

Table 1. Median values and 68% confidence interval for OGLE-TR-1031.

| Parameter | Units | Values |
|-------------------------------|---|--|
| Stellar Parameters: | | |
| M_* | Mass (M_\odot) | $1.15^{+0.22}_{-0.17}$ |
| R_* | Radius (R_\odot) | $1.96^{+0.17}_{-0.15}$ |
| $R_{*,SED}$ | Radius ¹ (R_\odot) | $1.96^{+0.19}_{-0.16}$ |
| L_* | Luminosity (L_\odot) | $3.06^{+0.91}_{-0.68}$ |
| F_{Bol} | Bolometric Flux (cgs) | $0.000000000497^{+0.0000000000083}_{-0.0000000000081}$ |
| ρ_* | Density (cgs) | $0.217^{+0.071}_{-0.058}$ |
| $\log g$ | Surface gravity (cgs) | $3.919^{+0.095}_{-0.11}$ |
| T_{eff} | Effective Temperature (K) | 5490^{+330}_{-420} |
| $T_{eff,SED}$ | Effective Temperature ¹ (K) | 5510^{+310}_{-440} |
| [Fe/H] | Metallicity (dex) | $0.18^{+0.23}_{-0.24}$ |
| [Fe/H] ₀ | Initial Metallicity ² | $0.19^{+0.22}_{-0.25}$ |
| Age | Age (Gyr) | $7.1^{+4.0}_{-3.3}$ |
| EEP | Equal Evolutionary Phase ³ | $460.4^{+9.0}_{-50}$ |
| A_V | V-band extinction (mag) | $1.15^{+0.23}_{-0.33}$ |
| σ_{SED} | SED photometry error scaling | $9.7^{+1.5}_{-1.2}$ |
| ϖ | Parallax (mas) | 0.709 ± 0.058 |
| d | Distance (pc) | 1410^{+130}_{-110} |
| Planetary Parameters: | | |
| | | b |
| P | Period (days) | $2.420147^{+0.000025}_{-0.000018}$ |
| R_p | Radius (R_J) | $1.009^{+0.073}_{-0.068}$ |
| M_p | Mass ⁴ (M_J) | 46^{+26}_{-28} |
| T_C | Time of conjunction ⁵ (BJD _{TDB}) | $2455376.749^{+0.012}_{-0.011}$ |
| T_T | Time of minimum projected separation ⁶ (BJD _{TDB}) | $2455376.749^{+0.012}_{-0.011}$ |
| T_0 | Optimal conjunction Time ⁷ (BJD _{TDB}) | $2456402.8919^{+0.0087}_{-0.0088}$ |
| a | Semi-major axis (AU) | $0.0374^{+0.0021}_{-0.0018}$ |
| i | Inclination (Degrees) | $85.5^{+3.0}_{-3.4}$ |
| T_{eq} | Equilibrium temperature ⁸ (K) | 1901^{+92}_{-84} |
| τ_{circ} | Tidal circularization timescale (Gyr) | $7.4^{+6.7}_{-5.1}$ |
| K | RV semi-amplitude ⁴ (m/s) | 6200^{+3300}_{-3700} |
| R_p/R_* | Radius of planet in stellar radii | $0.0529^{+0.0036}_{-0.0037}$ |
| a/R_* | Semi-major axis in stellar radii | 4.12 ± 0.40 |
| δ | $(R_p/R_*)^2$ | $0.00280^{+0.00039}_{-0.00037}$ |
| δ_I | Transit depth in I (fraction) | $0.00326^{+0.00044}_{-0.00043}$ |
| δ_V | Transit depth in V (fraction) | $0.00366^{+0.00052}_{-0.00050}$ |
| τ | Ingress/egress transit duration (days) | $0.0108^{+0.0021}_{-0.0012}$ |
| T_{14} | Total transit duration (days) | $0.186^{+0.019}_{-0.017}$ |

Table 1 continued on next page

Table 1 (continued)

| Parameter | Units | Values | |
|---------------------------|---|---|---|
| T_{FWHM} .. | FWHM transit duration (days) | 0.175 ^{+0.019} _{-0.017} | |
| b | Transit Impact parameter | 0.32 ± 0.22 | |
| $\delta_{S,2.5\mu m}$.. | Blackbody eclipse depth at 2.5 μm (ppm) | 266 ⁺³⁶ ₋₃₂ | |
| $\delta_{S,5.0\mu m}$.. | Blackbody eclipse depth at 5.0 μm (ppm) | 547 ⁺⁶⁶ ₋₆₂ | |
| $\delta_{S,7.5\mu m}$.. | Blackbody eclipse depth at 7.5 μm (ppm) | 675 ⁺⁸¹ ₋₇₆ | |
| ρ_P | Density ⁴ (cgs) | 56 ⁺³⁷ ₋₃₆ | |
| $\log g_P$ | Surface gravity ⁴ | 5.06 ^{+0.21} _{-0.43} | |
| Θ | Safronov Number | 3.0 ^{+1.8} _{-1.9} | |
| $\langle F \rangle$ | Incident Flux (10 ⁹ erg s ⁻¹ cm ⁻²) | 2.96 ^{+0.62} _{-0.49} | |
| T_P | Time of Periastron (BJD _{TDB}) | 2455376.749 ^{+0.012} _{-0.011} | |
| T_S | Time of eclipse (BJD _{TDB}) | 2455375.538 ^{+0.012} _{-0.011} | |
| T_A | Time of Ascending Node (BJD _{TDB}) | 2455378.564 ^{+0.012} _{-0.011} | |
| T_D | Time of Descending Node (BJD _{TDB}) | 2455377.354 ^{+0.012} _{-0.011} | |
| V_c/V_e | | 1.00 | |
| $M_P \sin i$.. | Minimum mass ⁴ (M_J) | 46 ⁺²⁶ ₋₂₈ | |
| M_P/M_* | Mass ratio ⁴ | 0.038 ^{+0.022} _{-0.023} | |
| d/R_* | Separation at mid transit | 4.12 ± 0.40 | |
| P_T | A priori non-grazing transit prob | 0.230 ^{+0.026} _{-0.021} | |
| $P_{T,G}$ | A priori transit prob | 0.256 ^{+0.027} _{-0.022} | |
| Wavelength Parameters: | | I | V |
| u_1 | linear limb-darkening coeff | 0.334 ^{+0.072} _{-0.070} | 0.544 ^{+0.094} _{-0.084} |
| u_2 | quadratic limb-darkening coeff | 0.256 ^{+0.057} _{-0.058} | 0.205 ^{+0.068} _{-0.074} |
| Transit Parameters: | | OGLE UT 2010-06-29 (I) | OGLE UT 2010-06-29 (V) |
| σ^2 | Added Variance | 0.0000492 ± 0.0000011 | 0.0000526 ^{+0.0000092} _{-0.0000076} |
| F_0 | Baseline flux | 0.99986 ± 0.00011 | 1.00077 ^{+0.00076} _{-0.00075} |

See Table 3 in Eastman, J. et al., 2019, arXiv:1907.09480 for a detailed description of all parameters

¹This value ignores the systematic error and is for reference only

²The metallicity of the star at birth

³Corresponds to static points in a star's evolutionary history. See §2 in Dotter, A., 2016, ApJS, 222, 8

⁴Uses measured radius and estimated mass from Chen, J., & Kipping, D. 2017, ApJ, 834, 17

⁵Time of conjunction is commonly reported as the "transit time"

⁶Time of minimum projected separation is a more correct "transit time"

⁷Optimal time of conjunction minimizes the covariance between T_C and Period

⁸Assumes no albedo and perfect redistribution