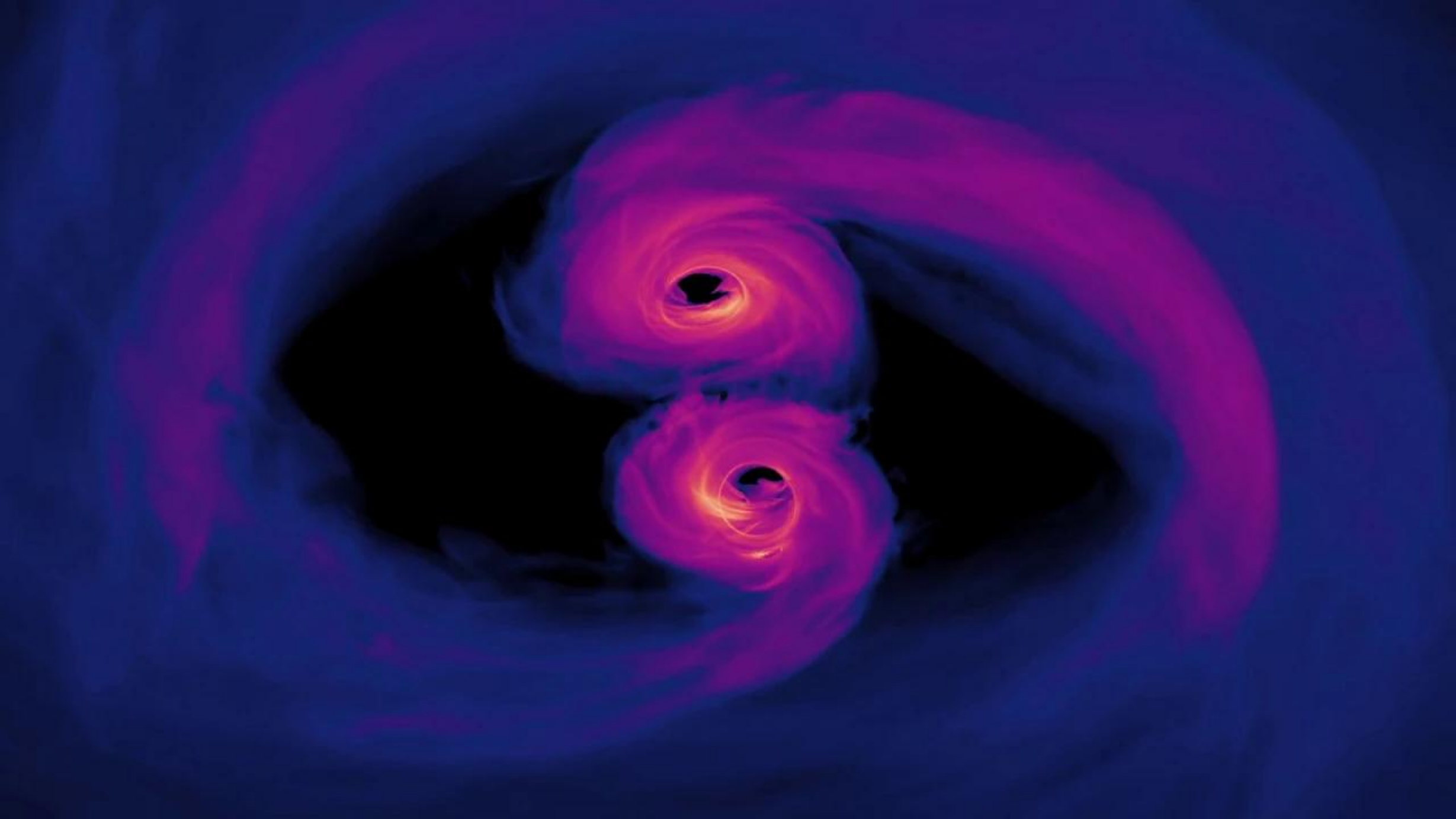

1
00:00:00,070 --> 00:00:05,160
[Music]

2
00:00:05,160 --> 00:00:11,270
This computer simulation shows two supermassive black holes orbiting each other.

3
00:00:11,270 --> 00:00:17,490
It's helping scientists learn what kind of light a real black hole binary system might produce.

4
00:00:17,490 --> 00:00:21,600
[Music]

5
00:00:21,600 --> 00:00:24,720
An outer ring of gas surrounds the whole system,

6
00:00:24,720 --> 00:00:27,840
and a mini disk surrounds each black hole.

7
00:00:27,840 --> 00:00:30,970
Streams of gas connect the disks.

8
00:00:30,970 --> 00:00:34,060
[Music]

9
00:00:34,060 --> 00:00:38,200
Magnetic and gravitational forces heat up the gas,

10
00:00:38,200 --> 00:00:47,400
Producing UV and X-ray light.

11
00:00:47,400 --> 00:00:49,470
[Music]

12
00:00:49,470 --> 00:00:53,550
The amount of gas flowing in the system

13
00:00:53,550 --> 00:00:57,530

and our viewing angle

14
00:00:57,530 --> 00:01:00,640
[Music]

15
00:01:00,640 --> 00:01:03,770
can alter what we'll see.

16
00:01:03,770 --> 00:01:05,930
[Music]

17
00:01:05,930 --> 00:01:10,000
Intense gravity bends space-time.

18
00:01:10,000 --> 00:01:15,110
The light follows a warped path and is distorted, as with a lens.

19
00:01:15,110 --> 00:01:22,290
[Music]

20
00:01:22,290 --> 00:01:27,350
This also creates an "eyebrow" next to one black hole

21
00:01:27,350 --> 00:01:32,430
caused by light from glowing gas immediately outside the other.

22
00:01:32,430 --> 00:01:34,600
[Music]

23
00:01:34,600 --> 00:01:40,760
Scientists haven't yet seen a supermassive black hole merger,

24
00:01:40,760 --> 00:01:46,880
but simulations like this are preparing them for what they'll find.

25
00:01:59,210 --> 00:01:53,010
[Music]

26
00:01:59,210 --> 00:02:03,230
NASA Astrophysics