

Bears find food in gardens of Rhode Island

Will Pavia New York

In back gardens in Rhode Island, recent attempts to feed the birds have been disrupted by the arrival of another diner who ate the lot in one sitting and came back later for seconds.

Bears, last seen in the state sometime before the arrival of the steam locomotive, have begun popping up in gardens guzzling bird seed. "Is it safe to put out my bird feeders?" wrote one resident, posting a video on social media featuring a young bear eating one of them.

In Hope Valley, about ten miles north of a coastline full of holiday resorts, another Rhode Islander complained that a bear had broken into his bee hives. One "is pretty much screwed", Jonathan Seavey wrote, in a message to a beekeeping group on Facebook. The large black bear was said to have returned on four consecutive days, destroying the beehive as well as six bird feeders on a neighbour's front lawn.

Black bears are thought to have been a common sight in New England when the Puritans settled there. Bears were hunted for their fur, or because they damaged crops, and are said to have disappeared by 1800 from what became one of the most densely populated states in the country. A few are thought to have ventured into Rhode Island as bear numbers revived in nearby states, encouraged by conservation initiatives and the abandonment of farmland.

"Now it's to the point where we can say we have a very small resident bear population," Charlie Brown, a state biologist, told the *Providence Journal*. His department has begun issuing warnings to residents to take down bird feeders in the spring, with a photograph of a bear chewing on one, "if you want to avoid visitors like this guy".



Cuddle time There was no social distancing for these koalas in the Australian Reptile Park in Somersby, New South Wales

Pre-nups now cover social media revenge

Will Pavia

For years young people from genteel parts of Massachusetts have gone to see a lawyer before they embark on marriage.

"The kinds of people who come into the office probably came into offices 50 years ago," Jonathan Fields, a family lawyer in Wellesley, outside Boston, said of those who want prenuptial agreements. "They are 25, their parents have huge estates."

Lately, however, clients of Fields and Dennis have arrived with new concerns, beyond those of protecting a family fortune. They want, for example, to protect their reputations on social media should matrimony end in acrimony. Other requests include whether frozen embryos can be used after divorce, binding statements on who owes what to which university, and who gets the dog.

"They don't want the one person to say nasty things about the other person," Mr Fields said of a generation weaned on social media. He tells his clients that this may be impossible to enforce, because of the free speech protections of the First Amendment.

But the request reflects one of a broad range of new concerns being written into prenuptial agreements.

Some have attributed the greater use of prenuptials to a broader cohort of young people whose parents divorced.

Jessica Marshall, a family lawyer in Chicago, has suggested that student debts and a tendency to marry later in life may also have caused couples to consider financial arrangements before tying the knot. In an article for *The National Law Review*, she said: "They would also like to ensure that debt is properly accounted for in a divorce."

'Oldest and biggest' black hole discovered in galaxy

United States

Jacqui Goddard Miami

Weighing as much as 100 billion suns and located in an environment where temperatures are thought to reach a sizzling 100 million Celsius, the object at the centre of the galaxy cluster Abell 2261 should, one might think, be fairly easy to find.

But a black hole thought to be located 2.7 billion light years from Earth has gone missing, posing a mystery for the astronomers scanning the universe for clues as to where it went. However, even as astronomers hunt for the missing black hole, other stargazers have detected a new one through the observation of a quasar — a swirling mass of light and matter circling a black hole — that they have named J0313-1806.

The quasar points to the existence of the most distant, supermassive black hole found to date. Located 13 billion light years away — a mere 690 million years after the Big Bang — it is 20 million years older than any black hole previously detected, and will, scientists believe, provide important insight into the formation of the universe and the immediate aftermath.

The quasar is 1,000 times brighter than the Milky Way and hides a black hole that weighs in at more than 1.6 billion times the mass of our sun.

Such findings stem from the pains-

taking study of millions of cosmic images. Joe Hennawi, of the team from University of California, Santa Barbara that made the discovery, said: "The success rate for finding these objects is around 1 per cent. You have to kiss a lot of frogs before finding your prince."

But Nasa is confident that the other



A quasar known as J0313-1806 may host the oldest black hole yet found

missing black hole will become evident. "Nearly every large galaxy in the universe contains a supermassive black hole in their centre," Nasa said in a statement. "Astronomers expect the galaxy in the centre of Abell 2261 to contain a supermassive black hole that rivals the heft of some of the largest known black holes in the universe."

"Despite searching with Nasa's Chandra x-ray observatory and Hubble space telescope, astronomers have no

evidence that a distant black hole estimated to weigh between three billion and 100 billion times the mass of the sun is anywhere to be found."

A black hole is an extremely dense object in space whose gravitational pull is so powerful that nothing dragged into it can escape, including light — meaning that it cannot be seen directly but can be detected through its effects on objects around it. There are two main classes of black hole: stellar-mass versions, which have between 5 and 20 times the mass of the sun, and which are formed when stars deplete their fuel and collapse; and supermassive black holes, which are found at the centre of large galaxies that weigh the equivalent of millions or even billions of suns.

A study led by astronomers at the University of Michigan considered the possibility that the black hole in Abell 2261 may have been ejected from the centre of the host galaxy by a violent merger with another galaxy. But "absence of evidence is not evidence of absence", they concluded.

The mystery of its whereabouts could be solved by the James Webb space telescope, which is due for launch in October after years of delay and budget overruns that have taken its cost to about \$10 billion. The JWST, as it is known, will peer deeper into the universe than any hardware has been able to do.

Wine aged in space tackles the gravity of climate change

Jacqui Goddard Miami

A case of wine and segments of grapevines have been flown millions of miles in space for a study that aims to adapt Earth's agriculture to the challenges of climate change.

The 12 bottles of red and 320 stems of merlot and cabernet sauvignon vines are part of a research programme that will help find answers to the question: "How will we grow quality food in tomorrow's harsher Earth conditions?"

"Wine and vine is like the canary in the coalmine, one of the most sensitive agricultural products, much more sensitive to climate change," Nicolas Gaume, co-founder and CEO of Space Cargo Unlimited, said.

The Luxembourg-based company's Mission WISE programme will study the changes in vines and the biological components of the wine when they are not subject to gravity.

The samples are en route to a laboratory in Bordeaux, France after splashing down off the coast of Florida last week in a SpaceX cargo capsule.

"We believe that this evaluation in space will give more strength to the plants — that they will be more resilient, more adaptive. We will replant them on Earth, grow them and measure how effective they are in reacting to stressors... If you can make it happen in a vine, you can make it happen to many other agricultural products," Mr Gaume said.

Climate change is behind challenges

for agriculture, such as increased salt levels in the soil that reduce yield.

A separate study published this week in the *Proceedings of the National Academy of Sciences*, in the US, predicts that if global temperatures rise by 2C viable wine-growing regions will shrink by 56 per cent globally with Italy, Spain and Australia suffering the largest losses.

The space-flown vines will be compared with specimens that stayed on Earth to identify any mutations that occurred during their period in microgravity and assess their potential.

"If you look at life over the last four billion years, we've had major evolution — for example temperatures going from the Ice Age to tropical climates, species dying and new species brought to life — and all those have had one constant, which is gravity. When you remove that constant, life changes," Mr Gaume said.

The research is similar to Nasa's Twins Study, launched in 2015, which compared the physical, molecular and cognitive profile of Scott Kelly, an astronaut who spent a year in space, with his identical Earth-bound twin Mark.

The wine was sent to the International Space Station in November 2019 in bottles that remained firmly off-limits to the crew. Mr Gaume will join renowned wine experts in sampling the bottles next month. He said wine was sent to space because it is simpler to study than the human body but is a liquid containing yeast and bacteria.