

**FORTH COMING EVENT**

Smt. Parvatibai Chowgule College of Arts & Science  
&  
Department of Physics  
Invites you all for  
**PHYSICS DAY CELEBRATION**  
on 28<sup>th</sup> February 2011

Students hurry up to enroll yourself for various events & win attractive prizes

Events :

On 28/02/2011

- Two Minute Talk on any Physicist
- Poster Presentation

*Theme :- Applications of Physics in everyday life.*

Written Test on basic principles of Physics on 23<sup>rd</sup> February 2011

Enroll Yourself : For written test on or before 21<sup>st</sup> Feb.  
For Poster & 2 Minutes talk: 25<sup>th</sup> Feb

Interested students may give their names to following faculty members

XI std. : Physics teacher of respective division  
XII std. : Physics teacher of respective division.  
F.Y.Bsc : Miss Vaishali Gaonkar  
S.Y.Bsc : Miss Brenda D'Souza  
T.Y.Bsc : Miss Vaishali Gaonkar

Please find details of events on college Website  
[www.chowgules.ac.in](http://www.chowgules.ac.in)

**Funny Quiz... compiled by Viola Rodrigues (T.Y.B.Sc.)**

Q: What is the difference between a Quantum Theorist and a Beauty Therapist?

A: The Quantum Theorist uses Planck's Constant as a foundation, whereas the Beauty Therapist uses Max Factor.

Q: Why did the two photons become a particle?

A: When they met they were getting bored with high speed travel and decided to make something of themselves

**Some Quotes...**

•Physics is becoming so unbelievably complex that it is taking longer and longer to train a physicist. It is taking so long to train a physicist to the place where he understands the nature of physical problems that he is already too old to solve them.  
-*Eugene Wigner*

• Research is what I'm doing when I don't know what I'm doing.  
- *Werner Von Braun*

•The wireless telegraph is not difficult to understand. The ordinary telegraph is like a very long cat. You pull the tail in New York, and it meows in Los Angeles. The wireless is the same, only without the cat.

- *Albert Einstein*

...compiled by **Viola Rodrigues (T.Y.B.Sc.)**

**Editorial Board:**

• Prof.. S. N. Pai Raiturkar  
- Chief Editor

-Prof. Yatin P. Desai

•Mr. Scott Conceicao (T.Y.B.Sc.)

•Ms. Achala Mapari (T.Y.B.Sc.)

•Ms. Viola Rodrigues (T.Y.B.Sc.)

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**Indemnity:**

**Opinions and news appearing herein are those of the Editor and not necessarily those of the Principal or the Management.**



# RIPPLES

A NEWSLETTER OF DEPARTMENT OF PHYSICS



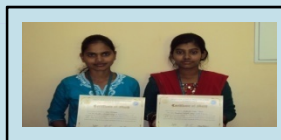
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JANUARY 2011

**TY students won prize for poster competition**

Ms. Viola Rodrigues and Ms. Achala Mapari won third prize in Poster Competition at 12<sup>th</sup> annual IAPT convention held at P. E. S. College of arts & Science, Farmagudi -Ponda, Goa, on 16<sup>th</sup> January 2011.



Poster was based on the work being carried out by them as a part of T.Y.B.Sc. project.

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**NGPE – 2011 held on Jan . 23**

National Graduate Examination in Physics (NGPE) is a voluntary Examination conducted by Indian Association of Physics teachers every year in January throughout India. Physics Students of our college participated in this exam and bagged certificates every year. This year six students of third year B.Sc. appeared for this national examination which was held on Sunday, 23<sup>rd</sup> January 2011.

**Results of NGPE - 2010**

Following students are center toppers at NGPE 2010:

- Mr. Parnaksh Kulkarni
- Mr. Prince D' Silva
- Ms. Rasmita Naik

Students are requested to collect certificates from Mr. S. N. Pai Raiturkar, Head of Physics Department

**Physics day celebrations on 28<sup>th</sup> February 2011...Please see pg. 4**



Andre Geim

**2010 Nobel Laureates in Physics**

K. Novoselov

A thin flake of ordinary carbon, just one atom thick, lies behind this year's Nobel Prize in Physics. Andre Geim and Konstantin Novoselov have shown that carbon in such a flat form has exceptional properties that originate from the remarkable world of quantum physics.

Graphene is a form of carbon. As a material it is completely new – not only the thinnest ever but also the strongest. As a conductor of electricity it performs as well as copper. As a conductor of heat it outperforms all other known materials. It is almost completely transparent, yet so dense that not even helium, the smallest gas atom, can pass through it. Carbon, the basis of all known life on earth, has surprised us once again.

**Contd. on Pg. 3**

### From the Editor...

It is indeed my great pleasure to bring out this issue of 'RIPPLES'. This issue portrays the success of student of our college in national level examination and state level poster competition. The department of Physics congratulates all successful students. Nobel prize in Physics, a major happening in the world of Physics is also depicted in this issue with a brief information on properties of Graphene, a material which is behind this years Nobel prize. Students response to contribute articles on recent scientific findings was enormous. I regret that all articles could not be published in this issue but will be done in subsequent issues. There is also an announcement about the Physics Day celebration which is planned to be held on February 28<sup>th</sup>, 2011. Some events are open not only for Physics students but for students of any discipline. I wish all students participate wholeheartedly in this event and explore the fascinating world of Physics. Finally, I would like to thank Head of Physics department, my colleagues and students who helped in some way or other to bring out this issue. Any comments and suggestions are always welcome.

**Editor,**  
**Yatin P. Desai**  
 Assistant Professor  
 Department of Physics  
 ypd001@chowgules.ac.in

### South Pole Neutrino Detector Completed



#### Scientists complete IceCube observatory:

Some particle physicists are giddy about a humongous gift at the South Pole. The world's largest detector for high-energy neutrinos was completed December 18, 2010, when scientists lowered the last of 5,160 sensors more than a mile beneath the ice of the Antarctic plateau.

IceCube Neutrino Observatory will hunt for tiny particles that are common in the universe, but rarely interact with other matter. In fact, trillions of neutrinos pass through a person's body each second. They rain down onto Earth as cosmic rays strike the upper atmosphere. Neutrinos also shoot out of the violent insides of stellar explosions, churn regularly from the sun and may even arise from the ambient leftovers of the Big Bang.

IceCube is tuned to find high-energy neutrinos like the ones bursting from active galactic nuclei, which are bright sources that are likely the radiation from a black hole gobbling the mass around it, and gamma ray bursts, intense beams of light from a star collapsing into a black hole. The \$279 million observatory is a full cubic kilometer in volume, or 1,000 times bigger than the Super-Kamiokande neutrino detector in Japan. While IceCube is less sensitive than the Super-K, scientists will need the huge volume to see long streaks of muons, exotic leftovers from collisions between neutrinos and water nuclei.

IceCube's sensors are designed to detect a flash of blue light when neutrinos collide with a water molecule. Ice at the South Pole is remarkably pure, so impinging neutrinos will almost certainly interact with water, not a different molecule. And because each new snowfall adds weight, packing down the ice below, there are a lot of molecules for a neutrino to hit.

Unlike most physics experiments, IceCube began taking data while under construction. Since 2005, it has already seen neutrinos with energies as high as 100 trillion electron-volts, seven times the maximum power that will be produced by collisions between protons at the Large Hadron Collider near Geneva, Switzerland.

**Scott Conceicao (T.Y.B.Sc.)**

### Nobel Laureates...Contd from pg. 1

Geim and Novoselov extracted the graphene from a piece of graphite such as is found in ordinary pencils. Using regular adhesive tape they managed to obtain a flake of carbon with a thickness of just one atom.

With graphene, physicists can now study a new class of two-dimensional materials with unique properties. Graphene makes experiments possible that give new twists to the phenomena in quantum physics. Also a vast variety of practical applications now appear possible including the creation of new materials and the manufacture of innovative electronics.

Graphene transistors are predicted to be substantially faster than today's silicon transistors and result in more efficient computers.

Since it is practically transparent and a good conductor, graphene is suitable for producing transparent touch screens, light panels.

When mixed into plastics, graphene can turn them into conductors of electricity while making them more heat resistant and mechanically robust. This resilience can be utilised in new super strong materials, which are also thin, elastic and lightweight. In the future, satellites, airplanes, and cars could be manufactured out of the new composite materials.

**Source:**  
<http://www.sciencedaily.com/>

### Swarm Satellite Mission to Sense Ocean Magnetism

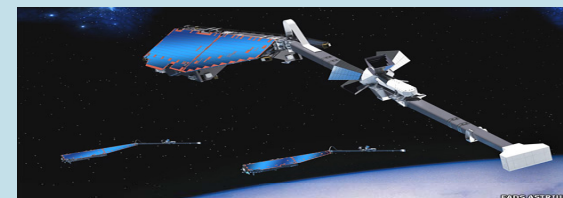
European scientists are going to try to measure the movement of the oceans by tracing their magnetism alone.

When salty ocean water flows through the magnetic field of the Earth, an electric field is generated and this electric field again makes a magnetic field, explained by the German Research Centre for Geosciences (GFZ) and a leading investigator on Swarm.

To measure the ocean currents which are so important for climate dynamics, as oceans are transporting a lot of heat. The German Champ mission was the first to see at least the tidal signal, but Swarm monitor the currents themselves."

The new mission is one of the several innovative European Space Agency (ESA) endeavours that major part of Earth's global magnetic field is generated by convection of molten iron within the planet's outer liquid core, but there are other components that contribute to the overall signal, including the magnetism retained in rocks.

Swarm's goal is to investigate all the components, but pulling out the small part produced by ocean movement will probably be its greatest challenge, concedes Dr Mark Drinkwater from ESA's Earth observation division.



Currently under construction with manufacturer EADS Astrium, the satellites look like giant mechanical rats with long tails.

The tails are booms designed to hold Swarm's sensitive magnetometer instruments away from the "noise" that would inevitably come from the electronics inside the main body of the spacecraft.

Every component put on the satellites has had to be tested, right down to the glues that have been used to bond some surfaces together. Any trace ferrous materials in the glues could ruin the measurements.

The Swarm satellites have the look of giant mechanical rats. The Champ spacecraft came out of orbit just a few weeks ago, burning up in the Earth's atmosphere.

Scientists reported first in 2003 that this satellite could sense the subtle magnetic field generated as the waters of the Earth moved under the gravitational tug of the Moon. This signal was apparent because of its very regular pattern.

At present, researchers use a range of methods to track the currents, including altimetry - the measurement of ocean surface height.

The Swarm satellites will be launched on a single rocket into a polar orbit some 300-500km (186-311 miles) above the Earth.

**Achala Mapari (T.Y.B.Sc.)**