SOE NEWSLETTER

SPECTRUM...

A TECHNO CREATIVE NEWSLETTER

NOVEMBER 2011

INSIDE THIS ISSUE:

Reach us @
newsletter.gbu@gmail.com

MESSAGE FROM VICE CHANCELLOR

Dear Students and Faculty,

I congratulate the School of Engineering for making this newsletter a regular feature. This is a showcase of their creative as well as their scientific qualifications.

Education should encourage a holistic growth in an individual. The five qualities, which were upheld by Buddha as the hallmark of a model disciple are faith, virtue, generosity, learning and wisdom. These are a combination of the emotional, intellectual and moral faculties of man. The Gautam Buddha University is striving to achieve this balance. The students of science and technology have a higher goal because the ultimate aim of science is understanding the true reality of nature, minimizing human suffering and making human beings happy by way of providing material comforts.

I hope the students and faculty not only create new benchmarks in science but also use their knowledge for the humanity.

DEAN'S MESSAGE

It is a matter of great satisfaction that School of Engineering has taken a lead in the GBU in publishing School's newsletter. This is second issue of the newsletter from the School showing academic profile of the School in recent past. School is aimed to run courses and conduct research in the core engineering and planning disciplines like Civil, Mechanical, Electrical Engineering and urban & regional planning. School of Engineering is one of the most sought School in the University and we offer quality engineering education coupled with the intellectual and technological resources of a world-class research institution. Our goal is to position our engineering postgraduates to be problem solvers, project leaders, communicators, and ethical citizens of a global community. Committed towards engineering education, innovation and interdisciplinary research, we offer our students a rich educational experience, an experience that marries intellectual rigor and cross-disciplinary breadth in an intimate, student-centered environment. Research is an integral part of this experience. Our close collaborations with the university's extraordinary professional schools create a wealth of research options. In the recent past School has successfully conducted many short term training programmes and management development programmes as a continuing education initiative. School is embarked on establishing state of the art experimental facilities. Recently, School has also got very good research funding, for the projects submitted by different faculty members, from various agencies for conducting research. I invite you to become better acquainted with the School of Engineering, where you will discover not only engineering excellence, but also a campus alive cultural, artistic, and intellectual activity.

INFORMATION TECHNOLOGY FOR CONSTRUCTION PROJECTS

Dr.Vanita Ahuja

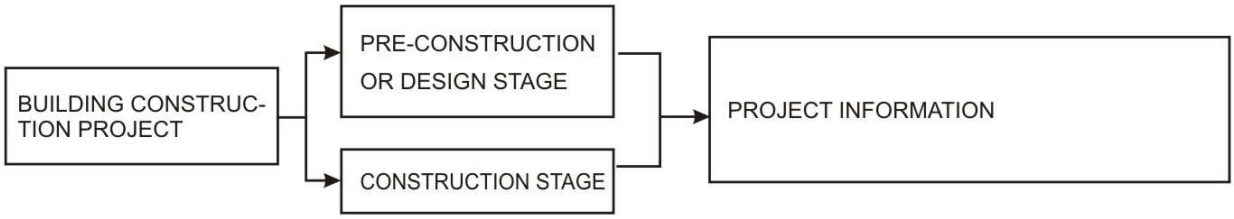
Since 1980s the construction projects have globally faced increased demands from the society for higher quality, more variation, higher complexity, shorter lead times, lower costs, a lesser burden on the environment and better working conditions. This increase in demand is only likely to continue. One of the industry's answer to these demands might be to make better use of information and knowledge that is available and maximize use of new tools including 'Information Technology' (IT). Use of Information Technology in Construction projects can be summarized under three following heads:

Pre-construction activities such as designing, analysis, computing, costing and scheduling.

Post construction activities

Project integration among various project participants.

Project communication management i.e flow of knowledge and information



Project Information could be further divided into following important information sets:

Clients' brief, Cash flow and procurement accounts for each organization, Intermediate analysis results during planning and design, Design documents, including drawings and specifications, Construction schedules and cost estimates etc.

In our country Delhi Metro project and Delhi international airport terminal T3 projects are examples of projects which have been completed successfully and on time due to strategic use of IT tools and techniques

But we still have a long way to go in adequate adoption of IT by the construction industry as a whole.

STUDENT EDITORIAL

Waris Nawaz Khan (B.Tech Mechanical 3rd sem)

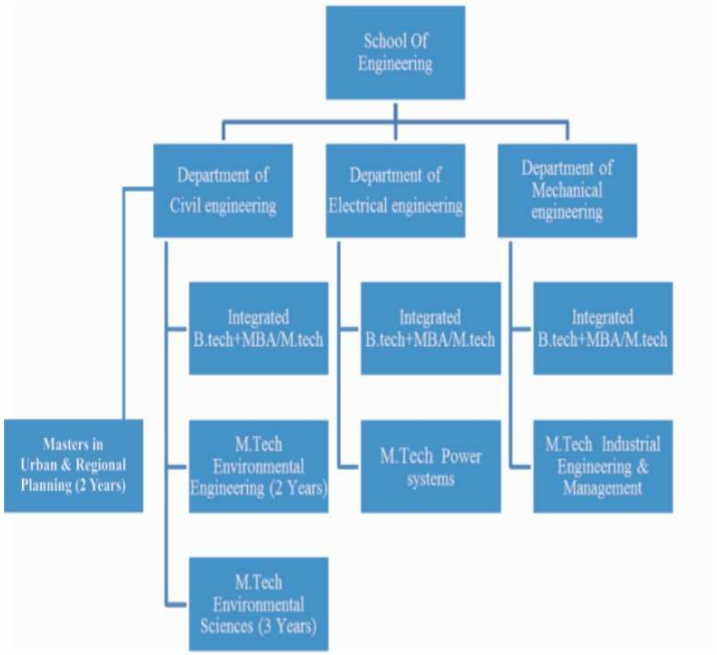
In the recent past I read an article that quoted Napoleon Hill:

" Desire is the starting point of all achievement, not a hope, not a wish, but a keen pulsating desire which transcends everything." and today when I am sitting to write another student editorial for this second edition of our SOE's newsletter " SPECTRUM" all I am going through is the thought about the desire and dream of the person who had a vision of establishing an engineering department here and all I am watching in flashback is time that I crossed a year back,, the day of the encounter of first ever batch of Engineering of Gautam Buddha University with SCHOOL OF ENGINEERING. The first interaction with of SOE began with a view of marvelous piece of architecture and small in number but apparently very strict faculty members. But today making statistical comparison of both whereas the architecture remains same, but the faculty has grown out be multi numerous with specialists in their respective fields. The initial student head count of SOE accounted to just 180 students which is now 600+ in the ongoing academic session !!!!

The year that passed saw School Of Engineering getting many feathers in cap ,as it became the first school in university to host a "Technical poster exhibition. The School also successfully organized several seminars ,training programs. This edition discusses these well in detail ,along with which technical project report has also been presented by faculty and students. The new launch in the edition is a faculty column that gives us an article from a faculty on the topic of their choice of specialization.

On behalf of Faculty coordinators I wish u the best of everything .Have a wonderful time reading this "SPECTRUM". With a hope that in the time we would witness more number of people associating themselves with the "SPECTRUM". Happy reading !!!!!

SOE LAYOUT



DEPARTMENTS @ SOE

Department of Civil Engineering: - The branch offers integrated dual degree program for undergraduates and the master degree in the fields of Environmental Engineering and Structural Engineering. The faculty coordinator for civil engineering is Dr. Shilpa Pal. Moreover civil engineering has total 6 faculty members as of now in different designations that specialize in various Civil engineering topics like Building Materials, IT Applications in Civil Engineering etc.

Department of Electrical Engineering: - The branch offers integrated dual degree program for undergraduates and the master degree in the fields Power system. The faculty coordinator for department is Dr. M.A.Ansari. There are 7 faculty members in different designations till date that assist students in topics like Electrical Engineering Materials, Circuit Analysis etc.

Department of Mechanical Engineering: - The branch offers integrated dual degree program for undergraduates and the master degree in the field's Industrial engineering. The faculty coordinator for mechanical engineering is Dr. Satpal Sharma. Department has 7 faculty members in different designations that specialize in topics like Fluid Mechanics, CAD etc.

Department of Power Engineering: - The branch offers integrated dual degree program for undergraduates and the master degree in the field's Power engineering. The faculty coordinator for Power engineering is Dr. Ashu Verma. Moreover it has faculty members in different designations that assist students in various Power engineering topic like Power Transmission Systems, Power System Analysis & Operation etc.

Department of Environmental Engineering: - The branch offers integrated dual degree program for undergraduates and the master degree in the field's Industrial engineering. The faculty coordinator for Environmental engineering 2 year as well as 3year is Dr. Athar Hussain. Moreover it has faculty members in different designations that assist students in various Environmental engineering topics like Engineering Hydrology, Natural Resources and Management etc.

Department of Industrial Engineering: - The branch offers integrated dual degree program for undergraduates and the master degree in the field's Industrial engineering. The faculty coordinator for mechanical engineering is Dr. Harlal Singh Mali. Moreover it has faculty members in different designations that assist students in various Industrial engineering topics like Operations Research, Modeling and Simulation etc.

ACHIEVEMENTS

Dr. Harlal Singh Mali in the School of engineering, brought laurels to the organization by becoming one of the three academician ACI (Autodesk Certified Instructor) in India with high score in Autodesk Inventor.

Screening Committee of Science and Engineering Research Council, Department of Science and Technology (DST),Ministry of Science and Technology on Fast Track Proposals for Young Scientist in Engineering Science in its meeting held at Indian Institute of Technology, Guwahati on 29-30 July,2011 recommended (SERC/ET-0159/2011) the project proposal of Dr. HS Mali' design and development of low cost one way Abrasice Flow Machine (AFM) utilizing pulp and fillers earth based media' amounting Rs. 23 lacs for 3 years.

Dr. Shilpa Pal and Dr.Ratnish have got the opportunity to work on behalf of IIT Roorkee under the project sponsored by National Disaster management Authority

TRAINING PROGRAMME ON SEWAGE TREATMENT FOR SRI LANKAN PROFESSIONALS

A team of Srilankan delegates came to India for a Short Term training Programme on Sewage Treatment held between May 23, 2011 to May 28, 2011.The Training programme was sponsored by UVA PROVINCIAL COUNCIL, PROVINCIAL DEPARTMENT OF BUILDING. The delegation was headed by Parackrama Karunarathne, Provincial Director of Buildings. The event was Co-ordinated by Dr. Mahesh Kumar Jat, and Dr. Athar Hussain,.

The programme was inaugurated by Honorable Vice Chancellor Shri S. R. Lakha .The Training programme was started with a series of lectures and case exercises from faculty members of Gautam Buddha University as well as the eminent experts from prestigious institutions such as IITs and Field experts from Industries of the respected field. The programme was followed by field visits made to the real scale wastewater treatment plants located in Delhi NCR region, Agra city as well as Asia's largest wastewater treatment plant located in Lucknow. During the programme discussions pertaining to the case studies on sewage treatment systems and the existing treatment technologies as well as advancement in the sewage treatment technologies were done. Also the Srilankan Engineers were trained to design the various sewage treatment schemes and also to upgrade the existing sewage treatment plants.

SHORT TERM TRAINING PROGRAMMES

1. A short term training programme on computer aided engineering and graphics and drawing was organized in school of engineering from June 13, 2011 to June 17, 2011 under the supervision of Dr. Harlal Singh Mali, Dr. Mahesh Kumar Jat, Dr. Shilpa Pal. The STTP was planned to cover integration of all the topics of Engineering Graphics & Architectural Drawing at micro level with commercially available CAD tools like the Autodesk Inventor and AutoCAD. This programme was basically developed for Faculty of Engineering / Architecture Institutions at Degree /Diploma levels, PG students, Research Scholars, practicing engineers & architects in government & industry. The programme had participants from various universities and colleges like SLIET, Longowal, Punjab, CS Patel Institute of Technology, CHARUSAT, Gujrat to name a few. The participants were taught the various aspects of computer aided engineering drawing like Drawing Engineering Curves by AutoCAD Inventor® ,Drawing projection of Points / Lines / Planes / Solids by AutoCAD Inventor® etc. with hands on Practice. The programme finally concluded with the felicitation of the participants by the Dean.
2. One week faculty development programme on "Design & Analysis of Engineering Experiments" during 4th July to 8th July 2011.
3. Three days training programme on "MATLAB & Its Application" during 13th July to 15th July 2011.
4. Three days training programme on "Waste Minimisation Tools & Techniques" during 24th September to 26th September 2011.

AUTODESK STUDENT EXPERTS DAY

On June 14, 2011 the school of engineering was a proud host to the Autodesk Student experts day programme, conducted by Autodesk Company The event had participants from GBU, DTU and CHITKARA UNIVERSITY. The event began with great enthusiasm and zeal. The event commenced from an expert lecture by Dr. Anil Sahni, followed by many activities for the participating students where the students of various institutes got to interact with each other, and also shared their experiences of the various projects they successfully carried out using Autodesk products. The people from Autodesk Fraternity also told the participants about Autodesk and they as a student can be a part of it. The main event was the Autodesk certification test which could not be carried out but still it did not hamper the spirit and enthusiasm of the participants. The event finally came to its closing ceremony which was presided by Registrar sir, and Professor Mahavir Singh.

PRATIBIMB: PHOTOGRAPHY CLUB

Besides the academic excellence in various fields GBU harbours a photography club which is run by young professionals of different fields under the guidnce of Dr. Imtiaz Qmar and Dr. Om Prakash, though are not professional photogaraphers but they are able to catch the pictures in their true spirits which has a soothing effect on entire soul. Recently an audition was held on the theme of monsoon. Students participated to show their talents with great zeal and zest in large. The general secretary of the club is Prateek Saxena. For queries catch the club at **pratibimb.gbu@gmail.com**.

The debating session

MUSIC AND DANCE CLUB

While preparing themselves to face the music of life students will set musically to amuse the music of life. The club co-ordinate various dance, instrumental and musical shows. The faculty co-ordinators of the club are Ms. K. Vijay chitra, Dr. Subrojeet banarjee, Dr. Savneet Kaur, Dr. Nidhi Singh, Dr. Deepali Singh and Dr. Barkha Singhal. The senior student co-ordinator is Isha Tyagi. The club organizes various competitive dance, dances with theme, instrumental and musical shows, singing compititions etc. Recently the dance auditions were held for our cultural fest Abhivyanjana.

DRISHTIKONE: THE DEBATE CLUB

The young professionals in budding show their logical aptitude and temperament in dealing with the most burning social events of day to day life which is an extra ordinary feature of the professional in dealing the various aspects of life which may help them in dealing the society, the country, and by in large globally so that they become more apted dynamic professionals. This group is run under the guidance of Dr. Shubhashish Bhadra, Dr. Vidushi Sharma and Dr. Shabana Urooj. The club invites a group discussion on every Wednesday which the student participate in great number. The general secretary of the club is Waris Nawaz Khan. Recently a group discussion was held on the topic THERE SHOULD BE A QUALIFYING EXAM FOR THE POLITICIANS. The orators came with the new ideas and the discussion was carried to the depth. The future plans of the club are to conduct interactive sessions round the year and the competition to reach at the university level. For more details mail the club at **drishtikone.gbu@gmail.com**

ADVENTURE CLUB

For excitement and thrilling experience the university has come up with the new club known to be as adventure club. It organizes various trips for trekking, mountain climbing and extreme sports. The club has got the membership of NATIONAL ADVENTURE CLUB. The faculty co-ordinators are Dr. Pradeep Kumar, Dr. Shilpa Pal and Dr. J.P Muyal. The university organized a trip at triund trek on 2nd oct '11. The trip consisted of 30 students along with faculty Dr. Pradeep Kumar, Dr. Omveer Dhaiya, and Dr. Nirmita Mehrotra. The club has future exciting trips also in February to National Adventure Festival which consist of parasailing and river drafing.

PRADARSH DRAMATICS

Life is drama which is well perceived by the young actors of gbu,though we are not trained in acting schools but our endaveour and excellence is well depicted by their excess participation in various dramas, plays, nukkad natak,skits etc.. The club is the largest of all the clubs in terms of number of members. The faculty coordinator is Dr. Navaras Jaat Aafreedi, Dr. Anuj Sharma, Dr. Sumitra Huidrom and Mrs Kavita Singh. The club will conduct various English plays round the year.The plays planned to be enacted this academic session in the campus are Crucible by Arthur Miller, The Room by Harold pinter, In The Dark by Motti Lerner, Death Of The Salesman by Arthur Miller and the hindi play Agra bazaar. The general secretary of the club is Vivek Rana. Eminent play writer Motti Lerner visited the university and guided the students how to write plays and fictions. One can also connect with the club through **aafreedi@gmail.com**.

AUDIO VISUAL CLUB

Pradarsh is an audio visual club of GBU. The motive of the group is to built a sound, healthy, interactive atmosphere. Through its screenings the club has drawn attention to the plight of the most troubled peoples of the world and drawn parallels to the Dalits, for instance, the Romans, the Blacks, the Jews. Under the banner of club every Friday at 5:00 pm a documentary movie is screened for students and faculty. Some of the screened movie include 'A Mighty Heart' etc. the movies usually deal with subject that would have a positive effect on the human psychology as such subject covr homicide period by Adolf Hitler unrest in African countries and many other. The faculty co-ordinator of this club are Dr. Arun Solanki. And Dr. Karan Singh.

QUANTITATIVE PREDICTION OF PHYSICAL PHENOMENA

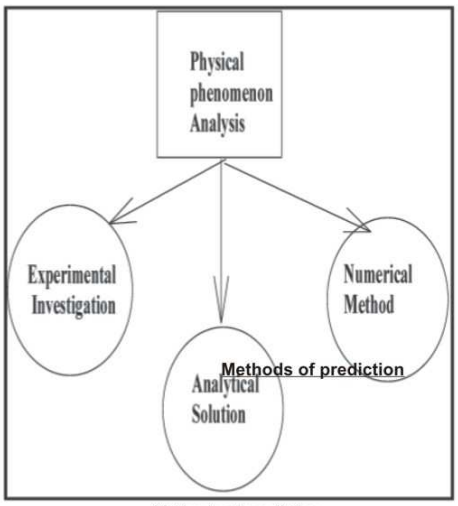
Dr. Harishchandra Thakur, Assistant Professor, Mech. Engg. Department

Analysis of physical phenomena has an overwhelming impact on human life. Prediction offers economic benefits and contributes to human well-being.

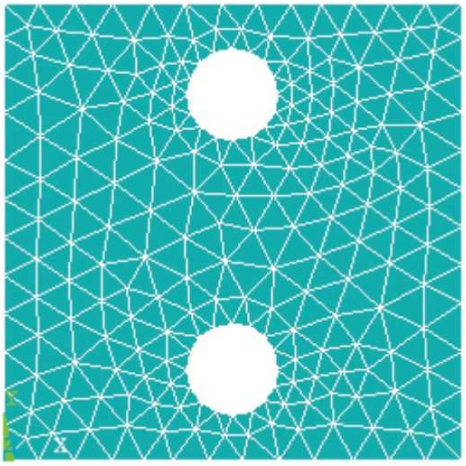
An experimental investigation can provide most reliable information about a physical process. But, most of the time, full-scale experiments are very expensive and even not possible. Other two methods originate from mathematical modeling of the physical phenomenon which often results in a set of differential equations. Solving those equations using classical mathematical methods can provide the analytical solution of the phenomenon.

Numerical methods have become a popular choice of prediction due to availability of high speed computers and advantages like: low cost, high speed and better analysis etc.. These methods have made design process much easier as many of the design alternatives can be viewed and analyzed without significant addition of cost and time.

The finite element method (FEM), finite volume method (FVM) and finite difference method (FDM) are well known conventional numerical methods. The spatial domain where the governing partial differential equations are defined is discretized into meshes in these methods. In contrast to the precedingmesh-based techniques, a comparably new class of numerical methods has been developed which approximates partial differential equations only based on a set of nodes without the need for the underlying mesh. They are called meshfree/ messless/ element free methods. They use a set of nodes scattered within the problem domain as well as on the boundary of the domain to represent the problem domain and its boundary. These form a mesh, which means that no information on the relationship between the nodes is required, at least for field variable interpolation.



Methods of prediction



FEM — Elements

PARTICLE VELOCITY MEASUREMENT

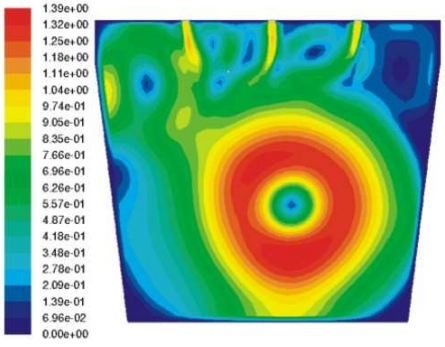
Dr. Brajesh Tripathi, Assistant professor, Mech. Engg. Department

At higher concentration some particles travels at higher speed which is not measurable with available equipments. We would like to utilize a combination of biological and chemical sensors, which was projected at different locations inside a closed space (container) or some other suitable applications. We would also measure the concentration in the path, through Path-line-Mass-line method developed by Bejan (1988). The complete concept would employ the thorough analysis through Computational Fluid Dynamics.

Fluent, as a simulation tool could be used for designing a container for the proper circulation of gas ensuring maximum contact. The location of injection plays an important role for designing the container. The development of a model for distribution of a gas in a closed container would be based on the analysis of different flow properties and flow behavior inside a container.

The complete development of the modeling and simulation part and its analysis at different combinations of flow equation and solvers could be performed on ANSYS Fluent. A latest version with all the possible tools makes it robust for detail investigation.

After establishing the specific objective in the Fluent, the available data might be verified with the simulation results ensuring the proper validation.



Contours of Velocity Magnitude (m/s) (Time=1.3000e+02)

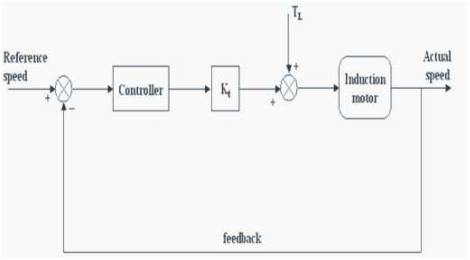
ROLE OF ADJUSTABLE SPEED DRIVES

Mr. Bhavnesh Kumar, Research Associate, Elect. Engg. Department

Electric drive is basically a system, employed for motion control. The various applications such as transportation systems, fans, pumps, textile mills, washing machine, mixer-juicer etc. require motion control.

Adjustable speed drives were first introduced with a primary motive to save energy in the process industries requiring controlled motion. With the advancement in the power electronics and converters, AC drive has taken over the DC drives. The AC drives further get more attention with the development of various control schemes such as vector control, direct torque control techniques and they were started to be used in industries requiring high precision of speed control and good dynamic performance ,such as machine tools, robotics, metal rolling, paper mill finishing lines, etc.

These are all applications which must have adjustable speed, by the nature of the process. The two most significant applications of AC drives to consumer products are in residential pumps and in passenger vehicles. Electric vehicles have been identified as a vital technology to reduce carbon emissions and dependence on fossil fuels.



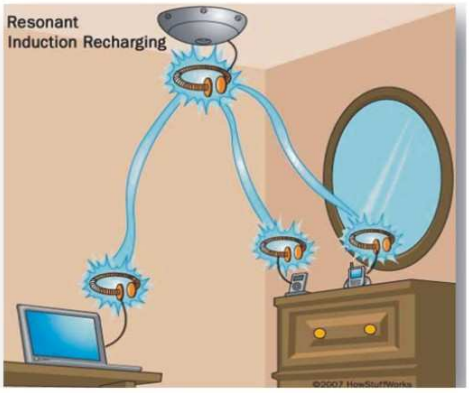
WITRICITY: THE WIRELESS ELECTRICITY

Sachin Mishra, IInd year Mech. Engg.

The conventional use of electricity is made possible through the use of wires. However researchers have devised a means of providing electricity without any wires.

Witricity is basically a portmanteau for wireless electricity. This concept of wireless electricity works on the principle of using coupled resonant objects for the transference of electricity to objects without the use of any wires. This system consists of a Witricity transmitter and another device called the receiver.

The receiver works on the same principle as radio receivers where the device has to be in the range of the transmitter. It is with the help of resonant magnetic fields that Witricity produces electricity, while reducing the wastage of power. As a need of moment, this concept can be projected on larger scale by increasing its practical uses.

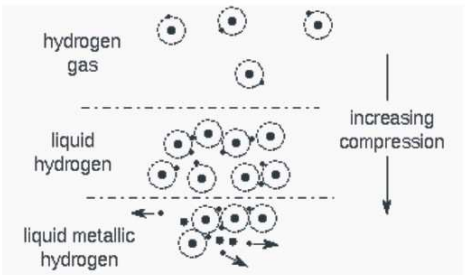


FUTURE FUEL– METALLIC HYDROGEN

Prateek Saxena, IInd year Mech. Engg.

When universe was created the first elementary atom was hydrogen followed by helium and lithium. The hydrogen and other particles created at that point of time were under immense pressure of ~25 GPa (250,000 atm or 3,500,000 psi) that the hydrogen changed its form from gas to a metal. In the hydrogen under that condition electrons are unbound and behave like the conduction electrons in a metal. In liquid metallic hydrogen, protons do not have lattice ordering; rather, it is a liquid system of protons and electrons.

The scientists found that, as pressure rose to 1,400,000 atm (142 GPa), the electronic energy band gap, a measure of electrical resistance, fell to almost zero. The band-gap of hydrogen in its uncompressed state is about 15 eV, making it an insulator but, as the pressure increases significantly, the band-gap gradually fell to 0.3 eV. Because the thermal energy of the fluid (the temperature became about 3,000 K due to compression of the sample) was above 0.3 eV, the hydrogen might be considered metallic. The most important application of metallic hydrogen is that it helps in making hydrogen fuel and nuclear power.



In Jupiter and Saturn the gravitational compression is great enough to squeeze electrons out of the hydrogen atoms so they move easily in the liquid and conduct electricity—liquid "metallic" hydrogen.

LITTLE

Dreams are the desires we have,
dreams are what I should not see.
I look upto everyface in this world to help me,
I look upto many face and feel jealous.
"Why me?", is what I always ask,
looking up to the sky.
My childhood betrayed,
my life misused,
my hopes fading,
still looking for that angel to come,
to come and rescue me from this hell.
Life has not given me any choices,
even to live is not in my hands.
Dying on the roads for my master,
beaten up every night
lost my innocence
lost my faith.
All to you I pray, is give me money
so that my master is happy
or else I'll have to pay with my blood.
Bare footed in the winters wth no clothes to wear
I stand here, with my
empty hands raised for
someone to oblige.
Those little silver circles,
have become my lfe.
-DEVYANI TEWATIA, Btech (Civil 2nd yr)

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newsletter.soe@gmail.com

THOSE DAYS

I remember those days

When the cool breeze

Soothed my face

I felt so happy that time

Those days when I was nine.

When god answered all my prayers

And ultimate fun was

Going to fairs

No wonder I enjoyed flitting

Here and there

Whether I was right or wrong

I didn't care.

Many years have passed

Everything is fresh

Memories and priorities

I wish to again go back to

The childhood days

Those carefree days….

-JYOTI BANKOTI B.Tech Civil)

My Experiences in SOE as a Freshman

Finally it was over. Huh! After all the searching, visiting and agonizing I chose this college- Gautam Buddha University. But to make an end is to make a beginning. The end is where we start from. So, I started my college life from here. I came to the college with a mixture of emotions. Although very exciting at prospect of studying at one of the largest universities in India , I couldn't help but feel anxious at the thought of spending the majority of my time in school of engineering.

However, I speak from experience, so tried to have some experiences before predicting things about the school. In the early days as a college freshman there seems to be a prepossessing periods where everything is new and exciting, but once students settle in, they realize that much of the college life consists of hard work and in SOE we were all already made cognizant of this so called 'hard work'.

Studying from the faculty of SOE was a unique experience…challenging and unbelievably rewarding. You are learning from the best in field. They made us learn, they worked hard on us…..we honestly couldn't ask for more. The another substantial thing for our teachers was our discipline (which was very uncommon for a regular engineering college). And we feel proud of that. But one thing I felt most strongly was SOE's greatest charm "the seductiveness of knowledge".

It was all good till the end. The end results were quite unironical, as well as complicated, thoughtful and charming (for some).

-AANCHAL YADAV, B.Tech(II year Mech.)

Change AttItude, Not LIfestyle

There are many who believe that to turn spiritual you have to change your wardrobe, diet and lifestyle. This does not appear to those who continue in there materialistic ways. A few inspired ones change everything except their thinking! They fail to benefit, get frustrated and give up. Rare is the wise one who focuses only on 'attitude' and succeeds.

Well in my experience I have seen people doing fast to show their spirituality, but among them very few really mean it. What does fasting really mean? FASTING primarily means the of willingly abstaining from all some or all food, drinks or both for a period of time. But it also means a clean mind having no wicked thoughts or awful behaviour. In life everyone is denied a few things. But all of us have been blessed with millions of gifts. If you focus on what you do not have, you will be unhappy. If you choose to focus on the things you have, you are grateful and you develop an irrestible desire to share, contribute and give. This makes you happy. The most precious things come for free, which you do not even consider! Hence you live life feeling deprived when, infact, you could be totally fulfilled and abundant. So enhance the qualities which you do not even consider! Hence you live life feeling deprived when, infact, you could be totally fulfilled and abundant. So enhance the qualities which you already have.Besides this,all selfish people are unhappy. To the extent you turn unselfish you will be happy. So my dear friends mind that the world and all that it offers is temporary. Understand the transient nature of the world while living in it and you will be happy. So change attitude not lifestyle. Your life will change from drudgery to revelry. From mediocrity to excellence. So my dear friends mind that the world and all that it offers is temporary. Understand the transient nature of the world while living in it and you will be happy. So change attitude not lifestyle. Your life will change from drudgery to revelry. From mediocrity to excellence. So my dear friends mind that the world and all that it offers is temporary. Understand the transient nature of the world while living in it and you will be happy. So change attitude not lifestyle. Your life will change from drudgery to revelry. From mediocrity to excellence. So my dear friends mind that the world and all that it offers is temporary. Understand the transient nature of the world while living in it and you will be happy. So change attitude not lifestyle. Your life will change from drudgery to revelry. From mediocrity to excellence.

ADITI SINGH (B.Tech,Civil II yr)