ANNUAL REPORT 2012-2013

GOVERNMENT COLLEGE OF ENGINEERING
&
CERAMIC TECHNOLOGY

73 A.C. Banerjee Lane, Kolkata 700 010, West Bengal, India

PREFACE

I am glad to announce that Govt. College of Engineering and Ceramic Technology has started publication of its Annual Report from the academic year 2012-2013 giving information of the annual performance of the Institute. With three bachelor degree programs in engineering, namely, Ceramic Technology, Computer Science and Engineering and Information Technology and two post graduate programs, in Ceramic Technology and Information Technology, the institute has recently received autonomous status from UGC. It is moving at a great pace towards attaining the ultimate goal of becoming center of excellence with active contribution, support and encouragement from all the stake holders. The Institute is producing high impact research papers, carrying out important research projects, giving teaching and training of high standard and getting students employed at prestigious organizations. I strongly believe in the coming year the institute will achieve many milestones in the academic world to become a globally recognized center. I personally express my sincerest thanks to all of our staff, faculty members and students for their hard work in the pursuit of achieving the mission and vision of the Institute.

Professor (Dr.) Saikat Maitra
Officer-in-Charge

CONTENTS

Department of

Ceramic Technology

General Profiles

of the

Faculty Members

1. a) **Name (with designation):** **Professor (Dr.) Saikat Maitra,** ***Officer-in-Charge***

b) **Date of Birth:** 24.06.1964

c) Academic Qualification in details: B.Sc (H), B.Tech, M.Tech, Ph.D (Tech),PGDIM, FIICERAM

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** 10 *(See – 45 page)*

e) **No of Projects undertaken or completed in 2012-13:** 01 *(Vide - 65 page)*

f) **Details of guiding Ph.D. candidates:** 08 *(Vide – 69 page)*

g) **Details of seminars conducted in 2012-13**

(1) Organized National Seminar on 'Ceramics in the Service of Human Society" on 26-27th February, 2012 at Kolkata from Indian Institute of Ceramics
(2) Organized as Secretary, Refresher course in Ceramics for the students appearing at the Associate Membership Examination of Indian Institute of Ceramics at Khurja, U.P in July 2012.
(3)Organized as Secretary International Conference on Utilization of Fly Ash, exploring New Frontiers (ICUFA-2013) on 10-11th January, 2013 at Kolkata
(4) Organize a Technical Session on 'Ceramics and Carrier Opportunity" at the 38th Annual Conference of Indian Institute of Ceramics on 19-20th January, 2013 at Ahmadabad, Gujarat.
(5) Going to organize an Workshop on Fly ash Brick Making with West Bengal Pollution Control Board at Kolkata on 23rd February, 2013 at Kolkata

h) **Details of conferences attended in 2012-13**

1. Prantik Banerjee, SaikatMaitra and SampaChakrabarty, "Photocatalytic degradation of azo dye under sunlight with different types of sonochemically synthesized ZnO nanoparticles; a comparative study", International Conference on Hydrology and Groundwater Expo, San Antonio, USA, 11th September, 2012

2. S. Mukhopadhyay, A.K.Chattopadhyay, G.C.Das and S.Maitra, "Mathematical Modeling of Thermal Expansion of Al2O3-MgO-C Refractory at elevated Temperature", 55th international Colloquium on Refractories, 2012, -Refractories for Metallurgy, Sept. 19th and 20th, 2012, EuroGress, Achen, Germany, pp225-229
3.Sagnik Das, Saikat Maitra, P. K. Singh, K. Bhattacharjee and G. C. Das, "Effect of oxygen partial pressure on the photoluminescence of nanoZnO in the thin film and powder form synthesized through sol-gel technique", National Conference on Sustainable Development through Innovative Research in Science and Technology", 28-29th September, 2012 at Jadavpur University, Kolkata
4. S. Maitra, "Perspective of Refractory Education in 21st century", 83-85, Proc. 9th India International refractory Congress (IREFCON 2012), Kolkata, 1-4th February, 2012

i) **Details of participation in co-curricular activities**

(i) *Invited Talks:*
1."Ceramic membrane for Gas Separation" Invited lecture at the Seminar Organized by Kolkata Chapter of Indian Ceramic Society at CGCRI, Kolkata on 20th January, 2012.
2."Ceramic Education and Research- Past, Present and Future" in the Seminar 'A Humble Tribute to Late Prof. N.K. Mitra - A Doyen of Ceramic Science and Technology' at Central Glass and Ceramic Research Institute on 2nd June , 2012.
3."Nanotechnology-Perspective, Prospect and Threat", in UGC Sponsored Refresher Course in Nano-science and Technology organized by UGC-Academic Staff College of Calcutta University in 28th June, 2012
4.'Fly ash based green bricks" At Seminar on Fly Ash Applications in building Product Industries, organized by Govt. of Tripura on 1st July, 2012
5. "Ceramic membrane for gas separation" at the Technical Seminar of Indian Science Congress, Kolkata, 3-7th January, 2013
6."Utilization of Fly Ash in Ceramics" at the Workshop Organized by Coimbatore Institute of Technology and University of New South Wales, Australia on 18-19th February, 2013 at Coimbatore

(ii) *Charing of Sessions:*
1. Chairman of the Technical session of 'Technology Vision 2035: Glass and Ceramics" TIFAC-CGCRI Workshop held at Central Glass and Ceramic Research Institute, at Kolkata on 26th June, 2012.
2. Chairman of the Technical Session on Fly ash Utilization in Agriculture at International Conference on Utilization of Fly Ash (ICUFA-2013) on 10th January, 2013 at Kolkata
3. Chairman of the Technical Session of the National Conference on Ceramics Organized by the Indian Ceramic Society at Ahmadabad on 19-20th January, 2013

2. a) **Name (with designation):** **Dr. Srimanta Kumar Patra,** ***HOD-CT,*** ***Associate Professor***

b) **Date of Birth:** 04.12.1963

c) **Academic Qualification in details:** M. Tech. (Ceramic Engineering), Ph.D. (Tech.)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:**

Ph.D. Student: Mr. Ranjan Ray
Qualification: M.Tech (Chemical Engg.)
Ph.D Doing in: Ceramic Technology, University of Calcutta
Title of Thesis: Studies on the Effect of some Metal Ions as Dopants on the Electrical Properties of Mullite Synthesized through Co-Precipitation Method
Year of Ph.D: To be submitted within few months

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

3.a) **Name (with designation):** **Mr. Rituparna Sen,** ***Associate Professor,*** ***Controller of Examinations***

b) **Date of Birth:**19.07.1963

c) **Academic Qualification in details:** B.Sc. (Tech) in Ceramic Technology, CU
M.Tech in Ceramic Engg, IT, BHU, Submitted Ph.D. thesis under Jadavpur University

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No. of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

4. a) **Name (with designation):** **Mr. Ranjan Ray,** ***Associate Professor***

b) **Date of Birth:**13.03.1958

c) **Academic Qualification in details:** M. Tech. (Chemical Engineering), Jadavpur University

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

5. a) **Name (with designation)**: **Mr. Ram Chandra Das, *Associate Professor***

b) **Date of Birth**: 15.05.1963

c) **Academic Qualification in details**: M. Tech. in Ceramic Engg, Diploma in Management, Diploma in Quality Assurance &ISO9000, Six Sigma Master Black Belt, Auditor for ISO9001:2008 QMS, ISO14001:2004 EMS & ISO18001:2007 OHSAS.

d) **No. of Publications in 2012-13 with details alongside the Abstracts**: Nil

e) **No of Projects undertaken or completed in 2012-13**: One

f) **Details of guiding Ph.D. candidates**: Nil

g) **Details of seminars conducted in 2012-13**: Nil

h) **Details of conferences attended in 2012-13**: International Seminars on "Utilisation of Fly Ash-Exploring New Frontiers"

i) **Details of participation in co-curricular activities**: Participated in different college cultural functions.

j) **Consultancy Services**: Providing consultancy services to M/S. British Standards Institution India Pvt. Ltd., M/S. TUV (NORD) Private Ltd. & M/S. TUV(SUD) Private Ltd. by way of auditing or providing technical expertise during audit of ISO9001:2008 QMS, ISO14001: EMS & ISO18001: 2007 OHSAS.

6. a) **Name (with designation)**: **Mr. Prithwijit Guha, *Associate Professor, In-Charge of Training & Placement***

b) **Date of Birth:** 21.04.1956

c) **Academic Qualification in details:** B.Sc. (Hons in Chem.), B.Tech. (Chem. Engg.), M.Tech. (Ceramic Engg), PG Dip in Business Management

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** 01 *(Vide – 48 page)*

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Myself is a Ph.D. Candidate

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** International Refractory Seminar at Jamshedpur, organized by Ind. Ceramic Soc-JSR Chapter

i) **Details of participation in co-curricular activities:** Almost all academic/administration related activity, Convener WBUT placement committee

k) **Membership of professional Society:** (i) Life member of Indian Ceramic Society
(ii) Life member of Indian Inst of Chemical Engineers
(iii) Life member of Materials Society of India

7. a) **Name (with designation):** **Dr. Kaberi Das,** ***Assistant Professor***

b) **Date of Birth:** 04.01.1963

c) **Academic Qualification in details:** M.Tech, Ph.D. (Tech)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** 03 *(Vide – 48 page)*

e) **No of Projects undertaken or completed in 2012-13:** 02 *(Vide – 67 page)*

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:**

(i) Attended Technical seminar on Latest Trend in Specialty Glass & Ceramics, on 11th Dec, 2012, organized by Chemical Dept, Bureau of Indian Standards, New Delhi, held at CSIR-CGCRI, Kolkata.

(ii) Attended 1st Intl workshop on Nanomaterials (IWoN): Engineering Photon & Phonon Transport, Dec 14-15, 2012 organized by School of Materials Sc & Nanotechnology, JU, Kolkata- 700 032.

(iii) Attended International Conference on utilization of fly Ash – Exploring New Frontiers, January 10-11, 2013 organized by WBPCB and GCECT, Kolkata.

i) **Details of participation in co-curricular activities:** Nil

8. a) Name (with designation): Dr. Tapas Kumar Bhattacharya

Assistant Professor

b) **Date of Birth:**27.04.1969

c) **Academic Qualification in details:** B.Sc. (Hons.-Chem) – Calcutta University, B.Tech. (Ceramic Engg., Applied Chem.) - Calcutta University, M. Tech. (Ceramic Engg.) - Calcutta University, Ph.D. (Engg.) – Jadavpur University

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** 02 *(Vide – 49 page)*

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** 03 (International)

i) **Details of participation in co-curricular activities:** Different Academic & Administrative activities

9. a) **Name (with designation):** Dr. Debdarpan Khan, *Reader*

b) **Date of Birth:** 26.12.1962

c) **Academic Qualification in details**: M.Sc. (Applied Geology) - Jadavpur University,
Ph.D. (Sc.) - Jadavpur University

d) **No. of Publications in 2012-13 with details alongside the Abstracts**: Nil

e) **No of Projects undertaken or completed in 2012-13**: Nil

f) **Details of guiding Ph.D. candidates**: Nil

g) **Details of seminars conducted in 2012-13**: Nil

h) **Details of conferences attended in 2012-13**: Nil

i) **Details of participation in co-curricular activities**: Nil

Part Ttime Faculty Members

1. a) **Name (with designation):** **Dr. M. S. Dutta,** ***Part Time Teacher***

b) **Date of Birth:** 03.01.1965

c) **Academic Qualification in details:** B. Sc. Tech. – Calcutta University, M. Tech. – IIT-kgp, Ph.D. (Engg.) – Jadavpur University

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

f) **No of Projects undertaken or completed in 2012-13:** Nil

g) **Details of guiding Ph.D. candidates:** Nil

h) **Details of seminars conducted in 2012-13:** Nil

i) **Details of conferences attended in 2012-13:** Nil

j) **Details of participation in co-curricular activities:** Nil

2. a) **Name (with designation):** **Mr. Pappu Halder,**
Part Time Teacher

b) **Date of Birth:** 10.01.1983

c) **Academic Qualification in details:** B. Tech. in Ceramic Technology.

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

f) **No of Projects undertaken or completed in 2012-13:** Nil

g) **Details of guiding Ph.D. candidates:** Nil

h) **Details of seminars conducted in 2012-13:** Nil

i) **Details of conferences attended in 2012-13:** Nil

j) **Details of participation in co-curricular activities:** Nil

3. a)**Name (with designation):** Ms. Sonali Sarkar, *Part Time Teacher*

b) **Date of Birth:** 05.06.1967

c) **Academic Qualification in details:** B.A. (Philosophy & Ethics) - Presidency College, M.A. (Philosophy & Ethics) -C.U., B.Ed- A.B.T.A.

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

4. a)**Name (with designation):** **Ms. Ipsita Pathak,** ***Part Time Teacher***

b) **Date of Birth:** 23.03.1981

c) **Academic Qualification in details:** B.A. (Eng), M.A. (Eng) – Rabindra Bharati University

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

1. "Developing Tools of Educational Research", ALL INDIA ASSOCIATION FOR EDUCATIONAL RESEARCH (AIAER)

2. "Pedagogy/Management Capacity Building", TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME

i) **Details of participation in co-curricular activities:** Short-Term training Programmes on

1. IMPROVING INTERPERSONAL SKILL & DEVELOPING EFFECTIVE PRESENTATION, NATIONAL INSTITUTE OF TECHNICAL TEACHERS' TRAINING AND RESEARCH

2. ENGLISH COMMUNICATION &SOFT SKILL, SRI SARADA MATH-RASIK VITA

Department of

<u>Information Technology</u>

General Profiles

of the

Faculty Members

1. a) **Name (with designation)**: **Dr. Mausumi Maitra (Mazumdar),** ***HOD, Associate Professor***

b) **Date of Birth :** 04.09.1963

c) **Academic Qualification in details:** B.Sc. (Phys.) - Presidency College, B.Tech. (Radiophysics and Electronics) - Calcutta University, M.Tech. (Radiophysics and Electronics) - Calcutta University, Ph.D. (Tech.)-Calcutta University

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** 02 *(Vide – 50 page)*

e) **No of Projects undertaken or completed in 2012-13:** 03 *(Vide – 65 page)*

f) **Details of guiding Ph.D. candidates:**

Ph.D. Student: Ms. Manali Mukherjee
Qualification: M.Tech. (Information Technology)
Ph.D. Doing in: Information Technology
Title of Thesis: Studies on some Imaging Algorithms and their Implications on FPGA
Year of Ph.D.: To be enrolled in University of Calcutta

g) **Details of seminars conducted in 2012-13:** Nil

h)**Details of conferences attended in 2012-13:** Attended the 2nd National Conference on Computing and Systems held on 15-16 March, 2012 at the University of Burdwan (ISBN:93-80813-18-X).

i) **Details of participation in co-curricular activities:**
(a) Life Member of The Indian Society for Technical Education (ISTE)
(b) Member of International Association of Computer Science and Information Technology
(c) Member of IEEE.
(d) Working as a member of Governing Body of GCECT
(e) Enrichment of Campus life: Attended cultural activities of the college (Hostel, Sports, Games, Cultural Activities)
Students' welfare and Discipline: Working as member of (i) Anti-ragging committee, (ii) Disciplinary committee, (iii) Organized Technical Seminar for students

2.

a) **Name (with designation):** **Mrs. Paramita Dey,**
Assistant Professor

b) **Date of Birth:** 27.01.1977

c) **Academic Qualification in details:** M.Tech. (Information Technology)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** 01 *(Vide – 51 page)*

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:**
(i) ``IP Networking" in NITTTR
(ii) ``Theory of internet and webpage design"
(iii) Refresher course in "Free Software Technologies" in Jadavpur University (CSE department)

i) **Details of participation in co-curricular activities:** Nil

3.

a) **Name (with designation):** **Mrs. Somdatta Chakravortty,**
Assistant Professor

b) **Date of Birth:** 25.06.1975

c) **Academic Qualification in details:** B.Tech. (Civil Engg.) - HBTI, Kanpur University, M. Tech. (Information Technology) - PDSIT, Bengal Engineering & Science University

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** 11 *(Vide – 52 page)*

e) **No of Projects undertaken or completed in 2012-13:** 05 *(Vide – 66 page)*

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:**

1. Organized a seminar on 'Remote Sensing and Image Processing :Contemporary Contextualities and Vistas for Future Generation' jointly with Computer Society of India, Kolkata Chapter on 9th October, 2012 at Govt. College of Engineering & Ceramic Technology, Kolkata (host institute)

h) **Details of conferences attended in 2012-13:**

1. West Bengal State Science Congress, Saha Institute of Nuclear Physics, Kolkata, 1st -2nd March,2012
2. Training course on 'Theory of Internet and Web Page Design', NITTTR, Kolkata, 02.07.2012 to06.07.2012
3. Training course on 'Office Management and Internet', NITTTR, Kolkata, 03.09.2012 to 14.09.2012
4. Environment and Energy Conclave on "Water Forum – Conserving Energy. Preserving Environment. Towards Tomorrow, Bengal Chamber of Commerce, ITC Sonar, Kolkata, 31st -1st September, 2012
5. DST Sponsored National Workshop on Hyperspectral Remote Sensing, Department of Science & Technology, New Delhi and M.S. University, Baroda, 17.01.2013 and 18.01.2013

i) **Details of participation in co-curricular activities:**

1. Literary contributions:

- Contributed popular article in monthly newsletters (Hardcopy) of Computer Society of India, Kolkata Chapter Volume 47, Issue 4 in July, 2012
- Contributed popular article in monthly newsletters (Hardcopy) of Computer Society of India, Kolkata Chapter Volume 47, Issue 5 in August, 2012

2. Reviewer for Papers in International Journals:

- Reviewed paper titled "Low-Complexity Distributed Near Lossless Compression of Hyperspectral Images"for *Journal of Applied Remote Sensing,2012*

- Reviewed paper titled "Spectral discrimination of giant reed (Arundo donax L.): ASeasonal Study in Riparian Areas" for *ISPRS Journal of Photogrammetry and Remote Sensing,2012*

4. a) **Name (with designation): Mr. Ritwik Mondal,** ***Assistant Professor***

b) **Date of Birth:** 05.01.1974

c) **Academic Qualification in details:** B.E. (Electrical Engg.) - North Bengal University,
M.Tech. (Information Technology) - BESUS

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

5. a) **Name (with designation): Mrs. Shyama Mondal**, ***Assistant Professor***

b) **Date of Birth:** 27.11.1979

c) **Academic Qualification in details: B.Tech. (**Information Technology) - Govt. College of Engg. & Leather Technology (WBUT), **M.E. (**Software Engineering) - Jadavpur University

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

6. a) Name (with designation): **Mr. Pranay Adak,**
Assistant Professor

b) **Date of Birth:**28.09.1981

c) **Academic Qualification in details:** B.Tech. (Information Technology)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:**Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:**S.D.P. Under TEQUIP-II On Soft Computing and it's Application, 18 – 22 March, 2013, RCCIIT.

i) **Details of participation in co-curricular activities:** Nil

7. a) **Name (with designation)**: **Mr. Atanu Kumar Paul,**
Assistant Professor

b) **Date of Birth:** 03.08.1984

c) **Academic Qualification in details:** B.Tech. (Information Technology)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

j) **Details of participation in co-curricular activities:** Nil

Part-time Faculty Members

1. a) **Name (with designation):** **Ms. Shampa Mahato,**
Part Time Teacher

b) **Date of Birth:** 15.04.1985

c) **Academic Qualification in details:** B.Tech. (CSE) - GCECT (WBUT), M.Tech. (IT) - CU

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

2. a) **Name (with designation):** **Ms. Moumita Maity,**
Part Time Teacher

b) **Date of Birth:** 25. 02. 1986

c) **Academic Qualification in details:** M.Tech. (Micro Electronics & VLSI), Pursuing Ph.D.

d) **No. of Publications in 2012-13 with details alongside the Abstracts:**03 *(Vide – 57 page)*

e) **No of Projects undertaken or completed in 2012-13: Nil**

f) **Details of guiding Ph.D. candidates: Nil**

g) **Details of seminars conducted in 2012-13: Nil**

h) **Details of conferences attended in 2012-13:**

i) EAIT(Third International Conference on Emerging Applications of Information Technology)
ii) ISED(International Symposium on Electronic System Design)
iii) Prime Asia 2012(Asia-Pacific Conference on Postgraduate Research in Microelectronics & Electronics)
iv) 100th Indian Science Congress.

i) **Details of participation in co-curricular activities: C**ollege programs like Rabindra jayanti, Najrul Jayanti etc.

3. a) **Name (with designation):** Mr. Saikat Dey, *Part Time Teacher*

b) **Date of Birth:** 18.10.1986

c) **Academic Qualification in details:** B.Tech. (IT) - GCECT (WBUT), M.Tech. (CSE) - WBUT

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:**Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

4. a) **Name (with designation):** Mr. Sudip Kuila, *Part Time Teacher*

b) **Date of Birth:** 26.12.1976

c) **Academic Qualification in details:** B.Tech. – Vidyasagar University, M.Tech. – Jadavpur University

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) Details of participation in co-curricular activities: Nil

Department of

Computer Science

&

Engineering

General Profiles

of the

Faculty Members

1. a) Name (with designation): Dr. Kalpana Saha (Roy), *Assistant Professor*

a) **Date of Birth:** 15.04.65

b) **Academic Qualification in details:** M.E. (C.S.E), Ph.D. (Eng)

c) **No. of Publications in 2012-2013 with details alongside the Abstracts:** 01 *(Vide – 58 page)*

d) **No. of Projects undertaken or completed in 2012-2013:** Nil

e) **Details of guiding Ph. D. candidates:** Nil

f) **Details of seminars conducted in 2012-2013:** Nil

g) **Details of conferences attended in 2012-2013:** Nil

h) **Details of participation in co-curricular activities:** Cultural Program

2. a) Name (with designation): Mr. Bimal Pal, *Assistant Professor*

b) **Date of Birth:** 19.04.1960

c) **Academic Qualification in details:** B.Sc. (Pure Science) - Calcutta University, AMIE (ECE) - The Institution of Engineers (India), M. Tech. (Information Technology) - BESUS

d) **No. of Publications in 2012-2013 with details alongside the Abstracts:** Nil

e) **No. of Projects undertaken or completed in 2012-2013:** Nil

f) **Details of guiding Ph. D candidates:** Nil

g) **Details of seminars conducted in 2012-2013:** Nil

h) **Details of conferences attended in 2012-2013:** Nil

i) **Details of participation in co-curricular activities:**
- Conducted Industrial visit at Doordarshan Kendra, Kolkata on 11.04.2012 for 2nd year CSE students of GCECT.
- Conducted one day in-house training at GCECT on industrial application of Microcontroller on 18.10.2012 for 2nd year CSE students of GCECT.

2. a) Mr. Soumit Chowdhury, *Assistant Professor*

b**) Date of Birth:**16.02.1976

c) **Academic Qualification in details:** B.Sc.(Tech.)Ceramic Technology-Calcutta University, M.Tech. (CSE)Computer Technology-Jadavpur University

d) **No. of Publications in 2012-13 with details alongside the Abstracts:**03 *(Vide – 58 page)*

e) **No of Projects undertaken or completed in 2012-13:**01 *(Vide – 67 page)*

f) **Details of guiding Ph.D. candidates :** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:**

i) National Conference ETCS 2012 (UGC Sponsored National Symposium), Barrackpore Rastraguru Surendranath College, Barrackpore, 20-21 January (2012).

ii) International conference CSIA 2012, Delhi, 25-27 May (2012).

iii) International Conference FICTA 2012, Bhubaneswar Engg. College, Bhubaneswar, 22-23 Dec (2012).

i) **Details of participation in co-curricular activities:**Member of the student welfare committee and the Free studentship committee.

4.a) Name (with designation): Mr. Ranjit Kr. Mandal, *Assistant Professor*

b) **Date of Birth:** 17.03.1976

c) **Academic Qualification in details:** B.E. (CST), M.E. (CSE)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates :** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

5. a) Name (with designation): Mrs. Sohini Dasgupta, *Assistant Professor*

b) **Date of Birt**h: 25.02.1981

c) **Academic Qualification in details:** B.Tech. (CSE), M.Tech. (Computer Technology)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:**Nil

h) **Details of conferences attended in 2012-13:**

1. Short Term Training Programme on IP Networking at NITTTR, Kolkata
2. Refresher Course on Free Software Technologies at Jadavpur University

i) **Details of participation in co-curricular activities:** Nil

6. a) Name (with designation): Mr. Partha Ghosh, *Assistant Professor*

b**) Date of Birth:** 18.12.1978

c) **Academic Qualification in details:** M.Tech. (CSE)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

Part-time Faculty Members

1. **a) Name (with designation):** **Mr. Bishwarup Das,**
Part Time Teacher

a) **Date of Birth:**17.04.1984

b) **Academic Qualification in details:** B. Tech. (CSE)-Govt. College of Engineering & Ceramic Technology under W. B. U. T., M.Tech. (Software Engineering)

c) **No. of Publications in 2012-13 with details alongside the Abstracts:** 03 *(Vide –57 page)*

d) **No of Projects undertaken or completed in 2012-13:** Nil

e) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:**
1. Prime Asia 2012(Asia-Pacific Conference on Postgraduate Research in Microelectronics & Electronics)
2. 100th Indian Science Congress.

i) **Details of participation in co-curricular activities:** Participate in all college programmmes

2. a) Name (with designation): Mr. Bijoy Kumar Mandal, *Part Time Teacher*

b) **Date of Birth:**29.10.1981

c) **Academic Qualification in details:** B. Tech. (CSE)-Govt. College of Engineering & Ceramic Technology under W. B. U. T. (2008), M. Tech. (Computer Technology) - Jadavpur University (2011)

d) **No. of Publications in 2012-13 with details alongside the Abstracts**: Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:**Nil

i) **Details of participation in co-curricular activities:** Nil

3. a) Name (with designation): Mr. Rajib Biswas, *Part Time Teacher*

b**) Date of Birth:** 10.01.1982

c) **Academic Qualification in details:** M.Tech. (CSE)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates :** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

4. a) **Name (with designation):** **Mr. Shahnawaz Shams,**
Part Time Teacher

b) **Date of Birth:**16.07.1984

c) **Academic Qualification in details:** B.Tech. (CSE), M.Tech. (CSE) - WBUT

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:**Nil

h) **Details of conferences attended in 2012-13:** Nil

j) Details of participation in co-curricular activities: Nil

5. a) Name (with designation): Mrs. Pallavi Pyne, *Part Time Teacher*

b) **Date of Birth:** 17.12.1985

c) **Academic Qualification in details:** B.Tech (Electronics & Communication Engineering) - West Bengal University of Technology (2008), M.Tech. (Computer Technology) - Jadavpur University (2011)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

6. a) Name (with designation): Mrs. Amrita Biswas, *Part Time Teacher*

b) **Date of Birth:** 28.11.1984

c) **Academic Qualification in details:** B.Tech (Information Technology)-Govt. College of Engineering & Ceramic Technology under W. B. U. T. (2008), M.Tech. (Computer Science and Application) - CU.

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

7. a) **Name (with designation):** **Mr. Aritra Mahapatra,**
Part Time Teacher

b) **Date of Birth:** 07.11.1986

c) **Academic Qualification in details:** B.Tech (Information Technology) - Govt. College of Engineering & Ceramic Technology under W. B. U. T. (2009), M.Tech. (Information Technology) - A.K.Choudhury School of Information Technology under CU (2011)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

8.

a) **Name (with designation):** **Mrs. Rima Bhowmick,**
Part Time Teacher

b) **Date of Birth:** 20.09.1984

c) **Academic Qualification in details:** B.Tech (Information Technology)-W. B. U. T.

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

9.

a) **Name (with designation):** **Ms. Sucharita Mondal,**
Part Time Teacher

b) **Date of Birth:** 20.09.1984

c) **Academic Qualification in details:** B.Tech. (Information Technology)-W. B. U. T.

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

10. a) Name (with designation): Mr. Pannalal Dey, *Part Time Teacher*

b) **Date of Birth:** 26.10.1985

c) **Academic Qualification in details:** B.Tech (Information Technology) - Govt. College of Engineering & Ceramic Technology under W. B. U. T., M.Tech. (pursuing)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

Department of

Basic Science, Engineering

&

Humanities

General Profiles

of the

Faculty Members

1. a) **Name (with designation):** **Dr Sankar Ray,** ***Associate Professor***

b) **Date of Birth:** 07.09.1954

c) **Academic Qualification in details:** B.E. in Mech. Engg. from J.U. in1977, M.E. in Mech. Engg. from J.U in1985, Ph.D. (Mech Engg.) from J.U. in 2006

d) **No. of Publications in 2012-13 with details alongside the Abstracts**: 01*(Vide – 59 page)*

e) **No of Projects undertaken or completed in 2012-13:** Nil.

f) **Details of guiding Ph.D. candidates:** 02 *(Vide – 71 page)*

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Acting as Professor-in–charge of the Games and Sports and participates in cultural activities.

3. a) Name (with designation): **Dr. (Mrs.) Kabita Das,** ***Assistant Professor***

b) Date of Birth: 09.11.1965

c) Academic Qualification in details: B.Sc. (Phys.-Hons) – Calcutta University, B.Tech. (Radiophysics and Electronics) - Calcutta University, M.Tech. (Radiophysics and Electronics) - Calcutta University,

d) No. of Publications in 2012-13 with details alongside the Abstracts: Nil

e) No of Projects undertaken or completed in 2012-13: Nil

f) Details of guiding Ph.D. candidates: Nil

g) Details of seminars conducted in 2012-13: Nil

h) Details of conferences attended in 2012-13: Nil

i) Details of participation in co-curricular activities: Attached with NSS Program

3. a) **Name (with designation): Dr. Saibal Ray, *Associate Professor***

b) **Date of Birth:** 01.07.1961

c) **Academic Qualification in details:** B.Sc. (Physics-Hons.) - Calcutta University, M.Sc. (Physics) – IIT Kharagpur, B.Ed.- Vidyasagar University, Ph.D. (Sc.) – Jadavpur University

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** 15 *(Vide –60 page)*

e) **No of Projects undertaken or completed in 2012-13:** 01 *(Vide – 67 page)*

f) **Details of guiding Ph.D. candidates:** 08 *(Vide – 71 page)*

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:**

1. Workshop on Gravitational Wave Data Analysis, BITS-Pilani, Goa (17 – 21 Dec. 2012).
2. International Conference on Mathematical Sciences, Nagpur (28 – 31 Dec. 2012).

i) **Details of participation in co-curricular activities:**

A. NSS programme officer

B. Membership in learned societies:

1) Life member of Indian Science Congress Association
2) Life member of Indian Physical Society
3) Life member of Indian Physics Association
4) Life member of Indian Association for General Relativity and Gravitation
5) Life member of Astronomical Society of India
6) Life member of Calcutta Mathematical Society
7) Honorary member of International Egyptian Engineering Mathematical Society

C. Reviewer for Papers in International Journals:

1) General Relativity and Gravitation, Kluwer Academic Sciences
2) Indian Journal of Pure and Applied mathematics, Indian National Science Academy
3) Astrophysics and Space Science, Kluwer Academic Sciences
4) Scholarly Research Exchange, Syrexe Publication
5) International Journal of Theoretical Physics, Springer Publication
6) Indian Journal of Physics, Springer Publication
7) Canadian Journal of Physics, Canadian Association of Physicists publication
8) Physical Review & Research International, Science Domain International
9) Journal of Modern Physics, Scientific Research Publishing
10) WebPub Journal of Scientific Research, Research WebPub

4. a) **Name (with designation): Dr. Debdulal Maity,**
Assistant Professor

b) **Date of Birth:** 24.12.1979

c) **Academic Qualification in details:** B.Sc. (Chemistry-Hons.) - Calcutta University, M.Sc. (Inorganic Chemistry)-Calcutta University, Ph.D. (Sc.) - Calcutta University
d) **No. of Publications in 2012-13 with details alongside the Abstracts**: Nil

e) **No of Projects undertaken or completed in 2012-13**: Nil

f) **Details of guiding Ph.D. candidates**: Nil

g) **Details of seminars conducted in 2012-13**: Nil

h) **Details of conferences attended in 2012-13**: Nil

i) **Details of participation in co-curricular activities**: Nil

5. a)Name (with designation): Dr. Swarup Ranjan Sahoo, *Assistant Professor*

b) **Date of Birth:** 21.05.1971

c) **Academic Qualification in details:** B.Sc. (Physics-Hons.) - Calcutta University, M.Sc. (Physics) - Jadavpur University, Ph.D. (Sc.) - Jadavpur University

d) **No. of Publications in 2012-13 with details alongside the Abstracts**: Nil

e) **No of Projects undertaken or completed in 2012-13**: Nil

f) **Details of guiding Ph.D. candidates**: Nil

g) **Details of seminars conducted in 2012-13**: Nil

h) **Details of conferences attended in 2012-13**: Nil

6. a) **Name (with designation):** **Dr. Krishnendu Dutta,**
Assistant Professor

b) **Date of Birth:07.09.1977**

c) **Academic Qualification in details:** M.Sc.(Pure Mathematics)-Calcutta University
Ph.D. (Sc.)-Calcutta University.

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** 01 *(Vide –73 page)*

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

6. a) **Name (with designation):** **Dr. Anil Ranjan Sarker,**
Associate Professor

b) **Date of Birth:** 30.06.1959

c) **Academic Qualification in details:** B.A.(Hons.-Economics) – Gauhati University, M.A.(Economics) - N.B. University, Ph.D. (Economics) - N.B. University

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities**: Nil

Part-time Faculty Members

1. **a) Name (with designation):** **Mr. Ashoke Kumar Majumdar,**
Part Time Teacher

b**) Date of Birth:** 26.09.1957

c) **Academic Qualification in details:** B.E. (Mechanical Engineering)

d) **No. of Publications in 2012-13 with details alongside the Abstracts:** Nil

e) **No of Projects undertaken or completed in 2012-13:** Nil

f) **Details of guiding Ph.D. candidates:** Nil

g) **Details of seminars conducted in 2012-13:** Nil

h) **Details of conferences attended in 2012-13:** Nil

i) **Details of participation in co-curricular activities:** Nil

Important Research Publications

(2012-13)

1. Professor (Dr.) Saikat Maitra, *Officer-in-Charge*

1) Ali. E.L. Elkhalifah, S. Maitra, M.A.Bustum and T. Murugesan, "Thermogravimetric analyses of different molar mass ammonium cations intercalated different cationic forms of montmorillonite", Journal of Thermal Analysis and Calorimetry, 110 (2), 765-771, (2012)

Abstract: Different cationic forms of montmorillonite, mainly K+, Na+, Ca2+ and Mg-montmorillonites were intercalated in this study via ion exchange process with mono-, di-, and triethanolammoniumcations. The developed samples were characterized by TG, XRD and CHNS techniques. Thermogravimetric study of ammonium-montmiorillonite shows three thermal transitions steps, which are attributable to the volatilization of the physically adsorbed water and dehydration, followed by the decomposition of the intercalated ammonium cations and dehydroxylation of the structural water of the modified clay respectively, while untreated and cationic forms of montmorillonite showed only two decomposition steps. The type of ammonium cations has affected both desorption temperature (position) and the amount of the adsorbed water (intensity). XRD results show a stepwise change in the crystallographic spacing of montmorillonite with the molar mass of ammonium cations, reflecting a change in the structure of the clay. CHNS data confirm the intercalation of ammonium cations into the interlayer space of montmorillonite and corroborate the effect of the molar mass of the ammonium cations on the amount absorbed by the clay.

2) Sikander Rafiq, Zakaria Man, AbdulhalimMamud, Nawshad Muhammad and SaikatMaitra, Separation of CO2 from CH4 using polysulfone//polyimide Silica nano-composite membranes" Journal of Separation and Purification Technology, 90,162-172, (2012)

Abstract: Mixed matrix membranes (MMMs) were developed by incorporating inorganic silica nanoparticles into blends of polysulfone/polyimide (PSF/PI) asymmetric membranes for gas separation using phase inversion technique. The membranes were characterized by using scanning electron microscopy (SEM), X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), thermogravimetric analysis (TGA). SEM results show different morphologies of surfaces and cross-sections of the membrane where agglomeration is observed at 20.1 wt.% silica loading. TGA analysis indicates good thermal stability of the hybrid membranes. Permeation results show that CO2 permeance increased with the introduction of 5.2 wt.% silica contents (73.7 ± 0.2 GPU) in PSF/PI-20% blend and it increased with the increase in silica contents. With 15.2 wt.% silica contents, the highest permselectivity of = 61.0 ± 0.3–60.2 ± 0.4 is observed for treated membrane at 2–10 bar. The selectivity using mixed gas test at various CO2/CH4 compositions shows consistent results with the ideal gas selectivity.

3) S. Rafiq, Z. Man, F. Ahmad, N. Muhammad and S. Maitra, "Kinetics of Thermal Degradation of PSF/PI Blended Polymeric Membranes", Journal of Applied Polymer Science, 123, 3755-3763, (2012)

Abstract: Flat-sheet asymmetric polysulfone (PSF)/polyimide (PI) blended membranes were fabricated by a phase-inversion technique. The fabricated membranes were characterized by Fourier transform infrared spectroscopy, differential scanning calorimetry, and field emission scanning electron microscopy analyses. The kinetics of thermal degradation of the membranes were studied from thermogravimetric data following Friedman's kinetic approach. The thermal degradation process of the membranes followed first-order rate kinetics, and the activation energy of the thermal degradation process increased with increasing PI content of the membrane compositions.

4) P. Banerjee, S. Chakrabarty, S. Maitra and B. K. Dutta, "Zinc Oxide Nano- particles–Sonochemical Synthesis, Characterization and Application for Photo-remediation of Heavy Metal", Ultrasonics SonoChemistry,19(1), 85-93, 2012

Abstract: Zinc oxide nanoparticles have been synthesized sonochemically from zinc acetate solution in aqueous methanol, ethanol and iso-propanol containing about 5 volume% of alcohol. Characterization with FESEM, XRD, AFM and BET surface area shows that the synthesized particles differ in shape and size. ZnO synthesized using isopropanol was observed to be the most crystalline one. The synthesized nanoparticles were used for the photocatalytic reduction of hexavalent chromium in aqueous medium under solar radiation. It was observed that the initial reduction rates varied with the difference in morphology of ZnO crystallites.

5) S. Mukhopadhyay, A. K. Chattopadhyay, G. C. Das and S. Maitra, "Effect of graphite on the expansion characteristics of Al2O3-MgO-C refractories at elevated temperature", Interceram, 61(6), 344-349, 2012

Abstract: Carbon, in the form of graphite, is one of the major constituents of the Al2O3-MgO-C refractory (AMC) used for steel ladles. The thermal expansion property of the AMC refractory is the most important property, which depends on the amount of MgAl2O4 in-situ spinel, formed due to the reaction between Al2O3 and MgO on heating. The spinelization depends on the quantity of MgO in the composition, the grain size of MgO, the firing temperature and the soaking time. Laboratory studies report that the carbon percentage also affects the expansion characteristics, but no quantitative study has been reported. As such, carbon does not play any chemical role in spinelization, but it covers a part of the MgO or Al2O3 grain surface area (TSAA), reducing the physical contact between grains. So, when the graphite surface area (TSAG) increases, the chance of covering such an area increases, as a result the probability of spinel formation decreases, thereby resulting in reduction of thermal expansion. Spinelization in the system at the interface of Al2O3 and MgO grains has been also studied from XRD, image analysis and SEM results. When the activation energy for spinelization was determined, it was established that it has a strong relationship with TSAG/TSAA factor.

6) S. Mukhopadhyay, G .C. Das, A. K. Chattopadhyay and S. Maitra, "Influence of Al2O3/MgO ratio on the Expansion Behavior of Al2O3-MgO-C Refractory", Interceram, 61(4), 205-209 (2012)

Abstract: The effect of the Al2O3/MgO ratio on the expansion behavior (permanent linear change, PLC) of a resin-bonded alumina-magnesia-carbon (AMC) based spinel refractory has been studied as a function of sintering time and Al2O3/MgO ratios. Spinelization in the system at the interface of Al2O3 and MgO grains has also been evaluated quantitatively from SEM. In addition, kinetics for spinelization has also been studied in the AMC system. The mechanism of the spinelization has been found to be diffusion controlled. The activation energy for spinelization was computed and the value is around ~135 KJ/mole, which is fairly high and indicates the kinetics of spinelization to be small.

7) Debasis Chandra, G. C. Das, U. Sengupta and SaikatMaitra, "Synthesis and Characterization of Reaction Sintered CaO Stabilized ZrO2-Mullite Composites, Interceram, 61[3] 106-112, (2012)

Abstract: Reaction sintered ZrO2-mullite composites were synthesized by the reaction between calcined alumina powder and zircon flour in different weight ratios. CaO was used as a stabilizer of zirconia in different proportions to the batches. The powder mixes were isostatically compacted and the compacts

were heat treated at elevated temperature. The heat treated compacts were characterized by different physico-mechanical properties like volume shrinkage, apparent porosity, bulk density, specific gravity, flexural strength and hot modulus of rupture values. The compacts were found to exhibit exceptionally high sintered density, mechanical strength and slag corrosion resistance. The phase analyses of the sintered compacts were carried out by XRD and microstructural analysis was carried out by scanning electron microscopy. The different major and minor phases like mullite, zirconia, corundum, etc. were found to be uniformly distributed with very few inter-granular spaces in the sintered compacts.

8) Sikander Rafiq, Zakaria Man, AbdulhalimMaulad, Nawshad Muhammad and SaikatMaitra, preparation and Characterization of Blended Composite Membranes", Advanced Materials Research, 488-489, 506-510 (2012)

Abstract: Composite membranes were prepared by incorporating inorganic silica nanoparticles into blends of polysulfone/polyimide (PSF/PI) membranes via sol-gel route. Morphological structures of the developed membranes were carried out by scanning electron microscopy (SEM). Spectroscopic analysis of the hybrid membranes were done by fourier transform infrared spectroscopy (FTIR) analysis. Differential scanning calorimetry (DSC) analysis shows that the glass transition temperature (Tg) increased from 209oC to 238oC in the hybrid membranes followed by thermogravimetric analysis (TGA) that showed significant improvement in thermal stability of the developed membranes.

9) M. Banerjee, S. Mukherjee and S. Maitra, "Synthesis and Characterization of Nickel Oxide doped barium Strontium Ceramics" Ceramica, 58, 99-104, (2012)

Abstract: Barium strontium titanate (BST) ceramics (Ba0.6Sr0.4)TiO3 were synthesized by solid state sintering using barium carbonate, strontium carbonate and rutile as the precursor materials. The samples were doped with nickel oxide in different proportions. Different phases present in the sintered samples were determined from X-ray diffraction investigation and the distribution of different phases in the microstructure was assessed from scanning electron microscopy study. It was observed that the dielectric properties of BST were modified significantly with nickel oxide doping. These ceramics held promise for applications in tuned circuits.

10) Mustakimah Mohamed, SuzanaYusup and SaikatMaitra, "Decomposition study of calcium carbonate in cockle shell", Journal of Engineering Science and Technology, 7(1), 1-10, (2012)

Abstract: Calcium oxide (CaO) is recognized as an efficient carbon dioxide (CO2) adsorbent and separation of CO_2 from gas stream using CaO based adsorbent is widely applied in gas purification process especially at high temperature reaction. CaO is normally been produced via thermal decomposition of calcium carbonate (CaCO3) sources such as limestone which is obtained through mining and quarrying limestone hill. Yet, this study able to exploit the vast availability of waste resources in Malaysia which is cockle shell, as the potential biomass resources for CaCO3 and CaO. In addition, effect of particle size towards decomposition process is put under study using four particle sizes which are 0.125-0.25 mm, 0.25-0.5 mm, 1-2 mm, and 2-4 mm. Decomposition reactivity is conducted using Thermal Gravimetric Analyzer (TGA) at heating rate of 20°C/minutes in inert (Nitrogen) atmosphere. Chemical property analysis using x-ray fluorescence (XRF), shows cockle shell is made up of 97% Calcium (Ca) element and CaO is produced after decomposition is conducted, as been analyzed by x-ray diffusivity (XRD) analyzer. Besides, smallest particle size exhibits the highest decomposition rate and the process was observed to follow first order kinetics. Activation energy, E, of the process was found to vary from 179.38 to 232.67 kJ/mol. From Arrhenius plot, E increased when the particle size is larger. To conclude, cockle shell is a promising source for CaO and based on four different particles sizes used, sample at 0.125-0.25 mm offers the highest decomposition rate.

2. Mr. Prithwijit Guha, *Associate Professor-In charge of Training & Placement*

1) P.K. Maiti, Amit Mallik, A. Basumajumdar and **P. Guha**, ``Influence of barium oxide on the crystallization, microstructure and mechanical properties of potassium fluorophlogopite glass–ceramics'', *Ceramics International***38** 251–258 (2012).

Abstract: The influence of barium oxide, heat treatment time and temperature on the crystallization, microstructure and mechanical behavior of the system Bax_K1_2x_Mg3_Al_Si3O10_F2 (where x = 0.0, 0.3 and 0.5) was investigated in order to develop novel, high strength and machinable glass–ceramics. Three glasses were prepared and characterized by differential thermal analysis (DTA), X-ray diffraction (XRD), scanning electronmicroscope (SEM) techniques and some mechanical testing methods.

The crystallization kinetics of glass–ceramics was also studied. Activation energy and Avrami exponent calculated for the crystallization peaktemperature (Tp) of three different glass batches. The Vickers hardness decreased slightly on formation of the potassium fluorophlogopite andbarium fluorophlogopite phases, but decreased significantly on formation of an interconnected 'house of cards' microstructure.

3. Dr. Kaberi Das, *Assistant Professor*

(i) Papers in the journals:

1) Kaberi Das, Sanjay Raha, Dibyendu Chakraborty, Burhanuddin and Sk. Saheb Ali, ``Effect of nucleating agents on the crystallization and microstructural characteristics of blast furnace derived glass-ceramics''

Abstract: Blast furnace slag collected from Bhilai Steel Plant, Chattishgarh, India, was used to prepare glass ceramics using different nucleating agents. The slag with nucleating agent was melted at 1475°C for 2 hours for homogenization and moulded into rectangular bars followed by annealing at 700°C for 15 mins. The crystallization temperature was shifted towards higher value in presence of nucleating agent. Three nucleating agents were selected i.e. ZrO_2, TiO_2 and P_2O_5. Two heat treatment schedules were used. A morphological change in microstructure was noticed with different nucleating oxides.

(ii) Papers in the conferences:

1) Prabhakar Jha, Debdarpan Khan and Kaberi Das, ``Sintering and Microstructural Characteristics of Indian Bauxite in presence of Magnesia'' Paper presented by M.Tech Student (Prabhakar Jha) at the National Conference on Green Manufacturing Technologies in Glass & Ceramics, GTGC 2013, 18 – 19 January, 2013

Abstract: Saurashtra bauxite was used as starting material in the present study. 5wt%, 10wt% and 15wt% of Patelnagar clay (Birbhum district of West Bengal) was added to the raw bauxite, ground in a rubber lined pot and calcined at 650°C for 2 hrs. 1450°, 1500°, 1550° and 1600°C were selected as

sintering temperature. Maximum bulk density of 3.39gm/cc, diametral shrinkage of 27.81% with zero apparent porosity was obtained with 5% clay containing batch sintered at 1600°C. Powder X-ray diffraction of the no addition batch confirmed the presence of small amount of tielite along with corundum as main crystalline phase. On the other hand the clay containing batch showed the formation of mullite crystals along with corundum in the sintered samples. Elongated corundum crystals in the glassy phase were observed in the microstructure of no addition batch. The presence of clay modified the microstructure significantly.

2) Prabhakar Jha, Debdarpan Khan and Kaberi Das, ``Effect of clay addition on the densification and microstructural characteristics of Indian Bauxite'' Poster presentation by M.Tech Student (Prabhakar Jha) at the 3rd International Conference on High –Tech Aluminas and unfolding their Business Prospects (Aluminas – 2013), 7-9 March, 2013 at CSIR-CGCRI, Kolkata (Recipient **3rd Best Poster Presentation Award)**

Abstract: Saurashtra bauxite was used as starting material in the present study. 5wt%, 10wt% and 15wt% of Patelnagar clay (Birbhum district of West Bengal) was added to the raw bauxite, ground in a rubber lined pot and calcined at 650°C for 2 hrs. 1450°, 1500°, 1550° and 1600°C were selected as sintering temperature. Maximum bulk density of 3.39gm/cc, diametral shrinkage of 27.81% with zero apparent porosity was obtained with 5% clay containing batch sintered at 1600°C. Powder X-ray diffraction of the no addition batch confirmed the presence of small amount of tielite along with corundum as main crystalline phase. On the other hand the clay containing batch showed the formation of mullite crystals along with corundum in the sintered samples. Elongated corundum crystals in the glassy phase were observed in the microstructure of no addition batch. The presence of clay modified the microstructure significantly.

4. Dr. Tapas Kumar Bhattacharya, *Assistant Professor*

1) **T. K. Bhattacharya**and Sanjit. Kr. Chakraborty**,** "Investigation on the Utilization of Fly Ash for the Development of Porcelain Ceramics", *International Conference on Utilization of Fly ash – Exploring New Frontiers (ICUFA-2013),* pp. 28-29, January 10—11 (2013).

Abstract: Fly ash an industrial waste material can be incorporated in porcelain ceramics due to compositional similarity with triaxial composition. The investigation is based on the partial or full replacement of quartz as well as clay by fly ash in the porcelain composition as well as to optimized the

amount of fly ash can safely be used for development of good quality porcelain ceramics. The plastic forming techniques namely extrusion and throwing (potter wheels) be adopted in this investigation and the sample fire at about 1100^0C to 1200^0C. The incorporation of fly ash in the porcelain composition upto 25 weight percent by substitution of quartz and 20 weight percent for substitution of clay showed the optimization effect on bulk density, apparent porosity, water absorption and mechanical strength. Addition of fly ash beyond this level detoriate the fired properties of porcelain sample due to blotting effect by more liquid formed with Fe_2O_3, TiO_2 and CaO inherently present in fly ash combined with feldspar. The main crystalline phase are mullite together with unconverted quartz is detected by XRD studies. The microstructure of the fired sample is the presence of scaly type primary mullite together with needle shape secondary mullite crystal embedded in glassy matrix and unconverted quartz rim.

2) **T. K. Bhattacharya** and Sanjit. Kr. Chakraborty**,**``Synthesis & Characterization of Ultrafine Alumina Powder Using Wet Chemical Process", *ALUMINAS-2013, International Conference on High-Tech Aluminas and Unfolding Their Busness Prospects.* Pp.48, 07-09 March (2013)

Abstract: The widely used ultrafine alumina powder in ceramics is prepared from solution by precipitation and peptisation techniques. Chemical graded Aluminium Nitrate nonahydrate is taken as a precursor and precipitation followed by peptisation is to be done by adding NH_4OH solution with a constant flow rate of 100 ml / minute into a stirred solution at a constant P^H of 10. The particle size of alumino hydro gel depends on the concentration of nitrate solution. Nano sized hydro gel is obtained at 0.2(M) nitrate concentration but at low concentration of 0.05 (M) nitrate solution yields micron sized hydro gel particles with an average particle size of 2 micron. The nano gel on standing gradually converted to micron sized due to agglomeration through admixture of nano-micron sized particles. The gel on complete drying at 90^0C yield hard agglomerates which was characterized by FTIR and DTA. Internal and free hydroxyl vibration as well as Al—O stretching and bending vibration was observed in the FTIR spectrum. The gel decomposes at 280^0C with a broadening peak probably due to formation of γ-Alumina through AlO(OH). The crystallite size of Al_2O_3 obtained on calcinations of gel is the function of calcinations temperature. The crystallite size of Al_2O_3 is 75 nm when gel is calcined at 400^0C and it increases to 4 μm at 1200^0C. The crystallization of gel started at 400^0C and sharp α-Al_2O_3 peak appears at 900^0C.

5. Dr. Mausumi Maitra (Mazumdar), *Associate Professor*

1) **Mausumi Maitra**, Rahul Kr. Gupta and Manali Mukherjee, "Identification of Red Blood Cells in Blood Cell Images using Hough Transform", The Proceedings of the 2nd National Conference on Computing and Systems, University of Burdwan, ISBN:93-80813-18-X, 15-16 (2012)

Abstract: Identification of red blood cells (rbc) in blood cell images is very important to detect many diseases likeanemia, leukemia etc. or to follow the process of treatment. However, locating, identifying and counting red blood cells manually are tedious and time-consuming that could besimplified by means

automatic analysis, in whichsegmentation is a crucial step. In this paper, we present an approach to automatic segmentation and counting of redblood cells in microscopic blood cell images using Hough Transform. Detection and counting of rbc have been done on three microscopic images and finally discussion hasbeen made by comparing the results achieved by ourmethod and the conventional manual counting method.

2) **Mausumi Maitra**, Rahul Kr. Gupta and Manali Mukherjee, "Detection and Counting of Red Blood Cells in Blood Cell Images using Hough Transform" The International Journal of Computer Applications (0975-8887), Vol.53-No.16, ISBN :973-93-80870-44-0 (2012)

Abstract: Counting of red blood cells (rbc) in blood cell images is very important to detect as well as to follow the process of treatment of many diseases like anaemia, leukaemia etc. However, locating, identifying and counting of -red blood cells manually are tedious and time-consuming that could be simplified by means of automatic analysis, in which segmentation is a crucial step. In this paper, we present an approach to automatic segmentation and counting of red blood cells in microscopic blood cell images using Hough Transform. Detection and counting of rbc have been done on five microscopic images and finally discussion has been made by comparing the results achieved by the proposed method and the conventional manual counting method.

3) **Mausumi Maitra**, Somnath Dey and Manali Mukherjee, ``Comparative Study on Noise Reduction in Ultrasound Liver Images - *International Journal of Computer Applications*, Vol.66(16), pp.13-16. ISBN: 973-93-80873-76-7 (2013)

Abstract: The gray scale digital image is an aggression of intensity values, represented in the form of two-dimensional array. But the digital images get corrupted by noise during acquisition and transmission. Noise is termed as any irrelevant data that obscures the authenticity of original data. Several noise removal algorithms are applied to ultrasound images in order to remove/reduce the noise level and improve the visual quality for better diagnoses. In the proposed method three algorithms named Median Filtering, Convolution and Wavelet Transform have been used on different ultrasound images and we have calculated the Relative Signal to Noise Ratio have been calculated for the measurement of image quality performance.

6. Mrs. Paramita Dey, *Assistant Professor*

1) **Paramita Dey** et al, ``An SOI LDMOS for Better Switch Application Increasing the Drift Region of an N-MOS: a Comparative Study'', *Journal of Electron Devices*, Vol. 14, pp. 1142-1150 (2012).

Abstract: In this paper we propose to develop an SOI (Silicon on Insulator) LDMOS in which a drift region of 1-µm is added to a conventional n-MOS and compare them on various aspects. The drift region utilizes the RESURF effect that is utilized to distribute the electric field into the LDD region. It is found using two dimensional simulations that the addition of a drift region of 1-µm in LDMOS improves the performance of the device in terms of breakdown-voltage and switching-speed over the conventional

MOSFET. We demonstrate that the proposed devise show an improvement in the breakdown voltage by 280%, reduction of transconductance by 84% and switching speed improves by 198%. However, as for the disadvantages, it increases on-resistance (Ron) and causes higher power dissipation. This LDMOS can be effectively used as a powerful switch.

7. Mrs. Somdatta Chakravortty, *Assistant Professor*

(i) International Journal

1) **S. Chakravortty** and S. Chakrabarti, ``Quality Enhancement of Hyperspectral Image Data through Atmospheric Correction: A Case Study of Henry and Lothian Islands of Sunderban Biosphere Reserve, West Bengal. , *International Journal of Applied Bio-engineering* (ISSN : 0973-9084), *Volume 6, Issue 2,pp 28-34* (2012)

Abstract: Hyperspectral data finds wide applicability in species level mapping of forest cover in pure and mixed stands. The Sunderban Biosphere Reserve of West Bengal is an ideal locale where hyperspectral image data may be successfully utilized for accurate mapping of nearly 94 mangrove species that exist here. The present study is the first attempt in the Sunderban eco-geographic province to make species level discrimination of mangroves in a mixed stand. However, prior to data classification, several corrections are required to be made for meaningful interpretation of data. Atmospheric correction is one such crucial correction and pre-processing step which is done to minimize the effect of atmospheric agents that alters the actual radiance data that the sensor should represent. It therefore becomes essential to properly analyse, process and correct hyperspectral data by applying atmospheric correction techniques to reduce or remove the influence of atmospheric agents on the sensor captured data.MODTRAN based FLAASH algorithm and scene based QUAC algorithm, both available in ENVI have been found to be effective in for atmospheric correction of data captured by the Hyperion sensor onboard the EO-1 satellite launched by NASA. In this paper the FLAASH and QUAC models have been applied on the Hyperion data and a comparative analysis carried out. The application of hyperspectral data is a unique attempt in the unexplored field of research for Indian mangroves in general and Sunderban mangroves in particular which is the world's largest single patch mangrove forest. This paper analyses the data processing steps for atmospheric correction of Hyperion data taken over the dense mangrove forest cover of the Henry and Lothian Islands of the Sunderban Delta of West Bengal. This data has been interpreted to understand the properties of mangroveforest cover and how they relate to the measurements actually made by the hyperspectral sensor.

2) **S. Chakravortty** and A. S. Saha Choudhury, ``Analysis of Red Edge Position and Spectral Unmixing of Hyperspectral Data for Identification of Mangrove Species'', accepted in *International Journal of Tomography and Simulation* (ISSN: 2319-2336) (2013)

Abstract: Application of hyperspectral data for species level mapping of mangroves is an area of active research in the present date. Linear Spectral Unmixing (LSU) of hyperspectral data has been successful in mangrove discrimination at sub pixel level. However, it only provides information about the fractional abundance of end members within each mixed pixel whereas their location within the pixel is unknown. This study has used spectral profile and data of pure end members extracted by automated target generation algorithm (NFINDR) and applied them to determine the fractional abundance of sub pixels in pure and mixed pixels. The locations of sub pixels have been determined using Simulated Annealing Algorithm. The study has been successful in finding out the spatial distribution of mixed mangrove

species within a pixel and has greatly helped in obtaining classified maps at finer spatial resolution. The accuracy has been validated from field visits made in the study area. This paper also attempts to show that the red edge position of different mangrove species vary and thus can be an effective parameter to classify and distinguish different mangrove types in this study. Comparison of ground reference map and the classified output generated from REP suggests some degree of success in identifying species such as Ceriops, Excoecaria Agallocha, Avicennia Marina and Avicennia Alba. Analysis of classified output and accuracy assessment shows that LSU shows better classification accuracy than red edge values. LSU has been able to successfully discriminate between 8 dominant mangrove species of the study area namely, Excoecaria, Aegialitis, Avicennia Alba, Avicennia Marina, Ceriops, Phoenix, Avicennia Officinalis and Casurina.

3) **S. Chakravortty,** ``Application of Hyperspectral data for Development of Spectral Library of Mangrove Species in the Sunderban Delta'',accepted in *International Journal of Geomatics and Geosciences*(ISSN 0976 – 4380)(2013)

Abstract: Remote sensing has played a crucial role in mapping and understanding of the spatial pattern of mangrove forests and changes in its areal extent caused by natural disasters and anthropogenic forces. So far traditional pixel-based classification of multispectral imagery has been widely applied for broad mapping of mangrove covers. But the recent and more advanced hyperspectral data taken from sensors (like Hyperion) is expected to demonstrate the potential for reliable and detailed characterization of mangrove forests including species level classification. This paper demonstrates the potential of hyperspectral imagery for species level identification of mangroves in the Henry Island of Sunderban Biosphere Reserve, West Bengal. After pre-processing of hyperspectral data, the spectral signature of each species have been extracted from the Hyperion data after which a spectral library has been developed comprising the seven dominant mangrove species of the region namely Excoeocaria Agallocha, Avicennia Officinalis, Ceriops Decandra, Avicennia Marina and Phoenix Paludosa, Brugueira Cylindrica, Aegialitis.

4) **S. Chakravortty,** ``Application of Hyperspectral Imagery for Tropical Mangrove Species Discrimination in the Sunderbans Delta India, accepted in *Journal of Forestry Research* (ISSN:1007-662X) (2013)

Abstract: The present study is the first attempt to use hyperspectral data in the Sunderban eco-geographic province to enable species level discrimination of mangroves. This paper applies automated target detection algorithms such as N-FINDR and ATGP for detection of end members (mangrove species) from the hyperspectral image data. The pixels comprising of either homogeneous or mixed mangroves species are unmixed using both constrained and unconstrained linear mixing model and the fractional abundance images of the detected species generated. It has been found that the abundance images generated after unconstrained linear unmixing shows more accuracy with use of end members generated by N-FINDR algorithm as compared to that of constrained linear unmixing with ATGP as well as N-FINDR. In the present study an attempt has also been made for correctly locating the sub pixels as it is necessary not only to identify the diverse mangrove species within this spatial resolution but also their location within each pixel. This has helped in obtaining classified maps at finer spatial resolution. The sub pixel locations have been determined using Simulated Annealing Algorithm. The study has been successful in finding out the spatial distribution of mangrove species within a pixel in the study area of Sunderban. The sub pixel classified results have led to the identification of species dominant in the island to be Avicennia Marina, Avicennia Officinalis, Excoecaria Agallocha, Ceriops Decandra, Phoenix Paludosa and Aegialitis. The area also comprises mixed patches of Ceriops-Excoecaria Agallocha as well as Aegialitis-Avicennia Marina var aquitesima in many places.

(ii) International Conference

1) **S. Chakravortty** and J. Saha Choudhury, ``Application of Unsupervised End Member Detection Algorithms for Spectral Unmixing of Hyperspectral Data for Mangrove Species Discrimination, *Proceedings of IEEE International Conference on Communications, Devices and Intelligent Systems*, Jadavpur University, Kolkata (IEEE Catalog Number: CFP1207U-CDR, ISBN: 978-1-4673-4698-6), doi: 10.1109.CODIS.2012.6422141, 28th-29th December (2012)

Abstract: The Sunderban Biosphere Reserve of West Bengal, India is an ideal locale where hyperspectral image data may be successfully utilized for accurate mapping of nearly 94 mangrove species that exist there. The present study is the first attempt to use hyperspectral data in the Sunderban eco-geographic province to enable species level discrimination of mangroves. As priori knowledge of mangrove species distribution in most of the densely forested islands of the Sunderbans is not available, this paper applies unsupervised automated target detection algorithms such as N-FINDR and ATGP for detection of end members (mangrove species) from the hyperspectral image data. The pixels comprising of either homogeneous or mixed mangroves species are unmixed using both constrained and unconstrained linear mixing model and the fractional abundance images of the detected species generated. It has been found that the abundance images generated after unconstrained linear unmixing shows more accuracy with use of end members generated by N-FINDR algorithm as compared to that of constrained linear unmixing with ATGP as well as N-FINDR. The sub pixel classified results have led to the identification of species dominant in Henry's Island to be Avicennia Marina, Avicennia Officinalis, Excoecaria Agallocha, Ceriops Decandra, Phoenix Paludosa and Aegialitis. The area also comprises mixed patches of Ceriops-Excoecaria Agallocha as well as Aegialitis-Avicennia Marina var aquitesima in many places.

2) **S. Chakravortty and E. Shah,** ``Application of Non-linear Spectral Unmixing on Hyperspectral Data for Species Level Classification of Mangroves'', *Proceedings of IEEE International Conference on Communication and Signal Processing (IEEE ISBN No. 978-1-4673-1620-0,* Adiprashakti Engg. College, Tamil Nadu,pp 1059-1063, 3-5th April (2013).

Abstract: The present study is the first attempt to make use of hyperspectral data in the Sunderban eco-geographic province to enable species level discrimination of mangroves. Our objective here, is to unmix hypespectral images using non-linear spectral unmixing techniques by taking into account the higher order interactions of light that occurs among different target endmembers (mangrove species). The linear mixing models have also provided a good abstraction of the mixing process, but some naturally occurring situations exist where nonlinear models provide the most accurate assessment of endmember abundance. It has been noted that the nonlinear models have been successful in estimating the abundances for the different endmembers in places where the non-linear situation is prevalent within the mangrove forests with several layers of tree canopy considered to be present one above the other. For such a situation, the second order interaction among the endmembers have been considered. This paper applies and compares the classification accuracy of non-linear techniques using the two methods shown in the Bilinear Model. They are Nascimento's and Fan's Bilinear model for unmixing hyperspectral images. On comparison, Fan's model has been able to classify mixed mangrove species more accurately than Nascimento's model. It has been possible to identify 7 dominant pure and mixed mangrove species present in the study area.

3) **S. Chakravortty** and J. Saha Choudhury,``Determining Spatial Location of Sub pixels in Hyperspectral data for Mangrove Species Mapping in a Mixed Stand: A Case Study of Henry Island in the Sunderban Delta India, Proceedings of *IEEE International Conference on Signal Processing, Image Processing and Pattern Recognition*, Karunya University, Coimbatore, IEEE

ISBN No.:978-1-4673-4861-4 doi: 10.1109/ICSIPR.2013.649.7955,pp39-43, 7-8th February (2013)

Abstract: Hyperspectral data finds wide applicability in species level mapping of mangrove forest cover in pure and mixed stands. The high spectral resolution of hyperspectral data enhances discriminatory power of target objects (mangrove species) on one hand whereas on the other hand its low spatial resolution leads to challenging problems of mixed pixels. Though Linear Spectral Unmixing (LSU) has been successful in mangrove discrimination at sub pixel level, it only provides information about the fractional abundance of endmembers within each mixed pixel. The spatial location of the sub-pixels remains unknown, as the unmixing technique does not perform any enhancement of spatial resolution. Hence, even though the abundance of target sub pixels is known their distribution within the area is unknown. In this paper, we have attempted a technique for correctly locating, from a spatial point of view the fractional abundances of the sub pixels i.e. mixture of mangrove species within the mixed pixel. In the present study, the Hyperion sensor captures images at a spatial resolution of 30m within which there is high probability of presence of mixed mangrove species besides homogeneous patches. It is therefore necessary not only to identify the diverse mangrove species within this spatial resolution but also their geographic locations which will greatly help in obtaining classified maps at finer spatial resolution. This takes into account the information of pure end members extracted by automated target generation algorithm (NFINDR in this case) and applies them to determine the fractional abundance of individual sub pixels in pure and mixed pixels. The sub pixel locations are then determined using Simulated Annealing Algorithm. The study has been successful in finding out the spatial distribution of mixed mangrove species within a pixel in the Henry Island of Sunderban. The accuracy has been validated from field visits made in the study area.

(iii) National Conference

1) **S. Chakravortty**and J. Saha,``Hyperspectral Image Analysis for Species Level Classification of Mangroves: A Case Study of Lothian Island,Sunderban, *IEEE and AICTE sponsored National Conference on Education Technology & Content Management,* Techno India Campus, Kolkata (ISBN: 978-81-923034-7-5), 3rd -4th March (2012)

Abstract: The Sunderban Biosphere Reserve of West Bengal is an ideal locale where hyperspectral image data may be successfully utilized for accurate mapping of nearly 94 mangrove species that exist here. The present study is an attempt in the Sunderban eco-geographic province to make species level discrimination of mangroves in a mixed stand. However, prior to data classification, several corrections are required to be made for meaningful interpretation of data. Atmospheric correction, Geometric Correction and Dimensionality Reduction are such crucial correction and pre-processing steps which is essential to properly analyse, process and correct hyperspectral data.

2) **S. Chakravortty,** ``Analysis of Remotely Sensed Multispectral Data for Landcover Classification of Sagardweep, Sunderbans, *IEEE and AICTE sponsored National Conference on Education Technology & Content Management,* Techno India Campus, Kolkata (ISBN: 978-81-923034-7-5), 3rd -4th March (2012)

Abstract: The Sagar island of the Sunderban Delta in West Bengal, India is one of the most vulnerable islands subjected to severe erosion due to cyclones, high tides and rising sea waters. Hence, an accurate and up-to-date assessment of the nature, extent and distribution of landcover is an essential pre-requisite in framing up a holistic management plan for sustenance of the island as well as the dwindling mangrove ecosystem thriving there. This study uses

satellite based LISS-3 images of the the study area for classification of landcover with supervised classification techniques of Parallelopiped Classifier and Minimum Distance to Mean Classifier. A comparative study of the classification output reveals better classification accuracy achieved by the Minimum Distance to Mean algorithm.

3) **S. Chakravortty,** ``Hyperspectral Image Analysis for Identification of Mangroves at Species Level: A Case Study of Lothian Island, Sunderban, *West Bengal State Science Congress,* Saha Institute of Nuclear Physics, West Bengal, 1st -2nd March (2012)

Abstract: Over the last decade, remote sensing has played a crucial role in mapping and understanding changes in the areal extent and spatial pattern of mangrove forests caused due to natural disasters and anthropogenic forces. While traditional pixel-based classification of multispectral imagery has been widely applied for mapping mangrove forest, more recent types of satellite imagery like hyperspectral data, taken from sensors like Hyperion combined with classification algorithms is expected to demonstrate the potential for reliable and detailed characterization of mangrove forests including species level classification. The Sunderban Biosphere Reserve of West Bengal is an ideal locale where hyperspectral image data may be successfully utilized for accurate mapping of nearly 94 mangrove species that exist here. The present study is an attempt in the Sunderban eco-geographic province to make species level discrimination of mangroves in a mixed stand. Prior to data classification, several pre-processing steps like atmospheric correction, geometric correction and dimension reduction have been applied for meaningful interpretation of data. This paper attempts to develop a spectral library of mangrove species of Lothian Island in Sunderban which is subsequently used for sub-pixel classification of mangroves at species level. This paper is intended to move one step closer to the conclusion whether hyperspectral technology could be used for tropical mangrove species discrimination.

4) **S. Chakravortty,** ``Application of Satellite Data for Classification of Mangroves at Species Level: A Case Study of Jharkhali in Sunderban West Bengal, *National Conference on Integrated Coastal Zone Management,* Berhampur University, Odisha, 24th and 25th February (2012)

Abstract: Jharkhali was once within the core Sunderban forest cover and supported a rich bio-diversity, including luxuriant growth of mangrove vegetation. With increasing human activities and consequent pollution, there has been a fast recession of mangrove forest cover from this area resulting in the shift of the Dumpier Hodges Line further southward near Ramnagar-Baruipur towards Kolkata in West Bengal. The paper aims to apply digital image processing and remote sensing techniques to map and understand the changes in the areal extent and spatial pattern of mangrove forests in Jharkhali in Sunderban caused due to natural disasters and anthropogenic forces. The goal is to classify and identify mangroves at species level with use of multispectral satellite imagery like IRS P6 LISS-4. Correlations of the mangrove types (communities or species) with discernible spectral characteristics from the image data have been identified. These spectral classes of the imagery are finally translated into species types in the image interpretation process. About 9 species could be identified the local names of which are Bani, Kalo Bani, Geonwa, Kakra, Kewra, Goran, Hental, Jhau(fern) and Khalshi. Supervised classification techniques like Parallelopiped algorithm, Minimum Distance to Mean and Maximum Likelihood Classification have been used and a comparative analysis of the output has been made. It has been found that using LISS-4 imagery the identification of homogeneous presence of mangrove species has been possible.

8. Ms. Maumita Maity & Mr. Biswarup Das, *Part Time Teacher*

1) **Maumita Maity**, Prasun Ghosal and **Biswarup Das**, "Design of Low Power Fault Tolerant Reversible Multiplexer Using QCA", Third International Conference on Emerging Applications of Information Technology (EAIT 2012), Kolkata, India, Nov 29 - Dec 01 (2012).

Abstract: In recent years, reversible logic has emerged as a promising computing paradigm having its application in low power CMOS design, quantum computing and nanotechnology. In this paper we have proposed a fault tolerant reversible multiplexer, designed using a parity preserving Fredkin gate for the first time.This proposed 2:1 MUX has been designed using only one Fredkin gate which has produced two garbage outputs. The proposed parity preserving reversible multiplexer circuit is more efficient in power dissipation and fault tolerance. It should be a promising step towards the low power, nano-scale circuit design for future generation quantum computer.

2) **Maumita Maity**, Prasun Ghosal and **Biswarup Das**, "Universal Reversible Logic Gate Design For Low Power Computation at Nano-Scale ", PrimeAsia 2012, Asia-Pacific Conference on Postgraduate Research in Microelectronics & Electronics, BITS, Pilani, India,December 5-7 (2012).

Abstract: Reversible logic has caught the attention of many a researchers during recent years for its enormous possibility of application in low power CMOS design, quantum computing and nanotechnology. Our contribution in this present work is in two folds. Firstly, we have proposed two new reversible gates ANOX (ANd-Or-Xor) gate and NDI (NanD-Inverter) gate which are universal in nature. These gates can be used for the design of large and complex combinational and sequential circuits. Secondly, for the design of the proposed gates we have used the advantages of two technologies, i.e. reversible logic and QCA (Quantum dot Cellular Automata). Reversible logic is used for low power computation and QCA is used for nano scale and high speed computation. So, these proposed gates can be used for high speed, low power and nano-scale computing.

3) **Maumita Maity**, Prasun Ghosal and **Bishwarup Das**, "Reversible Logic Gate Design and Implementation using QCA for Low power, High speed and Nano- Scale Computing", *100th Indian Science Congress, Kolkata-2013*,Kolkata, India, January, 3-7 (2013).

Abstract: Reversible logic is an emerging research area. Interest in reversible logic is sparked by its applications in several technologies, such as quantum computing, low power CMOS, optical computing and nanotechnology.It is information lossless and a low power technology. Power dissipation in modern technologies is an important issue. Current irreversible technologies will dissipate a lot of heat, which can be avoided if computation is carried out with no loss of information. According to Bennet and Landauer, information loss is directly related to the power loss of a circuit and information loss can be avoided if the computation is carried out in a reversible way. So, we can use this technology for designing power efficient circuits for next generation quantum computer. In this paper we have designed a new reversible logic gate named as “MPDRG” and implement it using QCA. It is a universal gate and we have proved it’s universality by implementing all the basic logic gates and all the thirteen standard functions.

9. Dr. Kalpana Saha (Roy), *Assistant Professor*

1) Kalpana Saha (Roy),"A New Call Admission Control Protocol for QoS Measurement in Wireless/Cellular Networks Using Markov Process", accepted in *International Journal of Wireless and Communication Networking (IJWCN)*(2013).

Abstract: Call Admission Control (CAC) protocol plays a crucial role in the performance of Wireless/Cellular networks. When a call requests admission in a specific cell, the CAC protocol must decide either to accept or reject this call. From the customer point of view, rejecting a new call is better than dropping a call which is ongoing call. In our paper we consider seven different classes of traffic, emergency and voice, data, multimedia for both handoff and new where emergency calls will be highest prioritized. Here, voice calls should get higher priority compared to data calls. The different types of calls are characterized by different arrival rates, service rates and bandwidth requirements. We assume that the bandwidth for a class is constant during the life time of the call and is determined during the admission procedure. We consider a finite buffer for storing queuing calls. We study the effect of waiting time in the buffer. Here, the objective is to limit the number of calls in order to guarantee the requested QoS for each admitted call. In our protocol, call selection is randomly chosen but total call arrival rate of is fixed. The rejection ratio (%) vs arrival rate for non pre-emptive and pre-emptive calls are shown in different figures taking different values of calls. It is concluded that preemption method is better for emergency calls andhandoff calls whereas pre-emptive method is better for new calls whatever it may be either voice or data or multimedia types.

10. Mr. Soumit Chowdhury, *Assistant Professor*

(i) International conference

1) Nabin Ghoshal, Soumit Chowdhury, Jyotsna Kumar Mandal, ``Z-Transform based Digital Image Authentication using Quantization Index Modulation", *The proceedings of the international conference CSIA 2012*, Delhi, 25-27 May (2012).

Abstract: This paper presents a Steganographic technique of color image authentication technique based on the Discrete two dimensional Z-Transform using Quantization Index Modulation (QIM). The Transform is applied on sub-image block of size 2 x 2 in row major order of the carrier image for frequency components of the corresponding spatial components. Image authentication is done by hiding secret message/image into the real part of the frequency component of the carrier image. A single bit of secrete message/image is embedded in each carrier image byte based on Quantization Index Modulation where a tolerance factor Δ has been used for invisible embedding. After embedding, a delicate re-adjusting phase is applied in all the frequency components of each mask, to keep the pixel values positive and non-fractional in the spatial domain. It is also applicable for secrete data transmission through carrier colour image by hiding secrete data. Experimental results proof the robustness and performance of the proposed technique.

2) Soumit Chowdhury, Dipankar Nag, Krishnendu Sadhu and Nabin Ghoshal, "Encryption Based Image Authentication Technique using Random Circular Insertion and Adjustment"(EIATRCIA),'' accepted in *The Proceedings of the International Conference FICTA 2012*, Bhubaneswar Engg. College, 22-23 Dec. (2012).

Abstract: This paper demonstrates a dynamic encryption based image authentication technique in the spatial domain that hides one authenticating color image inside another carrier color image where the authenticated receiver can only extract this embedded secrete image using the secrete key(s). The EIATRCIA technique actually embeds the secrete image bits into the randomly generated bit positions of each carrier image pixel bytes using the encryption with dynamic secrete key(s). The embedding of four numbers of the secrete image bits into the sub-image blocks of size 2×2 can also be organized in a randomly generated circular list involving encryption associating secrete key(s) and stenographic key. Finally a delicate readjustment in the respective bits of the concerned bit-embedded pixel bytes can minimize the introduced distortion as well. This carrier image after embedding also avoids the visual distortion and the experimental result shows the robustness along with performance of this scheme while embedding.

(ii) National Conference

1) Nabin Ghoshal, Soumit Chowdhury, Jyotsna Kumar Mandal, ``An Image Authentication in Z-Domain (IAZ-D)", The Proceedings of the National Conference ETCS 2012 (UGC Sponsored National Symposium), Barrackpore Rastraguru Surendranath College, 20-21 January (2012).

Abstract: This paper presents a novel technique for image authentication in the Z-domain based on the Discrete two dimensional Transform. The Transform is applied on sub-image block called mask of size 2 x 2 for frequency components of the corresponding spatial component in row major order. Image authentication is done by hiding secret message/image into the real part of the component obtained by discrete two dimensional Transform of the carrier image. A single bit from the authenticating image/message is embedded in each carrier image pixel values. Robustness is achieved through embedding bits in variable positions of carrier image determined by the decimal value of two higher order bits (i.e. b8b7). After embedding, a delicate re-adjust phase is incorporated in all the components of each mask, to keep the pixel values positive and non-fractional in the spatial domain. The invisibility is satisfied by using delicate re-adjust phase. This novel technique is also applicable for secrete data transmission through carrier color image by hiding secrete data. Experimental results show the robustness and performance of the proposed watermarking technique.

10. Dr. Sankar Ray, *Associate Professor*

1. Sankar Ray, "Acoustic metamaterial for anti-earthquake device implementation'', *Ceramics India International* **5**, 31 (2012).

11. Dr. Saibal Ray, *Associate Professor*

(i) Research papers:

1) F. Rahaman, A. K. Yadav, **Saibal Ray**, R. Maulick and R. Sharma ``Singularity-free dark energy star**''***Gen. Relativ.Gravit.***44**, 107 (2012).

Abstract: We propose a model for an anisotropic dark energy star where we assume that the radial pressure exerted on the system due to the presence of dark energy is proportional to the isotropic perfect fluid matter density. We discuss various physical features of our model and show that the model satisfies all the regularity conditions and stable as well as singularity-free.

2) F. Rahaman, **Saibal Ray**, A. A. Usmani and S. Islam ``The (2+1)-dimensional gravastars'' *Phys. Lett. B* **707,** 319 (2012).

Abstract: We propose a new model of a gravastar in (2+1) anti-de Sitter space-time. This new three dimensional configuration has three different regions with different equations of state: [I] Interior: 0 \leq r < r_1, \rho = -p ; [II] Shell: r_1 \leq r < r_2, \rho = p; [III] Exterior: r_2 < r, \rho = p =0. The outer region of this gravastar corresponds to the exterior (2+1) anti-de Sitter space-time, popularly known as the BTZ space-time. Like BTZ model, \Lambda is taken to be negative, which at the junction turns out to be positive as required by stability of gravastar and mathematical consistency. After investigating the Interior space-time, Shell and Exterior space-time we have highlighted different physical features in terms of Length and Energy, Entropy, and Junction conditions of the spherical distribution. It is shown that the present model of charge-free gravastar in connection to the exterior (2+1) anti-de Sitter space-time or the BTZ space-time is stable and non-singular.

3) P. P. Ghosh, U. Mukhopadhyay and **Saibal Ray** ``Does Accelerating Universe Permit Varying Speed of Light?''*Astrophys. Space Sci.***337**, 509 (2012).

Abstract: We investigate the possible variation of c in the context of the present accelerating Universe as discovered through SN Ia observations and show that variability of c is not permitted under the variable Λ models.

4) F. Rahaman, P. K. F. Kuhfittig, K. Chakraborty, A. A. Usmani, **Saibal Ray** ``Galactic rotation curves inspired by a noncommutative-geometry background'' *Gen. Relativ. Gravit.***44**, 905 (2012).

Abstract: This paper discusses the observed at rotation curves of galaxies in the context of noncommutative geometry. The energy density of such a geometry is di?used throughout a region due to the uncertainty encoded in the coordinate commutator. This intrinsic property appears to be su?cient for producing stable circular orbits, as well as attractive gravity, without the need for dark matter.

5) F. Rahaman, R. Sharma, **Saibal Ray**, R. Maulick and I. Karar, ``Model for a strange star in Krori-Barua spacetime'' *Euro.Phys. J. C***72**, 2071 (2012).

Abstract: The singularity space-time metric obtained by Krori and Barua\cite{Krori1975} satisfies the physical requirements of a realistic star. Consequently, we explore the possibility of applying the Krori and Barua model to describe ultra-compact objects like strange stars. For it to become a viable model for strange stars, bounds on the model parameters have been obtained. Consequences of a mathematical description to model strange stars have been analyzed.

6) F. Rahaman, P.K.F. Kuhfittig, R. Amin, G. Mandal, **Saibal** Ray and N. Islam, ``Quark matter as dark matter in modeling galactic halo'' *Phys. Lett. B* **714,** 131 (2012).

Abstract: Considering the flat rotation curves as input and treating the matter content in the galactic halo region as quark matter, we have found out a background spacetime metric for the region of the galactic halo. We obtain fairly general conditions that ensure that gravity in the halo region is attractive. We also investigate the stability of circular orbits, along with a different role for quark matter. Bag-model quark matter meeting these conditions therefore provides a suitable model for dark matter.

7) F. Rahaman, A.A. Usmani, **Saibal Ray** and S. Islam, ``The (2+1)-dimensional charged gravastars'' *Phys. Lett. B* **717**, 1 (2012).

Abstract: This is a continuation and generalization of our earlier work on {\it gravastar} in (2+1) anti-de Sitter space-time to 2+1 dimensional solution of charged gravastar. Morphologically this gravastar contains three regions namely: (i) charged interior, (ii) charged shell and (iii) electrovacuum exterior. We have studied different characteristics in terms of Length and Energy, Entropy, and Junction conditions of the spherical charged distribution. It is shown that the present model of charged gravastar is non-singular and represents itself an alternative of Black Hole.

8) A. K. Yadav, F. Rahaman, **Saibal Ray** and G. K. Goswami ``Magnetized dark energy model for the late time acceleration of the Universe'' *Eur. Phys. J. P* **127,** 127 (2012).

Abstract: In the present work we have searched the existence of the late time acceleration of the Universe. The matter source that is responsible for the late time acceleration of the Universe consists of cosmic fluid with the equation of state parameter $\omega =\frac{p}{\rho}$ and uniform magnetic field of energy density ρ_{B}. The study is done here under the framework of spatially homogeneous and anisotropic locally rotationally symmetric (LRS) Bianchi-I cosmological model in the presence of magnetized dark energy. To get the deterministic model of the Universe, we assume that the shear scalar (σ) in the model is proportional to expansion scalar (θ). This condition leads to $A=B^{n}$, where A and B are metric functions and n is a positive constant giving the proportionality condition between shear and expansion scalar. It has been found that the isotropic distribution of magnetized dark energy leads to the present accelerated expansion of the Universe and the derived model is in good agreement with the recent astrophysical observations. The physical behavior of the Universe has been discussed in details.

9) F. Rahaman, P.K.F. Kuhfittig, **Saibal Ray** and S. Islam, ``Searching for higher-dimensional wormholes with noncommutative geometry''*Phys. Rev. D* **86,** 106010 (2012).

Abstract: Noncommutative geometry, an offshoot of string theory, replaces point-like structures with smeared objects and has recently been extended to higher dimensions. The purpose of this letter is to obtain wormhole solutions with this extended noncommutative geometry as a background. It is found through this investigation that wormhole solutions exist in the usual four, as well as in five dimensions, but they do not exist in higher-dimensional spacetimes.

10) M. Hossein, F. Rahaman, J. Naskar, M. Kalam, **Saibal Ray**, `` Anisotropic Compact stars with variable cosmological constant'' *Int. J. Mod. Phys. D***21**, 1250088 (2012).

Abstract: Recently the small value of the cosmological constant and its ability to accelerate the expansion of the Universe is of great interest. We discuss the possibility of forming of anisotropic compact stars from this cosmological constant as one of the competent candidates of dark energy. For this purpose we consider the analytical solution of Krori and Barua metric. We take the radial dependence of

cosmological constant and check all the regularity conditions, TOV equations, stability and surface redshift of the compact stars. It has been shown as conclusion that this model is valid for any compact star and we have cited $4U 1820-30$ as a specific example of that kind of star.

11) M. Kalam, F. Rahaman, **Saibal Ray**, Sk. M. Hossein, I. Karar and J. Naskar, ``Anisotropic strange star with de Sitter spacetime", *Eur. Phys. J. C* **72**, 2248 (2012).

Abstract: Stars can be treated as self-gravitating fluid. Krori and Barua (1975) gave an analytical solutions to that kind of fluids. In this connection, we propose a de-Sitter model for an anisotropic strange star with the Krori-Barua spacetime. We incorporate the existence of cosmological constant in a small scale to study the structure of anisotropic strange stars and come to conclusion that this doping is very much compatible with the well known physical features of strange stars.

12) F. Rahaman, P. K. F. Kuhfittig, B. C. Bhui, M. Rahaman, **Saibal Ray**, U. F. Mondal, `` BTZ black holes inspired by noncommutative geometry''*Phys. Rev. D***87**, 084014 (2013).

Abstract: In this paper a Banados, Teitelboim and Zanelli (BTZ) black hole is constructed from an exact solution of the Einstein field equations in a (2+1)-dimensional anti-de Sitter spacetime in the context of noncommutative geometry. The BTZ black hole turns out to have two horizons, no horizon or a single horizon corresponding to a minimal mass. Certain thermodynamical properties are investigated, including Hawking temperature, entropy and heat capacity. Also discussed is the geodesic structure of BTZ black holes for both massless and massive particles. In particular, it is shown that bound orbits for test particles are possible.

13) F. Rahaman, **Saibal Ray** and S. Islam, `` Wormholes supported by two non-interacting fluids'' accepted in *Astrophys. Space Sci.* DOI: 10.1007/s10509-013-1423-4 [arXiv: gen-ph/1110.1572] (2013).

Abstract: We provide a new matter source that supplies fuel to construct wormhole spacetime. The exact wormhole solutions are found in the model having, besides real matter (RM), an anisotropic dark energy (DE) so that the source is termed as DERM. We have shown that the exotic matters that are the necessary ingredients for wormhole physics obey null and weak energy conditions but violate only strong energy condition. Though the wormhole comprises of exotic matters yet the effective mass remains positive. We have calculated the effective mass of the wormhole up to 4 km throat radius as $1.3559M_\odot $. Some physical features are briefly discussed.

14) P. P. Ghosh, **Saibal Ray**, A.A. Usmani and U. Mukhopadhyay, ``Oscillatory Universe, dark energy and general relativity" accepted in *Astrophys. Space Sci.* DOI: 10.1007/s10509-013-1390-9 [arXiv: gr-qc/1202.3937] (2013).

Abstract: The concept of oscillatory Universe appears to be realistic and buried in the dynamic dark energy equation of state. We explore its evolutionary history under the frame work of general relativity. We observe that oscillations do not go unnoticed with such an equation of state and that their effects persist later on in cosmic evolution. The `classical' general relativity seems to retain the past history of oscillatory Universe in the form of increasing scale factor as the classical thermodynamics retains this history in the form of increasing cosmological entropy.

15) M. Kalam, FR. Rahaman, Sk. M. Hossein and **Saibal Ray**, ``Central Density Dependent Anisotropic CompactStars''accepted in*Eur. Phys. J. C*, DOI 10.1140/epjc/s10052-013-2409-7 [arXiv:1301.0271/ physics.gen-ph].

Abstract: Stars can be treated as self-gravitating fluid. In this connection, we propose a model for an anisotropic star under the relativistic framework of Krori-Barua (1975) spacetime. It is shown that the solutions are regular and singularity free. The uniqueness of the model is that interior physical properties of the star solely depend on the central density of the matter distribution.

(ii) Books:

1. The Accelerating Universe: Role of Λ-Dark Energy
Saibal Ray & Utpal Mukhopadhyay
(Lambert Academic Publishing, Germany, 2012)

Progress of the Sponsored Projects

(2012-13)

1. Professor Saikat Maitra, *Officer-In-Charge*

Funding Agency	Type	Title	Role	Grant Sanctioned (Rs.)	Duration
Progressive Enterprises Ltd, Rajasthan	Minor	Studies on The Effect of Reduction of Ukrain Clay in Vitrified Tiles Composition	Principal Investigator	4,00,000	2012

2. Dr. Mausumi Maitra (Mazumdar), *HOD-IT, Associate Professor*

Funding Agency	Type	Title	Role	Grant Sanctioned (Rs.)	Duration
AICTE (MODROBS)		Development of Image Processing and GIS Lab	Coordinator	10.00 lac	*2010 – 2013*
AICTE (MODROBS)		Development of Image Processing and Computer Vision Lab	Coordinator	9.00 lac	*2011-2012*
UGC		Development of I P Core for implementation of Image Processing Algorithms on FPGA Board	Coordinator	6.97 lac	*2011-2014*

3. Mr. Ram Chandra Das, *Associate Professor*

Funding agency	Type	Title	Role	Grant Sanctioned (Rs.)	Period
AICTE	Major Research Project	Development of Wear Resistant Ceramics Using fly ash	Principal Investigator	8,00,000	2011 -2013

4. Smt. Somdatta Chakravortty, *Assistant Professor*

Funding Agency	**Type**	**Title**	**Role**	**Grant Sanctioned (Rs.)**	**Duration**
Department of Science & Technology, Govt. of India, New Delhi	Major Research Project	Development of Hyperspectral Image Classification Algorithm for Tropical Mangrove Species Discrimination in a Mixed Stand : A Case Study of Sunderban Biosphere Reserve, West Bengal	Principal Investigator	25,00,000	February'2011-February'2014 (ongoing)
Ministry of Earth Sciences, New Delhi	Major Research Project	Digital Image Processing of Hyperspectral Data for Pattern Recognition and Change Detection of Saline Blanks and Associated Mangrove Species: A Case Study of Sunderban Biosphere Reserve, West Bengal	Principal Investigator	75,00,000 (awaiting budget approval)	February'2013-February' 2016 (ongoing)
University Grants Commission, Kolkata	Minor Research Project	Application of Image Processing and Computer Simulation Modelling for Assessment of Carbon Sequestration Potentiality of Sunderban Mangroves, West Bengal	Principal Investigator	2,00,000	December'2010- July, 2012 (completed)
All India Council of Technical Education, New Delhi	MODROBS scheme	Development of Image Processing & GIS Lab	Co-Project Coordinator	10,00,000	February' 2010-February'2013 (ongoing)
All India Council of Technical Education, New Delhi	MODROBS scheme	Development of Image Processing & Computer Vision Lab	Co-Project Coordinator	9,00,000	June' 2011 – June'2012 (completed)

5. Dr. Kaberi Das, *Assistant Professor*

Funding agency	Type	Title	Role	Grant Sanctioned (Rs.)	Period
UGC	Minor Research Project	Development of Chemical & Abrasion resistant glass-ceramics from Blast Furnace slag	Principal Investigator	1,20,000	2011 -2013
AICTE, RPS	Major Research Project	Enrichment of Indian Bauxite by sintering route for refractory application	Principal Investigator	9,87,000	2012 -2014

6. Dr. Saibal Ray, *Associate Professor*

Funding agency	Type	Title	Role	Grant Sanctioned (Rs.)	Period
UGC	Minor Research Project	Cosmic Acceleration and Dark Energy	Principal Investigator	1,15,500	2011 -2013

7. Mr. Soumit Chowdhury, *Assistant Professor*

Funding agency	Type	Title	Role	Grant Sanctioned (Rs.)	Period
UGC	Minor Research Project	Study of Variable Symmetric key based encryption technique having variable length data block size with its application in Steganography	Principal Investigator	82,000	2011 -2013

Highlights of the Ph.D. Programmes

(2012-13)

1. Professor (Dr.) Saikat Maitra, *Officer-in-Charge*

Details of guiding Ph.D. candidates:

(i) List of Ph.D. Students awarded PhD in 2012:

1) **Ph.D. Student:** Jagannath Roy

Qualification: M.Sc. (Chemistry)
Ph.D. Done in: Applied Chemistry, University of Calcutta
Title of Thesis: Role of some transition metal additives on the formation and characterization of chemical mullite"
Year of Ph.D.: 2012

(ii) *List of Ph.D. Students Guiding:*

1) **Ph.D. Student:** Ms. Mousumi Banerjee

Qualification: M.Tech (Electrical Engg.)
Ph.D. doing on: Material Science, Jadavpur University
Title of Thesis: Role of Some Transition Metal Dopants on the Dielectric Behaviour of Doped Barium StrontiumTitanate Ceramics
Status of Thesis: To be Submitted within 1-2 months

2) **Ph.D. Student:** Mr.Santanu Mukhopadhyay

Qualification: B. Tech (Ceramic Technology)
Ph.D doing on: Metallurgical Engg, Jadavpur
Title of Thesis: Studies on Expansive Behaviour of AMC Refractories in Relation to in-situ Spinel Formation
Status of Thesis: To be submitted within 3-4 months

3) **Ph.D. Student:** Mr.Debasis Chandra

Qualification: B. Tech (Ceramic Technology)
Ph.D. doing on: Metallurgical Engg, Jadavpur
Title of Thesis: Role of some additives on the formation of dense reaction sintered ZrO2-Al2O3-SiO2 compacts
Status of Thesis: To be submitted within 3-4 months

4) **Ph.D. Student:** Mr. Praveen K. Singh
Qualification: M. Tech (Ceramic Technology)
Ph.D. doing on: Material Science, Jadavpur University
Title of Thesis: Fabrication and characterization of sol-gel derived TiO2 thin film
Status of Thesis: To be submitted within 1 year

5) **Ph.D. Student:** Mr. Ram Chandra Das
Qualification: M. Tech (Ceramic Technology)
Ph.D. doing on: Material Science, Jadavpur University
Title of Thesis: Role of MgO/Al2O3 molar ratios and other parameters on the kinetics of spinelization
Status of Thesis: To be submitted within 2 year

6) **Ph.D. Student:** Mr.Uday Singh Yadav
Qualification: M. Tech (Electrical Engg.)
Ph.D. doing on: Ceramic Engineering, Calcutta University
Title of Thesis: Modeling of hysteresis non linearity of piezoelectric transducers
Status of Thesis: Experimental work has been started

7) **Ph.D. Student:** Mr.Jagram Singh Yadav
Qualification: M.Sc (Physics)
Ph.D. doing on: Ceramic Engineering
Title of Thesis: Studies on the Kinetics of Thermal Decomposition of Indian magnesites.
Status of Thesis: Already registered and Experimental works has been started

2. Dr. Mausumi Maitra (Mazumdar), *HOD-IT, Associate Professor*

Details of guiding Ph.D. candidates:

Ph.D. Student: Ms. Manali Mukherjee
Qualification: M.Tech. (IT)
Ph.D. doing on: Information Technology
Title of Thesis: Studies on some imaging algorithms and their implementations on FPGA
Status of Thesis: To be registered in Calcutta University

3. Dr. Sankar Ray, *Associate Professor*

Details of guiding Ph.D. candidates:

1) **Ph.D. Student:** Debasis Das
Qualification: M.Tech (Mechanical Engg.)
Ph.D. doing on: Mechanical Engg., Jadavpur University
Title of Thesis: Mathematical modelling of multi-component fuel droplet combustion
Status of Thesis: Progressing slowly as he is working outstation

2) **Ph.D. Student:** Tapas Chakraborty
Qualification: M.Tech (Mechanical Engg.)
Ph.D. doing on: Mechanical Engg., Jadavpur University
Title of Thesis: MRR & Surface finish improvement in Sinking EDM Process
Status of Thesis: Progressing reasonably

4. Dr. Saibal Ray, *Associate Professor*

Details of guiding Ph.D. candidates:

(i) List of Ph.D. Students awarded/ Ph.D. thesis submitted in 2012:

1) Ph.D. Student: Mr**.** Partha Pratim Ghosh
Qualification: M.Sc. (Physics)
Ph.D. doing on: Cosmology
Title of Thesis: An Investigation about Possible Variations of Physical Constants and Their Consequences
Status of Thesis: Registered under Calcutta University (Reg. No. 3577Ph.D. (Sc.) proceed/2007) and submitted thesis in October 2012.

(ii) *List of Ph.D. Students Guiding:*

1) Ph.D. Student: Mr**.** Dibyendu Shee
Qualification: M.Sc. (Physics)
Ph.D. doing on: Astrophysics
Title of Thesis: Black Holes and other Astrophysical systems
Status of Thesis: Registered under Bengal Engineering & Science University (Registration No. PhD/R/2012/0080)

2) Ph.D. Student: Mr**.** Amit Das
Qualification: M.Sc. (Physics)
Ph.D. doing on: Astrophysics
Title of Thesis: Worm Holes and other Astrophysical systems
Status of Thesis: Registered under Bengal Engineering & Science University (Registration No. PhD/R/2012/0081)

3) Ph.D. Student: Ms**.** Ruby Sarkar
Qualification: M.Sc. (Physics)
Ph.D. doing on: Cosmology
Title of Thesis: Cosmic Acceleration and Dark Energy
Status of Thesis: To be registered in Jadavpur University

4) Ph.D. Student: Mr**.** Saikat Bhowmick
Qualification: M.Sc. (Physics)
Ph.D. doing on: Astrophysics
Title of Thesis: Conformal Killing Vectors and its Applications to Compact Stars
Status of Thesis: To be registered in Jadavpur University

5) Ph.D. Student: Mr**.** Gourab Kumar Ghosh
Qualification: M.Sc. (Physics)
Ph.D. doing on: Astrophysics
Title of Thesis: Non-commutative algebra and its Applications to Galactic Halo
Status of Thesis: To be registered in Jadavpur University

6) Ph.D. Student: Ms**.** Sreya Karmakar
Qualification: M.Sc. (Physics)
Ph.D. doing on: Astrophysics
Title of Thesis: Worm Hole Physics under General Relativity
Status of Thesis: To be registered in Jadavpur University

7) Ph.D. Student: Ms**.** Ipshita Chakraborty
Qualification: M.Sc. (Physics)
Ph.D. doing on: Astrophysics and Cosmology
Title of Thesis: Flat Rotation Galactic Curves and Dark Matter
Status of Thesis: To be registered in West Bengal State University

5. Dr. Krishnendu Dutta, *Assistant Professor*

Details of guiding Ph.D. candidates:

Ph.D. Student: Nabin Chandra Biswas
Qualification: M.Sc. (Maths.)
Ph.D. doing on: Mathematics
Title of Thesis: Study of some problems of soft topological spaces
Status of Thesis: Registered under Bengal Engineering & Science University (Enrollment No. 522013E004)

Highlights of the Research Collaboration

(2012-13)

The Institute has collaborated with reputed institutions/universities at national as well as international level for Postgraduate, Project and Ph.D. programmes. The names of such institutes/universities are mentioned below:

1. Professor (Dr.) Saikat Maitra, *Officer-in-Charge*

(i) National

- Dept. of Metallurgical Engineering and School of Nano Science and Technology, Jadavpur University, Kolkata, West Bengal
- Dept. of Instrumentation Engineering, Jadavpur University, Kolkata, West Bengal
- Dept. of Chemical Engineering and Chemical Technology, Calcutta University, Kolkata, West Bengal
- Dept. of Chemical Engineering, Calcutta University, Kolkata, West Bengal
- Dept. of IT and CSE, WBUT, Kolkata, West Bengal
- Dept. of Chemistry, Presidency University, Kolkata, West Bengal
- Central Glass and Ceramic Research Institute, Kolkata, West Bengal
- Saha Institute of Nuclear Physics, Kolkata, West Bengal

(ii) International

- Universiti Teknologi Petronas, Malayisa
- Northern University, Saudi Arabia
- Curtin University, Austarlia

2. Dr. Mausumi Maitra (Mazumdar), *HOD-IT, Associate Professor*

(iii) National

- Dept. of IT, A. K. Choudhury School of Information Technology, Calcutta University
- Dept. of IT, West Bengal University of Technology

3. Ms. Somdatta Chakravortty, *Assistant Professor*

(iv) National

- School of Oceanographic Studies, Jadavpur University

4. Dr. Saibal Ray, *Associate Professor*

(v) National

- Dept. of Mathematics, Jadavpur University
- Dept. of Physics, Bengal Engineering & Science University
- Dept. of Mathematics, Aliah University
- Dept. of Physics, Aliah University
- Dept. of Physics, Aligarh Muslim University
- Dept. of Mathematics, Nagpur University

(vi) International

- Milwaukee School of Engineering, USA
- Simon Fraser University, Canada
- APC laboratory, France
- Gh. Asachi Technical University, Romania
- Nankai University, China
- Sterlitamak State Pedagogical Academy, Russia
- University of Aberdeen, UK

Status of the Government Grants Utilization

(2012-13)

Financial Details:

Table I

1	**Income from Central Government**	**Rs. 0**
2	**Income From State Government**	**Rs. 59142000**
3	**Income From Student Fees**	**Rs. 6969400**
4	**Income From Donations**	**Rs. 0**
5	**Income From UGC**	**Rs. 60000**
6	**Income From Other Bodies**	**Rs. 0**
7	**Income From Other/ Internal Revenue**	**Rs. 36800**

Table II

1	**Salary Teaching Staff**	**Rs. 21066178**
2	**Remuneration to Visiting/Guest**	**Rs. 0**
3	**Salary Non-teaching Staff**	**Rs. 5874832**
4	**Library**	**Rs. 2996678**
5	**Equipment**	**Rs. 0**
6	**Building Maintenance**	**Rs. 9594790**
7	**Other Expenditure**	**Rs. 3815761**

Highlights of the students placement

(2012-13)

1. Ceramic Technology:

Name	Placed at	**Salary**	GATE marks	Gate Score	Gate Rank	Cut off
DEBADITYA CHATTOPADHYAY	CUMI	2.5 L				
ANURAG CHAKRABORTY	HSIL	3.o+ Acco+Mobile	38			
TANVIR JAMAL	CUMI	2.5	38.64	382	145	29.26(OBC)
BURHANUDDIN	M.Tech-BHU		33			32.51(Gen)
TAPAS KUMAR PAL	NITCO/ Kaefer	3.5 L	20.67			21.67(SC)
SK SAHEB ALI	TRL	3.6L	28			
SOMNATH MANDAL*	Torrecid/High Tech	2.22+ Acco	33.67		273	
MAINUL AKHTAR	IIT-KGP		44	453	70	
KAMRUZZAMAN AHMED	Asahi	2.5 Lakh	25.33	225	588	
ARUP MAITY *	Vesuvius	4.5 Lakh	46.67		53	
SUSOBHAN MUKHERJEE	Torrecid	2.22+ Acco	20.33	166	893	
AZHARUDDIN MONDAL	Kholer	2.4				
ABDUS SALAM	TRL	3.6L	23	198	716	
MD SAJAHAN MANDAL	Special Refractories	2.5 +acco	28.67	231	451	
RANJAN ROY	Lizmontagen					
NILANJANA ROY	Nilachal Refractory/BEROA	1.8	21			
TAZUDDIN	Research Scholar-CGCRI		41.67	418	101	
RAFI AHMAD IQBAL	Lizmontagen	2.16+Acco	26.33	237	540	
ANANYA SAHA	TISCO					
RAJU DEBNATH	OCL	3				
RAJESH GHOSH	TRL	3.6L				
MONIRUPA NAYEK	Lizmontagen	2.16+Acco	18	169	1037	

MD MOINUDDIN SK	Hopewell Tableware	1.92 +Acco+Cook	15				
PULAK SARDAR *	Torrecid/M.Tech-BHU	2.22+ Acco	26				
RAJIB KALSAR	IIT-Kanpur		33.33	319	286(Sc)		
ATANU DAS	M.Tech-BHU		31.33				
SANTANU MONDAL	NITCO	3.25L	16.33				
SANDIP KHAN	Nilachal Refractory	2.0+Acco					
SK RASIDUL ISLAM	Special Refractories	2.5 +acco					
PRASENJIT SAMAI	Hopewell Tableware	3.5/1.92 +Acco+Cook					
MUNSHI SIDDIQUE	Kohler	2.4	25.67	229	577		
PALLABITA BASU	Torrecid	2.22+ Acco					
KAUSHIK SARKAR	M.Tech-BHU		33.67	323	273		
MD SHAMIM AHMED	BEC/Sarvesh Refractory		41		106		
SUBHRA MAJUMDER	Kholer						
NABARUN KONWAR	Sarvesh Refractories						
MILTON BISWAS	Hopewell Tableware	1.92 +Acco+Cook					
MD ABDUL JALIL	M.Tech ,IIT-Hydrabad, Monarc Int						
SOUMIK SEN	SPL	1.9 L					
AVISEKH BARUA	Torrecid	2.22+ Acco					
VAIBHAV S. PANDAV	Working in Gujrat						

*** Short Listed/Final Interview/Vesuvius/22nd Septeber 2012**

2. Information Technology:

NAME	Placed at	Status
CHINMOY CHANDA	CTS	
TUSHAR MISTRY		
ANUPAM DAS		
DIBASREE PAL	CMC	2.4
PAPIYA DAS		
BISWAJIT PAUL	SYNTEL	2.8
SOUMYA DAS		
UTTIYA BASU	CTS	
RUBAN DUTTA	CTS	
SUJAN MAJUMDAR	M.Tech -Software Engg,	
RANJAN KUMAR	CTS	
ASISH KUMAR CHOUDHURY	CTS	
BHOLANATH MAHATA		
AMIT CHAKRABORTY		
SOMNATH DEY	CTS	
ARITRA BOSE		
CHAYAN BALA	M.Tech -Software Engg,	
AMIT KUMAR DAS		
ARINDAM KUMAR MONDAL	Capgemini	2.9
MONIRUZZAMAN BARI	CTS	
SANTANU GHOSH	CTS	
MAUMITA BHATTACHARJEE		
PIJUS KUMAR PAL	SYNTEL	2.5
PRIYANKA TAMANG	Capgemini	
KAWSHAL CHHETRI	CTS	
RAJU GHOSH		
ARIJIT MODAK		
SAYAN DAS	CMC	2.5
UPASANA SINHA	CTS	
SOUMYAJIT DAS		
PRASANTA SUTRADHAR		
TANAY DAS		
TANUJA SAMANTA		
SURAJIT KAR		

3. Computer Science & Engineering:

NAME	Placed at	Status
BAPAN GHOSH	CTS	
KOUSHIK MANDAL	CTS/ M.Tec h CSE,JU	May not Join
NITISH BHATTACHARJEE	CTS	
SAMPA GHOSH		
SUBHASISH HALDER	CTS	
KAMALESH BAIN		
TWISA DANDAPAT	CTS	
SAMIRAN RAHAMAN		
BICHITRA RANJAN DAS	CTS	3.015 L
DIPTESH SADHU		
SUMAN NATH		
PRAKASH CHANDRA ROY	CTS	
SOUMYA JYOTI ROY		
SHIWANGI TEWARY	CTS	
TITHI BHAKTA		
JAYANTA KUMAR DAS		
SHYAM SUNDAR SAHA		
RITTICK CHOWDHURY	SYNTEL	
ANIRBAN CHOWDHURY		
PRIYANKA DAS	CTS	
KOUSHIK SINHA		
SAHELI DAS		
DEBABRATA ROY	Capgemini	
HARIKISAN RAJBANGSHI		
EKTA SHAH	CTS(Refused)	
SAMIT BHOUMICK	CTS	
SUBHENDU KAYAL		
KOUSHIK SARKAR	CTS	
TRISHA BANERJEE	CTS	
MAHENDRA MANDI		
SAMAD HUSSEN		
SUKHEN DASMANDAL	CTS/ M.Tec h CSE,JU	May not Join
PROSENJIT SARKAR	CTS	
KRISHNENDU SADHU	CTS	
PRASENJIT BARUA	CTS	
SAURAV MUKHERJEE	CTS	
DIPANKAR NAG	CTS/ ME -JU	May Not Join
SUDIP ROY CHOUDHURY		
ABHISHEK MONDAL		
JYOTSNA BASKEY		
RANADIP BARMAN		
INDRANEE SARDAR	CTS	
SAYED SADIKUL ISLAM		
TANMOY DAS	Capgemini	2.5/3.0
NAMITA TOPO		

Highlights of the Special Programmes & Announcements

(2012-13)

I: Special programmes

Two special programmes have been organized in the period 2012-2013 on behalf of National Service Scheme (NSS) Unit of college as follows:

1) 150th Birth Day celebration of Swami Vivekananda:

In the auspicious occasion, held on 18th January 2013, Swami Dhrubapadananda, Ramakrishna Mission-Yagodyan Math and Sri Chiranjay Chakraborty, writer came as guests and delivered lectures on the life, thinking and works of Swami Vivekananda.

There were two competitions on Swami Vivekananda arranged for the students in the said programmes :

(i) Poster & drawing competition on the sayings of Swami Vivekananda,
(ii) Poems & recitation competition on Swami Vivekananda

2) Science Day celebration:

This year the 28th February has been celebrated in the Platinum Jubilee Auditorium of the Indian Institute of Statistics, Barahnagar by the NSS Unit of college in collaboration with the Science Association of Bengal, Kolkata. The guests in the occasion were Dr. S. Raychowdhury (Secretary, the Science Association of Bengal), Prof. B.K. Roy (Director, ISI), Prof. A.R. Thakur (VC, TechnoIndia University), Dr. P.K. Ghosh (Registrar, Jadavpur University) and Prof. S. Maitra (Officer-in-Charge, Government College of Engineering & Ceramic Technology).

In the occasion on behalf of the college Mr. Ranjan Ray and Dr. Saibal Ray delivered special lectures on the Science Day. Also two students Arjak Bhattacharjee and Pritha Dasgupta presented their views on different aspects on the Science Day celebration.

II: Special announcements

There are two special announcements regarding the following achievements:

1) The college presently possesses an amount of land 1.5 acres and hence according to UGC norm the college was lacking lands of 1 acre. Very recently the State Government has offered an adjacent land of 1 acre. This will immediately solve the land problem of the college to have achieve total amount of land 2.5 acres. The official process of handing over the land is going on from the Small Scale Industry to the College Authority via the Higher Education Department of West Bengal.

2) The college has been upgraded as Autonomous Institution from August 2012 by the UGC, New Delhi. The autonomy for the time being is for Academic Autonomy only. However, gradually it will get other types of autonomy in near future for further developments of the college in all its aspects. Therefore, presently the college is taking their own examinations starting from 1st year B.Tech. and M.Tech.