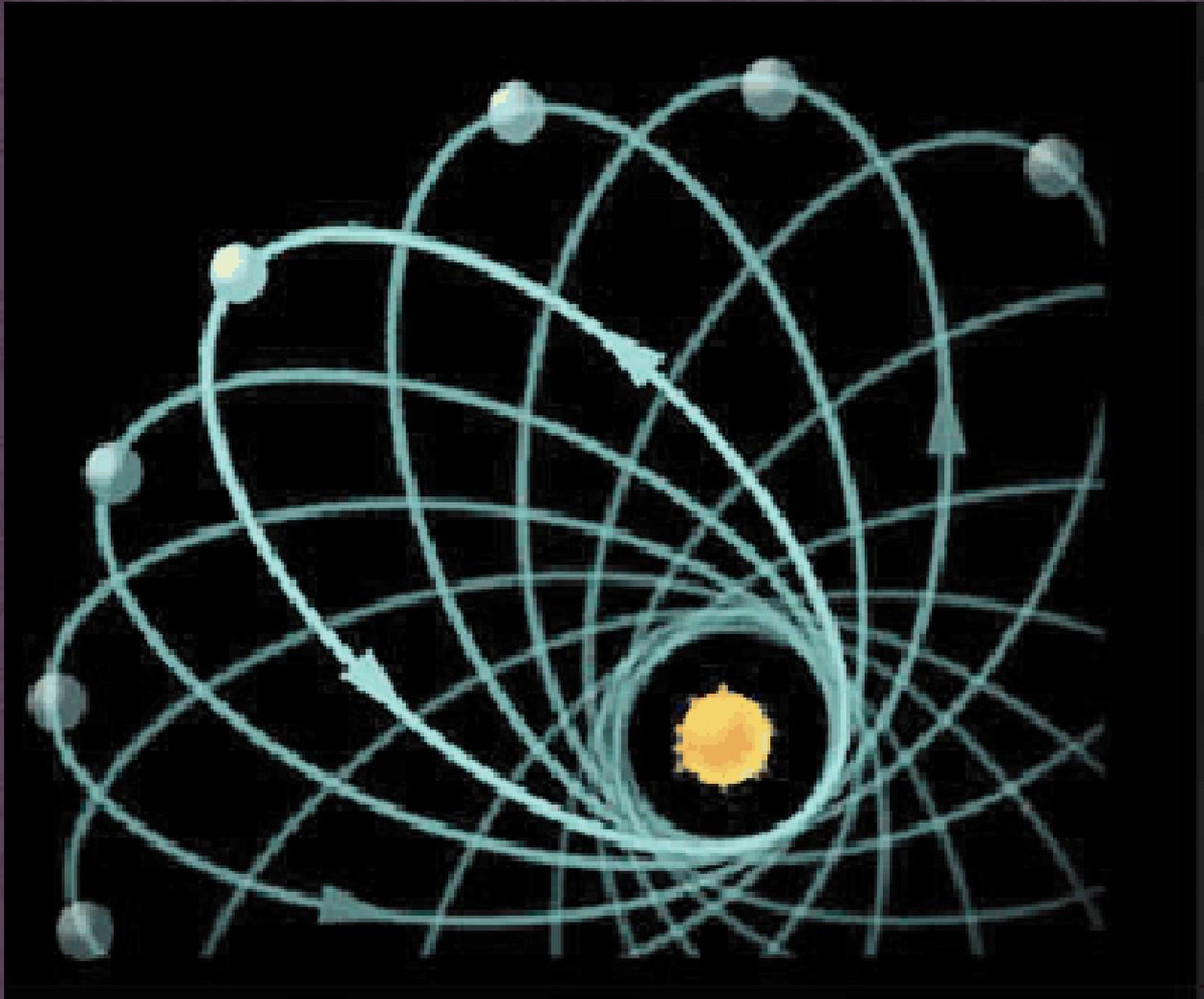


# Precession of Mercury's orbit around the Sun





# LIGHTS ALL ASKEW IN THE HEAVENS

Men of Science More or Less  
Agog Over Results of Eclipse  
Observations.

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EINSTEIN THEORY TRIUMPHS

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Stars Not Where They Seemed  
or Were Calculated to be,  
but Nobody Need Worry.

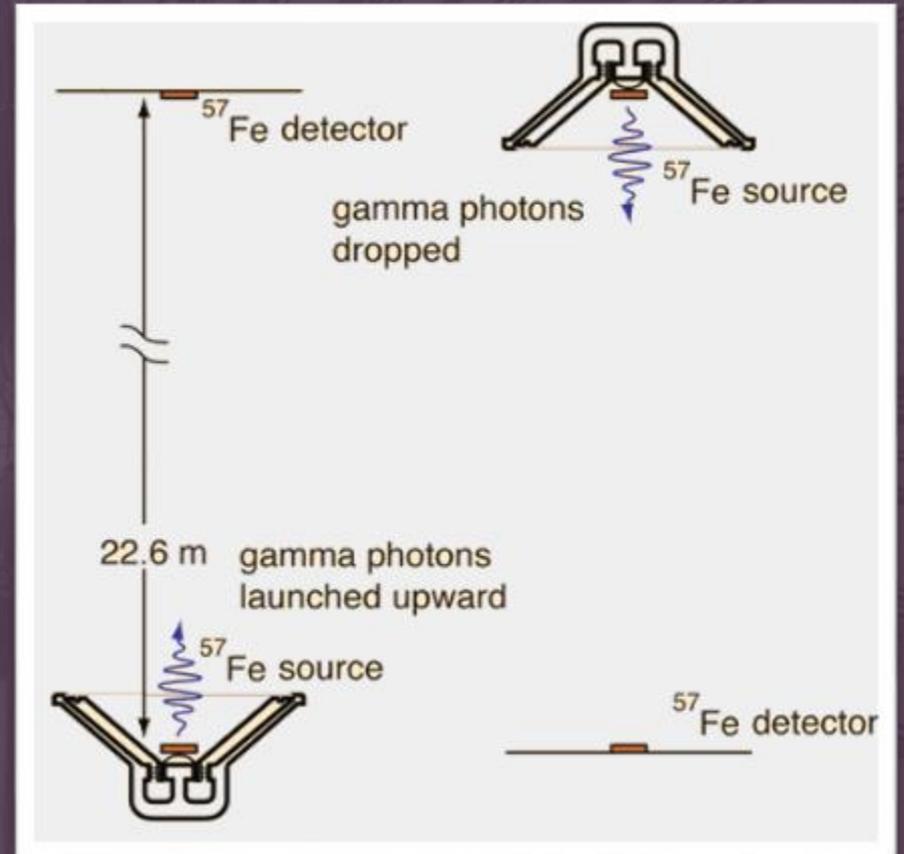
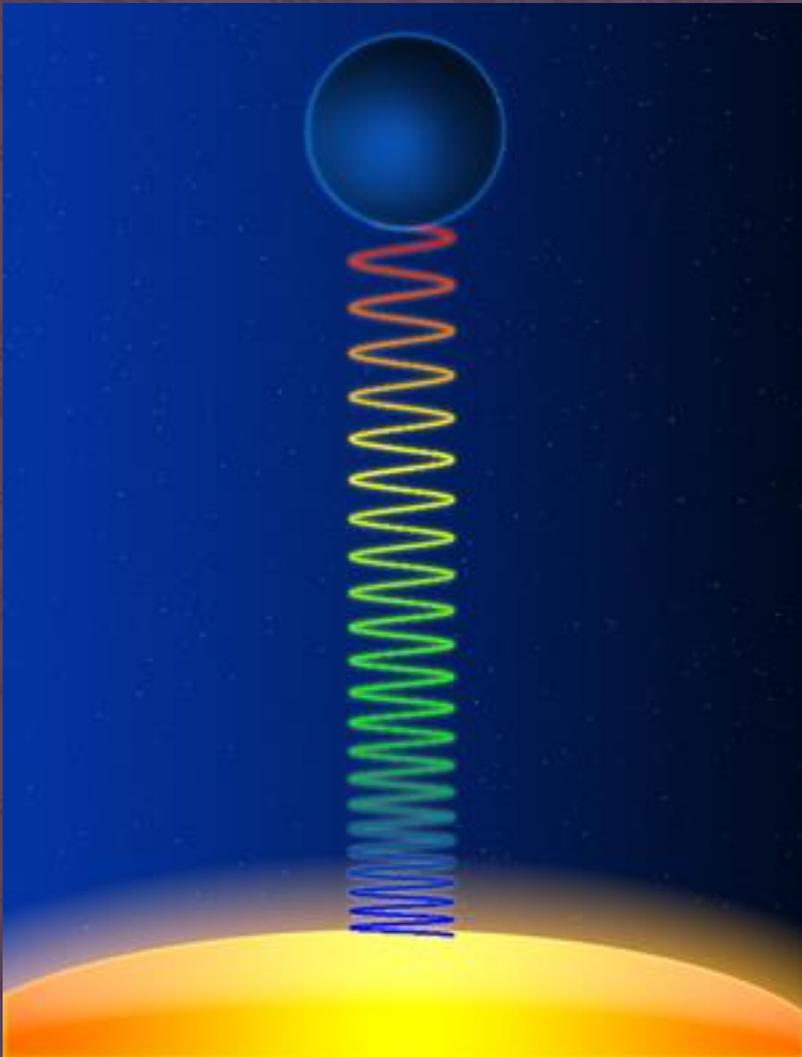
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A BOOK FOR 12 WISE MEN

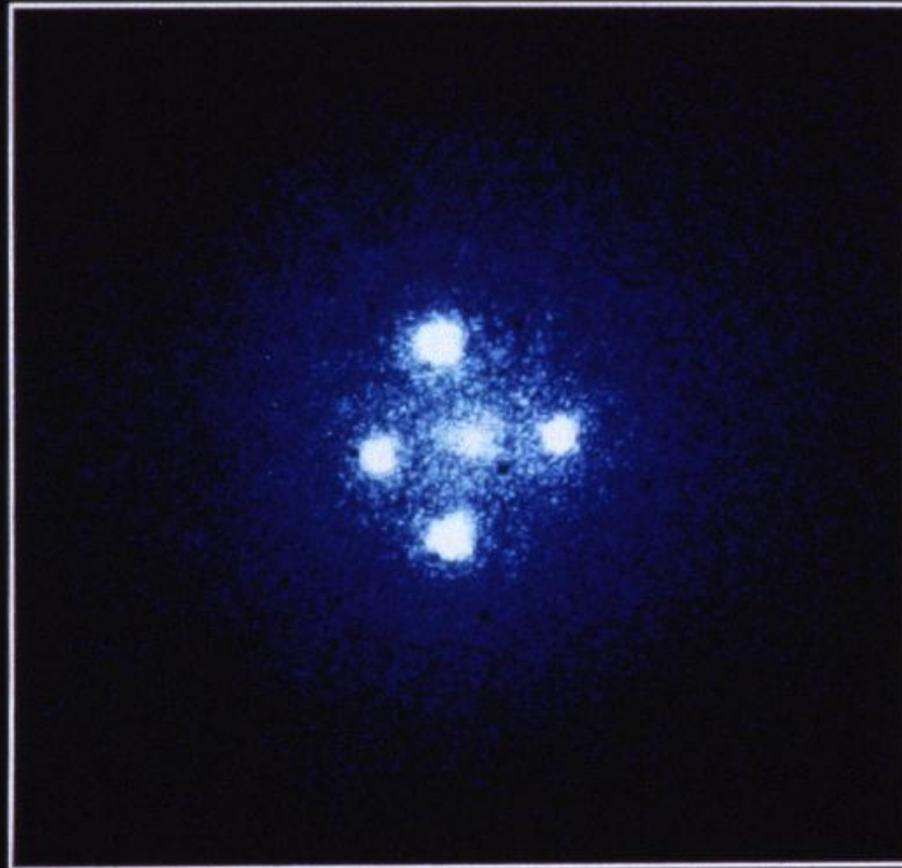
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No More in All the World Could  
Comprehend It, Said Einstein When  
His Daring Publishers Accepted It.

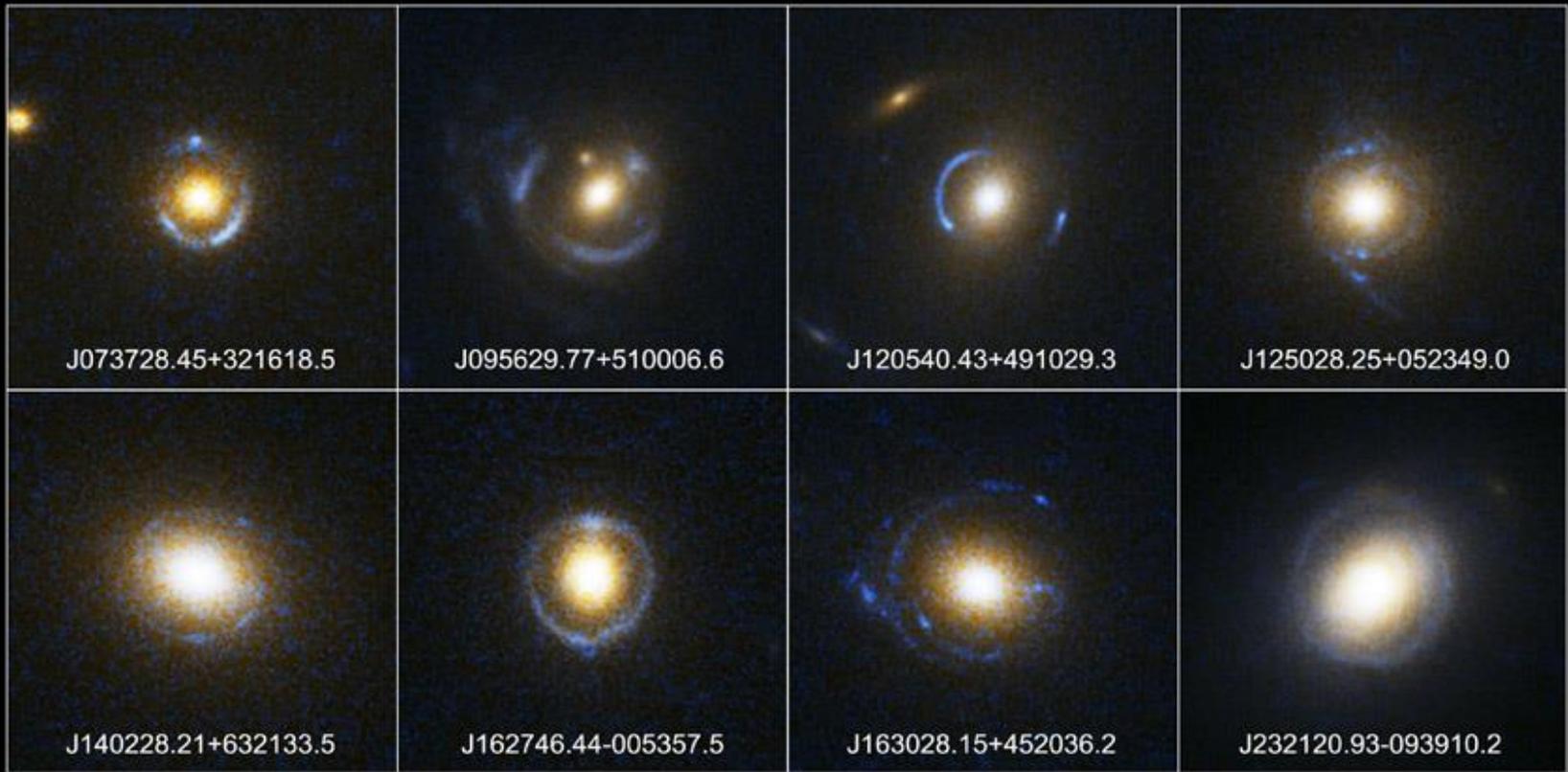
# Gravitational redshift



## Gravitational lenses



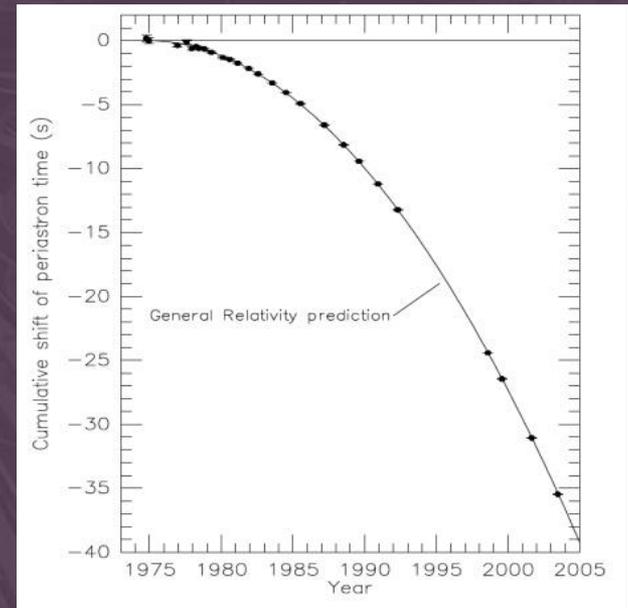
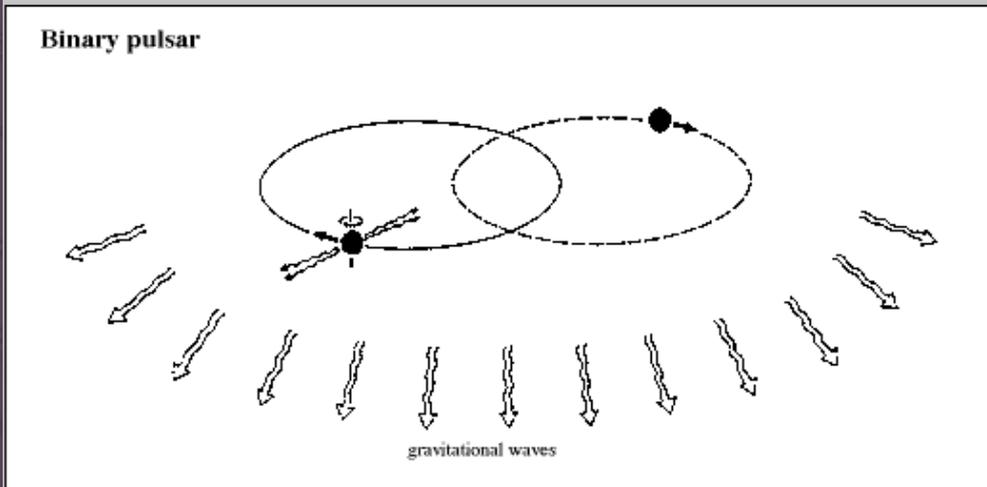
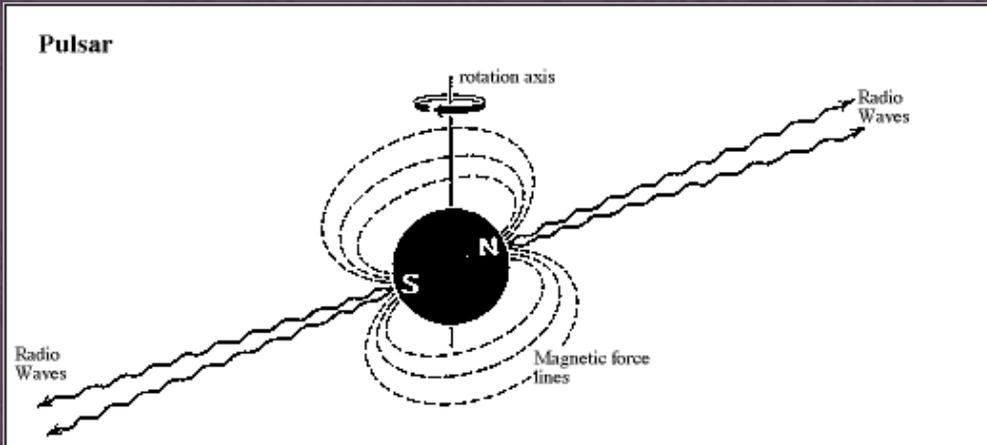
**Gravitational Lens G2237+0305**



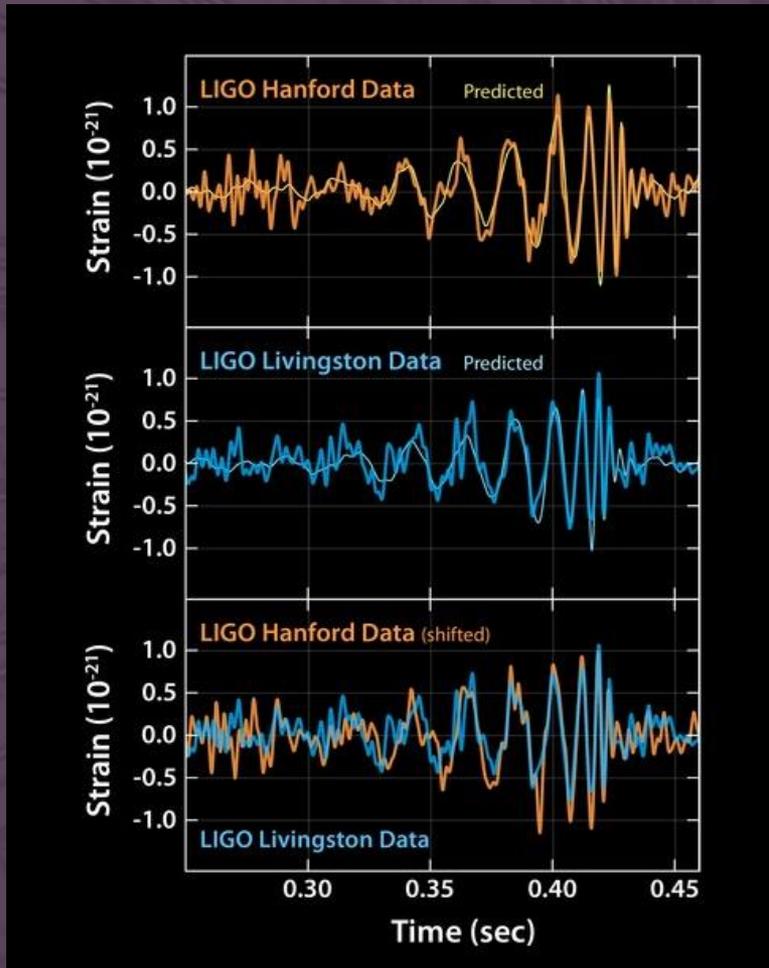
**Einstein Ring Gravitational Lenses**  
*Hubble Space Telescope • Advanced Camera for Surveys*



Orbit of binary pulsar (pair of neutron stars) shrinks as they emit gravitational waves that carry off energy.



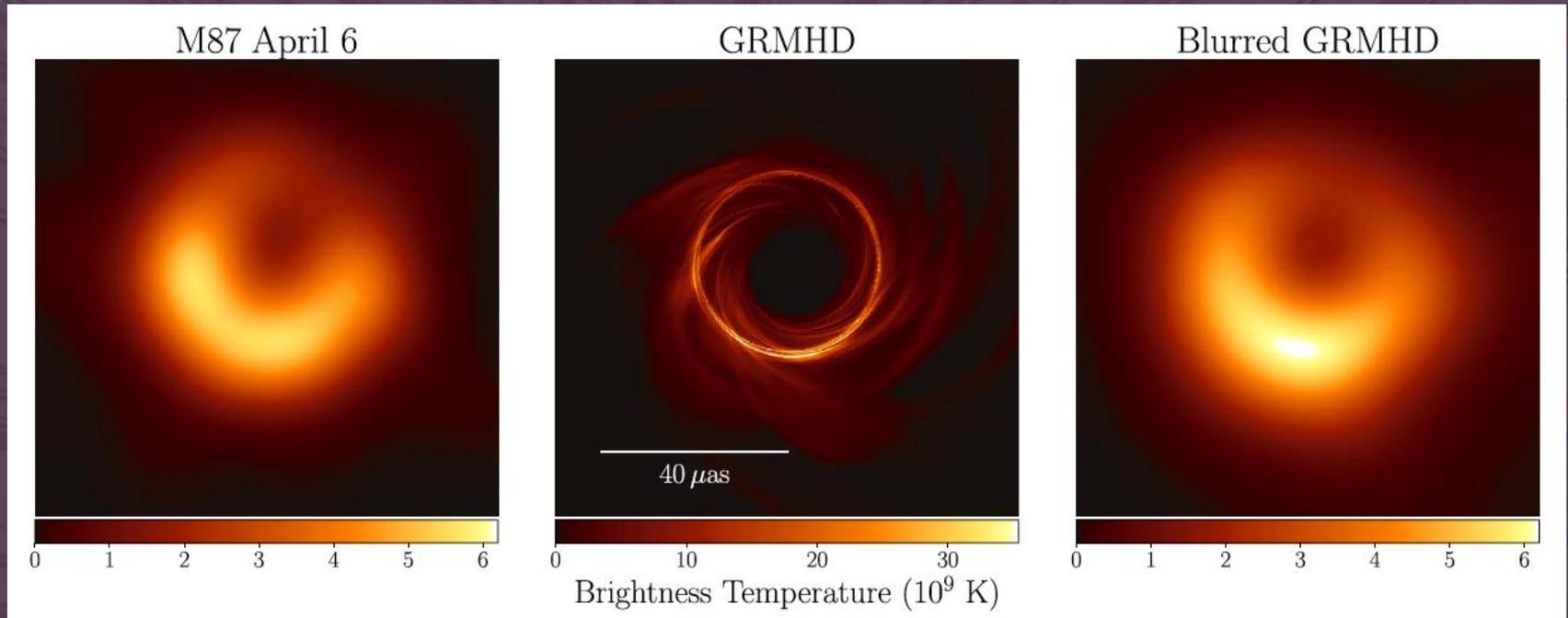
# Direct detection of gravitational waves from merging black holes



Observed image

Theoretically predicted image, perfect resolution

Theoretical image blurred to EHT resolution



Bright ring is the “photon ring” arising because light rays go many times around the black hole.

Asymmetry arises from “Doppler boosting” which makes emission from material moving towards us appear brighter. Requires gas moving close to the speed of light; approaching gas on the bottom of the ring.

Central black region is the shadow cast by the event horizon.