

## 披著神秘面紗的黑洞

黑洞是天文物理史上，最引人注目的題材之一，在科幻小說、電影甚至報章媒體經常可見將黑洞作為素材。

黑洞是根據廣義相對論所推論、在宇宙空間中存在的一種質量相當大的天體和星體。黑洞是由一個質量相當大的天體，在核能耗盡死亡後發生引力塌縮後形成。根據牛頓萬有引力定理，由於黑洞的第一宇宙速度過大甚至連光也逃逸不出來，故名黑洞。在此區域內的萬有引力非常強大，任何物質都不可能從此區域內逃逸出去，甚至光線都被它強大的引力拉回，因此黑洞不會發光，不能用天文望遠鏡看到，但天文學家可藉觀察黑洞周圍物質被吸引時的情況，找出黑洞位置。

當星體發生**超新星爆炸**時，中子之間強烈的互相排斥力量無法抵擋外界推擠力量，將中子星擠壓成更高密度狀態，同時在沒有其他力量足以抵擋如此強大壓力的情況下，整個星球會**不斷地縮小**，最終形成「黑洞」。<sup>[3]</sup>直至目前為止，所發現質量最小的黑洞大約有 3.8 倍太陽質量。



### 有沒有想過如果太陽變成黑洞呢？

如果太陽的質量壓縮到一個地球上的城鎮大小，它就會變成一個擁有無限大質量的黑洞。如果太陽“瞬間”塌陷為黑洞，地球上的生物會因為沒有能量而滅絕。然而，地球不會因此而毀滅，因為地球離太陽很遠，太陽直徑的變化不會影響地球的運轉，地球仍會依循現在的軌道繼續運行下去而不會有任何改變。然而，距離太陽較近的水星，其軌道則會因為太陽直徑的變化而受到影響。但是這件事不會實際發生。在她的文章中稱，很多黑洞僅僅是大質量恆星演化的重點，這些恆星的質量大部分都在太陽的 10 倍以上。就目前的太陽質量來說，還遠遠不夠形成黑洞。至少要到 50 億年以後，太陽才有可能變得越來越致密，才有可能成為黑洞。但是，由於太陽是不斷旋轉的，就算是有大量的能量流失，但是這種可能性依然很小。

## 7 AMAZING FACTS ABOUT BLACK HOLES

### Fact 1: You can't directly see a black hole.

Because a black hole is indeed “black” — no light can escape from it — it's impossible for us to sense the hole directly through our instruments, no matter what kind of electromagnetic radiation you use (light, X-rays, whatever.) The key is to look at the hole's *effects* on the nearby environment, points out [NASA](#). Say a star happens to get too close to the black hole, for example. The black hole naturally pulls on the star and rips it to shreds. When the matter from the star begins to bleed toward the black hole, it gets faster, gets hotter and glows brightly in X-rays.

**Fact 2: Look out! Our Milky Way(銀河系)likely has a black hole.**

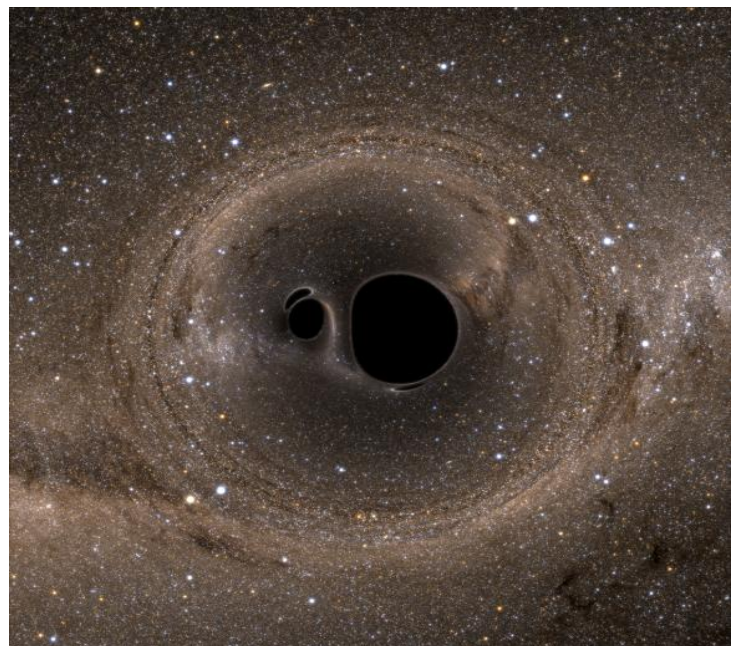
A natural next question is given how dangerous a black hole is, is Earth in any imminent danger of getting swallowed? The answer is no, astronomers say, although there is probably a huge supermassive black hole lurking in the middle of our galaxy. Luckily, we're nowhere near this monster — we are about two-thirds of the way out from the center, relative to the rest of our galaxy — but we can certainly observe its effects from afar. For example: the European Space Agency says it's four million times more massive than our Sun, and that it's surrounded by surprisingly hot gas.

**Fact 3: Dying stars create stellar black holes.**

Say you have a star that's about 20 times more massive than the Sun. Our Sun is going to end its life quietly; when its nuclear fuel burns out, it'll slowly fade into a white dwarf. That's not the case for far more massive stars. When those monsters run out of fuel, gravity will overwhelm the natural pressure the star maintains to keep its shape stable. When the pressure from nuclear reactions collapses, according to the Space Telescope Science Institute, gravity violently overwhelms and collapses the core and other layers are flung into space. This is called a supernova. The remaining core collapses into a singularity — a spot of infinite density and almost no volume. That's another name for a black hole.

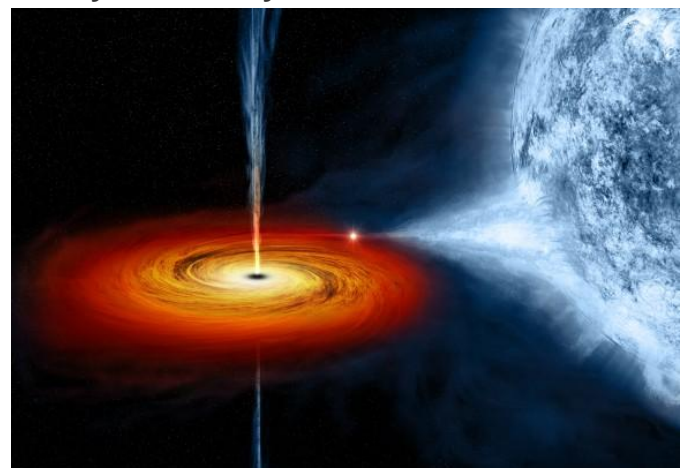
**Fact 4: Black holes come in a range of sizes.**

There are at least three types of black holes, NASA says, ranging from relative squeakers to those that dominate a galaxy's center. Primordial black holes are the smallest kinds, and range in size from one atom's size to a mountain's mass. Stellar black holes, the most common type, are up to 20 times more massive than our own Sun and are likely sprinkled in the dozens within the Milky Way. And then there are the gargantuan ones in the centers of galaxies, called "supermassive black holes." They're each more than one million times more massive than the Sun. How these beasts formed is still being examined.



**Fact 5: The first black hole wasn't discovered until X-ray astronomy was used.**

Cygnus X-1 was first found during balloon flights in the 1960s, but wasn't identified as a black hole for about another decade. According to NASA, the black hole is 10 times more massive to the Sun. Nearby is a blue supergiant star that is about 20 times more massive than the Sun, which is bleeding due to the black hole and creating X-ray emissions.



**Fact 6: The nearest black hole is likely not 1,600 light-years away.**

An erroneous measurement of V4641 Sagittarii led to a slew of news reports a few years back saying that the nearest black hole to Earth is astoundingly close, just 1,600 light-years away. Not close enough to be considered dangerous, but way closer than thought. Further research, however, shows that the black hole is likely further away than that. Looking at the rotation of its companion star, among other factors, yielded a 2014 result of [more than 20,000 light years](#).

**Fact 7: Black holes are only dangerous if you get too close.**

Like creatures behind a cage, it's okay to observe a black hole if you stay away from its event horizon — think of it like the gravitational field of a planet. This zone is the point of no return, when you're too close for any hope of rescue. But you can safely observe the black hole from outside of this arena. By extension, this means it's likely impossible for a black hole to swallow up everything in the Universe

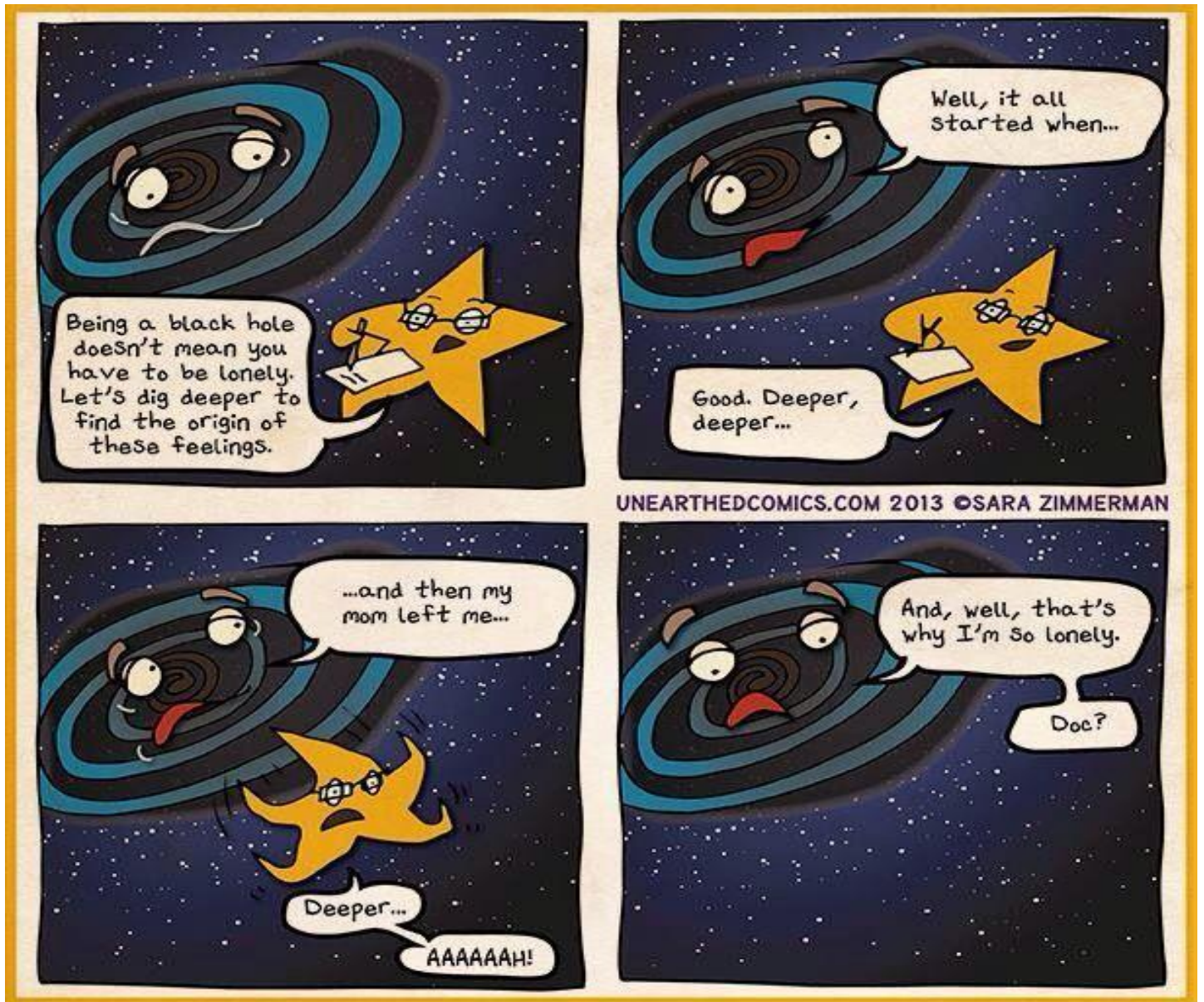
**QAQ RELAXING TIME! @W@**

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**ANS**

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# COMIC CORNER !!



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