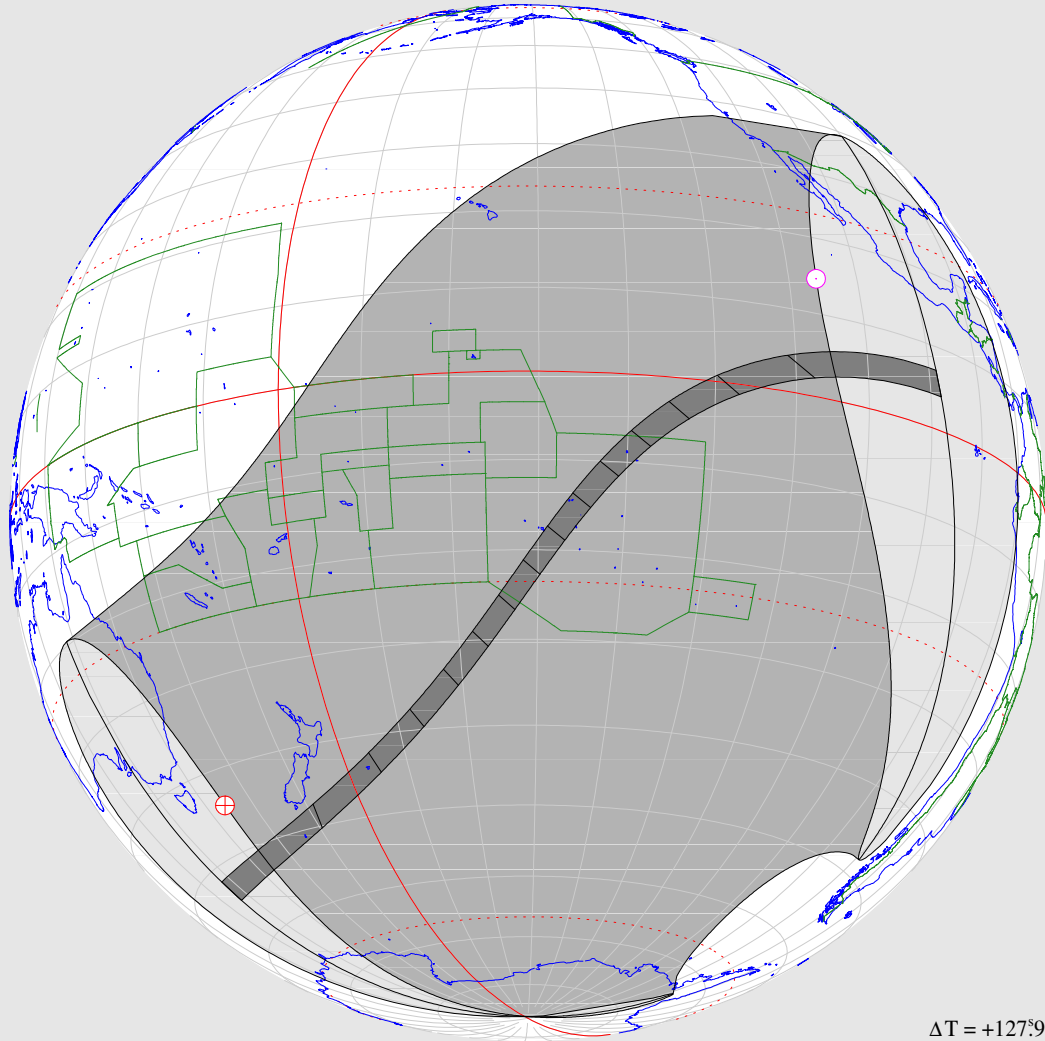


# I - Annular Eclipse of the Sun

2099 March 21-22



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$\Delta T = +127^{\text{s}}.9$   
Globe centred on W 151°2 and S 17°0

Circumstances	Time (UT)		Longitude		Latitude	
	h	m	°	'	°	'
⊕ Eclipse begins; first contact with Earth	19	52.7	E 154	09.6	S 44	12.3
Beginning of northern limit of penumbra	20	55.8	E 137	59.3	S 19	34.6
Beginning of northern limit of umbra	21	02.9	E 136	46.9	S 51	36.1
Beginning of centre line; central eclipse begins	21	04.2	E 136	31.4	S 53	06.2
Beginning of southern limit of umbra	21	05.4	E 136	14.9	S 54	37.3
Central eclipse at local apparent noon	22	25.8	W 154	43.6	S 26	55.6
Beginning of southern limit of penumbra	22	26.3	W 67	02.6	S 73	40.0
End of southern limit of penumbra	23	19.4	W 78	50.9	S 47	55.1
End of southern limit of umbra	0	39.6	W 98	08.6	N 4	01.3
End of centre line; central eclipse ends	0	40.9	W 98	26.5	N 5	32.2
End of northern limit of umbra	0	42.1	W 98	43.3	N 7	02.1
End of northern limit of penumbra	0	48.7	W 99	54.8	N 39	05.8
⊙ Eclipse ends; last contact with Earth	1	52.2	W 116	10.3	N 14	27.4