LOCATIONS and DATES for the TRADITIONAL MARCH EQUINOX - Twelve hours both Sun and night time!

....Atomic clocks are assumed to be 8.0 min in advance of Sun....Quoted values are reliant on an Equatorial extra time of 7.0 min.

SAT 11/12 ROVANIEMI, FINLAND 66.5 N2540 E 04:26/16:25 0.3987 2 X 8.8 min 202 dy MON 13 ARCHANGEL, RUSSIA 66.5 N60 40 E 03:2115:21 0.4305 2 X 8.13 201 TUE 14 OSLO, NORWAY 60 00 N11 00 E 05:2417:24 0.5000 2 X 8.13 201 TUE 14 S.PETERBURG RUSSIA 59 56 N30 20 E 04:0716:07 0.5012 2 X 6.86 199 TUE 14 / 15 STOCKHOLM SWEDEN 59 20 N18 00 E 04:5716:56 0.5100 2 X 6.86 199 TUE 14 / 15 STOCKHOLM SWEDEN 59 20 N18 00 E 04:5716:56 0.5100 2 X 6.86 199 WED 15 EDINBURGH SCOTLAND 55 55 N03 10 W 06:2018:20 0.5605 2 X 6.25 197 WED 15 MOSCOW RUSSIA 55 45 N37 40 E 03:3715:37 0.5625 2 X 6.23 197 WED 15 COPENHAGEN DENMARK 55 40 N12 30 E 05:1817:19 0.5640 2 X 6.21 197 WED 15 COPENHAGEN DENMARK 55 40 N12 30 E 05:1817:19 0.5640 2 X 5.21 197 WED 15 CAMBRIDGE ENGLAND 52 12 N00 10 E 06:0918:09 0.6130 2 X 5.71 196.5 THU 16 CAMBRIDGE ENGLAND 52 12 N00 10 E 06:0918:09 0.6130 2 X 5.71 196.5 THU 16 CAMBRIDGE MASSACHUS. 42 22 N71 04 W 10:5322:53 0.739 0 2 X 4.74 194.5 THU 16 LYON FRANCE 48 50 N02 20 E 06:0018:00 0.658.3 2 X 5.32 195 WED 15/16 PORTLAND OREGON 45 30 N122 40 W 14:1902:19 0.7009 2 X 5.00 195 THU 16 HALIFAX NOVA SCOTIA 48 30 N320 N 10:2122:21 0.7133 2 X 4.91 195 THU 16 VLADYVOSTOK RUSSIA 43 00 N132 00 E 05:4917:49 0.7373 2 X 4.73 195 THU 16 OETROIT MICHIGAN 42 30 N830 N 11:4023:40 0.7373 2 X 4.73 195 THU 16 / 17 BARCELONA SPAIN 41 22 N02 10 E 06:0017:59 0.7505 2 X 4.67 194.5 THU 16 / 17 ISTANBUL TURKEY 41 00 N29 00 E 04:1216:12 0.7547 2 X 4.64 194.5 THU 16 / 17 ISTANBUL TURKEY 41 00 N29 00 E 04:1216:12 0.7547 2 X 4.64 194.5 FRI 17 OSAKA JAPAN 35 40 N15 00 E 0:1017:59 0.7567 2 X 4.67 194.5 FRI 17 OSAKA JAPAN 35 40 N15 00 E 0:1017:59 0.7567 2 X 4.60 194.5 FRI 17 INCKYO JAPAN 35 35 N13 45 E 20:4908:49 0.8303 2 X 4.93 194 FRI 17 / 18 MUMBAI INDIA 1900 N24 00 W 11:2223:28 1.0000 2 X 4.73 194.5 FRI 17 / 18 MUMBAI INDIA 1900 N24 00 E 0:12115:21 0.9997 2 X 4.55 194 FRI	DATE MARCH 2007	PLACE	LAT/LONG	Sun Times(ESTIMATE) UTC / GMT	COSINE(lat)	EXTRA SUN TIME MARCH EQUINOX March 20 / 21 2007	(ESTIMATED) DELTA EQUILUX during the year
TUE 14 OSLO, NORWAY 60 00 N11 00 E 05:2417:24 0.5000 2 X 7.00 199 TUE 14 S. SPTERBURG RUSSIA 59 56 N30 20 E 04:0716:07 0.5012 2 X 6.88 199 WED 15 STOCKHOLM SWEDEN 59 20 N18 00 E 04:5716:56 0.5100 2 X 6.86 198 WED 15 MOSCOW RUSSIA 55 55 N03 10W 06:2018:20 0.5605 2 X 6.25 197 WED 15 MOSCOW RUSSIA 55 45 N37 40 E 03:3715:37 0.5625 2 X 6.23 197 WED 15 COPENHAGEN DEN MARK 55 40 N12 30 E 05:1817:19 0.5640 2 X 6.26 197 WED 15 CAMBRIDGE EN GLAND 51 00N114 00W 13:14401:143 0.6293 2 X 5.86 196 WED 15 CAMBRIDGE EN GLAND 51 00N114 00W 13:14401:143 0.6293 0 2 X 5.71 197. THU 16 CAMBRIDGE MASSACHUS. 42 22 N71 04W 10:5322:53 0.7390 2 X 4.74 194.5 THU 16 PARIS FRANCE 45 55 N03 40 W 10:5322:53 0.7390 2 X 4.74 194.5 THU 16 LYON FRANCE 45 45 N04 40 E 05:4917:49 0.6975 2 X 5.02 195 THU 16 HALIFAX NOVA SCOTIA 44 30 N63 30 W 10:2122:21 0.77133 2 X 4.91 195 THU 16 VLADYVOSTOK RUSSIA 43 00 N132 00 E 01:2120:21 0.77373 2 X 4.91 195 THU 16 OFFICIAL STAND THE AVERAGE AND 11:05 N22:05 0.7505 2 X 4.67 194.5 THU 16 NEW YORK 14 74 N40 W 11:0523:10 0.7505 2 X 4.67 194.5 THU 16 NEW YORK 14 74 N40 W 11:0523:10 0.7547 2 X 4.64 194.5 THU 16 NEW YORK 14 74 N40 W 11:0523:10 0.7585 2 X 4.60 194 THU 16 / TISTANBUL TURKEY 41 00 N25 00 E 05:09.17:08 0.7585 2 X 4.60 194 THU 16 / TO SAGEND THALY 40 40 N15 00 E 05:09.17:08 0.7585 2 X 4.60 194 THU 16 / TO SAGEND THALY 40 40 N15 00 E 05:09.17:08 0.7585 2 X 4.60 194 THU 16 / TO SAGEND THALY 40 40 N15 00 E 05:09.17:08 0.7585 2 X 4.60 194 THU 16 / TISTANBUL TURKEY 41 00 N15 00 E 05:09.17:08 0.7585 2 X 4.60 194 THU 16 / TO SAGEND THALY 40 40 N15 00 E 05:09.17:08 0.7585 2 X 4.60 194 THU 16 / TISTANBUL TURKEY 41 00 N15 00 E 05:09.17:08 0.7585 2 X 4.60 194 THU 16 / TISTANBUL TURKEY 41 00 N15 00 E 05:09.17:08 0.7585 2 X 4.60 194 THU 16 / TISTANBUL TURKEY 41 00 N15 00 E 05:09.17:08 0.7585 2 X 4.60 194 THU 16 / TISTANBUL TURKEY 41 00 N15 00 E 05:09.17:08 0.7585 2 X 4.	SAT 11/12	ROVANIEMI, FINLAND	66.5 N25 40 E	04:26 / 16:25	0.3987	2 X 8.8 min	202 dy
TUE 14 S.PETERBURG RUSSIA 59 56 N30 20 E 04:0716:07 0.5012 2 X 6.98 199 TUE 14 / 15 STOCKHOLM SWEDEN 59 20 N18 00 E 04:0716:56 0.5100 2 X 6.86 198 WED 15 EDIBURGH SCOTLAND 55 55 N03 10W 06:2018:20 0.5605 2 X 6.25 197 WED 15 MOSCOW RUSSIA 55 45 N37 40 E 0.313715:37 0.5625 2 X 6.23 197 WED 15 COPENHAGEN DENMARK 55 40 N12 30 E 05:1817:19 0.5640 2 X 6.21 197 WED 15 / 16 CALGARY CANADA 51 00 N114 00W 13:4401:43 0.6293 2 X 5.56 196 WED 15 / 16 CALGARY CANADA 51 00 N114 00W 13:4401:43 0.6293 2 X 5.56 196 WED 15 / 16 CAMBRIDGE ENGLAND 52 12N00 10 E 06:0918:00 0.66130 2 X 5.71 196.5 THU 16 CAMBRIDGE MASSACHUS. 42 22 N71 04 W 10:5322:53 0.7390 2 X 4.74 194.5 THU 16 PARIS FRANCE 48 50 N02 20 E 06:0018:00 0.6583 2 X 5.32 195 THU 16 LYON FRANCE 45 45 N04 40 E 0.5:4917:49 0.65975 2 X 5.02 195 THU 16 HALIFAX NOVA SCOTIA 44 30 N63 30 W 10:2122:21 0.7103 2 X 4.77 194.5 THU 16 VLADYVOSTOK RUSSIA 43 00 N132 00 E 21:2009:20 0.7300 2 X 4.77 194.5 THU 16 DETROIT MICHIGAN 42 20 N33 00 W 11:4023:40 0.75737 2 X 4.64 194.5 THU 16 / 17 BARCELONA SPAIN 41 22 N20 10 E 06:0017:59 0.7505 2 X 4.67 194.5 THU 16 / 17 SALERNO STAIN 41 22 N20 10 E 06:0017:59 0.7505 2 X 4.64 194.5 THU 16 / 17 SALERNO STAIN 41 20 N30 00 W 11:4023:40 0.75737 2 X 4.64 194.5 THU 16 / 17 SALERNO STAIN 41 20 N30 00 W 11:4023:40 0.75737 2 X 4.64 194.5 THU 16 / 17 SALERNO STAIN 41 20 N30 00 W 11:4023:40 0.7597 2 X 4.64 194.5 THU 16 / 17 SALERNO STAIN 41 20 N30 00 W 11:4023:40 0.7597 2 X 4.64 194.5 THU 16 / 17 SALERNO STAIN 41 20 N30 00 W 11:4023:40 0.7597 2 X 4.64 194.5 THU 16 / 17 SALERNO STAIN 41 00 N30	MON 13	ARCHANGEL, RUSSIA	64.5 N40 40 E	03:2115:21	0.4305	2 X 8.13	2 0 1
TUE 14 / 15	TUE 14	OSLO, NORWAY	60 00 N11 00 E	05:2417:24	0.5000	2 X 7.00	199
WED 15 MOSCOW RUSSIA 55 45 N37 40 E 03:3715:37 0.5625 2 X 6.25 197 WED 15 MOSCOW RUSSIA 55 45 N37 40 E 03:3715:37 0.5625 2 X 6.23 197 WED 15 COPENHAGEN DENMARK 55 40 N12 30 E 05:1817:19 0.5640 2 X 6.21 197 WED 15 CAMBRIDGE CANADA 51 00 N114 00 W 13:4401:43 0.6293 2 X 5.56 196 WED 15 CAMBRIDGE ENGLAND 52 12 N00 10 E 06:0918:09 0.6130 2 X 5.71 196.5 THU 16 CAMBRIDGE MASSACHUS. 42 22 N71 04 W 10:5322:53 0.7390 2 X 4.74 194.5 THU 16 PARIS FRANCE 48 50 N02 20 E 06:0018:00 0.6583 2 X 5.32 195 THU 16 PARIS FRANCE 45 454 N04 40 E 05:4917:49 0.6975 2 X 5.02 195 WED 15/16 PORTLAND OREGON 45 30 N122 40 W 14:1902:19 0.7009 2 X 5.00 195 THU 16 HALIFAX NOVA SCOTIA 43 30 N132 00 E 21:2009:20 0.7300 2 X 4.77 194.5 THU 16 HALIFAX NOVA SCOTIA 43 30 N132 00 E 21:2009:20 0.7303 2 X 4.73 195 THU 16 DETROIT MICHIGAN 42 30 N83 30 W 11:4023:40 0.7373 2 X 4.73 195 THU 16 DETROIT MICHIGAN 42 30 N83 00 W 11:4023:40 0.7373 2 X 4.73 195 THU 16 NEW YORK NEW YORK 41 74 N74 00 W 11:0523:05 0.7585 2 X 4.60 194 THU 16 / 17 ISTANBUL TURKEY 41 0029 00 E 04:1016:12 0.7585 2 X 4.60 194 THU 16 / 17 SALERNO ITALY 40 40 N15 00 E 05:0917:08 0.7585 2 X 4.60 194 FRI 17 OSAKA JAPAN 34 40 N18 50 E 22:2210:22 0.7679 2 X 4.55 194 FRI 17 LOSAKA JAPAN 34 40 N18 15 W 14:0102:01 0.8299 2 X 4.25 194 FRI 17 DOSAKA JAPAN 34 40 N18 15 W 14:0102:01 0.8299 2 X 4.25 194 FRI 17 PUBLA MEJICO 18 00 N91 18 00 N92 00 E 01:2113:21 0.9455 2 X 3.50 199 FRI 17/18 MUMBAI INDIA 19 00 N24 0E 01:2113:21 0.9997 2 X 3.50 191 FRI 17/18 MUMBAI INDIA 19 00 N24 0E 01:2113:21 0.9455 2 X 3.50 191 FRI 17/18 MUMBAI INDIA 19 00 N94 0E 01:2113:21 0.9997 2 X 3.50 191 FRI 17/18 MUMBAI INDIA 19 00 N94 0E 01:2113:21 0.9997 2 X 3.50 191 FRI 17/18 MUMBAI INDIA 19 00 N94 0E 01:2113:21 0.9997 2 X 3.50 191 SAT 18 PORTOFSPAIN TRINIDAD 11 40 N61 30 W 11:2223:22 10.09997 2 X 3.50 191 FRI 17/18 DUBBAN STH AFRICA 30 00 S80 00 00	TUE 14	S.PETERBURG RUSSIA	59 56 N30 20 E	04:0716:07	0.5012	2 X 6.98	199
WED 15	TUE 14 / 15	STOCKHOLM S W E D E N	59 20 N18 00 E	04:5716:56	0.5100	2 X 6.86	198
WED 15 COPENHAGEN DENMARK S5 40 N12 30 E 05:1817:19 0.5640 2 X 6.21 197 WED 15 CAMBRIDGE EN GLAN D S1 10 N114 00 W 13:4401:43 0.6293 2 X 5.56 196 WED 15 CAMBRIDGE EN GLAN D S2 12 N00 10 E 06:0918:09 0.6130 2 X 5.71 196.5 THU 16 CAMBRIDGE MASSACHUS. 42 22 N71 04 W 10:532:53 0.7390 2 X 4.74 194.5 THU 16 PARIS FRANCE 48 50 N02 20 E 06:0018:00 0.6583 2 X 5.32 195 THU 16 LYON FRANCE 45 45 N04 40 E 05:4917:49 0.6975 2 X 5.02 195 WED 15/16 PORTLAND OREGON 45 30 N122 40 W 14:1902:19 0.7009 2 X 5.00 195 THU 16 HALIFAX NOVA SCOTTA 44 30 N132 00 E 21:2009:20 0.7300 2 X 4.77 194.5 THU 16 VLADYVOSTOK RUSSIA 43 00 N132 00 E 21:2009:20 0.7300 2 X 4.77 194.5 THU 16 DETROIT MICHIGAN 42 30 N33 00 W 11:4023:40 0.7373 2 X 4.73 195 THU 16 NEW YORK NEW YORK 41 74 N74 00 W 11:0523:05 0.7505 2 X 4.67 194.5 THU 16 / 17 ISTANBUL TURKEY 41 00 N29 00 E 04:1216:12 0.7547 2 X 4.64 194.5 THU 16 / 17 SALERNO ITALY 40 40 N35 00 E 05:0917:08 0.7585 2 X 4.60 194 THU 16 PITTSBURGH PENNSYLVANIA 40 40 N30 00 W 11:3823:38 0.7585 2 X 4.60 194 FRI 17 CADIZ SPAIN 36 30 N139 45 E 20:4908:49 0.8133 2 X 4.35 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8239 2 X 4.26 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8299 2 X 4.26 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8299 2 X 4.26 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8299 2 X 4.26 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8299 2 X 4.26 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8299 2 X 4.26 194 FRI 17 TOKYO JAPAN 35 35 N39 45 E 20:4908:49 0.8299 2 X 4.26 194 FRI 17 TOKYO JAPAN	WED 15	EDINBURGH SCOTLAND	55 55 N03 10 W	06:2018:20	0.5605	2 X 6.25	197
WED 15 / 16 CALGARY CANADA 51 00 N114 00 W 13:4 401:43 0.6293 2 X 5.56 196 WED 15 CAMBRIDGE ENGLAND 52 12 N00 10 E 06:0 918:0 9 0.6130 2 X 5.71 196.5 THU 16 CAMBRIDGE MASSACHUS. 42 22 N71 04 W 10:5 322:53 0.7390 2 X 4.74 194.5 THU 16 PARIS FRANCE 45 45 N02 20 E 06:0 018:0 0 0.6583 2 X 5.32 195 THU 16 LYON FRANCE 45 45 N04 40 E 05:4 917:4 9 0.6975 2 X 5.02 195 WED 15/16 PORTLAND OREGON 45 30 N122 40 W 14:1 902:1 9 0.700 9 2 X 5.00 195 THU 16 HALIFAX NOVA SCOTIA 44 30 N63 30 W 10:2 122:2 1 0.7133 2 X 4.91 195 THU 16 HALIFAX NOVA SCOTIA 44 30 N63 30 W 10:2 122:2 1 0.7133 2 X 4.91 195 THU 16 DETROIT MICHIGAN 42 30 N30 00 W 11:4 023:4 0 0.7373 2 X 4.77 194.5 THU 16 NEW YORK NEW YORK 41 74 N74 00 W 11:0 523:0 5 0.7547 2 X 4.64 194.5 THU 16/17 ISTANBUL TURKEY 41 00 N29 00 E 04:1 216:1 2 07547 2 X 4.64 194.5 THU 16/17 SALERNO ITALY 40 40 40 N50 0 E 05:0 917:0 8 07585 2 X 4.60 194.5 FRI 17 CADIZ SPAIN 36 30 N16 25 E 22:2 210:2 2 07679 2 X 4.56 194 FRI 17 CADIZ SPAIN 36 30 N16 25 E 22:2 210:2 2 07679 2 X 4.56 194 FRI 17 CADIZ SPAIN 36 30 N16 25 E 22:2 210:2 2 07679 2 X 4.56 194 FRI 17 LOSANGELES CALIFORNIA 34 00 N13 95 E 04:9 0849 0839 2 X 4.22 194 FRI 17 LOSANGELES CALIFORNIA 34 00 N13 95 E 04:9 0899 2 X 4.22 194 FRI 17 LOSANGELES CALIFORNIA 34 00 N13 15 E 04:0 316:0 3 08299 2 X 4.22 194 FRI 17/18 UMBAI INDIA 1900 N72 40 E 01:2 113:1 10.9455 2 X 3.50 191 FRI 17/18 CAIRO EGYPT 30 00 N31 15 E 04:0 316:0 3 08660 2 X 4.04 193 FRI 17/18 VMBAI INDIA 1900 N72 40 E 01:2 113:2 1 09455 2 X 3.50 191 FRI 17/18 VMBAI INDIA 1900 N72 40 E 01:2 113:2 1 09455 2 X 3.50 191 FRI 17/18 VMBAI INDIA 1900 N72 40 E 01:2 113:2 1 09455 2 X 3.50 191 FRI 17/18 VMBAI INDIA 1900 N72 40 E 01:2 113:2 1 09979 2 X 3.55 192 FRI 17/18 VMBAI INDIA 1900 N72 40 E 01:2 113:2 1 09997 2 X 3.55 191 FRI 17/18 VMBAI INDIA 1900 N72 40 E 01:2 1.	WED 15	MOSCOW RUSSIA	55 45 N37 40 E	03:3715:37	0.5625	2 X 6.23	197
WED 15 CAMBRIDGE ENGLAND \$2 12 N00 10 E 06:0918:09 0.6130 2 X 5.71 196.5 THU 16 CAMBRIDGE MASSACHUS. 42 22 N71 04 W 10:5322:53 0.7390 2 X 4.74 194.5 THU 16 PARIS FRANCE 48 50 N02 20 E 06:0018:00 0.6975 2 X 5.02 195 THU 16 LYON FRANCE 45 45 N04 40 E 05:4917:49 0.6975 2 X 5.02 195 WED 15/16 PORTLAND O REGON 45 30 N122 40 W 14:1902:19 0.7009 2 X 5.02 195 THU 16 HALIFAX NOVA SCOTIA 44 30 N63 30 W 10:2122:21 0.7133 2 X 4.77 194.5 THU 16 VLADYVOSTOK RUSSIA 43 00 N132 00 E 21:2009:20 0.7300 2 X 4.77 194.5 THU 16 / 17 BARCELONA SPAIN 41 22 N02 10 E 06:0017:59 0.7505 2 X 4.64 194.5 THU 16 / 17 SALERNO TLY 40 40 N16 00 W 11:0523:05 0.7547 2 X 4.64 <th>WED 15</th> <th>COPENHAGEN DENMARK</th> <th>55 40 N12 30 E</th> <th>05:1817:19</th> <th>0.5640</th> <th>2 X 6.21</th> <th>197</th>	WED 15	COPENHAGEN DENMARK	55 40 N12 30 E	05:1817:19	0.5640	2 X 6.21	197
THU 16 CAMBRIDGE MASSACHUS. 42 22 N71 04 W 10:532:53 0.7390 2 x 4.74 194.5 THU 16 PARIS FRANCE 48 50 N02 20 E 06:0018:00 0.6583 2 x 5.32 195 THU 16 LYON FRANCE 45 45 N04 40 E 05:4917:49 0.6975 2 x 5.02 195 WED 15/16 PORTLAND OREGON 45 30 N122 40 W 14:1902:19 0.7009 2 x 5.00 195 THU 16 HALIFAX NOVA SCOTIA 44 30 N63 30 W 10:2122:21 0.7133 2 x 4.91 195 THU 16 VLADYVOSTOK RUSSIA 43 00 N132 00 E 21:2009:20 0.7300 2 x 4.77 194.5 THU 16 DETROIT MICHIGAN 42 30 N83 00 W 11:4023:40 0.7373 2 x 4.73 195 THU 16/17 BARCELONA SPAIN 41 22 N02 10 E 06:0017:59 0.7505 2 x 4.67 194 THU 16/17 ISTANBUL TURKEY 41 00 N29 00 E 04:1216:12 0.7547 2 x 4.64 194.5 THU 16/17 SALERNO ITALY 40 40 N15 00 E 05:0917:08 0.7585 2 x 4.60 194.5 THU 16 PITTSBURGH PENNSYLVANIA 40 40 N80 00 W 11:3823:38 0.7585 2 x 4.60 194.5 FRI 17 CADIZ SPAIN 36 30 N06 20 W 06:3318:33 0.8039 2 x 4.35 194 FRI 17 OSAKA JAPAN 34 40 N139 46 E 20:4908:49 0.8133 2 x 4.35 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8133 2 x 4.22 194 FRI 17/18 CADIZ SPAIN 34 00 N31 15 E 04:0316:03 0.8660 2 x 4.04 193 FRI 17/18 CADIZ SPAIN 19 00 N29 10 W 11:222:13 0.9455 2 x 3.50 191 FRI 17/18 CADIZ SPAIN 34 40 N131 15 W 14:0102:01 0.8299 2 x 4.22 194 FRI 17/18 CADIZ SPAIN 36 00 N118 15 W 14:0102:01 0.8299 2 x 4.22 194 FRI 17/18 CADIZ SPAIN 34 00 N31 15 E 04:0316:03 0.8660 2 x 4.04 193 FRI 17/18 MUMBAI INDIA 19 00 N72 40 E 01:2113:21 0.9455 2 x 3.70 191.5 FRI 17/18 MUMBAI INDIA 19 00 N72 40 E 01:2113:21 0.99797 2 x 3.50 191 FRI 17/18 CADIZ SPAIN TRINIDAD 11 40 N61 30 W 12:222:22 1 0.000 2 x 3.50 191 FRI 17/18 BRASILI BRASIL 16 00 S78 30 W 11:2223:22 1 0.000 2 x 3.50 191 SAT 18 PORTOFSPAIN TRINIDAD 11 40 N61 30 W 12:2223:22 1 0.000 2 x 3.50 191 FRI 17/18 BRASILI BRASIL 16 00 S	WED 15 / 16	CALGARY CANADA	51 00 N114 00 W	13:4401:43	0.6293	2 X 5.56	196
THU 16 PARIS FRANCE 48 50 N02 20 E 06:0018:00 0.6583 2 X 5.32 195 THU 16 LYON FRANCE 45 45 N04 40 E 05:4917:49 0.6975 2 X 5.02 195 WED 15/16 PORTIAND OREGON 45 30 N122 40 W 14:1902:19 0.7009 2 X 5.00 195 THU 16 HALIFAX NOVA 5 COTIA 44 30 N330 W 10:2122:21 0.7133 2 X 4.91 195 THU 16 HALIFAX NOVA 5 COTIA 44 30 N320 W 21:2009:20 0.7300 2 X 4.77 194.5 THU 16 DETROIT MICHIGAN 42 30 N330 W 11:4023:40 0.7373 2 X 4.91 195 THU 16/17 BARCELONA SPAIN 41 22 N02 10 E 06:0017:59 0.7505 2 X 4.67 194 THU 16 NEW YORK NEW YORK 41 74 N74 00 W 11:0523:05 0.7547 2 X 4.64 194.5 THU 16/17 ISTANBUL TURKEY 41 00 N29 00 E 04:1216:12 0.7547 2 X 4.64 194.5 THU 16/17 SALERNO ITALY 40 40 40 N500 W 11:3823:38 0.7585 2 X 4.60 194.5 FRI 17 BEIJING CHINA 39 50 N116 25 E 2:2210:22 0.7679 2 X 4.56 194 FRI 17 CADIZ SPAIN 36 30 N06 20 W 06:3318:33 0.8039 2 X 4.35 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8230 2 X 4.26 194 THU 16/17 BANGLES CALIFORNIA 34 40 N1815 W 14:0102:01 0.8299 2 X 4.26 194 FRI 17/18 CAIRO EGYPT 30 00 N1815 W 14:0102:01 0.8299 2 X 4.26 194 FRI 17/18 MUBBAI INDIA 19 00 N72 40 E 01:2113:21 0.9455 2 X 3.68 192.5 SAT 18 PORTOFSPAIN TRINIDAD 11 40 N61 30 W 12:2223:22 1.00:02 6 0.9511 2 X 3.68 192.5 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9997 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9997 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.99613 2 X 3.64 192.5 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.99613 2 X 3.64 192.5 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.99613 2 X 3.64 192.5 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.99613 2 X 3.64 192.5 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.99613 2 X 3.64 192.5	WED 15	CAMBRIDGE ENGLAND	52 12 N00 10 E	06:0918:09	0.6130	2 X 5.71	196.5
THU 16 LYON FRANCE 45 45 N04 40 E 05:4917:49 0.6975 2 X 5.02 195 WED 15/16 PORTLAND OREGON 45 30 N122 40 W 14:1902:19 0.7009 2 X 5.00 195 THU 16 HALIFAX NOVA SCOTIA 44 30 N63 30 W 10:2122:21 0.7133 2 X 4.91 195 THU 16 VLADYVOSTOK RUSSIA 43 00 N132 00 E 21:2009:20 0.7300 2 X 4.77 194.5 THU 16 DETROIT MICHIGAN 42 30 N83 00 W 11:4023:40 0.7373 2 X 4.73 195 THU 16/17 BARCELONA SPAIN 41 22 N02 10 E 06:0017:59 0.7505 2 X 4.67 194 THU 16 NEW YORK NEW YORK 41 74 N74 00 W 11:0523:05 0.7547 2 X 4.64 194.5 THU 16/17 ISTANBUL TURKEY 41 00 N29 00 E 04:1216:12 0.7547 2 X 4.64 194 THU 16/17 SALERNO ITALY 40 40 N15 00 E 05:0917:08 0.7585 2 X 4.60 194 THU 16/17 BEJING CHINA 39 50 N116 25 E 22:2210:22 0.7679 2 X 4.56 194 FRI 17 CADIZ SPAIN 36 30 N06 20 W 06:3318:33 0.8039 2 X 4.35 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8133 2 X 4.30 194 FRI 17 TOKYO JAPAN 35 35 N139 46 E 20:4908:49 0.8230 2 X 4.26 194 THU 16/17 LOS ANGELES CALIFORNIA 34 40 N139 46 E 20:4908:49 0.8230 2 X 4.26 194 FRI 17/18 MUMBAI INDIA 19 00 N72 40 E 01:2113:21 0.9455 2 X 3.68 192.5 SAT 18 PORTOFSPAIN TRINIDAD 11 40 N61 30 W 10:1322:13 0.9793 2 X 3.58 192.5 SAT 18 PORTOFSPAIN TRINIDAD 11 40 N61 30 W 11:223:22 1 0.9957 2 X 3.50 191 SAT 18 BRASILA BRASIL 16 00 S48 00 W 11:223:22 1 0.9957 2 X 3.50 191 SAT 18 BRASILA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.68 192.5 SAT 18 BRASILA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.68 192.5 SAT 18 BRASILA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.68 192.5 SAT 18 BRASILA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.68 192.5 SAT 18 BURBAN STH AFRICA 30 00 S18 00 W 09:2021:20 0.9613 2 X 3.68 192.5	THU 16	CAMBRIDGE MASSACHUS.	42 22 N71 04 W	10:5322:53	0.7390	2 x 4.74	194.5
WED 15/16 PORTLAND OREGON 45 30 N122 40 W 14:1902:19 0.7009 2 X 5.00 195 THU 16 HALIFAX NOVA SCOTIA 44 30 N63 30 W 10:2122:21 0.7133 2 X 4.91 195 THU 16 VLADYVOSTOK RUSSIA 43 00 N132 00 E 21:2009:20 0.7300 2 X 4.77 194.5 THU 16 DETROIT MICHIGAN 42 30 N83 00 W 11:4023:40 0.7373 2 X 4.73 195 THU 16/17 BARCELONA SPAIN 41 22 N02 10 E 06:0017:59 0.7505 2 X 4.67 194 THU 16 NEW YORK NEW YORK 41 74 N74 00 W 11:0523:05 0.7547 2 X 4.64 194.5 THU 16 TISTANBUL TURKEY 41 00 N29 00 E 04:1216:12 07547 2 X 4.64 194 THU 16 PITTSBURGH PENNSYLVANIA 40 40 N15 00 E 05:0917:08 07585 2 X 4.60 194 FRI 17 BEIJING CHINA 39 50 N116:25 E 22:22.21.0:22 07679 2 X 4.56	THU 16	PARIS FRANCE	48 50 N02 20 E	06:0018:00	0.6583	2 X 5.32	195
THU 16 HALIFAX NOVA S C O TIA 44 30 N63 30 W 10:2122:21 0.7133 2 X 4.91 195 THU 16 VLADYVOSTOK RUSSIA 43 00 N132 00 E 21:2009:20 0.73 00 2 X 4.77 194.5 THU 16 DETROIT MICHIGAN 42 30 N83 00 W 11:4023:40 0.73 73 2 X 4.73 195 THU 16 / 17 BARCELONA S PAIN 41 22 N02 10 E 06:0017:59 0.75 05 2 X 4.67 194 THU 16 / 17 BARCELONA S PAIN 41 22 N02 10 E 06:0017:59 0.75 05 2 X 4.67 194 THU 16 / 17 SALERNO ITALY 40 40 N29 00 E 04:1216:12 0.75 47 2 X 4.64 194.5 THU 16 / 17 SALERNO ITALY 40 40 N50 0E 05:0917:08 0.75 85 2 X 4.60 194 THU 16 PITTSBURGH PENNSYLVANIA 40 40 N80 00 W 11:3823:38 0.75 85 2 X 4.60 194 FRI 17 BEIJING CHINA 39 50 N116 25 E 22:2210:22 0.76 79 2 X 4.56 194 FRI 17 CADIZ S PAIN 36 30 N06 20 W 06:3318:33 0.80 39 2 X 4.35 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.81 33 2 X 4.30 194 FRI 17 OSAKA JAPAN 34 40 N139 46 E 20:4908:49 0.82 30 2 X 4.26 194 FRI 17 IOSANGELES CALIFORNIA 34 00 N31 15 E 04:0316:03 0.82 99 2 X 4.26 194 FRI 17 PUEBLA MEJICO 18 00 N31 15 E 04:0316:03 0.86 60 2 X 4.04 193 FRI 17 PUEBLA MEJICO 18 00 N72 40 E 01:2113:21 0.94 55 2 X 3.50 191 SAT 18 PORTOF SPAIN TRINIDAD 11 40 N61 30 W 12:2600:26 0.95 11 2 X 3.68 192.5 SAT 18 PORTOF SPAIN TRINIDAD 11 40 N61 30 W 11:2223:22 10.0000 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.96 13 2 X 4.04 193 FRI 17 / 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.96 13 2 X 4.04 193 FRI 17 / 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.86 60 2 X 4.04 193	THU 16	LYON FRANCE	45 45 N04 40 E	05:4917:49	0.6975	2 X 5.02	195
THU 16 VLADYVOSTOK RUSSIA 43 00 N132 00 E 21:2009:20 0.73 00 2 x 4.77 194.5 THU 16 DETROIT MICHIGAN 42 30 N83 00 W 11:4023:40 0.73 73 2 x 4.73 195 THU 16/17 BARCELONA SPAIN 41 22 N02 10 E 06:0017:59 0.75 05 2 x 4.67 194 THU 16 NEW YORK NEW YORK 41 74 N74 00 W 11:0523:05 0.75 47 2 x 4.64 194.5 THU 16/17 ISTANBUL TURKEY 41 00 N29 00 E 04:1216:12 0.75 47 2 x 4.64 194 THU 16/17 SALERNO ITALY 40 40 N80 00 W 11:3823:38 0.75 85 2 x 4.60 194 THU 16 PITTSBURGH PENNSYLVANIA 40 40 N80 00 W 11:3823:38 0.75 85 2 x 4.60 194 THU 16 PITTSBURGH PENNSYLVANIA 40 40 N80 00 W 11:3823:38 0.75 85 2 x 4.60 194 FRI 17 CADIZ SPAIN 36 30 N16 25 E 22:2210:22 0.76 79 2 x 4.56 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8133 2 x 4.30 194 FRI 17 LOSANGELES CALIFORNIA 34 00 N18 15 W 14:0102:01 0.82 99 2 x 4.26 194 FRI 17/18 CAIRO EGYPT 30 00 N31 15 E 04:0316:03 0.86 60 2 x 4.04 193 FRI 17/18 MUMBAI INDIA 19 00 N72 40 E 01:2113:21 0.94 55 2 x 3.70 191.5 FAI 17 PUEBLA MEJICO 18 00 N94 30 W 12:2600:26 0.95 11 2 x 3.68 192.5 SAT 18 PORTOFSPAIN TRINIDAD 11 40 N61 30 W 10:1322:13 0.99 7 2 x 3.50 190 SAT 18 NAIROBI KENIA 01 20 S37 00 E 03:4115:40 0.99 97 2 x 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.96 13 2 x 3.64 192.5 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.96 13 2 x 3.68 192.5 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.96 13 2 x 3.68 192.5 SAT 18 DURBAN STH AFRICA 30 00 S	WED 15/16	PORTLAND O R E G O N	45 30 N122 40 W	14:1902:19	0.7009	2 X 5.00	195
THU 16 DETROIT MICHIGAN 42 30 N83 00 W 11:4023:40 0.7373 2 X 4.73 195 THU 16 / 17 BARCELONA SPAIN 41 22 N02 10 E 06:0017:59 0.7505 2 X 4.67 194 THU 16 NEW YORK NEW YORK 41 74 N74 00 W 11:0523:05 0.7547 2 X 4.64 194.5 THU 16 / 17 ISTANBUL TURKEY 41 00 N29 00 E 04:1216:12 0.7547 2 X 4.64 194 THU 16 / 17 SALERNO ITALY 40 40 N15 00 E 05:0917:08 0.7585 2 X 4.60 194 THU 16 PITTSBURGH PENNSYLVANIA 40 40 N80 00 W 11:3823:38 0.7585 2 X 4.60 194.5 FRI 17 BEIJING CHINA 39 50 N116 25 E 22:2210:22 0.7679 2 X 4.56 194 FRI 17 CADIZ SPAIN 36 30 N06 20 W 06:3318:33 0.8039 2 X 4.35 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8133 2 X 4.30 194 FRI 17 LOSAKA JAPAN 34 40 N139 46 E 20:4908:49 0.8230 2 X 4.26 194 THU 16 / 17 LOSANGELES CALIFORNIA 34 00 N118 15 W 14:0102:01 0.8299 2 X 4.22 194 FRI 17 PUBLA MEJICO 18 00 N72 40 E 01:2113:21 0.9455 2 X 3.70 191.5 FRI 17 PUBLA MEJICO 18 00 N94 30 W 12:2600:26 0.9511 2 X 3.58 192.5 SAT 18 PORTOF SPAIN TRINIDAD 11 40 N61 30 W 12:2223:22 1.0000 2 X 3.50 191 SAT 18 NAIROBI KENIA 01 20 S178 50 E 18:1306:13 0.9977 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.68 192.5 SAT 18 PUBBA STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193.5	THU 16	HALIFAX NOVA SCOTIA	44 30 N63 30 W	10:2122:21	0.7133	2 X 4.91	195
THU 16 / 17 BARCELONA SPAIN	THU 16	VLADYVOSTOK RUSSIA	43 00 N132 00 E	21:2009:20	0.7300	2 x 4.77	194.5
THU 16	THU 16	DETROIT MICHIGAN	42 30 N83 00 W	11:4023:40	0.7373	2 X 4.73	195
THU 16 / 17 ISTANBUL TURKEY 41 00 N29 00 E 04:1216:12 0.7547 2 x 4.64 194 THU 16 / 17 SALERNO ITALY 40 40 N15 00 E 05:0917:08 0.7585 2 x 4.60 194 THU 16 PITTSBURGH PENNSYLVANIA 40 40 N80 00 W 11:3823:38 0.7585 2 x 4.60 194.5 FRI 17 BEIJING CHINA 39 50 N116 25 E 22:2210:22 0.7679 2 x 4.56 194 FRI 17 CADIZ S PAIN 36 30 N06 20 W 06:3318:33 0.8039 2 x 4.35 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8133 2 x 4.30 194 FRI 17 OSAKA JAPAN 34 40 N139 46 E 20:4908:49 0.8230 2 x 4.26 194 THU 16 / 17 LOS ANGELES CALIFORNIA 34 00 N118 15 W 14:0102:01 0.8299 2 x 4.22 194 FRI 17 / 18 CAIRO E GYPT 30 00 N31 15 E 04:0316:03 0.8660 2 x 4.04 193 FRI 17 PUEBLA MEJICO 18 00 N94 30 W 12:2600:26 0.9511 2 x 3.68 192.5 SAT 18 PORTOF SPAIN TRINIDAD 11 40 N61 30 W 10:1322:13 0.9793 2 x 3.50 190 SAT 18 QUITO E CUADOR 00 25 S78 30 W 11:2223:22 1.0000 2 x 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 x 3.68 192.5 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 x 3.68 192.5 SAT 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 x 4.04 193	THU 16 / 17	BARCELONA SPAIN	41 22 N02 10 E	06:0017:59	0.7505	2 X 4.67	194
THU 16 / 17 SALERNO ITALY	THU 16	NEW YORK NEW YORK	41 74 N74 00 W	11:0523:05	0.7547	2 X 4.64	194.5
THU 16 PITTSBURGH PENNSYLVANIA 40 40 N80 00 W 11:3823:38 0.7585 2 X 4.60 194.5 FRI 17 BEIJING CHINA 39 50 N116 25 E 22:2210:22 0.7679 2 X 4.56 194 FRI 17 CADIZ SPAIN 36 30 N06 20 W 06:3318:33 0.8039 2 X 4.35 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8133 2 X 4.30 194 FRI 17 OSAKA JAPAN 34 40 N139 46 E 20:4908:49 0.8230 2 X 4.26 194 THU 16 / 17 LOS ANGELES CALIFORNIA 34 00 N118 15 W 14:0102:01 0.8299 2 X 4.22 194 FRI 17 / 18 CAIRO EGYPT 30 00 N31 15 E 04:0316:03 0.8660 2 X 4.04 193 FRI 17 / 18 MUMBAI INDIA 19 00 N72 40 E 01:2113:21 0.9455 2 X 3.70 191.5 FRI 17 PUEBLA MEJICO 18 00 N94 30 W 12:2600:26 0.9511 2 X 3.68 192.5 SAT 18 PORTOF SPAIN TRINIDAD 11 40 N61 30 W 10:1322:13 0.9793 2 X 3.58 192.5 SAT 18 QUITO ECUADOR 00 25 S78 30 W 11:2223:22 1.0000 2 X 3.50 191 SAT 18 BRASILA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.64 192.5 SAT 18 BRASILA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.68 192.5 SAT 18 PORTOF SPAIN STH AFRICA 30 00 S178 50 E 18:1306:13 0.9511 2 X 3.68 192.5	THU 16 / 17	ISTANBUL TURKEY	41 00 N29 00 E	04:1216:12	0.7547	2 X 4.64	194
FRI 17 BEIJING CHINA 39 50 N116 25 E 22:2210:22 0.7679 2 X 4.56 194 FRI 17 CADIZ SPAIN 36 30 N06 20 W 06:3318:33 0.8039 2 X 4.35 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8133 2 X 4.30 194 FRI 17 OSAKA JAPAN 34 40 N139 46 E 20:4908:49 0.8230 2 X 4.26 194 THU 16 / 17 LOS ANGELES CALIFORNIA 34 00 N118 15 W 14:0102:01 0.8299 2 X 4.22 194 FRI 17 / 18 CAIRO E GYPT 30 00 N31 15 E 04:0316:03 0.8660 2 X 4.04 193 FRI 17 / 18 MUMBAI INDIA 19 00 N72 40 E 01:2113:21 0.9455 2 X 3.70 191.5 FRI 17 PUEBLA MEJICO 18 00 N94 30 W 12:2600:26 0.9511 2 X 3.68 192.5 SAT 18 PORTOFSPAIN TRINIDAD 11 40 N61 30 W 10:1322:13 0.9793 2 X 3.58 192.5 SAT 19 SINGAPORE SINGAPORE 01 20 N103 50 E 23:1711:17 0.9997 2 X 3.50 190 SAT 18 NAIROBI KENIA 01 20 S37 00 E 03:4115:40 0.9997 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.64 192.5 SAT 18 PUEBAN STH AFRICA 30 00 S178 50 E 18:1306:13 0.9511 2 X 3.68 192 FRI 17 / 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193	THU 16 / 17	SALERNO ITALY	40 40 N15 00 E	05:0917:08	0.7585	2 X 4.60	194
FRI 17 CADIZ SPAIN 36 30 N06 20 W 06:3318:33 0.8039 2 X 4.35 194 FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8133 2 X 4.30 194 FRI 17 OSAKA JAPAN 34 40 N139 46 E 20:4908:49 0.8230 2 X 4.26 194 THU 16 / 17 LOS ANGELES CALIFORNIA 34 00 N118 15 W 14:0102:01 0.8299 2 X 4.22 194 FRI 17 / 18 CAIRO EGYPT 30 00 N31 15 E 04:0316:03 0.8660 2 X 4.04 193 FRI 17 / 18 MUMBAI INDIA 19 00 N72 40 E 01:2113:21 0.9455 2 X 3.70 191.5 FRI 17 PUEBLA MEJICO 18 00 N94 30 W 12:2600:26 0.9511 2 X 3.68 192.5 SAT 18 PORTOF SPAIN TRINIDAD 11 40 N61 30 W 10:1322:13 0.9793 2 X 3.58 192.5 SAT 19 SINGAPORE SINGAPORE 01 20 N103 50 E 23:1711:17 0.9997 2 X 3.50 190 SAT 18 QUITO ECUADOR 00 25 S78 30 W 11:2223:22 1.0000 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.64 192.5 SAT 18 PORTOF SUVA FIJI 18 00 S48 00 W 09:2021:20 0.9613 2 X 3.68 192.5	THU 16	PITTSBURGH PENNSYLVANIA	40 40 N80 00 W	11:3823:38	0.7585	2 X 4.60	194.5
FRI 17 TOKYO JAPAN 35 35 N139 45 E 20:4908:49 0.8133 2 X 4.30 194 FRI 17 OSAKA JAPAN 34 40 N139 46 E 20:4908:49 0.8230 2 X 4.26 194 THU 16 / 17 LOSANGELES CALIFORNIA 34 00 N118 15 W 14:0102:01 0.8299 2 X 4.22 194 FRI 17 / 18 CAIRO E G Y P T 30 00 N31 15 E 04:0316:03 0.8660 2 X 4.04 193 FRI 17 / 18 MUMBAI INDIA 19 00 N72 40 E 01:2113:21 0.9455 2 X 3.70 191.5 FRI 17 PUEBLA MEJICO 18 00 N94 30 W 12:2600:26 0.9511 2 X 3.68 192.5 SAT 18 PORTOF SPAIN TRINIDAD 11 40 N61 30 W 10:1322:13 0.9793 2 X 3.58 192.5 SAT 19 SINGAPORE SINGAPORE 01 20 N103 50 E 23:1711:17 0.9997 2 X 3.50 190 SAT 18 QUITO E C U A D OR 00 25 S78 30 W 11:2223:22 1.0000 2 X 3.50 191 SAT 18 NAIROBI KENIA 01 20 S37 00 E 03:4115:40 0.9997 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.68 192.5 SAT 18 / 19 SUVA FIJI 18 00 S178 50 E 18:1306:13 0.9511 2 X 3.68 192.5	FRI 17	BEIJING CHINA	39 50 N116 25 E	22:2210:22	0.7679	2 X 4.56	194
FRI 17 OSAKA JAPAN 34 40 N139 46 E 20:4908:49 0.8230 2 x 4.26 194 THU 16 / 17 LOS ANGELES CALIFORNIA 34 00 N118 15 W 14:0102:01 0.8299 2 X 4.22 194 FRI 17 / 18 CAIRO E GYPT 30 00 N31 15 E 04:0316:03 0.8660 2 X 4.04 193 FRI 17 / 18 MUMBAI INDIA 19 00 N72 40 E 01:2113:21 0.9455 2 X 3.70 191.5 FRI 17 PUEBLA MEJICO 18 00 N94 30 W 12:2600:26 0.9511 2 X 3.68 192.5 SAT 18 PORTOF SPAIN TRINIDAD 11 40 N61 30 W 10:1322:13 0.9793 2 X 3.58 192.5 SAT 19 SINGAPORE SINGAPORE 01 20 N103 50 E 23:1711:17 0.9997 2 X 3.50 190 SAT 18 QUITO E C U A D OR 00 25 S78 30 W 11:2223:22 1.0000 2 X 3.50 191 SAT 18 NAIROBI KENIA 01 20 S37 00 E 03:4115:40 0.9997 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.68 192.5 SAT 18 / 19 SUVA FIJI 18 00 S178 50 E 18:1306:13 0.9511 2 X 3.68 192 FRI 17 / 18 DURBAN STH A FRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193	FRI 17	CADIZ S P A I N	36 30 N06 20 W	06:3318:33	0.8039	2 X 4.35	194
THU 16 / 17 LOS ANGELES CALIFORNIA 34 00 N118 15 W 14:0102:01 0.8299 2 X 4.22 194 FRI 17 / 18 CAIRO E G Y P T 30 00 N31 15 E 04:0316:03 0.8660 2 X 4.04 193 FRI 17 / 18 MUMBAI INDIA 19 00 N72 40 E 01:2113:21 0.9455 2 X 3.70 191.5 FRI 17 PUEBLA MEJICO 18 00 N94 30 W 12:2600:26 0.9511 2 X 3.68 192.5 SAT 18 PORTOF SPAIN TRINIDAD 11 40 N61 30 W 10:1322:13 0.9793 2 X 3.58 192.5 SAT 19 SINGAPORE SINGAPORE 01 20 N103 50 E 23:1711:17 0.9997 2 X 3.50 190 SAT 18 QUITO ECUADOR 00 25 S78 30 W 11:2223:22 1.0000 2 X 3.50 191 SAT 18 NAIROBI KENIA 01 20 S37 00 E 03:4115:40 0.9997 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.64 192.5 SAT 18 / 19 SUVA FIJI 18 00 S48 50 E 18:1306:13 0.9511 2 X 3.68 192 FRI 17 / 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193	FRI 17	TOKYO JAPAN	35 35 N139 45 E	20:4908:49	0.8133	2 X 4.30	194
FRI 17 / 18 CAIRO	FRI 17	OSAKA JAPAN	34 40 N139 46 E	20:4908:49	0.8230	2 x 4.26	194
FRI 17 / 18 MUMBAI INDIA 19 00 N72 40 E 01:2113:21 0.9455 2 X 3.70 191.5 FRI 17 PUEBLA MEJICO 18 00 N94 30 W 12:2600:26 0.9511 2 X 3.68 192.5 SAT 18 PORTOF SPAIN TRINIDAD 11 40 N61 30 W 10:1322:13 0.9793 2 X 3.58 192.5 SAT 19 SINGAPORE SINGAPORE 01 20 N103 50 E 23:1711:17 0.9997 2 X 3.50 190 SAT 18 QUITO ECUADOR 00 25 S78 30 W 11:2223:22 1.0000 2 X 3.50 191 SAT 18 NAIROBI KENIA 01 20 S37 00 E 03:4115:40 0.9997 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.64 192.5 SAT 18 SUVA FIJI 18 00 S178 50 E 18:1306:13 0.9511 2 X 3.68 192 FRI 17 / 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193	THU 16 / 17	LOS ANGELES CALIFORNIA	34 00 N118 15 W	14:0102:01	0.8299	2 X 4.22	194
FRI 17 PUEBLA MEJICO 18 00 N94 30 W 12:2600:26 0.9511 2 X 3.68 192.5 SAT 18 PORTOF SPAIN TRINIDAD 11 40 N61 30 W 10:1322:13 0.9793 2 X 3.58 192.5 SAT 19 SINGAPORE SINGAPORE 01 20 N103 50 E 23:1711:17 0.9997 2 X 3.50 190 SAT 18 QUITO ECUADOR 00 25 S78 30 W 11:2223:22 1.0000 2 X 3.50 191 SAT 18 NAIROBI KENIA 01 20 S37 00 E 03:4115:40 0.9997 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.64 192.5 SAT 18 / 19 SUVA FIJI 18 00 S178 50 E 18:1306:13 0.9511 2 X 3.68 192 FRI 17 / 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193	FRI 17 / 18	CAIRO E G Y P T	30 00 N31 15 E	04:0316:03	0.8660	2 X 4.04	193
SAT 18 PORTOF SPAIN TRINIDAD 11 40 N61 30 W 10:1322:13 0.9793 2 X 3.58 192.5 SAT 19 SINGAPORE SINGAPORE 01 20 N103 50 E 23:1711:17 0.9997 2 X 3.50 190 SAT 18 QUITO ECUADOR 00 25 S78 30 W 11:2223:22 1.0000 2 X 3.50 191 SAT 18 NAIROBI KENIA 01 20 S37 00 E 03:4115:40 0.9997 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.64 192.5 SAT 18 / 19 SUVA FIJI 18 00 S178 50 E 18:1306:13 0.9511 2 X 3.68 192 FRI 17 / 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193	FRI 17 / 18	MUMBAI INDIA	19 00 N72 40 E	01:2113:21	0.9455	2 X 3.70	191.5
SAT 19 SINGAPORE SINGAPORE 01 20 N103 50 E 23:1711:17 0.9997 2 X 3.50 190 SAT 18 QUITO ECUADOR 00 25 S78 30 W 11:2223:22 1.0000 2 X 3.50 191 SAT 18 NAIROBI KENIA 01 20 S37 00 E 03:4115:40 0.9997 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.64 192.5 SAT 18 / 19 SUVA FIJI 18 00 S178 50 E 18:1306:13 0.9511 2 X 3.68 192 FRI 17 / 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193	FRI 17	PUEBLA MEJICO	18 00 N94 30 W	12:2600:26	0.9511	2 X 3.68	192.5
SAT 18 QUITO ECUADOR 00 25 S78 30 W 11:2223:22 1.0000 2 X 3.50 191 SAT 18 NAIROBI KENIA 01 20 S37 00 E 03:4115:40 0.9997 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.64 192.5 SAT 18 / 19 SUVA FIJI 18 00 S178 50 E 18:1306:13 0.9511 2 X 3.68 192 FRI 17 / 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193	SAT 18	PORT of SPAIN TRINIDAD	11 40 N61 30 W	10:1322:13	0.9793	2 X 3.58	192.5
SAT 18 NAIROBI KENIA 01 20 S37 00 E 03:4115:40 0.9997 2 X 3.50 191 SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.64 192.5 SAT 18 / 19 SUVA FIJI 18 00 S178 50 E 18:1306:13 0.9511 2 X 3.68 192 FRI 17 / 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193	SAT 19	SINGAPORE SINGAPORE	01 20 N103 50 E	23:1711:17	0.9997	2 X 3.50	190
SAT 18 BRASILIA BRASIL 16 00 S48 00 W 09:2021:20 0.9613 2 X 3.64 192.5 SAT 18 / 19 SUVA FIJI 18 00 S178 50 E 18:1306:13 0.9511 2 X 3.68 192 FRI 17 / 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193	SAT 18	QUITO E C U A D O R	00 25 S78 30 W	1 1 : 2 22 3 : 2 2	1.0000	2 X 3.50	191
SAT 18 / 19 SUVA FIJI 18 00 S178 50 E 18:1306:13 0.9511 2 X 3.68 192 FRI 17 / 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193	SAT 18	NAIROBI KENIA	01 20 S37 00 E	03:4115:40	0.9997	2 X 3.50	191
FRI 17 / 18 DURBAN STH AFRICA 30 00 S31 00 E 04:0416:04 0.8660 2 X 4.04 193	SAT 18	BRASILIA BRASIL	16 00 S48 00 W	09:2021:20	0.9613	2 X 3.64	192.5
	SAT 18 / 19	SUVA FIJI	18 00 S178 50 E	18:1306:13	0.9511	2 X 3.68	192
THU 16 SYDNEY AUSTRALIA 33 52 S151 15 F 20.03 08.03 0 8300 2 X 4 22 193 5	FRI 17 / 18	DURBAN STH AFRICA	30 00 S31 00 E	0 4 : 0 41 6 : 0 4	0.8660	2 X 4.04	193
=	THU 16	SYDNEY AUSTRALIA	33 52 S151 15 E	20:0308:03	0.8300	2 X 4.22	193.5
FRI 17 BUENOSAIRESA R G E N T I NA 34 37 S58 22 W 10:0122:01 0.8230 2 X 4.26 193	FRI 17	BUENOSAIRESA R G E N T I NA	34 37 S58 22 W	10:0122:01	0.8230	2 X 4.26	193
THU 16 AUCKLAND N. ZEALAND 36 50 S174 45 E 18:2906:29 0.8000 2 x 4.35 193		AUCKLAND N. ZEALAND	36 50 S174 45 E	18:2906:29			193
THU 16 WELLINGTON N. ZEALAN D 41 20 S174 50 E 18:2906:29 0.7505 2 x 4.67 193			41 20 S174 50 E				193
THU 16 DUNEDIN N. ZEALAND 42 52 S170 50 E 18:4506:45 0.7400 2 x 4.75 193	THU 16	DUNEDIN N. ZEALAND	42 52 S170 50 E	18:4506:45	0.7400	2 x 4.75	193
WED 15 PUNTA ARENAS CHILE 53 10 S71 00 W 10:5322:52 0.5967 2 x 5.90 196			53 10 S71 00 W	10:5322:52		2 x 5.90	196

Origin: Hostal Centro Sol, Manzanares 7, 11005 ${\bf CADIZ}$, Spain,10 February, 2007.

THE FIRST DAY OF SPRING AND AUTUMN.

The "**EQUINOX DAY**" no longer occurs on the day with the Sun appearing for exactly twelve hours 00 minutes (and that has been so for about 400 years!).

The definition of the Equinox Date by the astronomers is suitable for viewing only on those occasions when there is *NO atmosphere*. (It is the time defined for the Sun to be overhead (at zenith) when appearing to pass over the Equator).

The atmosphere behaves like a weak lens on the level of the horizon, but is strong enough to make the Sun appear to be above the horizon for longer than the theory "without an atmosphere" allows. (The Sun can be seen for *some minutes over* twelve hours on that date - even at the Equator, where the "new" definition applies).

In March, the date for the *traditional, twelve-hour* "Equilux", as some describe it, is EARLIER as a consequence, by a number of days – the number depending on how far North or South is the latitude of the observer.

In September, that date is similarly LATER as a consequence, by a number of days. The variation in the DATE of the Equilux with latitude is principally a result of the angle at which the Sun approaches the horizon, either from below or above at dawn or dusk, and appears as a result of the degree of "refraction" by the atmospheric "lens".

The Sun, with few exceptions, is always visible from levels below the horizon about the dates of the Equinox, when it has or will travel an equivalent of a vertical "distance or time" of 3.50 to 4.00 minutes. The effective time or "distance" is longer because the Sun "moves" along the path defined by the angle just mentioned, until it has traversed that depth.

The Table shows by the results, that the time taken for the Sun to achieve the steps above, around the time of the Equinoxes, at the particular latitude of an observer, is inversely dependent on the COSINE of the latitude angle. (That is particularly clear for the situations of Quito and Oslo in the Table!). The Table is constructed on the assumption that 3.50 minutes divided by the cosine of the latitude is appropriate. (As a consequence of the large number of days difference between the two types of Equinox at high latitudes, that formula is not so accurate for very high locations, both North and South!).

Very often, observers having newspapers available for a city, or sometimes are located near a "web-camera" site on the internet, can find quotes for the sunrise and sunset times for the day of publication. (Do not confuse with times quoted for traffic lighting up and extinguishing times!).

If such times are available, then on the Equilux date the times will show virtually *identical minutes*! On the Official Equinox date, the times will differ by the "twice factor" shown on the Table.

Please inform colleagues who might find this of interest. "GOOD OBSERVING!"

William E G Plumtree, M. Phil. (Lond) 10 / 02 / 2007