

TRANSIT OF MERCURY, 2019

A transit of Mercury over the disk of the Sun will occur on November 11. The entire transit will be visible in eastern North America, South America, Antarctica, extreme southern Greenland, extreme western Africa, and the Atlantic Ocean.

The times provided in the following tables are given provisionally in Universal Time, using $\Delta T(A) = +69^s.0$. Once the value of ΔT is known, the data on these pages may be expressed in Universal Time as follows:

Define $\delta T = \Delta T - \Delta T(A)$, in units of seconds of time.

Change the times given in provisional Universal Time by subtracting δT .

Apply the correction $0.00417807 \delta T$ to the longitudes in such a way that if δT is positive, the longitudes shift to the east.

Leave all other quantities unchanged.

Longitude is positive to the east and negative to the west.

GEOCENTRIC PHASES

	UT	Position Angle P	Mercury being in the Zenith in	
			Longitude	Latitude
	d h m s	°	° ′	° ′
Ingress, exterior contact	November 11 12 35 27.2	109.8	– 12 36.2	–17 30.5
Ingress, interior contact	11 12 37 08.5	109.8	– 13 01.7	–17 30.5
Least angular distance	11 15 19 48.3	24.3	– 53 56.8	–17 25.8
Egress, interior contact	11 18 02 33.3	298.8	– 94 53.1	–17 21.0
Egress, exterior contact	11 18 04 14.7	298.7	– 95 18.6	–17 21.0

Least angular distance: $1' 15''.9$

The position angle P of the point of contact is reckoned from the north point of the limb of the Sun towards the east as viewed at the geocenter.

The position angle V of the point of contact, reckoned from the vertex of the limb of the Sun towards the east, is found by:

$$V = P - C$$

where C , the parallactic angle, is given by:

$$\tan C = \frac{\cos \phi' \sin h}{\sin \phi' \cos \delta - \cos \phi' \sin \delta \cos h}$$

in which ϕ' is the geocentric latitude of the place, δ is the declination of the Sun, and h is the local hour angle of the Sun; $\sin C$ has the same algebraic sign as $\sin h$.

TRANSIT OF MERCURY OF 2019 NOVEMBER 11

Location	Position		Ingress Exterior Contact		Ingress Interior Contact		Least Angular Distance		Egress Interior Contact		Egress Exterior Contact			
	Latitude	Longitude	UT	<i>P</i>	UT	<i>P</i>	UT	Separation	UT	<i>P</i>	UT	<i>P</i>		
United States	°	'	h	m	s	°	h	m	s	°	h	m	s	°
Hartford, CT	+41 46.2	- 72 40.6	12 36 03.4	109.9	12 37 44.6	109.9	15 20 12.8	1 13.2	18 02 39.8	298.5	18 04 21.0	298.5		
Boston, MA	+42 20.0	- 71 05.0	12 36 02.9	109.9	12 37 44.2	109.9	15 20 12.0	1 13.1	18 02 39.2	298.5	18 04 20.4	298.5		
New York, NY	+40 44.0	- 74 00.0	12 36 03.9	109.9	12 37 45.2	109.9	15 20 13.4	1 13.2	18 02 40.1	298.5	18 04 21.2	298.5		
Washington, DC	+38 53.7	- 77 02.2	12 36 04.9	109.9	12 37 46.2	109.9	15 20 14.7	1 13.4	18 02 40.9	298.5	18 04 22.1	298.5		
Raleigh, NC	+35 49.1	- 78 38.7	12 36 05.8	109.9	12 37 47.1	109.9	15 20 15.5	1 13.6	18 02 40.8	298.6	18 04 21.9	298.5		
Atlanta, GA	+33 45.3	- 84 23.4	12 36 07.1	109.9	12 37 48.4	109.9	15 20 18.1	1 13.9	18 02 43.2	298.6	18 04 24.4	298.5		
Miami, FL	+25 45.0	- 80 15.0	12 36 07.5	109.9	12 37 48.8	109.8	15 20 15.8	1 14.2	18 02 38.4	298.6	18 04 19.6	298.5		
Montgomery, AL	+32 21.7	- 86 16.8	12 36 07.5	109.9	12 37 48.8	109.8	15 20 18.9	1 14.0	18 02 43.9	298.6	18 04 25.0	298.5		
Detroit, MI	+42 19.9	- 83 02.8	12 36 04.9	109.9	12 37 46.3	109.9	15 20 17.2	1 13.4	18 02 44.9	298.5	18 04 26.1	298.5		
Indianapolis, IN	+39 47.5	- 86 08.9	12 36 05.9	109.9	12 37 47.3	109.9	15 20 18.6	1 13.6	18 02 45.8	298.6	18 04 26.9	298.5		
Chicago, IL	+41 50.0	- 87 38.0	. . . . .	. . .	. . . . .	. . .	15 20 19.0	1 13.6	18 02 47.0	298.6	18 04 28.2	298.5		
Milwaukee, WI	+43 03.0	- 87 57.0	. . . . .	. . .	. . . . .	. . .	15 20 19.0	1 13.5	18 02 47.4	298.6	18 04 28.6	298.5		
Minneapolis, MN	+44 58.8	- 93 15.1	. . . . .	. . .	. . . . .	. . .	15 20 20.6	1 13.6	18 02 50.3	298.6	18 04 31.5	298.5		
St. Louis, MO	+38 40.0	- 90 15.0	. . . . .	. . .	. . . . .	. . .	15 20 20.3	1 13.8	18 02 47.6	298.6	18 04 28.7	298.5		
Louisville, KY	+38 15.3	- 85 45.6	12 36 06.3	109.9	12 37 47.6	109.9	15 20 18.5	1 13.7	18 02 45.2	298.6	18 04 26.3	298.5		
Lincoln, NE	+40 48.6	- 96 40.5	. . . . .	. . .	. . . . .	. . .	15 20 22.3	1 13.8	18 02 51.2	298.6	18 04 32.4	298.5		
Oklahoma City, OK	+35 28.9	- 97 32.1	. . . . .	. . .	. . . . .	. . .	15 20 23.2	1 14.1	18 02 50.7	298.6	18 04 31.8	298.5		
Denver, CO	+39 44.4	-104 59.1	. . . . .	. . .	. . . . .	. . .	15 20 24.9	1 14.1	18 02 55.0	298.6	18 04 36.2	298.5		
Salt Lake City, UT	+40 45.0	-111 55.0	. . . . .	. . .	. . . . .	. . .	15 20 26.4	1 14.2	18 02 58.3	298.6	18 04 39.5	298.5		
Dallas, TX	+32 47.0	- 96 48.2	. . . . .	. . .	. . . . .	. . .	15 20 23.1	1 14.3	18 02 49.7	298.6	18 04 30.9	298.5		
Houston, TX	+29 45.0	- 95 25.0	. . . . .	. . .	. . . . .	. . .	15 20 22.7	1 14.4	18 02 48.3	298.6	18 04 29.4	298.5		
Albuquerque, NM	+35 06.6	-106 36.6	. . . . .	. . .	. . . . .	. . .	15 20 26.0	1 14.4	18 02 55.2	298.6	18 04 36.4	298.6		
Las Vegas, NV	+36 10.6	-115 08.2	. . . . .	. . .	. . . . .	. . .	15 20 27.8	1 14.6	18 02 59.4	298.6	18 04 40.6	298.6		
Los Angeles, CA	+34 03.0	-118 15.0	. . . . .	. . .	. . . . .	. . .	15 20 28.7	1 14.8	18 03 00.7	298.6	18 04 41.9	298.6		
San Diego, CA	+32 42.9	-117 09.7	. . . . .	. . .	. . . . .	. . .	15 20 28.6	1 14.9	18 03 00.0	298.6	18 04 41.2	298.6		
San Francisco, CA	+37 46.8	-122 25.2	. . . . .	. . .	. . . . .	. . .	15 20 28.7	1 14.7	18 03 02.7	298.6	18 04 43.9	298.6		
Portland, OR	+45 32.0	-122 40.0	. . . . .	. . .	. . . . .	. . .	15 20 26.9	1 14.2	18 03 02.7	298.6	18 04 43.9	298.6		
Seattle, WA	+47 36.6	-122 20.0	. . . . .	. . .	. . . . .	. . .	15 20 26.3	1 14.1	18 03 02.5	298.6	18 04 43.7	298.5		
Canada														
St. John's, Nfld.	+47 34.1	- 52 42.4	12 35 56.6	110.0	12 37 37.8	109.9	15 20 03.9	1 12.5	18 02 33.7	298.5	18 04 14.9	298.5		
Moncton, N.B.	+46 07.0	- 64 48.2	12 36 00.4	110.0	12 37 41.7	109.9	15 20 09.3	1 12.8	18 02 37.9	298.5	18 04 19.1	298.5		
Halifax, N.S.	+44 38.0	- 63 35.0	12 36 00.5	110.0	12 37 41.7	109.9	15 20 08.7	1 12.8	18 02 36.7	298.5	18 04 17.9	298.5		
Charlottetown, P.E.I.	+46 14.4	- 63 08.4	12 36 00.0	110.0	12 37 41.2	109.9	15 20 08.5	1 12.8	18 02 37.2	298.5	18 04 18.4	298.5		
Montreal, Que.	+45 30.5	- 73 33.2	12 36 02.5	110.0	12 37 43.8	109.9	15 20 13.1	1 13.0	18 02 41.5	298.5	18 04 22.6	298.5		
Toronto, Ont.	+43 43.0	- 79 20.4	12 36 04.0	109.9	12 37 45.3	109.9	15 20 15.6	1 13.3	18 02 43.5	298.5	18 04 24.7	298.5		
Thunder Bay, Ont.	+48 22.9	- 89 14.8	. . . . .	. . .	. . . . .	. . .	15 20 18.7	1 13.3	18 02 49.2	298.5	18 04 30.3	298.5		
Winnipeg, Man.	+49 54.0	- 97 08.0	. . . . .	. . .	. . . . .	. . .	15 20 20.8	1 13.4	18 02 52.7	298.6	18 04 33.9	298.5		
Edmonton, Alta.	+53 34.6	-113 31.0	. . . . .	. . .	. . . . .	. . .	15 20 23.2	1 13.6	18 02 59.1	298.6	18 04 40.3	298.5		
Iqaluit, Nunavut	+63 44.9	- 68 31.2	. . . . .	. . .	. . . . .	. . .	15 20 09.9	1 12.4	18 02 45.6	298.5	18 04 26.9	298.5		
Vancouver, B.C.	+49 15.0	-123 06.0	. . . . .	. . .	. . . . .	. . .	15 20 25.8	1 14.0	18 03 02.6	298.6	18 04 43.9	298.5		

Location	Position		Ingress Exterior Contact		Ingress Interior Contact		Least Angular Distance		Egress Interior Contact		Egress Exterior Contact	
	Latitude	Longitude	UT	<i>P</i>	UT	<i>P</i>	UT	Separation	UT	<i>P</i>	UT	<i>P</i>
Martinique Fort-de-France	+14 36.0	− 61 05.0	12 36 01.9	109.9	12 37 43.2	109.8	15 20 02.9	1 14.2	18 02 23.1	298.6	18 04 04.3	298.6
Bermuda Hamilton	+32 18.0	− 64 48.0	12 36 03.0	109.9	12 37 44.3	109.9	15 20 08.2	1 13.4	18 02 32.3	298.6	18 04 13.4	298.5
Puerto Rico San Juan	+18 29.0	− 66 08.0	12 36 04.0	109.9	12 37 45.2	109.8	15 20 06.9	1 14.1	18 02 27.5	298.6	18 04 08.7	298.5
Haiti Port-au-Prince	+18 32.0	− 72 20.0	12 36 05.9	109.9	12 37 47.1	109.8	15 20 10.5	1 14.3	18 02 31.2	298.6	18 04 12.4	298.5
Jamaica Kingston	+17 58.0	− 76 48.0	12 36 07.0	109.8	12 37 48.3	109.8	15 20 13.0	1 14.5	18 02 33.7	298.6	18 04 14.9	298.6
Bahamas Nassau	+25 03.6	− 77 20.7	12 36 06.9	109.9	12 37 48.2	109.8	15 20 14.2	1 14.1	18 02 36.5	298.6	18 04 17.6	298.5
Cuba Havana	+23 08.0	− 82 23.0	12 36 08.0	109.9	12 37 49.3	109.8	15 20 16.6	1 14.4	18 02 38.9	298.6	18 04 20.0	298.5
Mexico												
Mexico City	+19 25.0	− 99 10.0	. . . .	. . .	. . . .	. . .	15 20 23.7	1 15.1	18 02 47.9	298.6	18 04 29.0	298.6
Monterrey	+25 40.0	−100 20.0	. . . .	. . .	. . . .	. . .	15 20 24.5	1 14.8	18 02 50.1	298.6	18 04 31.2	298.6
Guadalajara	+20 40.0	−103 21.0	. . . .	. . .	. . . .	. . .	15 20 25.3	1 15.2	18 02 50.6	298.6	18 04 31.8	298.6
Veracruz	+19 26.1	− 96 23.0	12 36 09.2	109.8	12 37 50.6	109.8	15 20 22.7	1 15.0	18 02 46.2	298.6	18 04 27.3	298.6
Guatemala Guatemala City	+14 38.0	− 90 22.0	12 36 08.9	109.8	12 37 50.2	109.8	15 20 19.4	1 15.1	18 02 41.1	298.6	18 04 22.2	298.6
El Salvador San Salvador	+13 40.0	− 89 10.0	12 36 08.7	109.8	12 37 50.1	109.8	15 20 18.7	1 15.1	18 02 40.0	298.6	18 04 21.2	298.6
Honduras Tegucigalpa	+14 05.0	− 87 14.0	12 36 08.6	109.8	12 37 49.9	109.8	15 20 17.8	1 15.1	18 02 38.9	298.6	18 04 20.1	298.6
Belize Belmopan	+17 13.0	− 88 48.0	12 36 08.8	109.8	12 37 50.2	109.8	15 20 19.1	1 14.9	18 02 40.9	298.6	18 04 22.0	298.6
Nicaragua Managua	+12 06.0	− 86 18.0	12 36 08.3	109.8	12 37 49.6	109.8	15 20 17.0	1 15.1	18 02 37.7	298.6	18 04 18.8	298.6
Venezuela Caracas	+10 30.0	− 66 55.0	12 36 03.6	109.8	12 37 44.9	109.8	15 20 05.6	1 14.6	18 02 25.0	298.6	18 04 06.1	298.6
Costa Rica San Jose	+ 9 59.0	− 84 04.0	12 36 07.8	109.8	12 37 49.1	109.8	15 20 15.5	1 15.2	18 02 35.6	298.6	18 04 16.7	298.6
Panama Panama City	+ 8 57.0	− 79 30.0	12 36 06.9	109.8	12 37 48.2	109.8	15 20 12.8	1 15.1	18 02 32.3	298.6	18 04 13.4	298.6
Argentina												
Buenos Aires	−34 40.0	− 58 30.0	12 35 45.3	109.7	12 37 26.6	109.7	15 19 46.6	1 17.2	18 02 08.4	298.8	18 03 49.6	298.7
Cordoba	−31 25.0	− 64 11.0	12 35 48.9	109.7	12 37 30.2	109.7	15 19 50.8	1 17.1	18 02 11.7	298.8	18 03 52.8	298.7
Falkland Islands Stanley	−51 41.5	− 57 51.5	12 35 35.9	109.7	12 37 17.2	109.6	15 19 40.9	1 18.1	18 02 07.4	298.9	18 03 48.7	298.8
Brazil												
Recife	− 8 03.0	− 34 54.0	12 35 44.0	109.8	12 37 25.1	109.8	15 19 39.2	1 14.8	18 02 02.0	298.7	18 03 43.3	298.6
Rio de Janeiro	−22 54.5	− 43 11.8	12 35 43.8	109.8	12 37 25.0	109.7	15 19 40.8	1 16.0	18 02 02.7	298.7	18 03 43.9	298.7
Belo Horizonte	−19 55.1	− 43 56.3	12 35 45.3	109.8	12 37 26.5	109.7	15 19 42.0	1 15.8	18 02 03.5	298.7	18 03 44.7	298.7
Sao Paolo	−23 33.0	− 46 38.0	12 35 45.3	109.8	12 37 26.5	109.7	15 19 42.8	1 16.1	18 02 04.1	298.7	18 03 45.3	298.7

TRANSIT OF MERCURY OF 2019 NOVEMBER 11

Location	Position		Ingress Exterior Contact		Ingress Interior Contact		Least Angular Distance		Egress Interior Contact		Egress Exterior Contact	
	Latitude	Longitude	UT	<i>P</i>	UT	<i>P</i>	UT	Separation	UT	<i>P</i>	UT	<i>P</i>
Brazil	° ′	° ′	h m s	°	h m s	°	h m s	′ ″	h m s	°	h m s	°
Brasilia	-15 45.0	- 47 57.0	12 35 48.9	109.8	12 37 30.0	109.7	15 19 45.8	1 15.7	18 02 06.2	298.7	18 03 47.4	298.7
Porto Alegre	-30 02.0	- 51 13.8	12 35 44.7	109.7	12 37 25.9	109.7	15 19 43.8	1 16.7	18 02 05.5	298.8	18 03 46.7	298.7
Chile												
Santiago	-33 30.0	- 70 40.0	12 35 49.7	109.7	12 37 31.0	109.6	15 19 53.5	1 17.4	18 02 14.7	298.8	18 03 55.9	298.7
Concepcion	-36 50.0	- 73 03.0	12 35 48.4	109.7	12 37 29.7	109.6	15 19 53.3	1 17.7	18 02 15.3	298.8	18 03 56.5	298.8
Colombia												
Medellin	+ 6 14.2	- 75 34.5	12 36 05.6	109.8	12 37 46.9	109.8	15 20 09.9	1 15.1	18 02 28.9	298.6	18 04 10.0	298.6
Bogota	+ 4 38.0	- 74 05.0	12 36 04.9	109.8	12 37 46.2	109.8	15 20 08.6	1 15.2	18 02 27.4	298.6	18 04 08.5	298.6
Guyana Georgetown	+ 6 46.0	- 58 10.0	12 35 59.7	109.8	12 37 40.9	109.8	15 19 59.1	1 14.5	18 02 18.5	298.6	18 03 59.6	298.6
Suriname Paramaribo	+ 5 52.0	- 55 14.0	12 35 58.3	109.8	12 37 39.5	109.8	15 19 56.9	1 14.5	18 02 16.5	298.6	18 03 57.6	298.6
French Guiana Cayenne	+ 4 55.0	- 52 18.0	12 35 56.7	109.8	12 37 37.9	109.8	15 19 54.6	1 14.5	18 02 14.5	298.6	18 03 55.7	298.6
Bolivia												
Santa Cruz	-17 45.0	- 63 14.0	12 35 54.8	109.7	12 37 36.0	109.7	15 19 55.0	1 16.2	18 02 13.9	298.7	18 03 55.1	298.7
Cochabamba	-17 23.0	- 66 10.0	12 35 55.9	109.7	12 37 37.2	109.7	15 19 56.9	1 16.3	18 02 15.7	298.7	18 03 56.9	298.7
Paraguay Asuncion	-25 15.0	- 57 40.0	12 35 49.5	109.7	12 37 30.7	109.7	15 19 49.1	1 16.5	18 02 09.3	298.7	18 03 50.5	298.7
Ecuador Quito	- 0 15.0	- 78 35.0	12 36 05.0	109.8	12 37 46.3	109.7	15 20 09.9	1 15.6	18 02 28.6	298.7	18 04 09.8	298.6
Peru Lima	-12 06.0	- 77 03.0	12 36 01.0	109.7	12 37 42.4	109.7	15 20 05.2	1 16.3	18 02 23.8	298.7	18 04 05.0	298.7
Uruguay Montevideo	-34 53.0	- 56 10.0	12 35 44.4	109.7	12 37 25.6	109.7	15 19 45.2	1 17.1	18 02 07.3	298.8	18 03 48.5	298.7
Easter Island Hanga Roa	-27 09.0	-109 26.0	12 35 55.6	109.7	12 37 37.1	109.6	15 20 12.4	1 18.2	18 02 37.9	298.8	18 04 19.1	298.8
Pitcairn Islands Adamstown	-25 04.0	-130 06.0	. . . .	. .	. . . .	. .	15 20 16.9	1 18.7	18 02 48.8	298.8	18 04 30.0	298.8
French Polynesia Papeete, Tahiti	-17 32.0	-149 34.0	. . . .	. .	. . . .	. .	15 20 19.7	1 18.7	18 02 59.4	298.9	18 04 40.7	298.8
Kenya Nairobi	- 1 17.0	+ 36 49.0	12 34 59.6	110.0	12 36 40.8	109.9	15 19 09.0	1 14.3	.. . . .	.. . . .	.. . . .	.. . . .
Mozambique Maputo	-25 58.0	+ 32 35.0	12 34 58.7	109.9	12 36 39.9	109.8	15 19 06.6	1 15.9	.. . . .	.. . . .	.. . . .	.. . . .
Uganda Kampala	+ 0 18.8	+ 32 34.9	12 35 02.2	110.0	12 36 43.4	109.9	15 19 10.0	1 14.2	.. . . .	.. . . .	.. . . .	.. . . .
Zimbabwe Harare	-17 51.8	+ 31 01.8	12 35 00.0	109.9	12 36 41.2	109.8	15 19 07.0	1 15.3	.. . . .	.. . . .	.. . . .	.. . . .
Zambia Lusaka	-15 25.0	+ 28 17.0	12 35 01.8	109.9	12 36 42.9	109.9	15 19 07.7	1 15.1	.. . . .	.. . . .	.. . . .	.. . . .
South Africa, Rep. of												
Johannesburg	-26 12.3	+ 28 02.7	12 35 01.0	109.9	12 36 42.2	109.8	15 19 07.3	1 15.9	.. . . .	.. . . .	.. . . .	.. . . .
Cape Town	-33 55.5	+ 18 25.4	12 35 05.8	109.8	12 36 46.9	109.8	15 19 10.0	1 16.3	.. . . .	.. . . .	.. . . .	.. . . .
Namibia Windhoek	-22 34.2	+ 17 05.0	12 35 07.3	109.9	12 36 48.5	109.8	15 19 10.0	1 15.5	.. . . .	.. . . .	.. . . .	.. . . .
Angola Luanda	- 8 50.3	+ 13 14.1	12 35 11.9	109.9	12 36 53.0	109.9	15 19 12.8	1 14.5	.. . . .	.. . . .	.. . . .	.. . . .

Location	Position		Ingress Exterior Contact		Ingress Interior Contact		Least Angular Distance		Egress Interior Contact		Egress Exterior Contact	
	Latitude	Longitude	UT	<i>P</i>	UT	<i>P</i>	UT	Separation	UT	<i>P</i>	UT	<i>P</i>
Congo, Democratic Republic of Kinshasa	− 4 19.5	+ 15 19.3	12 35 11.5	109.9	12 36 52.6	109.9	15 19 13.0	1 14.2	.. .. .	.. .. .	.. .. .	.. .. .
Libya												
Benghazi	+32 07.0	+ 20 04.0	12 35 19.3	110.0	12 37 00.5	110.0	15 19 26.8	1 12.4	.. .. .	.. .. .	.. .. .	.. .. .
Tripoli	+32 54.1	+ 13 11.1	12 35 23.3	110.0	12 37 04.4	110.0	15 19 29.1	1 12.3	.. .. .	.. .. .	.. .. .	.. .. .
Central African Republic Bangui	+ 4 22.0	+ 18 35.0	12 35 11.4	110.0	12 36 52.5	109.9	15 19 14.5	1 13.7	.. .. .	.. .. .	.. .. .	.. .. .
Chad N'Djamena	+12 06.7	+ 15 02.1	12 35 15.8	110.0	12 36 56.9	109.9	15 19 18.4	1 13.2	.. .. .	.. .. .	.. .. .	.. .. .
Tunisia Tunis	+36 48.0	+ 10 11.0	12 35 26.2	110.1	12 37 07.3	110.0	15 19 32.2	1 12.2	.. .. .	.. .. .	.. .. .	.. .. .
Cameroon Yaounde	+ 3 52.0	+ 11 31.0	12 35 15.9	110.0	12 36 57.0	109.9	15 19 16.7	1 13.7	.. .. .	.. .. .	.. .. .	.. .. .
Nigeria Lagos	+ 6 27.2	+ 3 23.8	12 35 21.9	110.0	12 37 03.0	109.9	15 19 20.9	1 13.5	.. .. .	.. .. .	.. .. .	.. .. .
Algeria Algiers	+36 42.0	+ 3 13.0	12 35 29.9	110.0	12 37 11.0	110.0	15 19 34.5	1 12.2	.. .. .	.. .. .	.. .. .	.. .. .
Niger Niamey	+13 31.3	+ 2 06.3	12 35 24.6	110.0	12 37 05.7	109.9	15 19 24.1	1 13.1	.. .. .	.. .. .	.. .. .	.. .. .
Ghana Accra	+ 5 33.0	− 0 12.0	12 35 24.2	110.0	12 37 05.3	109.9	15 19 22.3	1 13.6	.. .. .	.. .. .	.. .. .	.. .. .
Ivory Coast Abidjan	+ 5 20.2	− 4 01.6	12 35 26.7	109.9	12 37 07.8	109.9	15 19 24.2	1 13.6	.. .. .	.. .. .	.. .. .	.. .. .
Morocco Rabat	+34 02.0	− 6 50.0	12 35 35.0	110.0	12 37 16.1	110.0	15 19 37.3	1 12.3	.. .. .	.. .. .	.. .. .	.. .. .
Mali Bamako	+12 39.0	− 8 00.0	12 35 31.2	110.0	12 37 12.3	109.9	15 19 28.8	1 13.2	.. .. .	.. .. .	.. .. .	.. .. .
Liberia Monrovia	+ 6 19.0	− 10 46.8	12 35 31.6	109.9	12 37 12.7	109.9	15 19 28.1	1 13.6	18 01 59.6	298.6	18 03 40.9	298.6
Western Sahara El Aaiun	+27 09.2	− 13 12.2	12 35 37.5	110.0	12 37 18.6	110.0	15 19 37.3	1 12.6	.. .. .	.. .. .	.. .. .	.. .. .
Sierra Leone Freetown	+ 8 29.1	− 13 14.1	12 35 33.8	109.9	12 37 14.9	109.9	15 19 30.2	1 13.5	18 02 00.9	298.6	18 03 42.2	298.6
Guinea-Bissau Bissau	+11 51.0	− 15 34.0	12 35 36.1	109.9	12 37 17.2	109.9	15 19 32.7	1 13.3	18 02 02.9	298.6	18 03 44.2	298.6
Mauritania Nouakchott	+18 06.0	− 15 57.0	12 35 37.6	110.0	12 37 18.7	109.9	15 19 35.2	1 13.0	18 02 06.0	298.6	18 03 47.3	298.5
Senegal Dakar	+14 41.6	− 17 26.8	12 35 37.9	110.0	12 37 19.0	109.9	15 19 34.8	1 13.2	18 02 04.6	298.6	18 03 45.9	298.5
Albania Tirana	+41 19.8	+ 19 49.2	12 35 22.9	110.1	12 37 04.1	110.0	15 19 32.4	1 12.1	.. .. .	.. .. .	.. .. .	.. .. .
Bosnia-Herzegovina Sarajevo	+43 50.9	+ 18 21.4	12 35 24.5	110.1	12 37 05.7	110.0	15 19 34.3	1 12.0	.. .. .	.. .. .	.. .. .	.. .. .
Austria Vienna	+48 12.5	+ 16 22.4	12 35 27.0	110.1	12 37 08.2	110.0	15 19 37.5	1 12.0	.. .. .	.. .. .	.. .. .	.. .. .
Croatia Zagreb	+45 49.0	+ 15 59.0	12 35 26.3	110.1	12 37 07.5	110.0	15 19 36.0	1 12.0	.. .. .	.. .. .	.. .. .	.. .. .
Czech Republic Prague	+50 05.0	+ 14 25.0	12 35 28.5	110.1	12 37 09.7	110.0	15 19 39.1	1 11.9	.. .. .	.. .. .	.. .. .	.. .. .
Germany												
Munich	+48 08.0	+ 11 34.0	12 35 29.1	110.1	12 37 10.2	110.0	15 19 38.5	1 11.9	.. .. .	.. .. .	.. .. .	.. .. .
Stuttgart	+48 46.7	+ 9 10.8	12 35 30.3	110.1	12 37 11.5	110.0	15 19 39.6	1 11.9	.. .. .	.. .. .	.. .. .	.. .. .

TRANSIT OF MERCURY OF 2019 NOVEMBER 11

Location	Position		Ingress Exterior Contact		Ingress Interior Contact		Least Angular Distance		Egress Interior Contact		Egress Exterior Contact	
	Latitude	Longitude	UT	<i>P</i>	UT	<i>P</i>	UT	Separation	UT	<i>P</i>	UT	<i>P</i>
Germany Dusseldorf	+51° 14.2′	+ 6° 47.0′	12 35 32.0	110.1	12 37 13.2	110.0	15 19 41.7	1 11.9	.. .. .	... .	.. .. .	... .
San Marino San Marino	+43 56.0	+ 12 26.0	12 35 27.3	110.1	12 37 08.5	110.0	15 19 35.8	1 12.0	.. .. .	... .	.. .. .	... .
Italy Rome	+41 54.0	+ 12 30.0	12 35 26.6	110.1	12 37 07.8	110.0	15 19 34.5	1 12.1	.. .. .	... .	.. .. .	... .
Milan	+45 27.8	+ 9 11.4	12 35 29.3	110.1	12 37 10.5	110.0	15 19 37.6	1 12.0	.. .. .	... .	.. .. .	... .
Switzerland Zurich	+47 22.0	+ 8 33.0	12 35 30.2	110.1	12 37 11.3	110.0	15 19 38.9	1 11.9	.. .. .	... .	.. .. .	... .
Netherlands Amsterdam	+52 22.4	+ 4 53.5	12 35 33.1	110.1	12 37 14.3	110.0	15 19 42.9	1 11.9	.. .. .	... .	.. .. .	... .
France Ajaccio, Corsica	+41 55.6	+ 8 44.2	12 35 28.5	110.1	12 37 09.6	110.0	15 19 35.6	1 12.0	.. .. .	... .	.. .. .	... .
Marseille	+43 17.8	+ 5 22.2	12 35 30.5	110.1	12 37 11.7	110.0	15 19 37.4	1 12.0	.. .. .	... .	.. .. .	... .
Paris	+48 51.4	+ 2 21.0	12 35 33.4	110.1	12 37 14.5	110.0	15 19 41.6	1 11.9	.. .. .	... .	.. .. .	... .
Spain Barcelona	+41 23.0	+ 2 11.0	12 35 31.6	110.1	12 37 12.8	110.0	15 19 37.4	1 12.0	.. .. .	... .	.. .. .	... .
Madrid	+40 24.0	- 3 41.0	12 35 34.5	110.0	12 37 15.6	110.0	15 19 39.1	1 12.1	.. .. .	... .	.. .. .	... .
United Kingdom London	+51 30.5	- 0 07.5	12 35 35.1	110.1	12 37 16.2	110.0	15 19 43.8	1 11.9	.. .. .	... .	.. .. .	... .
Birmingham	+52 29.0	- 1 53.6	12 35 36.0	110.1	12 37 17.2	110.0	15 19 44.9	1 11.9	.. .. .	... .	.. .. .	... .
Edinburgh	+55 57.0	- 3 09.6	12 35 37.1	110.1	12 37 18.3	110.0	15 19 47.1	1 11.8	.. .. .	... .	.. .. .	... .
Taunton	+51 01.1	- 3 06.0	12 35 36.2	110.1	12 37 17.4	110.0	15 19 44.5	1 11.9	.. .. .	... .	.. .. .	... .
Ireland Dublin	+53 20.9	- 6 15.6	12 35 38.0	110.1	12 37 19.2	110.0	15 19 46.7	1 11.9	.. .. .	... .	.. .. .	... .
Faroe Islands Torshavn	+62 00.0	- 6 47.0	12 35 39.3	110.1	12 37 20.5	110.0	15 19 51.3	1 11.8	.. .. .	... .	.. .. .	... .
Portugal Lisbon	+38 42.8	- 9 08.4	12 35 37.1	110.0	12 37 18.2	110.0	15 19 40.5	1 12.1	.. .. .	... .	.. .. .	... .
Ascension Island Georgetown	- 7 55.7	- 14 24.7	12 35 30.7	109.9	12 37 11.8	109.8	15 19 26.3	1 14.5	18 01 55.7	298.7	18 03 37.0	298.6
Canary Islands Las Palmas de Gran Canaria	+28 09.0	- 15 25.0	12 35 39.0	110.0	12 37 20.1	110.0	15 19 38.9	1 12.5	18 02 11.3	298.6	18 03 52.6	298.5
Madeira Funchal	+32 39.1	- 16 54.6	12 35 40.5	110.0	12 37 21.7	110.0	15 19 41.5	1 12.4	18 02 14.3	298.5	18 03 55.6	298.5
Iceland Reykjavik	+64 08.0	- 21 56.0	12 35 44.0	110.1	12 37 25.3	110.0	15 19 56.3	1 11.9	.. .. .	... .	.. .. .	... .
Cape Verde Islands Praia, Santiago	+14 55.2	- 23 30.5	12 35 41.9	109.9	12 37 23.0	109.9	15 19 38.6	1 13.2	18 02 06.3	298.6	18 03 47.6	298.5
Azores Ponta Delgada	+37 44.0	- 25 40.0	12 35 45.8	110.0	12 37 26.9	110.0	15 19 48.0	1 12.3	18 02 19.4	298.5	18 04 00.7	298.5
South Georgia Grytviken	-54 16.9	- 36 30.5	12 35 27.9	109.7	12 37 09.1	109.6	15 19 31.6	1 17.9	18 02 01.2	298.9	18 03 42.5	298.8
Greenland Nuuk	+64 10.0	- 51 44.0	12 35 51.7	110.0	12 37 33.0	110.0	15 20 05.0	1 12.2	18 02 41.4	298.5	18 04 22.7	298.5