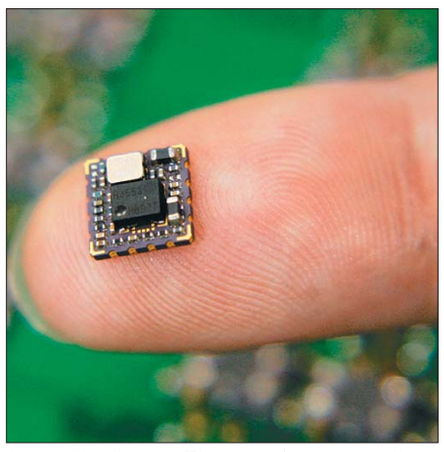
Short stories

Microsoft's paid security service

A new security service from Microsoft Corp. will charge users $49.95 (Rs2250) per year to better protect its Windows operating system from spyware, viruses and other Internet attacks. Microsoft plans to release the product in early June. Called Windows OneCare Live, the subscription service will compete with security products made by traditional Microsoft partners, like Symantec of McAfee. Ryan Hamlin, general manager of Microsoft's Technology Care and Safety Group, said that Microsoft's goal is to provide protection for users who don't have any added or up-to-date security — a group that Microsoft estimates comprises 70 percent of consumer users. OneCare, which is already available for free in test form, aims to protect people running the most recent version of Windows against Internet attacks.

New property of protein found

Biochemists at Duke University, US have detected a surprising, subtle new gyration that protein molecules undergo in the intricate dance that influences their activity in the cell. The researchers have also created a realistic geometrical model of the twisting "backrub" motion that could help scientists understand the basics of protein function and design proteins for medical use. Also, they said, the backrub motion could have implications for understanding how proteins can accommodate locally to some mutations that occur during evolution, without altering their global structure or function. The Duke University Medical Center biochemists, led by Professors Jane and David Richardson, published in the journal Structure. Understanding the subtleties of protein motion is important because the molecules are central to the machinery of life.



As small as it gets: The quest for ever smaller GPS-enabled equipment, such as mobile phones, PDAs and even watches has just taken a giant step forward with the development of the world's smallest GPS radio frequency receiver module by a New Zealand company Rakon in Auckland, on Wednesday. The module is as tiny as a baby's fingernail. — Dean Treml/AFP

Depression higher among parents

Parents face more depression than non-parents as they have more to worry about than others, a new study says. The study was conducted by Robin Simon and others at Florida State University and Vanderbilt University. The researchers were surprised to find that the effects of parenthood on depression were the same for men and women. These findings are inconsistent with earlier studies which assumed that parenthood means emotional well-being of women. Simon said, "The findings do not mean parents don't find any pleasure in their roles; it's just that the emotional costs can outweigh the psychological benefits."

MUST HAVES

ASUS PW191

19-inch LCD monitor comes with touch sensor buttons and stereo speakers

It evaluates each pixel in every frame and adjusts them in smaller regions.

Features OnScreen Display to enable quick application activation

Suggested MRP: Rs29,500

Toshiba DVD Player

The SD-P2800 has a resolution of 800x480, and a viewing angle of 170 degrees.

Supports DVD-Video, and DVD-R/RW, and plays MP3, WMA, JPEG, and DivX files from memory cards.

Dollar converted price: Rs14,500

Scientists build a bridge over turbulent waters

Indian student in the US teams up with his physics professor to overcome a 73-year-old problem of classical physics

In a spin: The swirl at the wingtip traces the aircraft's wake vortex. Gioia's work is relevant for such fluid flow over wing surfaces.

Shivaji Das

This is what causes clouds to break open suddenly with rainstorms. A lack of this weakens the bones of astronauts within months in space. Weaker water-borne creatures survive in their ecosystem due to this. A physicist could go on roll-calling the instances of this ubiquitous and important phenomenon they call turbulence: the restless, swirling and semi-random behaviour of fluids. It is also the last great fort of classical physics scientists are yet to storm. But, a paper published recently in the Physical Review Letters by scientists from the University of Illinois, Urbana-Champaign, has just heated up the offensive.

FLUID SCIENCE

The paper has explained a pivotal experiment on turbulence conducted 73 years ago by Johann Nikuradse.

He had found that when fluids pass through a rough pipe an odd thing happens, the friction experienced by the fluid decreases as the speed of the fluid rises till suddenly after a point the friction begins to increase before settling to a constant value. Without a theoretical framework for this phenomenon, engineers and scientists have had to refer to elaborate charts and graphs based on Nikuradse's data when working on topics ranging from aerodynamics to construction of oil pipes.

"Our explanation of Nikuradse's results is based on a conceptual model of turbulence that goes back to Leonardo Da Vinci, who pictured turbulence as made up of many locally swirling motions, all jumbled up.

"Our work is relevant to turbulent flows over all sorts of surfaces — the surface of a submarine to the scaled skin of a fish."
—Gustavo Gioia

The results will make it possible for engineers to calculate the friction from first principles, instead of having to rely on a chart or table," explains Gustavo Gioia, who authored the paper with his student Pinaki Chakraborty.

Nikuradse's experiment and consequently its theoretical explanation by Gioia et al are of fundamental importance to turbulent flow. Gioia says, "In pipelines that transport oil and gas, the cost of pumping is proportional to the friction. Understanding and controlling the friction could save millions of dollars a year.

"It is not a matter of pipes only, but also open channels, such as rivers and flood plains. Our work is relevant to hydraulics engineering, hydrology, geomorphology, etc. In fact, our work is relevant to turbulent flows over all sorts of rough surfaces — the surface of a submarine, the wings of an airplane and the scaled skin of a fish."

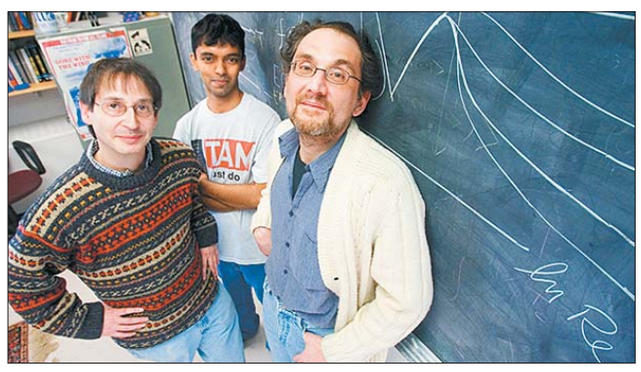
The paper by their colleague Nigel Goldenfeld is closely related to their work. Goldenfeld's work provides a long-sought-after link between turbulence and phase transitions.

Everything you wanted to know about turbulence

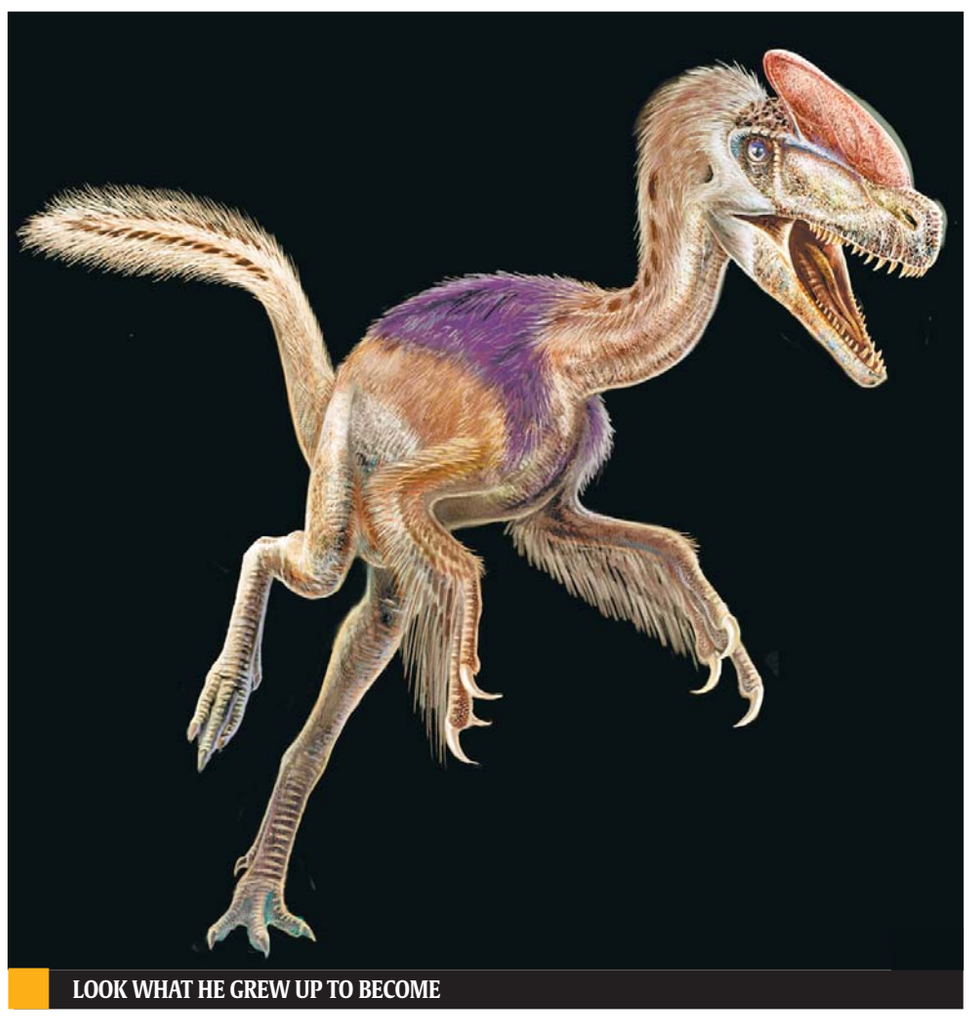
Turbulence in everyday life
As you turn on the tap, the initial stream of water is clear and smooth. But, as you keep turning the knob, you reach a point when this steady stream suddenly degenerates into an unclear pillar of spluttering water. The water is the same, but now there are eddies and vortices on the surface of the stream, which render the flow unclear. This is called turbulence.

Why turbulence is considered one of the thorniest problems in physics
Any flow is governed by the Navier-Stokes equations. In principle, one could answer any question about turbulence and make predictions by solving these equations. But, they are so difficult that no current supercomputer can effectively compute solutions from these equations.

What the recent paper has done
Provides a mathematical approximation which can be used to make predictions about turbulent flow, and to make theoretical sense and give an interpretation to complicated experimental results.



L to R: Nigel Goldenfeld, Pinaki Chakraborty, Gustavo Gioia



LOOK WHAT HE GREW UP TO BECOME

A handout photograph from the British Journal 'Nature' shows an artist's rendering of 'Guanlong Wucaii,' the most primitive member of the group that went on to include the fearsome Tyrannosaurus rex. The three-metre-long creature, found in the Junggar basin in northwest China, represents perhaps the earliest tyrannosaur, and allows palaeontologists a glimpse of one of the murkiest chapters of dinosaur evolution. The new dinosaur hails from the Late Jurassic period, around 160 million years ago. — AFP/Zhongda Zhang

Chip trick: A potato minus the carbs and the calories

Indo-Asian News Service
London

Scientists in Britain have developed potatoes with less carbohydrate and fewer calories but with all the other nutritional values of the regular spud.

British company Naturally Best that developed Vivaldi after nine years of research say their potato could a fulfil a dieters' dream, reports the online edition of BBC News.

According to tests by the Grimsby-based Allied Laboratory Services, the new potato has 26 percent less carbohydrate and 33 percent fewer calories.

The potato, which has normal levels of vitamin C and other nutrients, was originally developed from seed for a creamy taste.

The popularity of the low GI (glycaemic index) diet has recently prompted a shift in the way spuds are perceived.

Low GI diets involve replacing high GI foods, such as potatoes and white bread, with low GI options such as apples, pasta and beans.

The potato will be available in Sainsbury's stores.

"This great-tasting, versatile potato is the perfect solution for those of us who like to watch what we eat — and they taste just as good for those who don't," reported the online edition of the London Daily Mail quoting John Maylam of Sainsbury's grocery store chain.

Researchers can't agree over hurricanes, climate change

Katy Human
Colorado, USA

Storm researchers Tuesday squabbled over why the last Atlantic hurricane season was the most dangerous on record, and what should be done about it.

Among the disputed issues are whether climate change is making storms stronger or whether increased coastal development and other social factors are increasing storm risks.

Meeting here at the National Center for Atmospheric Research, the National Science Board working group collected inputs from scientists for a report to Congress and the White House on hurricanes.

The board, which helps set national science policy, formed the working group after Hurricane Katrina devastated the US Gulf Coast, killing 1,300 people.

Post Katrina, storm researchers debate whether climate change is making storms stronger

The group plans to deliver its report before the June start of the next Atlantic hurricane season, Washington said.

About 20 scientists gathered for the Boulder meeting, agreeing, however, on little more than the fact that hurricanes are likely to become more deadly and damaging in the future.

"Well, if there's some controversy here, it's because the science is controversial," said Kelvin Droegemeier, co-chair of the National Science Board hurricane group.

The meeting drew participants from Louisiana to California. Some attended the American Meteorological Society meeting last week, where researchers argued that climate change has increased the intensity of hurricanes around the world. Others argued that climate change is irrelevant, given the rate of coastal development, poor hurricane planning, response, and outdated construction practices. — NYT News Service

Apple iPods going cheap

World's favourite music player now available at reduced prices, and also in a new flavour — the 1GB Nano

May Wong
San Jose, California

As competitors continue leaving the portable audio player market, Apple Computer Inc. beefed up its iPod product mix Tuesday with a new 1-gigabyte version of the nano and lower-priced shuffles.

The pencil-thin, flash memory-based nano player now ranges from $149 for the new 1GB model to $249 for the 4GB model. Previously, the 2GB nano was the lowest-capacity and least expensive model at $199.

MUSIC TO EARS

Apple also cut the prices of its bare-boned shuffle players. The 512-megabyte version dropped from $99 to $69 and the 1GB model was discounted from $129 to $99.

Both moves, analysts say, will help Apple maintain its market-leading position and further its strategy to attract consumers with slimmer budgets.

"No one has been able to catch up to Apple," IDC analyst Susan Kevorkian said. "Apple's ongoing dominance has made it difficult not only for major consumer electronics brands to compete, but also the much smaller brands." Dell quietly began to phase out production of its hard drive-based audio players in December but said on Tuesday it will continue to sell its flash-based DJ Ditty player, which costs $99.

MP3 player pioneer Rio has retrenched as well. Last fall, its parent company D&M Holdings withdrew from the portable player market to focus on higher-end home audio products. — AP

Music at your fingertips: The Apple iPod range

iPod Models

iPod Video
60 GB — $399
30 GB — $299

iPod Nano
1 GB — $149
2 GB — $199
4 GB — $249

iPod Shuffle
512 MB — $69
1 GB — $99