

# MATERIAL ADVANTAGE

@

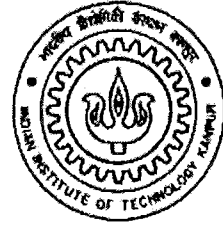
**Indian Institute of Technology Kanpur**



**Fall Membership Challenge 2011**

**Report Submitted On**

Oct. 31, 2011



IIT Kanpur

## Material Advantage Student Chapter Report

### *Our student activity based on the three objectives:*

- i) To improve student member's academic ability and open doors for our members to communicate with established professional's workings in the fields of metallurgy, materials and related disciplines. Thus regular website was updated: <http://www.iitk.ac.in/mme/materials>.
- ii) To outreach community to the budding Engineer and to inspire students to become the future researcher. Hence various activities such as understanding lectures series , Quiz contests, and Micrography Contest were arrange by our chapter which invited an average of over 60 participants in every activity.
- iii) Our student chapter encouraging personal & professional skills in view of this student talk has been arranged on metallurgy and material science aspect outside the campus CSJM University (UP) India.

## Fall Membership Challenge 2011 at MA @ IIT Kanpur

The current membership of 11 has now increased by two renewals and 26 new memberships bringing the total count to 39 members. Thus, a **whopping growth of 236.4 %** (from existing 11 added with 27 new members) has been observed during the 2011 Fall Membership challenge for Material Advantage @ IIT Kanpur during the period from Oct. 1, 2011 to Oct. 31, 2011 as shown in the growth bar-chart below.

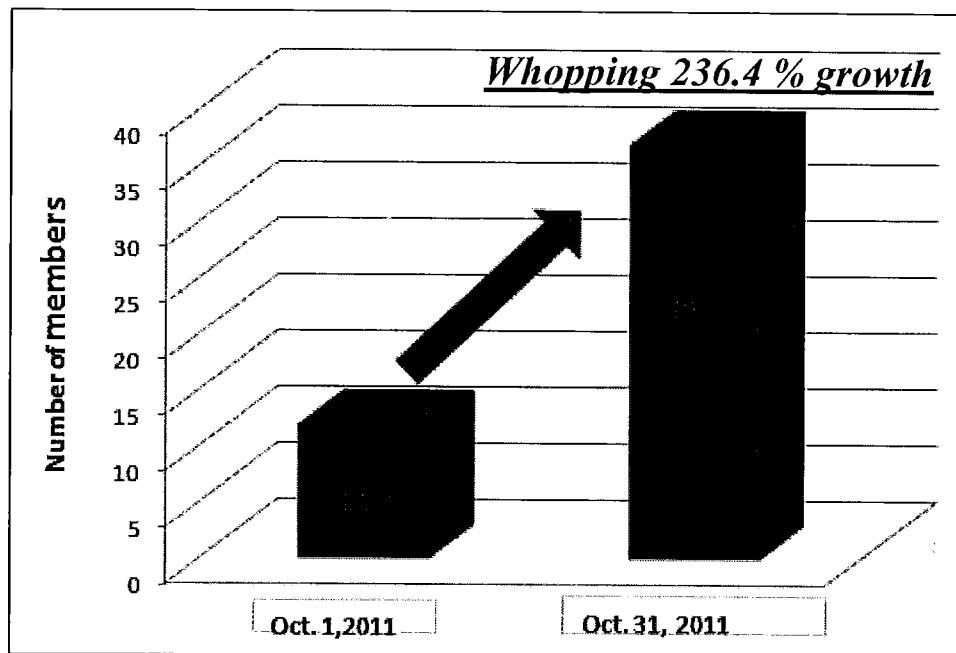


Fig. 1: Bar graph showing the increase in Material Advantage @ IIT Kanpur membership during Fall 2011 membership challenge.

### Office Members Student Chapter @ IIT Kanpur

- 1. Faculty Advisor:** Dr Kantesh Balani
- 2. Chairman:** Mr. Abhijeet Moon
- 3. Vice Chairman:** Mr. Soumitro Mahanty
- 4. Secretary:** Ms. Neha Gupta
- 5. Treasurer:** Mr. Piyush Sharma
- 6. Head Creative Team:** Mr Ramakrishna

### Details of the recent meetings of Material Advantage@ IIT Kanpur

Sr No.	Date	Venue	Agenda	Committee Attendance
1.	1/09/2011 5-6pm	WL 205	Future Planning of MA	Saumen, Moon, Soumitro, Shiva, Neha, Sarvana, Ramakrishna
2.	15/09/2011 5-6 pm	WL205	Bus tour	Moon, Shiva, Neha, Sarvana, Ramakrishna
3.	22/09/2011 5-6 pm	WL205	MA Quiz / Faculty Talk arrangement	Moon, Shiva, Neha, Sarvana, Ramakrishna
4.	4 /10/2011 4-5 pm	WL205	Micrography Contest/MA -T shirt Design	Moon, Shiva, Neha, Sarvana, Ramakrishna
5.	12/10/2011 5-6 pm	WL205	Talk in CSJM/MA membership drive in CSJM university	Moon, Shiva, Neha, Sarvana, Ramakrishna
6.	18/10/2011 3-4 pm	WL205	Micrography/Membership drive in IITK	Abhijeet Moon, Neha, Sarvana, Ramakrishna

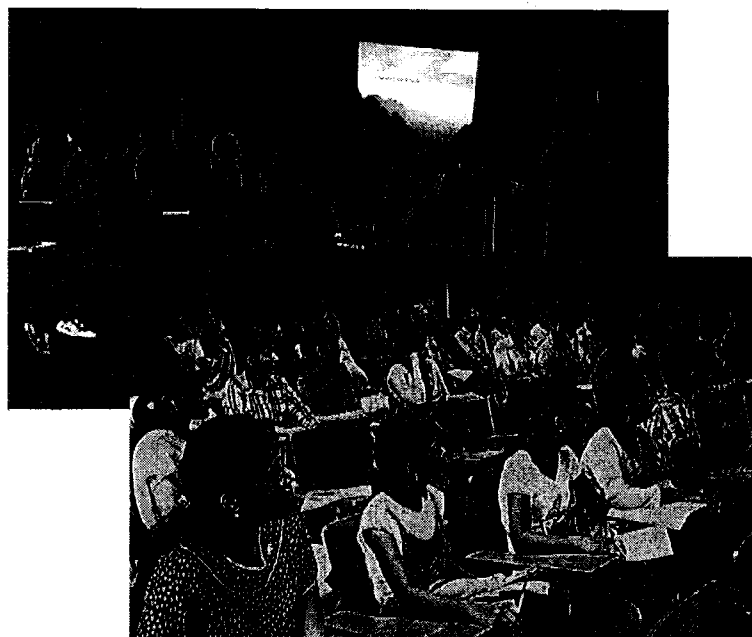
In order to increase the encourage and cultivate interest in the minds of the students a wide variety of activities has been organize comprising of presentations by faculty on career prospects in the field of Materials science & Engineering, promoted student's lecture outside campus, and various contest related to Material Science. The events have witness huge number of participation from the students from inside and outside campus averaging more than 50 and we are hoping this will grow further with upcoming year.

Our overall activities team has been appended below which has take place successfully and our forthcoming events which is under planning

<i>S. No.</i>	<i>Events (name)</i>	<i>Date</i>
1	Talk by Dr. Kantesh Balani	10 <sup>th</sup> Sept., 2011
2	Bithoor Bus trip	18 <sup>th</sup> Sep 2011
3	MA quiz and Lecture series	23 <sup>rd</sup> Sep 2011
4	MA T shirt Design	4 <sup>th</sup> October 2011
5	Booth Table for membership drive	5 <sup>th</sup> October 2011
6	Exhortation'11	13 <sup>th</sup> October 2011
7	"Occhiolino 2011" Micrography Contest	19 <sup>th</sup> October 2011
8	Social Gathering (Diwali)	26 <sup>th</sup> October 2011
9	Pushing the Membership Drive	31 <sup>st</sup> October 2011
10	Extempore (Upcoming event),	23 Nov 2011
11	Sports Contest (Upcoming event),	26 Nov 2011
12	Treasure hunt (Upcoming event).	28 Dec 2011

## ***1. Sensitizing the Membership Drive (Sept. 10, 2011)***

A leadership lecture on the topic “*Develop a Leader in You*” was presented by Dr. Kantesh Balani on Sept. 10, 2011. Since many of the attendees were also non-members, this lecture followed with informal discussion on the benefits of Material Advantage student membership in developing the network.

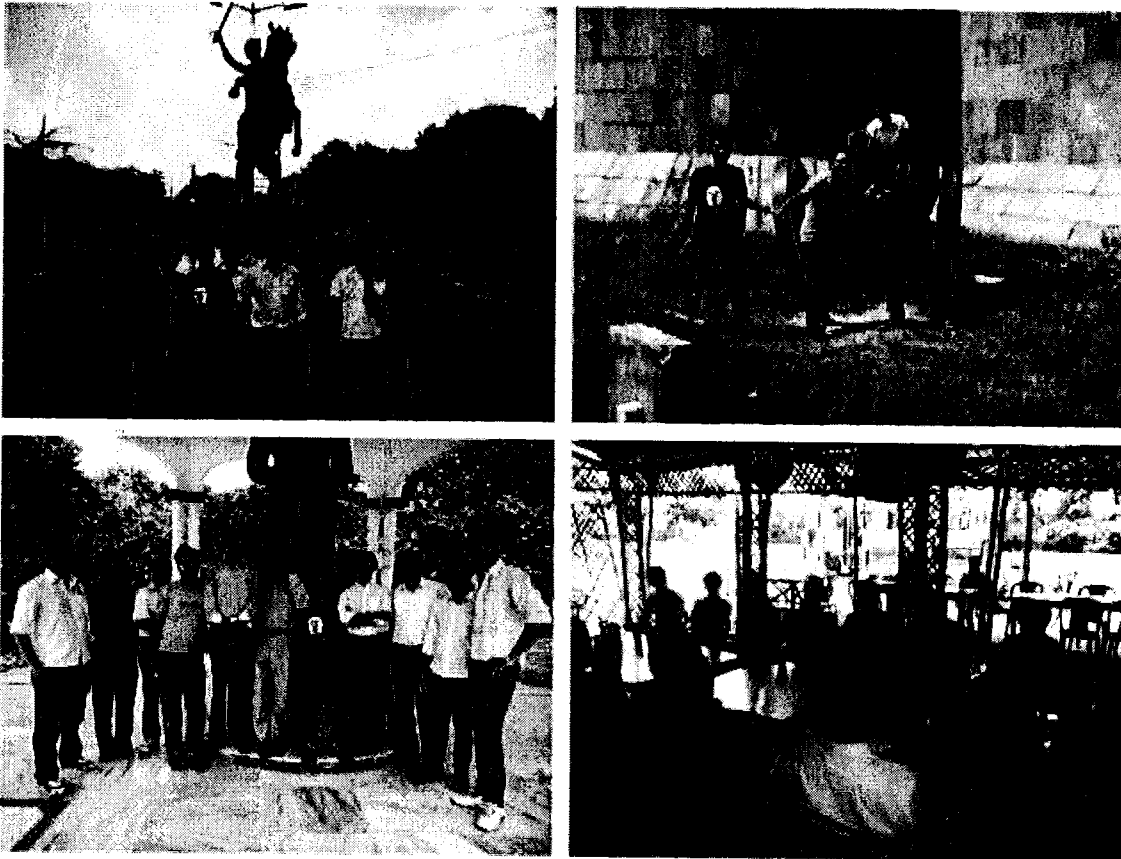


*Dr. Kantesh Balani delivering the lecture on "Develop a Leader in You" on Sept. 10, 2011.*

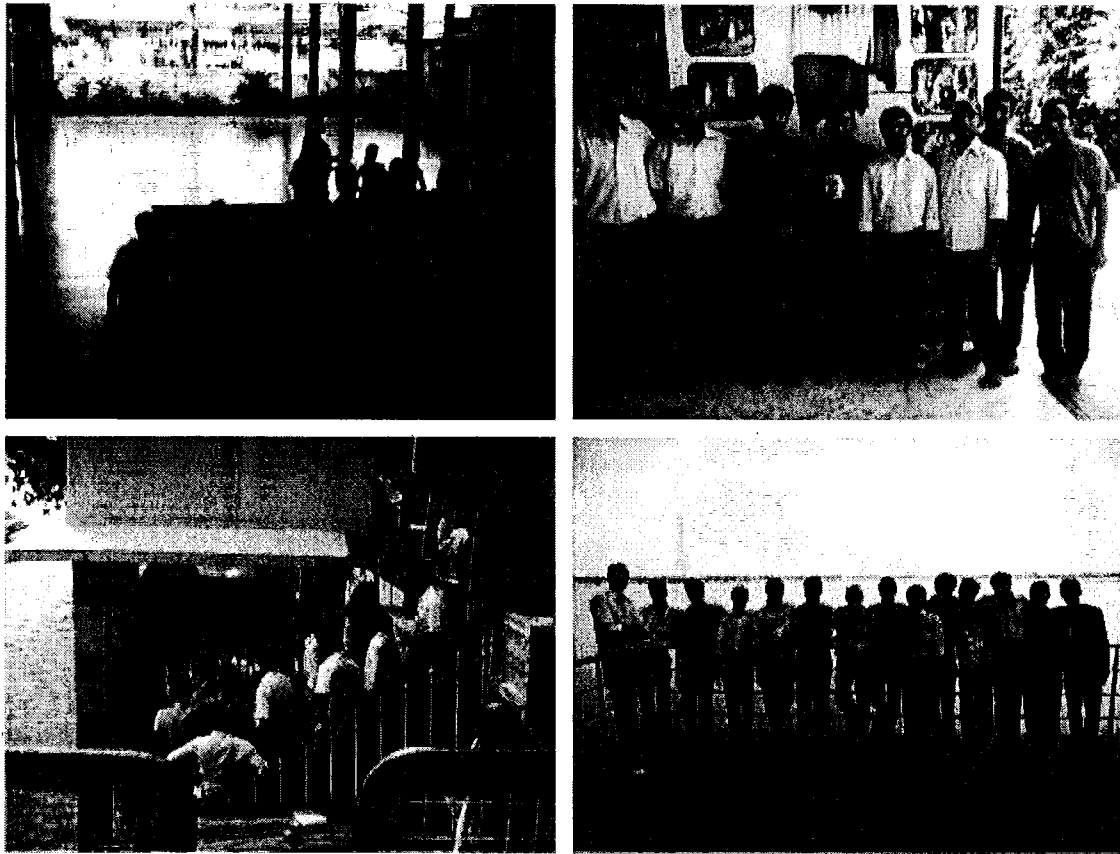
## ***2. Bithoor Bus trip: (Sept. 18, 2011)***

Our chapter also had encourage tour which was enjoyed by many students in large number. A good number of students had joined to Bithoor bus tour on 18<sup>th</sup> September 2011. Bithoor or Brahmavart, as it was originally known, lies 22 km from Kanpur, on the road to Kannauj in the Indian state of UP state. Bithoor, situated on the banks of the Ganges, and is steeped in mythology, folklore, and history. The place was known as Brahmavart due to its connection with Brahma

the Creator. Bithoor is also very closely associated with the legends of Rama, Valmiki, Lav & Kush, and Dhruv, the legendary prince. It has been closely associated with the Indian independence movement, especially the war of 1857.



*Students attended historical and beautiful mythological places around Bithoor. Lunch has been arrange in Bithoor*



**Students praying in the temple and visiting holy Ganga River**

### ***3. MA Quiz (Sept. 23, 2011)***

Quiz based on Metallurgy & Materials Science was organized on 23<sup>rd</sup> September 2011. 8 teams consists of 24 participants were shortlisted among 100 number of participants from IIT Kanpur and CSJM University for the main quiz rounds based on their performance in a preliminary test of 30 minutes duration based on Metallurgy & Materials Science. The flyer for the event is attached below.

# Material Advantage Technical QUIZ

Quiz based on Material Science & Metallurgy

No cost to play  
but here to win a  
chance



## Think & Win !



Attractive Prizes & Certificates

Deadline for entries: 20<sup>th</sup> September 2011

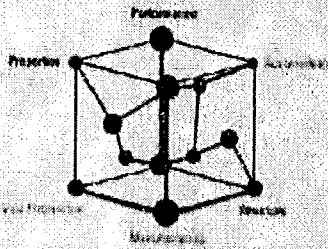


Send your Entries  
[ma.iitk2011@gmail.com](mailto:ma.iitk2011@gmail.com)

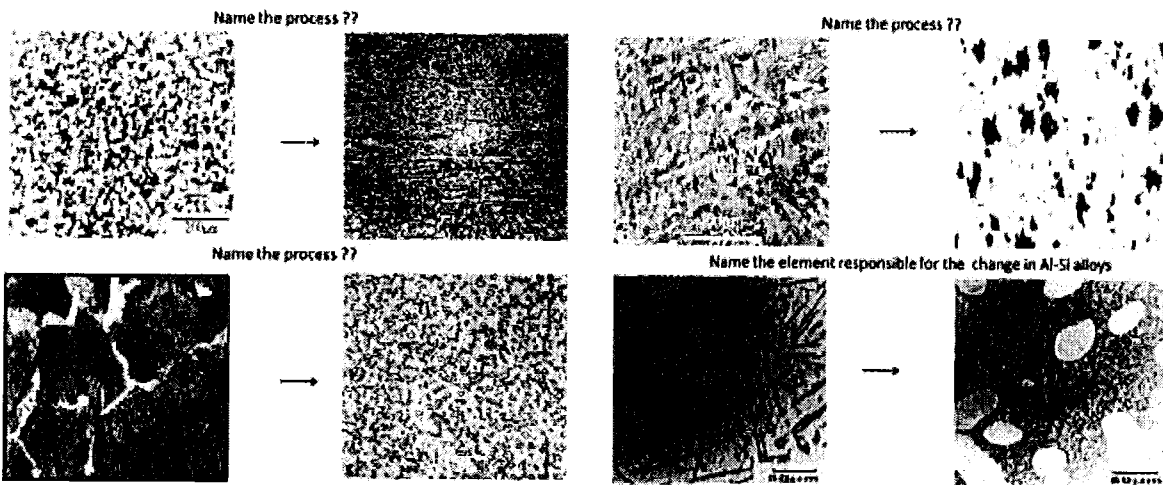
Quiz on 23<sup>rd</sup> September 2011

All IIT Kanpur students are invited and interested participants get register themselves by giving your Name, Roll number, Branch ,UG/ PG, email ID

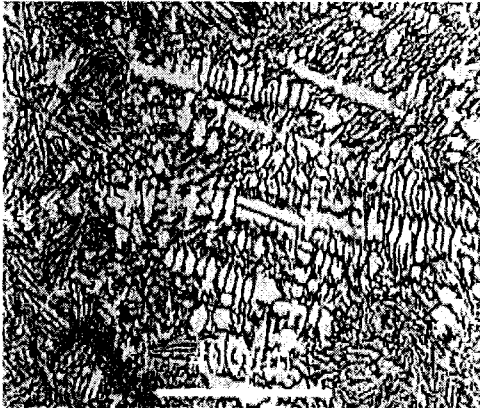
\*Other details will be communicated later to the registered members



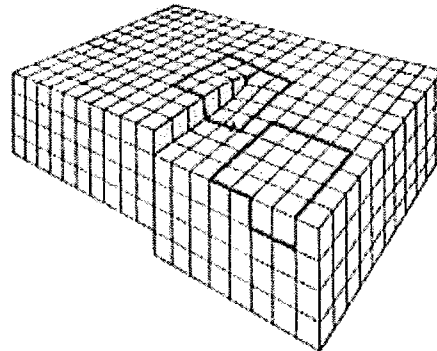
The quiz divided into 4 rounds (General, visual, dumb charades, and Rapid fire). In visual round, images related to process or concepts of metallurgy & materials science were displayed. Few images are attached below.



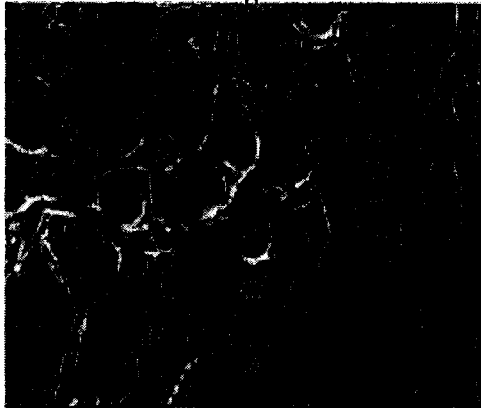
Name the microstructure .....



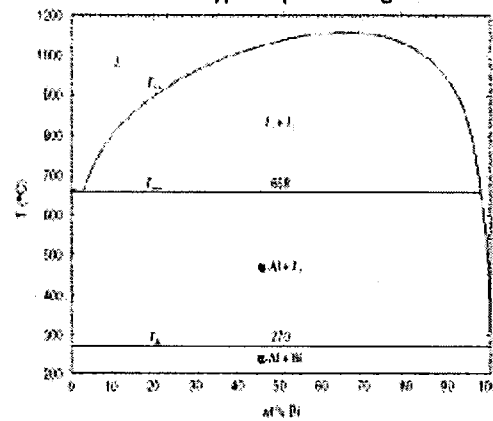
Name the line defect....



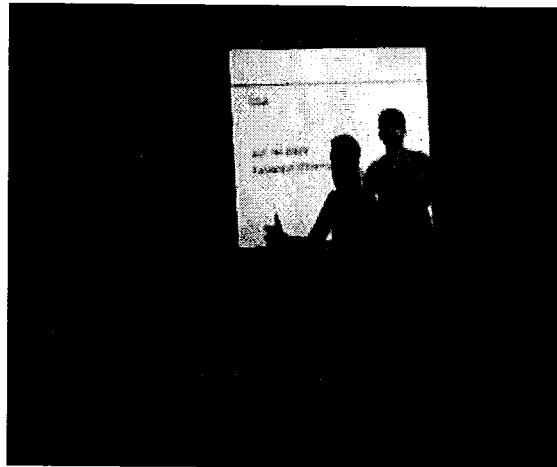
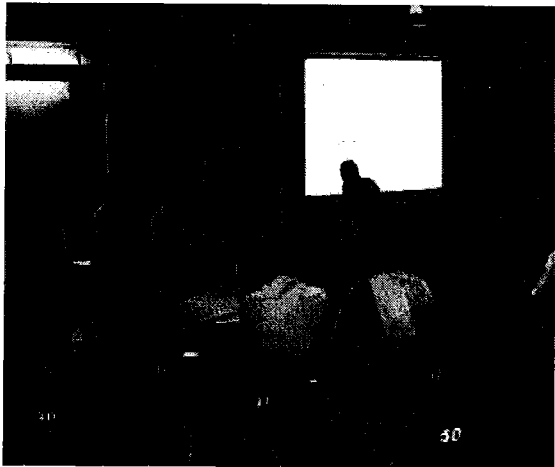
Name the type of fracture



Name the type of phase diagram



The dumb charades round was the highlight of the event in which a word related to metallurgy and materials science was provided to the team and one member of the team has to “act” the word, 30 seconds was allotted for answering the question followed by clue (related images or words) was given, if unanswered and based on the next clue the next 30 seconds was given. Words such as aging, vacancy, nano-structure, solar cell, super conductor, convertor, fluid flow and heat transfer etc was provided. Few images of participants acting and clues are attached below.



The final round consisting of rapid fire round a set of questions from varies fields of metallurgy & materials science was supposed to be answered within 1 minute. The quiz witness Tie for the second position and fight for the second position was worth a sight indeed!

### **Winners for MA Quiz**

Winner team

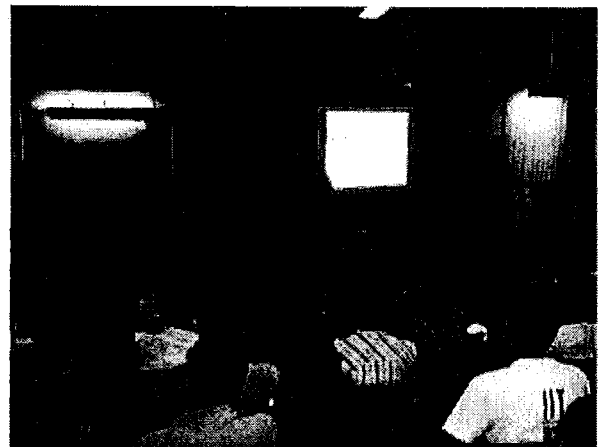
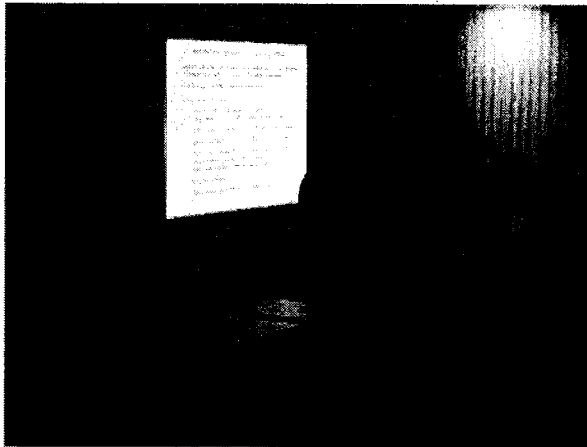
- (1)Bipin kedia      IIT kanpur
- (2)Pradeep Kumar    CSJM University
- (3)Siddhant singh    CSJM University

Runner up team:

- (1)Ankur Agnihotri    CSJM University
- (2)Abhishek singh    CSJM University
- (3)Akansha pandey    CSJM University

#### ***4. Career Prospects on Material Science & Metallurgy (Sept. 23, 2011)***

A Lecture on “Career Prospects on Material Science & Metallurgy” was delivered by **Prof. S.P Mehrotra** on 23<sup>rd</sup> September. The talk covered starting with the growth scenario in various industrial sectors involving metals and alloys and several other advanced materials, Career prospects in Industry, R&D and Academia are specifically analysed. Potential of newly emerging sectors like Residual Life Assessment (RLA) and Rejuvenation of large infrastructures, and Waste recycling is examined from career prospects point of view.



**Prof. S P Mehrotra delivering lecture entitled with “Career Prospects on Material Science & Metallurgy.”**

## 5. Material Advantage T shirt Design (Oct. 4, 2011)

Our chapter has initiated to design Material Advantage T shirt in view to popularize our chapter and to boost our upcoming events with new colour and energy. The design for the MA -T shirt is shown below.



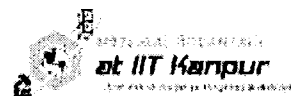
## 6. Student Talk : Exhortation 2011 (Oct. 13, 2011)

In view to encourage student and to spread knowledge among students, seminar has been arranged outside IIT Kanpur campus on 13 October 2011 titled “Introduction to Modeling and its Application to Steel Making” by Mr. Saravanakumar in CSJM University. The talk aimed to introduce the concept of modeling and demonstrating the way to control and analyze the process through sophisticated modeling techniques. Furthermore, it helped to realize the science behind the steel making operations. The event witnessed huge participation and spread knowledge about the importance of modeling to improve productivity of steel. The flyer of the talk and few images taken during the talk are attached below. The talk was cordially welcome by the students and faculties and encouraging such events in future too. The basic idea of this lecture has been developed by Material

Advantage faculty Advisor Dr. Kantesh Balani and which was implemented by the core team of the Material Advantage.



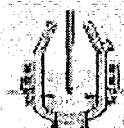
**Material Advantage @ IIT Kanpur**  
Presents



## Exhortation' 11

Talk on necessity to explore

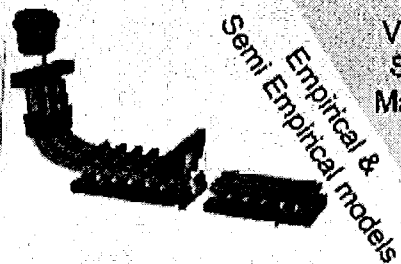
# “Introduction to Modeling and Its Application to Steel Making”



Physical Modeling

Mathematical Modeling

$$\frac{F_{\text{max}} K}{R} = C_v \left( \frac{l}{R} \right)^v \left( \frac{\rho'}{2R^2} \right)^v$$



Virtual Steel Making

Intelligent modeling

$$\rho C_p \frac{\partial T}{\partial t} = \frac{1}{r} \frac{\partial}{\partial r} \left( r K \frac{\partial T}{\partial r} \right) + \frac{\partial}{\partial z} \left( K \frac{\partial T}{\partial z} \right) + S_r$$

$$\frac{\partial C_c}{\partial t} = \frac{1}{r} \frac{\partial}{\partial r} \left( r D_c(T) \frac{\partial C_c}{\partial r} \right) + \frac{\partial}{\partial z} \left( D_c(T) \frac{\partial C_c}{\partial z} \right)$$

RANS based model

K-ε model

Date: 13-10-11

Venue: CSJM University

Time: 3.00 P.M

About the speaker: Saravanakumar R is a Publicity Co-Ordinator of Material Advantage @ IIT Kanpur doing Masters at IIT Kanpur. He completed his graduation from Government College of Engineering, Salem. His Areas of Interest are Iron and steel making, Modeling and simulation.

*Flyer by Student Talk Exhortation 2011*



*Mr. Sarvana kumar(M. Tech student) delivering lecture in CSJM University (UP) India under banner of Material Advantage @ IIT Kanpur. All students attending the talk with great enthusiasm (Oct. 13, 2011)*

### *7. Occhiolino 2011 - Micrography Contest (Oct. 19, 2011)*

The most famous event of MA was organized on 19<sup>th</sup> October 2011, in 4 different categories: optical, scanning electron microscopy, transmission electron microscopy and special techniques. *More than 80 (eighty) entries were received in various categories!*



Venue place for Micrography contest New LHC Floor

The event has witness huge number of participation by students from various departments from all over the IITK Institute and local Engineering College. IIT Faculty, Dr. Gouthoma (MSE Department), Dr.. Dharendra S. Katti (BSBE Department) and Prof. Deshdeep Sahdev (Physics), were invited as judges. The best micrographs were awarded with prizes (MA T-shirt also) & certificates. The flyer for the event is attached below.



**MA T-SHIRT ADVANTAGE**  
**at IIT Kanpur**

## *"Occhiolino 2011"*

### Micrography Contest

**Categories:**

- Optical Microscopy
- Scanning Electron Microscopy
- Transmission Electron Microscopy
- Special Techniques (AFM, STM, Fluorescence)






First two winners will receive Attractive prizes in each category & Certificates to all the selected entries.

**Display at LHC Floor**

19 October 2011

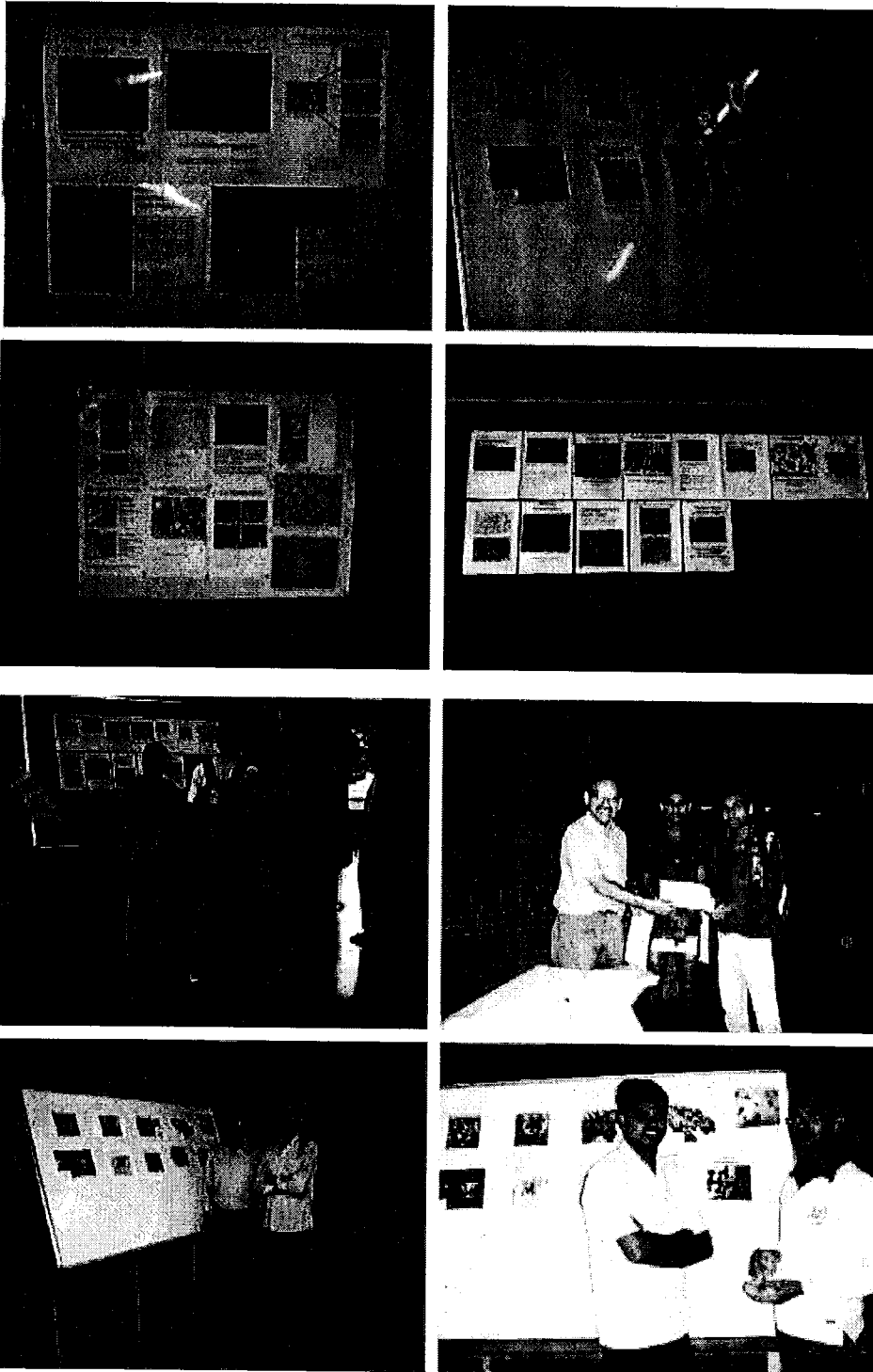
Send your softcopies  
[mailtk2011@gmail.com](mailto:mailtk2011@gmail.com)

- Deadline for entries: 17 October 2011
- Good resolution micrograph on a glossy paper will be welcome
- Use Arial bold size 44 for title, Arial 24 font size for description.
- Handover hardcopies to Abhijeet Moon at WL 205

All students are invited to submit original micrographs (hard and soft copies) under any of four heads on A4 sheet with a suitable title with 2-3 line description.

Certificates and Attractive prizes will be given

The micrographs for the event participation attach below as shown in the pictures



*Micrograph images which were displayed at the Micrography Contest*

## **Winners of Micrography Contest 2011**

### Category 1: Special Micrography Technique

1 st Prize Miss Sneh Harsh  
2 nd Prize Alok Kumar

### Category 2: Scanning Electron Microscopy

1 st Prize Shiplee Jain  
2 nd Prize Neha Gupta

### Category 3: Transmission Electron Microscopy

1 st Prize J Bhagyraj  
2 nd Prize Sivagananapalani

### Category 4: Optical Microscopy

1 st Prize Raja Annamalai/Rajeev Kumar  
2 nd Prize Sarvana Kumar /Sivagananapalan

### Overall : Most popular Micrograph on the basis of Voting

Premanshu (CSJM University)

### *8. Social Gatherings (Various dates):*

Social gatherings are best way to network with people, and has fetched many memberships due to setting up of stalls (On Oct. 5, and Oct. 31<sup>st</sup>) both at IIT Kanpur and CSJM University. Moreover Diwali celebrations (On Oct. 26<sup>th</sup>) also were celebrated along with colleagues and the thrust was provided to Fall 2011 membership challenge.

## ***Upcoming Events “Extempore, Sport Contest, Treasure Hunt”***

Materials Advantage is planning to organize some exciting events which comprises the following:

**Extempore:** The event basically contains in which student have to participate and talk for 3 minute for a particular scientific phrases which can be explained in number of ways like our life, the life cycle of the materials or the universe which are some tricky and some mind boggling topics which the students suppose to answer with their common sense.

**Sports Contest:** Our chapter planning to encourage sports activities to bring out hidden talent in view of this sports such as Cricket, Badminton, Carrom, Chess, Tag war, Disc throw, Table Tennis has been plan, which can be participated by everyone

**Treasure Hunt:** Our chapters planning to arrange a small quest on “Treasure Hunt” by providing hint based on Material Science & Metallurgical terminology and the answer hints will take the participants near the treasure. This event we will going to include in Material Advantage chapter for the first time.

***Students taking participation in Material Advantage membership drive, with the active participation from the members, able guidance of the faculty advisor and whole hearted efforts of the chapter officers, we have reached thus far and we look forward to reach greater heights in the future.***

