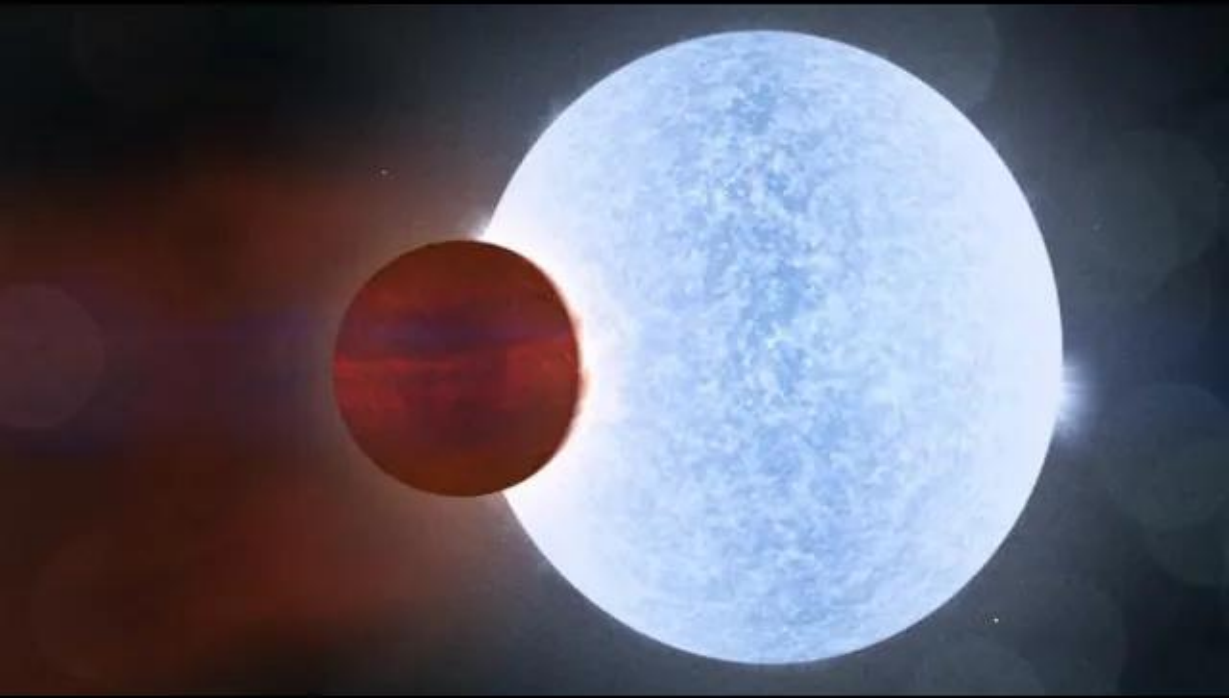

1
00:00:03,669 --> 00:00:01,589
[Music]

2
00:00:05,910 --> 00:00:03,679
this is celt9b

3
00:00:09,110 --> 00:00:05,920
it's about twice the size of jupiter and

4
00:00:11,030 --> 00:00:09,120
is always super hot taking only 36 hours

5
00:00:13,910 --> 00:00:11,040
to orbit its star

6
00:00:15,990 --> 00:00:13,920
it receives 44 000 times more energy

7
00:00:18,070 --> 00:00:16,000
than the sun delivers to earth making it

8
00:00:19,830 --> 00:00:18,080
one of the hottest planets known with a

9
00:00:21,830 --> 00:00:19,840
dayside temperature hotter than the

10
00:00:24,310 --> 00:00:21,840
surfaces of some stars

11
00:00:25,670 --> 00:00:24,320
this causes its atmosphere to boil away

12
00:00:26,470 --> 00:00:25,680
into space

13
00:00:28,630 --> 00:00:26,480

now

14
00:00:31,109 --> 00:00:28,640
thanks to observations from nasa's test

15
00:00:32,310 --> 00:00:31,119
satellite we know celt 9b is even

16
00:00:34,549 --> 00:00:32,320
weirder

17
00:00:36,470 --> 00:00:34,559
test spots dips in starlight whenever a

18
00:00:38,630 --> 00:00:36,480
planet passes in front of its star from

19
00:00:42,150 --> 00:00:38,640
our perspective astronomers call these

20
00:00:45,670 --> 00:00:42,160
dips transits but celt 9b's odd star

21
00:00:47,270 --> 00:00:45,680
complicates things it spins so fast it's

22
00:00:49,190 --> 00:00:47,280
squished into an oval

23
00:00:51,270 --> 00:00:49,200
this makes its poles hotter than its

24
00:00:52,950 --> 00:00:51,280
middle a property scientists call

25
00:00:55,590 --> 00:00:52,960
gravity darkening

26
00:00:57,189 --> 00:00:55,600
the planet's orbit also odd carries it

27
00:00:59,590 --> 00:00:57,199
over the star's poles

28
00:01:01,750 --> 00:00:59,600
combined these effects make the start of

29
00:01:04,070 --> 00:01:01,760
each transit different from its end

30
00:01:06,630 --> 00:01:04,080
making further study difficult

31
00:01:08,710 --> 00:01:06,640
a team led by nasa goddard scientists

32
00:01:10,469 --> 00:01:08,720
used test observations to disentangle

33
00:01:12,710 --> 00:01:10,479
these effects and provide further

34
00:01:15,030 --> 00:01:12,720
insight into the system

35
00:01:18,310 --> 00:01:15,040
the polar orbit and gravity darkening

36
00:01:20,230 --> 00:01:18,320
give celt 9b an unusual type of season

37
00:01:23,910 --> 00:01:20,240
summer occurs when it passes over the

38
00:01:25,510 --> 00:01:23,920

star's hot poles winter such as it is

39
00:01:28,469 --> 00:01:25,520
happens when it passes the cooler

40
00:01:30,469 --> 00:01:28,479
equator and for every 36 hour orbit

41
00:01:32,630 --> 00:01:30,479
which is kelt 9b's year

42
00:01:35,270 --> 00:01:32,640
the planet experiences these seasons

43
00:01:36,390 --> 00:01:35,280
twice and each is less than nine hours

44
00:01:37,990 --> 00:01:36,400
long

45
00:01:40,710 --> 00:01:38,000
scientists expect the frequently

46
00:01:42,469 --> 00:01:40,720
changing temperatures produce wild winds

47
00:01:43,910 --> 00:01:42,479
and they're busy modeling kelp 9b's

48
00:01:46,469 --> 00:01:43,920
atmosphere

49
00:01:49,030 --> 00:01:46,479
thanks to tess astronomers are equipped

50
00:01:53,320 --> 00:01:49,040
to learn more about this curious system