

# Choreographer Of Northern Lights Revealed

The gracefully flitting symphony of lights that color polar skies has its very own high-energy choreographer.

Astronomers have long puzzled over the invisible forces at work that give rise to the auroras--bright glows observed in the night sky, usually in the polar zone called Northern Lights and Southern Lights. New measurements from a group of satellites reveal that conditions at boundaries between layers of electrified particles control the lights.

Researchers knew that relatively static electric fields, which hover parallel to Earth's magnetic fields, play an important role in the acceleration of electrons that causes auroras to shine, SPACE.com reports.

The electric potential structures come in two flavors: symmetric U-shaped and asymmetric S-shaped. In 2004, Marklund discovered the U-shaped circuits form at a plasma boundary between a region within



Aurora borealis or northern lights, a glow powered by energetic particles at the edge of space. In the background are familiar stars of the northern sky.

the magnetotail at equatorial latitudes and one at higher latitudes. The S-shapes occur at the boundary between the plasma sheet (at the inner edge of the auroral oval) and the polar cap.

A group of four spacecraft, part of the European Space Agency's Cluster mission, orbiting in a triangular pyramid formation provided a behind-the-scenes look at an aurora's

choreographer.

As expected, it detected the U-shaped structure when crossing the boundary within the plasma sheet. Just 16 minutes later another Cluster spacecraft crossed the same boundary and revealed an asymmetric S-shaped structure, which was a surprise since the S-shape was thought to arise at the polar cap boundary.

So the shape morphing-

-concurrent with plasma and electric field conditions--strengthened Marklund's theory. "These results nicely demonstrate that the way the potential structure looks really reflects the plasma conditions and the electric current system," Marklund said. He added, "We don't know yet how long [the potential structures] last or how they are distributed in terms of altitude."

## Versatile Robots

They're not quite transformers, but new robots created by researchers at the University of Southern California are definitely more than meets the eye.

Called "superbots," they are made up of identical modular units that plug into each other to create robots that can walk on four legs like an animal or two like a human, crawl like a centipede, climb like a spider, wig-



SuperBot modular robotic units assemble into a circular structure able to roll like a wheel.

gle like a snake and even roll like a wheel, Live Science says.

"Superbot consists of Lego-like but autonomous robotic modules that can reconfigure into different systems for different tasks," explained Wei-Min Shen, a researcher involved in the robot's development. "This design allows flexible bending, docking and continuous rotation. A single module can move forward, back, left, right, flip-over and rotate as a wheel."

Each module contains its own power supply, sensors



Modular robotic units self-assembled into this structure able to walk on four legs.



SuperBot modular robotic units self assemble into larger structures, such as this humanoid walker assembly, and micro-controllers. They can communicate with one another and even reshuffle themselves.

## Color Determines Best Orange Juice

Color skews people's taste for orange juice more than a price tag, quality, or even its actual taste, a new study reveals.

According to Live Science, the color of orange juice influences what people say they taste and also impairs their ability to compare different tastes, according to the recent taste test. Color skews people's taste more than a price tag or the juice's actual quality.

Previous research has focused on people's preference for taste. Instead, University of British Columbia marketing professor JoAndrea Hoegg and colleagues focused on people's ability to distinguish among different juicy tastes.

When the researchers spooned sweetener into standard, unadulterated orange juice, testers could discern the difference between sweetened and unsweetened juice. But taste testers lost the ability to taste a difference when food coloring was added to darken them.

"Color totally dominated taste," said Hoegg, a specialist in visual effects who coauthored findings published in the March issue of the Journal of Consumer Research.

The big surprise came when the researchers did a blind taste test, with no brand labels, and found that the color of orange juice blinded people's taste buds to the point where they could not distin-

guish pure, fresh squeezed orange juice from a generic juice made from concentrate.

With the help of a brand label, testers accurately discriminated between the juice qualities, no matter the color.

The findings suggest that, while preference for a brand or a taste may be developed through cues such as what family and friends drink, our ability to discriminate tastes may be dictated more by what we see.

"Discrimination is focusing on whether you can see if there is a difference here or not," Hoegg told LiveScience. "Discrimination appears to be much more sensory than preference, because it is more visual."

# Black Soya Cuts Diabetes Risk

Eating black soya beans could lower fat and cholesterol levels and may help prevent diabetes, a study suggests.

According to BBC, yellow soya is already known to lower cholesterol, but black soya is used in traditional oriental medicine as a treatment for diabetes.

The Korean study found rats who got 10% of their energy from black soya gained half the weight of those who had none, Chemistry and Industry reports.

UK diabetes experts warned black soya alone would not prevent the condition.

The researchers, led by Shin Joung Rho, said the study showed that eating black soya prevented weight gain and improved cholesterol levels, but did not suggest why the food might have the effects.

But David Bender, of the Royal Free and University College Medical School, London, suggested the protein might affect fat metabolism in the liver and fatty tissue, reducing synthesis

of new fatty acids and cholesterol.

He said: "The key prob-

lem is certainly a key issue when it comes

beans are low in fat, high in soluble fiber and a good source of protein



Eating black soya beans could lower fat and cholesterol levels and may help prevent diabetes, a study suggests.

lem in type 2 diabetes is impairment of insulin action, mainly as a result of excess abdominal adipose tissue--so loss of weight often improves glycaemic control."

But he said eating black soya was unlikely to be a useful treatment for obe-

type 2 diabetes--80% of people are overweight when diagnosed with the condition--and keeping the right weight for your height is important in helping to reduce your risk of developing type 2 diabetes."

She added: "Black soya

stop someone from developing diabetes.

"Regular physical activity and a healthy, balanced diet are proven to be very effective in reducing the risk of developing the condition."

## Computer Model of Brain

Scientists have, for the first time, applied a computer model of how the brain processes visual information to a complex, real world task.

"People have been talking about computers imitating the brain for a long time," Massachusetts Institute of Technology Professor Tomaso Poggio told UPI.

"That was Alan Turing's original motivation in the 1940s. But in the last 50 years, computer science and AI (artificial intelligence) have developed independ-

ently of neuroscience."

Thomas Serre, a postdoctoral associate in Poggio's lab, said the team developed a model of the visual system that was meant to be useful for neuroscientists in designing and interpreting experiments but that also could be used for computer science.

The research appears in the March issue of the journal of the Institute of Electrical and Electronics Engineers.

## Bowel Pain Linked To Perfectionism

Perfectionists are more prone to develop irritable bowel syndrome (IBS) after an infection, a study has suggested.

University of Southampton researchers asked 620 people with gastroenteritis about stress and their illness, BBC reported.

Those who pushed themselves or were particularly anxious about symptoms were more likely to develop IBS. Up to one in 10 people develop it after having a bacterial gut infection, having previously been healthy.

Such infections cause inflammation and ulceration in the bowel and can cause severe vomiting and rectal bleeding.

Dr Rona Moss-Morris, who led the research, said: "We found people's beliefs about their symptoms, how anxious they got and their behavior were all important."

"These people were not hypochondriacs. But they did have a negative attitude towards their symptoms."

She added: "These are people who have high expectations of always doing the right thing - and going off work goes against their beliefs."

Such people try to remain active and may go back to work too soon, she said.

"They are 'all or nothing' people who have high expectations of themselves."

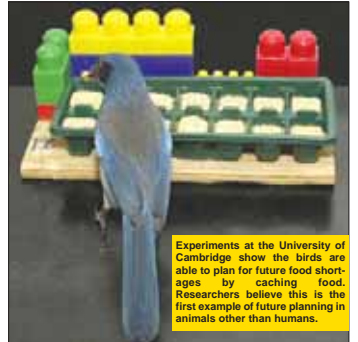
She suggested cognitive behavioural therapy might be an effective treatment.

But she added there was no suggestion that IBS was "all in the mind".

"It might be that stress and anxiety affects the immune system. But it could also be that if you don't rest, it might do you more harm."

## Birds Plan for Future

Planning and worrying about the future has always been considered an exclusively human activity, but now at least one species of bird has also been found to plan for tomorrow. The finding also raises the intriguing possibility that, like humans, birds may get anxious about the future.



Experiments at the University of Cambridge show the birds are able to plan for future food shortages by caching food. Researchers believe this is the first example of future planning in animals other than humans.

Research published in the journal Nature shows that western scrub-jays are able to plan for future food shortages by caching food. The birds are shown to have learned from their previous experiences of food scarcity, storing food for future use in places where they anticipate future slim pickings. The researchers at the University of Cambridge believe this is the first known example of future planning in animals, Science Daily says.

On alternate mornings eight jays were given breakfast in one compartment or refused breakfast in another, before being allowed free access to food the rest of the day. On the sixth day of the experiment they were suddenly given whole pine nuts suitable for caching in the evening. The researchers observed that the jays consistently cached most pine nuts in the tray in the 'no breakfast' compartment, anticipating that they would not be fed in the following morning in that compartment.

Another experiment showed that the birds were able to plan ahead to provide themselves with a more varied diet. The jays were consistently given a breakfast of peanuts in one compartment and dog kibble in the other. When the birds in the evening were offered both foods, they preferred to cache peanuts in the kibble compartment and vice versa--to make sure they had an interesting breakfast the following morning.

"People have assumed that animals only have a concept of the present, but these findings show that jays also have some understanding of future events and can plan for future eventualities."

## Chinese Scientists Control Pigeons

Chinese scientists have succeeded in implanting electrodes in the brain of a pigeon to remotely control the bird's flight, state media said.

According to AP, Xinhua News Agency said the scientists at the Robot Engineering Technology Research Center at Shandong University of Science and Technology in eastern China used the micro electrodes to command the bird to fly right or left, and up or down.

The implants stimulated different areas of the pigeon's brain according to electronic signals sent by the scientists via a computer, mirroring natural signals generated by the brain, Xinhua quoted chief scientist Su Xuecheng as saying.

It was the first such successful experiment on a pigeon in the world, said Su, who conducted a similar successful experiment on mice in 2005.