
Visible light image
by Hubble Space Telescope

1
00:00:06,630 --> 00:00:03,750
what's up for november

2
00:00:08,629 --> 00:00:06,640
the crab nebula hello and welcome i'm

3
00:00:10,470 --> 00:00:08,639
jane houston jones at nasa's jet

4
00:00:12,549 --> 00:00:10,480
propulsion laboratory in pasadena

5
00:00:14,709 --> 00:00:12,559
california

6
00:00:15,669 --> 00:00:14,719
2009 is the international year of

7
00:00:17,510 --> 00:00:15,679
astronomy

8
00:00:18,950 --> 00:00:17,520
and this month's special viewing target

9
00:00:21,269 --> 00:00:18,960
is the crab nebula

10
00:00:24,550 --> 00:00:21,279
the only supernova remnant that's easy

11
00:00:27,589 --> 00:00:24,560
to see from a modest telescope

12
00:00:29,589 --> 00:00:27,599
in 1758 charles messier was scanning the

13
00:00:32,310 --> 00:00:29,599

skies for comet halley

14
00:00:33,750 --> 00:00:32,320
he noticed a whitish light shaped like

15
00:00:35,750 --> 00:00:33,760
the flame of a candle in the

16
00:00:37,830 --> 00:00:35,760
constellation taurus

17
00:00:39,190 --> 00:00:37,840
he soon noticed it wasn't moving against

18
00:00:42,709 --> 00:00:39,200
the background stars

19
00:00:45,350 --> 00:00:42,719
so it couldn't be the comet m1

20
00:00:46,470 --> 00:00:45,360
became the first entry in his catalog of

21
00:00:50,549 --> 00:00:46,480
110

22
00:00:56,790 --> 00:00:53,270
this object was discovered in 1731 by

23
00:00:59,430 --> 00:00:56,800
english amateur astronomer john beavis

24
00:01:00,150 --> 00:00:59,440
and sketched by irish astronomer william

25
00:01:03,430 --> 00:01:00,160
parsons

26
00:01:05,429 --> 00:01:03,440
the third earl of ross in 1844

27
00:01:06,870 --> 00:01:05,439
through his big 36-inch reflector

28
00:01:09,190 --> 00:01:06,880
telescope

29
00:01:12,070 --> 00:01:09,200
his sketch resembled a crab and the name

30
00:01:13,830 --> 00:01:12,080
crab nebula stuck

31
00:01:15,109 --> 00:01:13,840
the history of this object goes back

32
00:01:17,590 --> 00:01:15,119
even further

33
00:01:20,310 --> 00:01:17,600
a guest star was visible in the summer

34
00:01:22,390 --> 00:01:20,320
sky of 1054.

35
00:01:25,109 --> 00:01:22,400
ancient astronomers in both the old and

36
00:01:28,310 --> 00:01:25,119
new worlds documented a bright new star

37
00:01:29,910 --> 00:01:28,320
in the daytime sky it was a supernova in

38
00:01:32,230 --> 00:01:29,920

the constellation taurus

39
00:01:34,870 --> 00:01:32,240
and was visible with the unaided eye for

40
00:01:37,670 --> 00:01:34,880
nearly two years

41
00:01:39,910 --> 00:01:37,680
in the 1940s the 100-inch hooker

42
00:01:41,190 --> 00:01:39,920
telescope at mount wilson was used to

43
00:01:43,429 --> 00:01:41,200
compute back

44
00:01:44,789 --> 00:01:43,439
to when the crab nebula first began to

45
00:01:47,030 --> 00:01:44,799
expand

46
00:01:49,270 --> 00:01:47,040
it began near the time of the supernova

47
00:01:51,350 --> 00:01:49,280
of 1054.

48
00:01:52,870 --> 00:01:51,360
at the center of the nebula is a rapidly

49
00:01:55,030 --> 00:01:52,880
spinning neutron star

50
00:01:58,230 --> 00:01:55,040
or pulsar which emits pulses of

51
00:02:01,030 --> 00:01:58,240
radiation 30 times a second

52
00:02:03,109 --> 00:02:01,040
in 1967 british astronomy graduate

53
00:02:05,350 --> 00:02:03,119
student jocelyn bell discovered this

54
00:02:07,510 --> 00:02:05,360
first pulsar

55
00:02:09,669 --> 00:02:07,520
three of nasa's great observatories show

56
00:02:13,430 --> 00:02:09,679
that the super dense neutron star

57
00:02:15,750 --> 00:02:13,440
is energizing the expanding nebula

58
00:02:17,670 --> 00:02:15,760
the chandra x-ray image traces the most

59
00:02:19,190 --> 00:02:17,680
energetic particles

60
00:02:21,270 --> 00:02:19,200
the white dot in the center is the

61
00:02:23,510 --> 00:02:21,280
pulsar

62
00:02:25,670 --> 00:02:23,520
spitzer's infrared image traces the

63
00:02:27,910 --> 00:02:25,680

cloud of electrons trapped within the

64
00:02:29,589 --> 00:02:27,920
star's magnetic field

65
00:02:31,589 --> 00:02:29,599
and the hubble telescope's image

66
00:02:33,750 --> 00:02:31,599
invisible light is one of the largest

67
00:02:36,229 --> 00:02:33,760
images taken by hubble's wide field and

68
00:02:38,390 --> 00:02:36,239
planetary camera 2.

69
00:02:40,229 --> 00:02:38,400
the crab nebula is faint but it can be

70
00:02:42,470 --> 00:02:40,239
seen with binoculars if your sky

71
00:02:44,790 --> 00:02:42,480
conditions are really good

72
00:02:47,430 --> 00:02:44,800
aim your binoculars at the red giant

73
00:02:49,270 --> 00:02:47,440
star aldebaran in taurus

74
00:02:51,350 --> 00:02:49,280
draw a straight line out to the

75
00:02:53,270 --> 00:02:51,360
southernmost of the bull's horns

76
00:02:55,270 --> 00:02:53,280
and the crab nebula is right next to

77
00:02:57,350 --> 00:02:55,280
that star

78
00:03:00,790 --> 00:02:57,360
you'll see a fuzzy patch shaped like the

79
00:03:04,949 --> 00:03:02,949
it's difficult but not impossible to see

80
00:03:05,990 --> 00:03:04,959
the faint neutron star within the crab

81
00:03:08,390 --> 00:03:06,000
nebula

82
00:03:10,790 --> 00:03:08,400
if you can see two stars the fainter of

83
00:03:12,390 --> 00:03:10,800
the two is the crab pulsar

84
00:03:13,990 --> 00:03:12,400
it's one of the few historically

85
00:03:16,390 --> 00:03:14,000
observed supernovae

86
00:03:18,550 --> 00:03:16,400
in our milky way galaxy so go out and

87
00:03:20,790 --> 00:03:18,560
try to see it

88
00:03:22,630 --> 00:03:20,800

on november 17th if you can get away

89
00:03:25,350 --> 00:03:22,640
from city lights you'll have a great

90
00:03:27,350 --> 00:03:25,360
view of the annual leonid meteor shower

91
00:03:30,070 --> 00:03:27,360
after midnight local time you should see

92
00:03:32,149 --> 00:03:30,080
lots of shooting stars

93
00:03:35,509 --> 00:03:32,159
you can learn all about nasa's missions

94
00:03:37,430 --> 00:03:35,519
at www.nasa.gov