Newspaper Clips

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3 get Nobel for taking chemistry to cyberspace

MODEL RESEARCH

Austrian-American Martin Karplus (Universite de Strasbourg, France, and Harvard University); Michael Levitt (Stanford University), who has American, Israeli and British citizenship; and Israeli-American Arieh Warshel (University of Southern California) win Nobel prize in chemistry for developing computer models that simulate complex chemical processes

Their research in the 1970s helps us to **understand how exhaust fumes are purified or how photosynthesis takes place** in green leaves. This kind of knowledge makes it **possible to find the best design for things like new drugs, solar cells or catalytic converters for cars**

"Today the computer is just as important a tool for chemists as the test tube
—THE ROYAL SWEDISH ACADEMY OF SCIENCES

Kounteya Sinha | TNN

Stockholm: The ability to carryout computerized chemical experiments in real-time won an Israeli, Austrian and a Briton the 2013 Nobel prize for chemistry on Wednesday.

The Royal Swedish Academy of Sciences (RSAS) said Arieh Warshel (University of Southern California) Michael Levitt (Stanford School of Medicine) and Martin Karplus (Harvard University) got the prize "for the development of multi-scale models for complex chemical systems".

The computerized experiments have yielded a deeper understanding of how chemical processes play out. Computer models mirroring real life have become crucial for most advances in chemistry. Chemists earlier used to create models of molecules using plastic balls and sticks, which is now done on computers.

In the 1970s, the three scientists had laid foundation for powerful programs used to understand and predict chemical processes. They can be used to study all kinds of chemistry; from the molecules of life to industrial chemical processes. Scientists can optimize solar cells, catalysts in motor vehicles or even drugs. Experts say the trio's work is ground-breaking as they managed to make Newton's classical physics

Malala & the dark side of peace Nobel

Oslo: Alongside the glory, the Nobel peace prize has a darker side likely to make the awards committee think hard before honouring Malala Yousafzai, a Pakistani teenage activist shot by the Taliban who is favourite to win on Friday.

The prize has changed the lives of presidents, freedom fighters or humble human rights workers but some winners say it is hard to be put on a lifelong pedestal where actions, flaws and foibles can get judged against a yardstick of sainthood.

This year that flip side of fame is more relevant than ever because Malala, shot in the head by the Taliban a year ago for demanding education for girls, is just 16. All other winners have made career choices as adults. She would be half the age of the youngest winner of the award since it was set up in 1901. REUTERS

cademy, said.

Warshel said he felt "extremely well" after getting the prize. He added they developed the method that shows how proteins actually work.

work side by side with the fundamentally different quantum physics. Previously, chemists had to use either.

"This year's prize is about taking the chemical experiment to cyberspace," Staffan Normark, secretary of the A-

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the exact structure of a human body and then understand how exactly it does what it does."

HT Mumbai

600 MU students may lose yr over attendance

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MUMBAI: Bunking one too many classes could cost around 600 Mumbai university students a year, as authorities are planning to bar them from the semester exams. While few students were penalised before, this year, colleges have starting taking stricter action against those who do not fulfil the University's 75% attendance requirement.

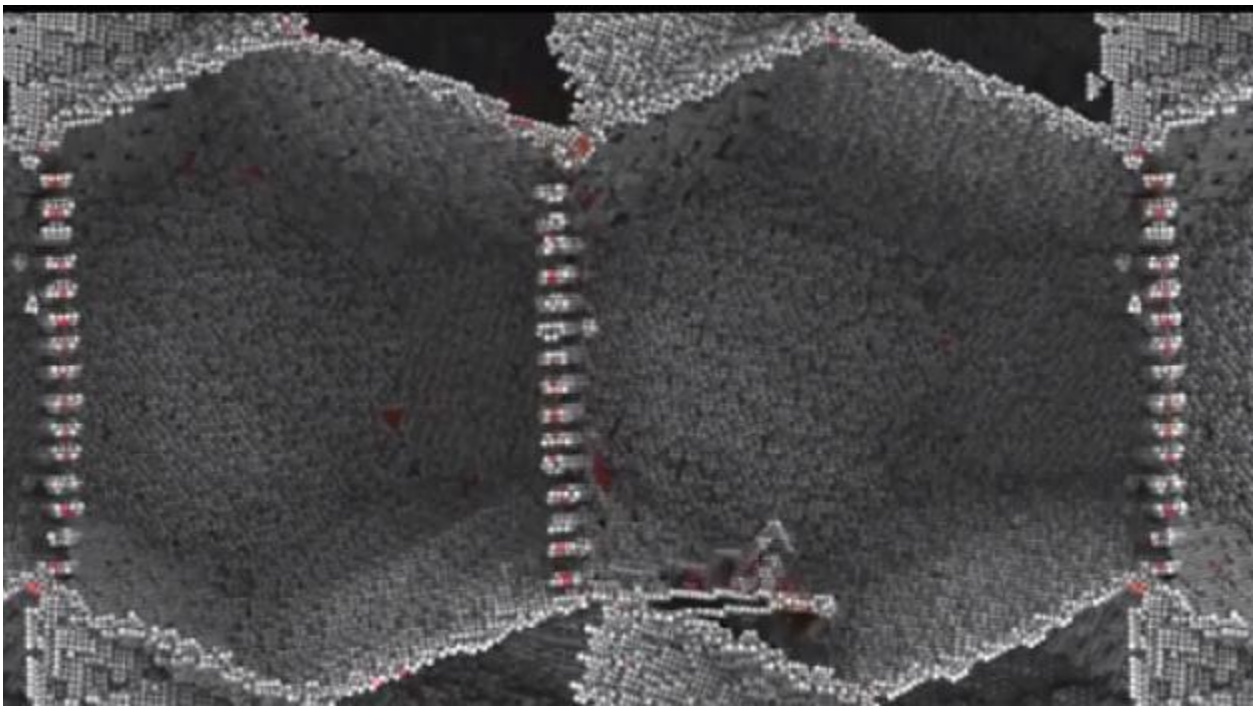
Narsee Monjee College and Usha Pravin Gandhi College, both in Vile Parle, and Thakur College Kandivli, are among those with a sizeable number of defaulting students.

Naresh Chandra, pro vice chancellor of the university, said the students would be allowed to complete the year through the varsity's distance learning institute, but admissions to it have been closed for nearly a month.

» FULL REPORT, P4

MIT's self-healing metal fixes tiny flaws before they can create massive problems

(http://www.extremetech.com/extreme/168382-mit-self-healing-metal-fixes-tiny-flaws)



When a material is damaged, you wouldn't expect pulling it apart to suddenly make it less damaged. This counterintuitive effect is exactly what researchers at MIT observed in an experimental model recently, and it was so unexpected that the results had to be rechecked before anyone was ready to believe it. Astonishingly, it seems that under the right conditions, metal with small flaws and cracks can heal itself when tension is applied — if you pull it apart, it puts itself back together.

Researchers led by graduate student Guoqiang Xu and professor Michael Demkowicz modeled microscopic cracks in a sheet of nickel with tension applied. Instead of worsening, the cracks became smaller, then closed on their own as the edges fused together. After assuring themselves the effect was real, the next step was figuring out how it happens.

The answer has to do with the basic structure of metals, most of which are composed of microscopic crystalline grains of varying sizes and shapes. The orientation and size of these grains affects the overall mechanical strength and other characteristics of the material. Nickel is of particular interest because it is a basis for many so-called superalloys used in harsh environments like jet turbines, deep-sea oil rigs, and joints in heavy industrial equipment. It turns out that the grains making these materials so strong are not as static as scientists thought.

As the metal is pulled outward, the edge of the crystalline grains begins to migrate and can eventually fill in the crack completely. The migration of this crystalline boundary — the edge of the grain — is what heals the gaps in the material. This is different than the quest for self-healing artificial skin, but no less important.

This doesn't affect the large-scale cracks that you are able to see with the naked eye — only damage to the microstructure. Researchers have only been able to reproduce the healing behavior with defects known as disclinations (A disclination is a small crack that extends part way through a grain.) However, it is believed that these micro-scale defects are the seeds of much larger, sometimes catastrophic cracks and metal fatigue. The geometry of disclinations can actually reverse an applied force locally, which is how the tension leads to the metal pulling itself back together.

The team believes this mechanism can be used to prevent superalloys developing structural cracks by healing the tiny flaws that can lead to real damage. Material could even be engineered to direct damage into disclination-type structures which could be easily healed with a little stress in the right direction. If the healing effect is robust enough, this could even lead to metals that don't weaken with age.

AT THE HEART OF THE
HIGHER EDUCATION DEBATE

Indian student denied entry for want of £20

10 October 2013 | By Jack Grove (URL=/jack-grove/1114.bio)

'Callous' Home Office refuses leeway for applicant hit by currency drop

Source: Getty

Score to settle: rupee's loss of value scuppered student's chances

An Indian student was denied a visa to study at a UK university after currency fluctuations left him less than £20 short of the amount required for living costs.

The student, who had paid his course fees in full, fell foul of Home Office rules stating that applicants must have funds in their bank accounts equivalent to £800 for each month of their courses.

Having deposited enough money to meet the total of £7,200 specified for maintenance, the student was told that his visa application had been denied. This was because he had £7,180.18 in the bank when the total was converted into sterling: £19.82 less than he was supposed to have, according to documents shown to *Times Higher Education*.

The value of the rupee has fluctuated wildly in the past few months, and it fell by 2 per cent on the day the visa was assessed.

An appeal for leniency by the university, which has asked not to be named, has been refused, with a reassessment of the case in India likely to take up to three weeks, the institution said.

The 22-year-old student paid £300 for his visa application and is unlikely to get his permit in time to start the new term, so his course fees may have to be refunded, the university added.

"A student has put money aside in good faith and has been turned away due to circumstances completely beyond their control," said the university's vice-chancellor. "You can understand why you need rules about this type of thing, but there should be some flexibility."

Other universities were likely to have been hit by similar problems, the leader added.

"The callous way that officialdom appears to be dealing with these students is causing a lot of bad feeling towards the UK."

Under Home Office rules, students must "hold a specified amount of funds [in sterling] for 28 days prior to making an application". If the minimum balance dips below that amount at any point during the 28 days, the visa can be denied.

Applicants should take depreciation into account to ensure that they can display "adequate funds" on the date of their application, the rules state.

Edward Acton, vice-chancellor of the University of East Anglia and chair of Universities UK's task force on the Tier 4 student visa system, said: "If verified, this case would suggest that the Home Office's policy and attitude is continuing to damage UK universities in Indian eyes.

"The US is sharply increasing its drive for quality international recruitment, and we need a national drive to do the same."

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'Nobel' God particle elates Panjab University

Priyanka Kachhava, TNN | Oct 10, 2013, 05.06 AM IST

CHANDIGARH: They were part of the team that helped establish the existence of the elusive Higgs Boson, or God particle. Now, they are rejoicing at the news of the 2013 Nobel Prize being awarded to Briton Peter Higgs and Belgian Francois Englert for the "theoretical discovery"of the sub-atomic particle.

Five faculty members and 10 research scholars of the department of Physics at Panjab University (PU) were amongst the team of scientists who helped find the Higgs Boson particle at the Large Hadron Collider near Geneva — a discovery that was announced on July 4 last year.

"It was the most awaited Nobel. These legendary scientists — Higgs, Englert and Robert Brout, who di in 2011 — had indicated the existence of the God particle almost 50 years ago, in 1964. The idea neede real confirmation in a laboratory, after which the Nobel was much-anticipated," said PU professor Vipi Bhatnagar, who was part of the Geneva project. "We were also expecting that something would also come for the experiment in Geneva, but it is also exciting to be a part of a project that has now been acknowledged at this scale," Bhatnagar added.

Also associated with the project were professors JB Singh, Suman Beri, present chairperson Manjit Kaur and now-retired professor R K Kohli. The project, which is being upgraded right now, will start again in 2015.

The team from PU is also involved in upgrading the detectors at the reactor, along with the Bhabha Atomic Research Centre. "We are making around 100 more sub-detectors and our technicians have been going there for maintenance work," JB Singh added.