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One US firm files 135% more patents in India than all top labs together

Bengaluru: The number of patents filed by a US firm in India in 2016-17 was more than double of all patent applications from 50 labs under DRDO, more than 40 labs in IISc, 38 labs under CSIR, 31 NITs, 23 IITs and six major Error! Hyperlink reference not valid. research facilities under Isro. While all these institutes together filed 781 patent applications, Qualcomm Inc — a US semiconductor and telecom equipment firm — filed 1,840 applications, according to the Controller General of Patents, Design and Trademark. India, which lags behind other countries whose patents outnumber India’s by huge margins globally, suffers the same problem even domestically with foreign countries filing way more patents than locals. In 2016-17, 45,444 patents were filed in India, of which 71% were filed by foreigners (inventors and applicants) and other foreign applicants (legal entities), while 29% were filed by Indians.

HOW THEY STACK UP

Indian Institutes	Patents Filed	Foreign Firms	Patents Filed
IITs (collectively)	400	Qualcomm (US)	1,840
CSIR	230	Samsung (Korea)	706
DRDO	58	Huawei (China)	625
IISc	54	Microsoft Tech Licensing (US)	589
NITs (collectively)	26	Koninklijke Philips (Netherlands)	557
Isro	13	GE (US)	520
Total	781	Total	4,837

The US, Japan and China together account for more patents filed in India than the entire Indian scientific, research and business communities. Only 2.9 of every 10 patents filed in India are by Indians In a continuing trend of foreign domination, only 2.9 of every 10 patents filed in India as per data for 2016-17 are by Indians, a marginal improvement from 2.8 of every 10 patents in 2015-16. The information for 2017-18 will be released later this year. Renowned scientist Prof Roddam Narasimha says, “We don’t lack talent or

entrepreneurship but we lack the ecosystem. Work in science and innovation is abysmal because there’s been a legacy of poor policy and low confidence to take risks.

But that has been changing over the past few years.” Of all foreigners filing patents, 10 big companies account for 19% and data shows that Qualcomm Incorporated continues to top the list, followed by Samsung Electronics and Huawei Technologies. A country-wise break-up of patents filed shows that the US, Japan and China, which occupy the top three positions, together account for 14,636, which is 1,659 more than patents by Indians. Of the 45,444, just 10 countries filed 22,970, including countries like Netherlands (1,295), and experts say India has a long way to go before the scenario changes, even as they point out that most foreigners only file patents in India to prevent reproduction of their technology. “We need to bring in the patent culture, which is not there in all institutes. We have a handful of people whose innovations are good enough for patents, and that needs to change,” said K Kasturirangan, former ISRO chairman and head of the committee formulating India’s new education policy. In the period between 2013-14 and 2016-17, 1.9 lakh patent applications were filed in India, of which 1.37 lakh (72%) were filed by foreigners.

Tue, 24 July 2018

Govt responds to Express series: ‘Will end menace of predatory journals’

By Liz Mathew

Referring to the investigation published last week in The Indian Express on fake research paper shops in India, the Government Monday said that it has asked all universities to review by August 30 the list of academic journals that are to be recognised by the UGC.

“We will end this menace of predatory journals,” Union HRD Minister Prakash Javadekar said during Question Hour in Lok Sabha.

Replying to a supplementary question from Prabhas Kumar Singh of BJD, Javadekar said: “What has been published in a very reputed newspaper is really a story that is not a good story. In one room, there are 87 journals being published, and stories like that. We have taken note of that and we are asking universities to review their recommendations about journals to be recognised by the UGC for promotion and accreditation. They will review by August 30 and give a final recommendation.”

Responding to another supplementary question raised by Congress MP Adhir Ranjan Chowdhury, Javadekar said: “We are rectifying these things... We do not want any predatory journals to exist.”

According to Javadekar, a UGC Standing Committee has, after due verification, removed over 4,000 sub-standard journals. He said the committee has recognised 26,000 journals as on May 2, 2018.

In a series of investigative reports published across three days starting July 19, The Indian Express reported on how India has emerged as one of the biggest markets for a business in which over 300 publishers manage what are called “predatory journals” that claim to be international and publish papers for a “charge” ranging from \$30-\$1,800 per piece.

The investigation found that the range of names linked to articles and conferences organised by publishers of such journals includes Vice-Chancellors, AIIMS directors and IIT professors.

It also revealed that Hyderabad has become the hub of predatory publishing in India with companies based in the city bringing out over 1,500 active journals on subjects ranging from medicine to management.



Tue, 24 July 2018

The deep and far of science

By Shubashree Desikan

One of the greatest challenges in science communication is to understand the significance of the phenomena being written about. While science writers are often asked how their subject impacts life and people, the simple answer when writing about basic sciences is that it’s too early for that assessment. That, however, does not take away from the fact that the research in question could be groundbreaking. For cases where this answer does not suffice, here are some reasons to appreciate writing on basic science that go pasts the ‘so what’ reaction.

The most exciting discoveries in science are those that significantly deepen existing knowledge about familiar phenomena. There is another category of discoveries that uncovers a brick on the metaphorical wall that blocks scientists from seeing far into the unknown. All scientific research falls in between these two points. The closer the discovery is to pushing the limits of knowledge, the more its significance, and the more it is loved by science writers, for the discovery is that much easier to grapple with.

Two discoveries exemplify this point: one was the August 17, 2017 detection of the merging of two neutron stars, achieved by studying gravitational waves that the stars set off when merging. The other is the puzzle posed by the transient discovered by Stephen Smartt using the Hawaii-based ATLAS telescope, on June 16 this year. The transient was called AT2018cow and nicknamed the ‘cow’ because of the last three letters of its official label.

The neutron star merger was the fifth time a gravitational wave signal had been detected by observatories on earth. It was a known area, yet this was markedly different from earlier observed mergers of black holes. “The new siren sang for 100 seconds at frequencies climbing to thousands of cycles per second,” said an article in *Science*. And after the collapse there was a brilliant flash of light — the kilonova — observed experimentally for the first time. This time more than the two detectors of LIGO were at work. The Pisa-based VIRGO detector had joined in, and by a process called triangulation, scientists were able to localise this event in the sky as never before.

While the window had already been opened by earlier discoveries, this event deepened existing knowledge significantly. The ‘cow’, on the other hand, appears to be an unknown in every sense of the word. While astronomers guess that it might be a type Ic supernova, they are not completely sure. The race is on to find out what exactly it is.

Perhaps neither of these discoveries would really touch our lives were we to insist that research always must have an immediacy or be useful. But when you contemplate how far human endeavour has reached beyond what it can perceive with bare hands and naked senses, the wonder begins.



Tue, 24 July 2018

Earth set to run out of resources two days sooner this year, says study

The day is marked as Earth Overshoot Day, illustrating the point at which the consumption of resources such as carbon, food, water and wood exceeds the capacity of nature to regenerate.

August 1 will mark the day humanity’s annual demand for natural resources will exceed what the planet’s ecosystem can provide for the year, a date that has arrived two days sooner than last year.

The day is marked as Earth Overshoot Day, illustrating the point at which the consumption of resources such as carbon, food, water and wood exceeds the capacity of nature to regenerate.

“It is barely eight months into the year and we have already used up the nature’s budget for the entire year. The fact that the overshoot day is constantly moving up the calendar — from late September in 1997 to its earliest yet in 2018 — is symbolic of the unprecedented pressure mankind and human activities are putting on nature and its resources,” said Dr Sejal Worah, conservation director, WWF-India.

The Global Footprint Network, an international think tank that calculates the Earth Overshoot Day by coordinating research, said that at the current rate of consumption and waste production, humanity will need 1.7 earths to satisfy its exploitative needs. “Our economies are running a Ponzi scheme with our planet. We are using the Earth’s future resources to operate in the present and digging ourselves deeper,” said Mathis Wackernagel, chief executive of the Global Footprint Network, in a press release. “Each day this date moves up is a stark reminder of the fact that we are running out of time to reverse the trend,” said Dr Sejal Worah, conservation director, WWF-India.

The rate at which the overshoot date is moving up the calendar, however, has slowed. Over the last five years, on average, the day has moved less than a day a year, compared to three days a year on average since overshoot began in 1970s. Last year, the day came on August 3.

“This is not an absolute date on which natural resources run out but represents a trend that we need to roll back to a date as close to December 31 as possible. The ‘business as usual’ attitude will not help,” said Dr Rajiv Seth, pro vice chancellor at TERI School of Advanced Studies in New Delhi.

The Earth Overshoot Day is calculated by taking into account “biologically productive land and sea area, including forest lands, grazing lands, cropland, fishing grounds, and built-up land”, and comparing their state with a population’s demand for plant-based food and fibre products, livestock and fish products, timber and other forest products, space for urban infrastructure, and forest to absorb its carbon dioxide emissions from fossil fuels.

The data shows that if everyone in the world lived like the people in the US, we would need five earths to sustain our lifestyles. If everyone lived like Indians, we would need 0.7 earths.



Tue, 24 July 2018

Drug-filled 'nano-submarines' can target tumours

Scientists have developed miniature drug-filled 'nano-submarines' that can latch on to immune cells and empower them to attack tumours without damaging to healthy tissue.

In modern medicine, patients receiving medication to treat tumours or for pain therapy are often given drugs that disperse throughout the entire body, even though the section of the organ to be treated may be only small and clearly demarcated.

One solution would be to administer drugs that target specific cell types. Such nanocarriers are just what scientists are working to develop. These contain, in a manner of speaking, miniature submarines no larger than a thousandth of the diameter of a human hair.

Invisible to the naked eye, these nanocarriers are loaded with a pharmacologically-active agent, allowing them to function as concentrated transport containers.

The surface of these nanocarriers or drug capsules is specially coated to enable them, for example, to dock on to tissue interspersed with tumour cells.

The coating is usually composed of antibodies that act much like address labels to seek out binding sites on the target cells, such as tumour cells or immune cells that attack tumours.

"Up to now, we have always had to use elaborate chemical methods to bind these antibodies to nanocapsules," said Volker Mailander, from Johannes Gutenberg University Mainz (JGU) in Germany.

"We have now been able to show that all that you need to do is to combine antibodies and nanocapsules together in an acidified solution," said Mailander.

The study, published in the journal *Nature Nanotechnology*, emphasises that binding nanocapsules and antibodies in this way is almost twice as efficient as chemical bonding in the test tube, significantly improving the targeted transport of drugs.

In conditions such as those found in the blood, they also found that chemically coupled antibodies almost completely lost their efficacy, while antibodies that are not chemically attached remained functional.

"The standard method of binding antibodies using complex chemical processes can degrade antibodies or even destroy them, or the nanocarrier in the blood can become rapidly covered with proteins," said Katharina Landfester from the Max Planck Institute for Polymer Research in Germany.

In contrast, the new method, which is based on the physical effect known as adsorption or adhesion, protects the antibodies. This makes the nanocarrier more stable and enables it to distribute the drugs more effectively in the body.

Researchers combined antibodies and drug transporters in an acidic solution. This led to more efficient coating of the nanoparticle surface, leaving less room on the nanocarrier for blood proteins that could prevent them from docking to a target cell.