HOW does a word gain entry into the authoritative word bank, the *Oxford English Dictionary*? The criterion is that a word, phrase or sense of the word should have been popular and extensively featured in the printed media over a few years. For example, Brexit was an official entrant last year.

Among the 600 new words/phrases/senses added to the *Oxford English Dictionary* this year, Indian food ingredients Chana and Chana dal have found an official place.

Among special words, ‘zyzzyva’ is the latest entry. *Zyzzyva* (pronounced as ziz-uh-va) is the name of a genus of tropical weevils (a type of bug often invading grains like rice, wheat and corn). Native to South America, and often found around palm trees, the ant-sized, yellow-red pests are highly destructive to plants.

The genus was first studied and recorded by entomologist Thomas Lincoln Casey in his work in 1922. The technical name is *Zyzzyva ochreotecta* and it belongs to the family Curculionidae. The strange name is thought to be coined to attract attention as it takes the last place in most English dictionaries.

Before this, *zythum* – an ancient Egyptian malt beer – was the last word, but now *zyzzyva* replaces it, as this last name gained frequent entry in other word repositories and dictionaries for a substantial time.

*Contributed by Ms Susheela Srinivas. Address: #189, I F cross, 3rd Stage, 4th Block, Basaveshwaranagar, Bengaluru-560079; Email: sushsri@gmail.com*
Book Your Flying Car!

BY the end of 2018, a few lucky customers will own cars which can zip on roads and take to the skies as well! Courtesy PAL-V (Personal Air and Land Vehicle), a company based in Raamsdonksveer, Netherlands.

This company is aiming to deliver its first such vehicle to the customer by the end of 2018, beating competitors from Czech Republic, Japan, Slovakia, China and USA.

While toying with their idea to make drivable gyroplanes, the founder of the company Robert Dingmanse and his team realised that the weight and length of the blades on the plane were contributing to a high centre of gravity to the vehicle, especially while manoeuvring turns.

The basic design of this wonder-car is based on a gyrocopter. Gyros are helicopter-like in construction and use pylons to mount the rotating blades. These wings when rotated give the required lift to the vehicle. However, the wings of a gyroplane rotate by airflow and not by a rotor. The gyrocopters are not capable of hovering like helicopters; since airflow turns the blades, they are considered safer as in the event of an engine failure the gyroplane glides down due to the turning blades and does not crash.

The PAL-V uses two 100-horsepower engines which run on unleaded petrol, flies at altitudes of 3500 metres and has a top speed of 170 km/hr on the road. This vehicle has a capacity to fly for 500 km at a stretch. And, on the roads, a flick of a button will fold the wings, just as a bird would.

This three-wheeled vehicle is certified to be used on roads and also fly. The two-seater option is touted to give a ‘door-to-door’ experience to the owner: one can drive to the nearest airport in the vehicle just as in a car, from where it will take off like a plane, land at the destination airport and again drive on the road to the final point.

The prototype made in 2012 has already undergone rigorous tests. The commercial vehicle has to log in at least 150 hours of test flying and also obtain the European Aviation Safety Agency (EASA) certification before handing over to the customer. So, what type of licence should the owner have? A pilot’s or a driver’s? Well, both.

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Abel Prize 2017

PROF. Yves Meyer of the Ecole Normale Superieure Paris Saclay in France has been nominated for the Abel Prize-2017, “for his pivotal role in the development of the mathematical theory of wavelets.”

Prof. Meyer worked in the field of number theory and then switched over to methods for breaking down complex mathematical objects into simple wave-like components – harmonic analysis. His work is generally concerned with the understanding of mathematical functions with complex and changing forms, which can be described by different equations.

Meyer’s contribution to the field of harmonic analysis led him into wavelet theory, which enables complex signals to be “atomized” into some kind of mathematical particles known as wavelet. In 1986, Meyer and Pierre Gilles Lemarie-Rieusset showed that wavelets may form mutually independent sets of mathematical objects called orthogonal bases.

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Indian Prediction on Solar Corona Proves Right

THE predictions made by Indian scientists about the shape of solar corona during the solar eclipse of August 21 have been largely right.

This is a significant development as it was for the first time that physicists attempted to predict the shape of the solar corona as it would be visible during an eclipse, using computer simulation and solar models. The development means that in future scientists will be able to make more complex predictions about space weather which is influenced greatly by solar flares.

Dibyendu Nandi, scientist and head of the MHRD Center of Excellence in Space Sciences India (CESSI) at IISER, Kolkata and his team of students along with a British physicist, had predicted two broad lotus petal-like structures (known as helmet streamers) on the southeast (lower-left as viewed from Earth) and southwest (lower-right) edge of the Sun, and a third, narrow elongated streamer structure on the northwest (upper-right) edge of the Sun for the solar eclipse on August 21. The team also rightly predicted that the southeast (upper-left) edge of the Sun will be the least active.

These predictions have all been largely verified,” said Niruj Mohan, Chair of the Astronomy Society of India’s Committee on Public Outreach and Education.

The close correspondence between the prediction and observations is an impressive feat for a first attempt which utilized only modest and limited computing powers without recourse to supercomputers. Pointed out Nandi, “We were not able to reproduce some fine details since our model is not complex enough.”

It was a sleepless night for Nandi’s team. “I told my students not to be disappointed if we had got it wrong. After all, this was the first time we were testing our model with a live cosmic event,” says Nandi. “None of us even winked. We were all awake all through the night and remained glued to the live broadcast on NASA TV. Only when the first clear sharp images of the corona came in late night that we could relax.”

The structure of solar corona basically mirrors the invisible magnetic fields, just as the iron filings align along the butterfly shaped magnetic lines around a bar magnet in our high school physics experiments. However, in the blazing sunlight the corona is invisible, and can be seen only during the total solar eclipse. The magnetic structure of sun impacts the space weather, which in turn has implication for satellite communication, electric grids etc. on the earth.

The relative success of the model has implications for the solar observatory, Aditya-L1, to be launched by the Indian Space Research Organisation (ISRO). It will include Visible Emission Line Coronagraph (VELC) instrument designed and developed by Dipankar Banerjee of Indian Institute of Astrophysics. It artificially creates a total solar eclipse in space by blocking emissions coming from the solar disk, revealing otherwise invisible corona.

“The work by Nandi’s team will let us directly compare observed images with these models and help us understand the corona better,” said Banerjee.

Contributed by Dr. T.V. Venkateswaran, India Science Wire, Vigyan Prasar

Insect Promises Speedy Biodegradation of Plastic

SEVERAL attempts have been made to biologically degrade plastic but with little success. Recently, an accidental detection of honeycomb wax moth by a Spanish scientist Federica Bertocchin has brought a ray of hope.

Bee keeping is Federica Bertocchin’s hobby. While cleaning beehives she found that it was infested with waxworms, which feed on beehives and are a headache for beekeepers. She collected the larvae and placed it inside a plastic cover. After 40 minutes she found that the larvae were crawling around the plastic cover. She took out the plastic and observed there were holes in the plastic cover made by the waxworms.

Paolo Bombelli and Chris Howe, research scientists working on biodegradable plastic in Cambridge University, joined with Federica Bertocchin keen to understand the molecular mechanism in consumption and degradation of plastic. Their research findings were published in Current Biology.

Honeycomb wax moth is the common name of Galleria mellonella, a Lepidopteran insect that belongs to Pyralidae family found widely. A caterpillar larvae measuring about 16-20 mm completes its life cycle on beehives.
They chew and swallow plastic as it is similar to consuming beehives, a natural plastic. Beeswax is composed of a highly diverse mixture of lipid compounds, including alkanes, alkenes, fatty acids and esters.

The authors propose that the caterpillar consumes the plastic and degrades it, but this needs more research to determine whether this chemistry is the result of *G. mellonella* enzymes involved in digestion or its gut microbial flora. If a single enzyme is responsible for this chemical process, its reproduction on a large scale using biotechnological methods may be achievable.

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