

## [Recording of the week: let it snow!](#)

*This week's selection comes from Cheryl Tipp, Curator of Wildlife and Environmental Sounds*

There's nothing quite like the sound of walking through freshly fallen snow. This particular recording was made in the Kentish village of Knockholt, just after midnight on the 3rd February 2009. This signalled the start of a prolonged period of heavy snowfall that was to see most of the British Isles grind to a halt, forcing schools, railway lines and even airports to close because of the treacherous conditions.

[Footsteps in the snow, 3 Feb 2009, Kent, United Kingdom, Phil Riddett](#)



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## [74 tourism websites closed for violations](#)

A total of 74 tourism websites have been closed in a nationwide campaign that began in September, according to China's Internet regulator.

Violations included failure to register in accordance with law, counterfeiting legal tourism websites, and disseminating illegal content involving gambling and pornography, said a statement issued by the Cyberspace Administration of China.

The administration called on consumers to choose tourism products through legal websites and encouraged the public to report violations.

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## [Allies, friends and trade partners](#)

A country needs good allies, some friendly countries and many trade partners.

A country cannot run its allies or control their governments. It can try to

influence them, and work to common standards. I think the USA is a strong enough democracy to sort out the concerns about the temporary travel ban. It has already been modified following court and political action. The Vice President himself called the original version unconstitutional.

It is not feasible for a country to provide a permanent running commentary on all the decisions and views of all its allies and certainly not of all its trading partners. There are many features of undemocratic regimes we do not like, yet we carry on trading with them. Some of us did not like the USA's use of Guantanamo Bay for detention without charge or trial, but we kept our stance as an ally of Mr Obama's USA. A UK company has recently signed a contract to supply arms to Turkey, a NATO ally. Are we happy with all Turkey's policies? The EU has been helping Turkey build frontier walls. Are we content with that? That after all is being done our money and in our name as an EU member.

Today many say we have to take a further view on Mr Trump's policies. What do you think the UK should say and do?

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## [Researcher unveils time crystal as new form of matter](#)

A University of California, Berkeley, researcher has described how to make and measure the properties of a crystal that have a structure that repeats in time, namely a time crystal.

Norman Yao, a UC Berkeley assistant professor of physics, has also predicted what the various phases surrounding the time crystal should be akin to the liquid and gas phases of ice in a paper published online recently in the journal *Physical Review Letters*.

While conventional crystals have an atomic structure that repeats in space, like the carbon lattice of a diamond, time crystals repeat in time because they are kicked periodically, sort of like tapping Jell-O repeatedly to get it to jiggle, Yao was quoted as saying in a news release from UC Berkeley.

The breakthrough, Yao argued, is less that these particular crystals repeat in time than that they are the first of a large class of new materials that are intrinsically out of equilibrium, unable to settle down to the motionless equilibrium of, for example, a diamond or ruby. "This is a new phase of matter, period, but it is also really cool because it is one of the first examples of non-equilibrium matter," he said. "For the last half-century, we have been exploring equilibrium matter, like metals and insulators. We are just now starting to explore a whole new landscape of non-equilibrium matter."

Two groups followed Yao's blueprint and have already created the first-ever time crystals. The groups at the University of Maryland and Harvard University reported their successes, using two totally different setups, in two papers posted online last year, both with Yao as a co-author.

Time crystals were first proposed in 2012 by Nobel laureate Frank Wilczek, and last year theoretical physicists at Princeton University and UC Santa Barbara's Station Q independently proved that such a crystal could be made. According to Yao, the UC Berkeley group was "the bridge between the theoretical idea and the experimental implementation."

The time crystal created by Chris Monroe and his colleagues at the University of Maryland employs a conga line of 10 ytterbium ions whose electron spins interact, similar to the qubit systems being tested as quantum computers. To keep the ions out of equilibrium, the researchers alternately hit them with one laser to create an effective magnetic field and a second laser to partially flip the spins of the atoms, repeating the sequence many times.

As the spins interacted, the atoms settled into a stable, repetitive pattern of spin flipping that defines a crystal.

Yao worked closely with Monroe as his Maryland team made the new material, helping them focus on the important properties to measure to confirm that the material was in fact a stable or rigid time crystal. Yao also described how the time crystal would change phase, like an ice cube melting, under different magnetic fields and laser pulsing.

From the perspective of quantum mechanics, electrons can form crystals that do not match the underlying spatial translation symmetry of the orderly, three-dimensional array of atoms, Yao said. This breaks the symmetry of the material and leads to unique and stable properties we define as a crystal. A time crystal breaks time symmetry. In this particular case, the magnetic field and laser periodically driving the ytterbium atoms produce a repetition in the system at twice the period of the drivers, something that would not occur in a normal system.

"Wouldn't it be super weird if you jiggled the Jell-O and found that somehow it responded at a different period?" Yao said. "But that is the essence of the time crystal. You have some periodic driver that has a period 'T', but the system somehow synchronizes so that you observe the system oscillating with a period that is larger than 'T'."

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**[Toddler rescued 15 hours after abduction prior to NYE](#)**

A boy is seen taken away by a woman in this surveillance video.  
[Photo/Weibo]

A three-year-old boy was rescued by police just 15 hours after he was kidnapped by a woman on Thursday, two days before the Spring Festival.

A Shenzhen resident surnamed Zhao reported shortly after 17:00 on Thursday that his son had gone missing while playing near home. The family searched for him for over an hour but could not find him.

The local police found via surveillance video that shortly after 15:40 the boy was taken away in a taxi by a middle-aged woman, whom the family did not know.

The police identified the woman as 34-year-old migrant worker from Guangxi Zhuang autonomous region. She was unemployed and lived in a hotel in Shenzhen. When the police arrived at her hotel, they found that the woman surnamed Wei took the boy to the hotel but had checked out and left.

Police found that Wei appeared at the Luohu Railway Station in Shenzhen shortly after 17:00 and they concluded that she had left Shenzhen by train. With help from railway police, they found that Wei boarded a train with the boy to Wuchang, Hubei province, at 18:00.

Wei was spotted on the train. When the train arrived in Wuchang shortly after 6 am Friday, the police arrested the woman and rescued the boy.

Wei said she took the boy to fake as her own son to repair the relationship with her former boyfriend. Wei gave birth to a boy in 2015 in Shenzhen, who died shortly after. Wei broke up with her boyfriend soon after the birth however the boyfriend was unaware of the baby's death. This year she wanted to meet her ex-boyfriend in Hubei for Spring Festival.