

Table 1. Median values and 68% confidence interval for OGLE-TR-1039.

Parameter	Units	Values
Stellar Parameters:		
M_*	Mass (M_\odot)	$1.63^{+0.18}_{-0.24}$
R_*	Radius (R_\odot)	$2.12^{+0.21}_{-0.15}$
$R_{*,SED}$	Radius ¹ (R_\odot)	$2.19^{+0.22}_{-0.17}$
L_*	Luminosity (L_\odot)	$8.3^{+2.9}_{-2.1}$
F_{Bol}	Bolometric Flux (cgs)	$0.000000000482^{+0.000000000011}_{-0.0000000000084}$
ρ_*	Density (cgs)	$0.238^{+0.071}_{-0.078}$
$\log g$	Surface gravity (cgs)	$3.992^{+0.084}_{-0.13}$
T_{eff}	Effective Temperature (K)	6700^{+480}_{-430}
$T_{eff,SED}$	Effective Temperature ¹ (K)	6610^{+450}_{-440}
[Fe/H]	Metallicity (dex)	$0.08^{+0.22}_{-0.21}$
[Fe/H] ₀	Initial Metallicity ²	$0.19^{+0.21}_{-0.22}$
Age	Age (Gyr)	$1.49^{+1.4}_{-0.64}$
EEP	Equal Evolutionary Phase ³	368^{+43}_{-24}
A_V	V-band extinction (mag)	$1.84^{+0.24}_{-0.26}$
σ_{SED}	SED photometry error scaling	$10.4^{+1.5}_{-1.2}$
ϖ	Parallax (mas)	$0.431^{+0.035}_{-0.038}$
d	Distance (pc)	2320^{+220}_{-170}
Planetary Parameters:		
		b
P	Period (days)	$9.158188^{+0.000038}_{-0.000037}$
R_P	Radius (R_J)	$1.167^{+0.15}_{-0.096}$
M_P	Mass ⁴ (M_J)	26^{+54}_{-22}
T_C	Time of conjunction ⁵ (BJD _{TDB})	$2455380.9316^{+0.0070}_{-0.0077}$
T_T	Time of minimum projected separation ⁶ (BJD _{TDB})	$2455380.9316^{+0.0070}_{-0.0077}$
T_0	Optimal conjunction Time ⁷ (BJD _{TDB})	$2456983.6146^{+0.0038}_{-0.0043}$
a	Semi-major axis (AU)	$0.1017^{+0.0037}_{-0.0052}$
i	Inclination (Degrees)	$85.53^{+0.62}_{-0.91}$
T_{eq}	Equilibrium temperature ⁸ (K)	1485^{+91}_{-78}
τ_{circ}	Tidal circularization timescale (Gyr)	850^{+1600}_{-760}
K	RV semi-amplitude ⁴ (m/s)	1800^{+3700}_{-1600}
R_P/R_*	Radius of planet in stellar radii	$0.0570^{+0.0025}_{-0.0024}$
a/R_*	Semi-major axis in stellar radii	$10.24^{+0.94}_{-1.2}$
δ	$(R_P/R_*)^2$	$0.00325^{+0.00029}_{-0.00027}$
δ_I	Transit depth in I (fraction)	$0.00320^{+0.00024}_{-0.00023}$
δ_V	Transit depth in V (fraction)	$0.00314^{+0.00022}_{-0.00023}$
τ	Ingress/egress transit duration (days)	$0.0272^{+0.0093}_{-0.0050}$
T_{14}	Total transit duration (days)	$0.1984^{+0.011}_{-0.0094}$

Table 1 continued on next page

Table 1 (continued)

Parameter	Units	Values		
T_{FWHM} . . .	FWHM transit duration (days)	0.1695 ^{+0.010} _{-0.0090}		
b	Transit Impact parameter	0.800 ^{+0.051} _{-0.052}		
$\delta_{S,2.5\mu m}$. . .	Blackbody eclipse depth at 2.5 μm (ppm)	92 ⁺²¹ ₋₁₄		
$\delta_{S,5.0\mu m}$. . .	Blackbody eclipse depth at 5.0 μm (ppm)	290 ⁺⁴⁷ ₋₃₂		
$\delta_{S,7.5\mu m}$. . .	Blackbody eclipse depth at 7.5 μm (ppm)	404 ⁺⁶² ₋₄₁		
ρ_P	Density ⁴ (cgs)	22 ⁺³⁶ ₋₂₀		
$\log g_P$	Surface gravity ⁴	4.71 ^{+0.46} _{-0.91}		
Θ	Safronov Number	2.9 ^{+6.6} _{-2.5}		
$\langle F \rangle$	Incident Flux (10 ⁹ erg s ⁻¹ cm ⁻²)	1.11 ^{+0.30} _{-0.22}		
T_P	Time of Periastron (BJD _{TDB})	2455380.9316 ^{+0.0070} _{-0.0077}		
T_S	Time of eclipse (BJD _{TDB})	2455376.3525 ^{+0.0070} _{-0.0077}		
T_A	Time of Ascending Node (BJD _{TDB})	2455387.8002 ^{+0.0070} _{-0.0076}		
T_D	Time of Descending Node (BJD _{TDB})	2455383.2211 ^{+0.0070} _{-0.0077}		
V_c/V_e		1.00		
$M_P \sin i$	Minimum mass ⁴ (M_J)	25 ⁺⁵⁴ ₋₂₂		
M_P/M_*	Mass ratio ⁴	0.016 ^{+0.033} _{-0.013}		
d/R_*	Separation at mid transit	10.24 ^{+0.94} _{-1.2}		
P_T	A priori non-grazing transit prob	0.0921 ^{+0.012} _{-0.0077}		
$P_{T,G}$	A priori transit prob	0.1032 ^{+0.014} _{-0.0087}		
Wavelength Parameters:		I	V	
u_1	linear limb-darkening coeff	0.177 ^{+0.052} _{-0.046}	0.336 ^{+0.055} _{-0.049}	
u_2	quadratic limb-darkening coeff	0.321 \pm 0.039	0.324 ^{+0.040} _{-0.043}	
Transit Parameters:		OGLE UT 2010-03-06 (I)	OGLE UT 2010-03-06 (V)	OGLE UT 2010-07-03
σ^2	Added Variance	0.00001166 ^{+0.0000022} _{-0.0000021}	0.0000337 ^{+0.0000044} _{-0.0000038}	0.00001166 ^{+0.0000022} _{-0.0000021}
F_0	Baseline flux	1.000056 ^{+0.000036} _{-0.000035}	1.00022 \pm 0.00044	1.000057 \pm 0.000035

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