory. Under canonical core-accretion models, protoplanetary disk mass scales roughly linearly with host-star mass, limiting the solid-core mass budget available around low-mass stars to trigger runaway gas accretion before disk dispersal. Detecting massive companions in low-mass stellar environments constrains either the efficiency of pebble accretion at early epochs or the viability of rapid gravitational disk instability.

TOI-2535 b joins the growing inventory of transiting worlds vetted from Transiting Exoplanet Survey Satellite (TESS) time-series photometry, where transit depth directly constrains the planet-to-star radius ratio and radial-velocity follow-up breaks mass-radius degeneracies. Meanwhile, OGLE-2013-BLG-1125L b and OGLE-2015-BLG-1395L b enter via Optical Gravitational Lensing Experiment (OGLE) microlensing lightcurves. Unlike transit or radial-velocity surveys -- which are strongly biased toward short-period, close-in orbits -- gravitational microlensing detects planetary companions through brief caustic perturbations in the magnification curve of a background Galactic bulge source star, making it uniquely sensitive to cold worlds near or beyond the protoplanetary snow line.

| Archive Update Category | | Targets Included in November 2026 Release | | Primary Scientific Role |

| Newly Confirmed Planets (4) | | RX J0534 b, TOI-2535 b, OGLE-2013-BLG-1125L b, OGLE-2015-BLG-1395L b | | Probes low-mass-host gas giants, TESS transits, and snow-line microlensing |

| New Transmission Spectra (21) | | AF Lep b, HD 209458 b, WASP-4 b, WASP-31 b, WASP-52 b, WASP-80 b, WASP-103 b | | Standardizes wavelength-dependent transit depths for atmospheric retrievals |

| Updated System Parameters | | Men b-d, HD 48948 b-d, KMT-2019-BLG-0253L b, WASP-13 b | | Refines orbital ephemerides, masses, and multi-planet architectures |

| False Positive Curation | | Gl 48 b (reclassified as False Positive Planet) | | Maintains catalog purity after discovery paper withdrawal |

Twenty-One Transmission Spectra and Atmospheric Scale-Height Physics

Beyond planetary demographics, the release adds 21 new transmission spectra to the Atmospheric Spectroscopy Table covering AF Lep b , HD 209458 b , WASP-4 b , WASP-31 b , WASP-52 b , WASP-80 b , and WASP-103 b . During a primary transit, a fraction of host-starlight filters obliquely through the planet's limb terminator. Because atmospheric opacity varies with wavelength , molecular and atomic absorbers increase the effective opaque radius R p ( ), producing measurable variations in transit depth Delta F / F = (R p ( ) / R *) 2 .

The amplitude of these spectral features scales with the atmospheric pressure scale height H = k B T / (u g), where k B is Boltzmann's constant, T is atmospheric temperature , u is mean molecular weight, and g is surface gravity. Hot and warm gas giants such as HD 209458 b , WASP-4 b , WASP-52 b , and WASP-103 b possess large, hydrogen -dominated scale heights that yield strong signal-to-noise signatures across optical Rayleigh-scattering slopes, alkali resonance doublets (Na I and K I), and near-infrared H 2 O, CO, and CO 2 bands -- while cooler targets like WASP-80 b bridge the transition toward methane -bearing atmospheres.

Consolidating 21 newly ingested spectra alongside existing datasets allows atmospheric retrieval teams to compare uniform reduction pipelines, diagnose stellar-contamination signals such as unocculted starspots (the transit light source effect), and quantify aerosol cloud-deck or photochemical haze muting across irradiated giant planets.

Ephemeris Refinement and False-Positive Hygiene

Equally critical for operational astronomy is the curation of previously cataloged systems. Updating orbital and physical parameters for multi-planet systems such as Men b, c, and d and HD 48948 b, c, and d , alongside WASP-13 b and KMT-2019-BLG-0253L b , tightens transit-timing ephemerides -- preventing "ephemeris drift" that can cause expensive space-observatory time windows to miss mid-transit ingress and egress years after initial discovery.

Finally, reclassifying Gl 48 b as a False Positive Planet underscores the self-correcting rigor of modern exoplanet archiving. Stellar activity cycles, blended eclipsing binaries, and instrumental systematics can mimic planetary radial-velocity or transit signals; promptly flagging withdrawn detections ensures that population-synthesis benchmarks and statistical occurrence-rate pipelines

remain free of contaminated entries.

References & Primary Sources

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