



***Dead Star Caught
Ripping Up Planetary System***

1
00:00:06,630 --> 00:00:03,350
when a star like our sun begins to die

2
00:00:08,870 --> 00:00:06,640
it expands into a bloated red giant star

3
00:00:10,310 --> 00:00:08,880
shedding mass by puffing off its outer

4
00:00:12,709 --> 00:00:10,320
layers

5
00:00:15,110 --> 00:00:12,719
this change alters the gravitational

6
00:00:17,830 --> 00:00:15,120
influence the star has on its planetary

7
00:00:20,310 --> 00:00:17,840
system the gravity of the remaining

8
00:00:22,870 --> 00:00:20,320
large planets can disrupt the orbits of

9
00:00:25,429 --> 00:00:22,880
small objects like asteroids comets and

10
00:00:27,910 --> 00:00:25,439
moons scattering them like pinballs in

11
00:00:29,349 --> 00:00:27,920
an arcade game into exaggerated oval

12
00:00:31,589 --> 00:00:29,359
orbits

13
00:00:34,389 --> 00:00:31,599

as the red giant star runs out of its

14

00:00:37,350 --> 00:00:34,399

nuclear fuel it begins to contract

15

00:00:38,790 --> 00:00:37,360

creating a compact white dwarf star no

16

00:00:40,869 --> 00:00:38,800

larger than earth

17

00:00:43,270 --> 00:00:40,879

the exaggerated orbits of the wayward

18

00:00:45,510 --> 00:00:43,280

objects may bring them very close to the

19

00:00:47,910 --> 00:00:45,520

star where they experience powerful

20

00:00:50,549 --> 00:00:47,920

tidal forces that tear them apart

21

00:00:52,950 --> 00:00:50,559

creating a gas and dust disk around the

22

00:00:55,029 --> 00:00:52,960

white dwarf that eventually falls onto

23

00:00:57,270 --> 00:00:55,039

the star's surface

24

00:00:58,869 --> 00:00:57,280

five billion years from now when our sun

25

00:01:01,430 --> 00:00:58,879

is at the end of its life

26

00:01:03,830 --> 00:01:01,440

mercury venus and earth will likely be

27

00:01:05,350 --> 00:01:03,840

completely vaporized as the sun becomes

28

00:01:07,270 --> 00:01:05,360

a red giant

29

00:01:09,990 --> 00:01:07,280

the orbits of asteroids in the main

30

00:01:11,830 --> 00:01:10,000

asteroid belt will be altered eventually

31

00:01:13,750 --> 00:01:11,840

falling onto the white dwarf that our

32

00:01:15,590 --> 00:01:13,760

sun will become

33

00:01:18,230 --> 00:01:15,600

this scenario is exactly what is

34

00:01:19,710 --> 00:01:18,240

happening to a nearby white dwarf star

35

00:01:23,190 --> 00:01:19,720

named

36

00:01:25,910 --> 00:01:23,200

g23844 the star's death throws have so

37

00:01:28,310 --> 00:01:25,920

violently disrupted its planetary system

38

00:01:30,630 --> 00:01:28,320

that it is actively siphoning off debris

39

00:01:32,069 --> 00:01:30,640

from both the system's inner and outer

40

00:01:34,230 --> 00:01:32,079

reaches

41

00:01:36,390 --> 00:01:34,240

using archival data from hubble and

42

00:01:38,469 --> 00:01:36,400

other nasa space observatories

43

00:01:40,710 --> 00:01:38,479

astronomers have for the first time

44

00:01:44,149 --> 00:01:40,720

observed a white dwarf star consuming

45

00:01:46,630 --> 00:01:44,159

both rocky metallic and icy material

46

00:01:49,190 --> 00:01:46,640

the findings are intriguing because icy

47

00:01:52,149 --> 00:01:49,200

bodies are credited with irrigating dry

48

00:01:54,069 --> 00:01:52,159

rocky planets billions of years ago

49

00:01:56,789 --> 00:01:54,079

comets and asteroids are thought to have

50

00:01:58,950 --> 00:01:56,799

hit our planet delivering water and

51
00:02:00,630 --> 00:01:58,960
sparking the conditions necessary for

52
00:02:02,630 --> 00:02:00,640
life as we know it

53
00:02:04,789 --> 00:02:02,640
the makeup of the bodies raining onto

54
00:02:06,870 --> 00:02:04,799
the white dwarf implies that icy

55
00:02:08,949 --> 00:02:06,880
reservoirs might be common among

56
00:02:11,029 --> 00:02:08,959
planetary systems

57
00:02:13,030 --> 00:02:11,039
this white dwarf provides a unique

58
00:02:14,949 --> 00:02:13,040
opportunity to take distant planets

59
00:02:16,790 --> 00:02:14,959
apart and see what they were made of

60
00:02:17,750 --> 00:02:16,800
when they were first formed around the

61
00:02:19,910 --> 00:02:17,760
star

62
00:02:22,020 --> 00:02:19,920
letting us better understand what makes