

#### **Research Activities**

to 37921. In addition to that the library has about 32000 reprints. Thus the total collection of the library stands at around 309493.

The library has a good collection of electronic resources on different media and has access to several online journals/databases. During the year under report the library has added 40 CDs & floppies containing books and 22 CDs on statistical data. Thus, the total collection of CDs has risen to 815. The library has provided the online access to about 380 full-text journals. It has renewed the online databases like MathSciNet, ScienceDirect, Springer Link through consortia. It has also subscribed to the IEL Online of the IEEE/IEE publications, ACM Digital Library, Current Index to Statistics (CIS) on Web, DMJ 100 (Duke Mathematical Journal- 100 volumes on-line). The library has also subscribed to few statistical data sources available on CDs such as Census of India, National Sample Survey (NSS) data, Central Statistical Organization (CSO) data etc.

**Membership:** Membership of the ISI-Library is restricted to persons with post-graduate or equivalent academic qualification, interested in the objectives of the Institute. Faculty members, research scholars, students, research associates, visiting scientists, ISEC trainee, project-linked staff, project assistants, ISI-employees, outside students and the Institute members are eligible for the membership of the Institute Library. However, they have to apply for the membership of the library and receive a bar-coded Library Card. During this period, library membership was given to 780 persons and 970 readers were given special permission to use the library for a short period. Currently the total number of library member rose to 3468. Total number of members including staff, students and research scholars of the Institute rose to 874 in its workers' circulating library.

**Services:** The ISI-Library, since its inception has been providing a variety of library and information services to its users. The services presently being provided include:

**Web-OPAC -** Members use this facility to browse and search the database to see the status of a document including their own transactions.

**Circulation Service:** During this period 135362 books and other documents were issued to the user on loan and reference. Publications from Government of India and other International Organization and data CDs, were issued to users on reference. The library supported 3500 reprint requests for journal articles. It provided email-based reminder services like 7-day advance alert, long overdue notice and check-in information. 650 books from the workers' circulating library were issued for lending and reference in this period.

**Inter-library loan:** 7 books and journals were borrowed from other libraries and 78 books and journals were lent to other libraries.

**Current Awareness Service:** 12 monthly lists of current additions to the library were made available online.

**Self-Photocopying Service:** The library provides the Self-photocopying service in its journal section and it is available everyday throughout the library hours. During this period 39000 pages were photocopied from the journals.

**Electronic Document Delivery Service:** Full-text articles and/or bibliographical data were provided through email from online resources. Besides electronic document delivery, 2903 pages of printout and 1519 pages in CD from full-text articles were provided.

**Online Full-Text Access to Journals/ Databases:** During the period under review, the library has provided services from more than 380 online journals and major databases like MathSciNet, EconLit, ScienceDirect, Springer Link, IEL Online (IEEE/IEE Electronic Library), ACM Digital Library, CIS on Web. The online access is available through campus-wide network.

**Reprographic & Photographic Services:** During the year, it produced more than 4.16 lakhs photocopies of research and academic materials, 65,655 digital copy print, 3871 photographs (analogue and

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digital), 460 graphic designs, 4213 items of computer output (color and B&W), 2343 digital scan photos, documents and CD writing, 825 pieces of restoration and modification of images etc.

Documentation Service: A searchable bibliographic database has been prepared on scientific contributions made by the ISI scientists on all subject fields since 1934. Editing of the entries has been done.

#### General Enquiry Assistance & Consultation Service

##### Special Initiatives:

Consortia arrangements: During the year under report, the Library has initiated different consortia to enhance the electronic collection and to cope with the increasing subscription cost and diminishing budget.

Preservation and conservation: In this period total 2131 books, 1750 journals were bound. Lamination and de-acidification of 25 rare books and 5-bound volume of journals, fumigation of 578 books, and photocopying of 4 rare and out-of-print books were made during this time.

Electronic Article Surveillance (EAS) System: To enhance the security of the central library, an imported radio frequency (RF) based electronic article surveillance (EAS) system has been installed and about 30000 tags were pasted to the books of selected subject areas.

Digitization of ISI Ph.D. Theses: During this period, a few theses have been digitized on Compact Disks to be made available on the Web after the completion of the work.

3200 books on PCM collection have been processed.

An exhibition on the life and time of Albert Einstein was held in the Library to mark the 100<sup>th</sup> year of Einstein's Theory of Relativity.

#### Prasanta Chandra Mahalanobis Memorial Museum and Archives

The Museum and archives carried out regular maintenance programme for the large collection of original source materials in respect of life and works of Professor P C Mahalanobis and the growth of Indian Statistical Institute. For the renovation of the museum area in the ground floor, the display of 752 exhibits in 91 panels has been dismantled and stored safely. After completion of the renovation work all will be reinstated and set open for public viewing.

The renovation of the 1<sup>st</sup> floor has been completed and the floor space redecorated retaining the original style and set up and was open for visitors as extended display area. The renovation work of the western side of the building has been undertaken.

The museum was visited by the students from school, collage, university and by visiting scientists from different countries. The museum and its archives were used by several scholars.

Among the archival collections, 15 audio spools and 4 film rolls were converted into CD. 50 items of 6000 sheets of letters, files, reports etc. were treated for preservation. Five researchers have used the archival documents for research purpose.

A project for "Developing Archival Record Management System" has been initiated. More than 4000 archival items has been documented so far. All data sheets will be transferred to computerized format and archived with network link.

## Research Activities

### *Library, Delhi*

Indian Statistical Institute, Delhi Centre maintains an academic library, which aims to be a leading library in the fields of Mathematics, Statistics, Economics, Econometrics, Operations Research and Statistical Quality Control.

The Library caters, mainly to the needs of students, scholars and staff of the Institute. However, it is also open for reference to academic and research users of other educational and scientific institutions of the city, and its neighbouring regions. Some of the main activities of the Library during the period under review were as under :

**Collections:** The Library purchased 382 books, during this period both from the regular and NBHM funds. It has received 42 books as gift. Thus raising the stock to 43510 volumes. During the period under review subscription to 252 titles of journals, both foreign as well as Indian have been renewed. It has received few titles in exchange of 'Sankhya'. 21 journals, both Foreign as well as Indian are being received in the library as gift from various sources. Loose issues of periodicals have been collated to make sets for binding. Approximately 200 Technical Reports/Discussion Papers in Economics have been received in the library from various sources, in exchange of "Discussion Papers in Economics" of ISI Delhi.

The library has renewed the consortium for MathSciNet with the American Mathematical Society and Academic membership with SIAM. It gets online access to the Elsevier journals and Springer-Kluwer journals through the consortium programme among the three centers of ISI.

**Membership:** During this period, 111 members availed of the lending facilities as permanent members of the library and 685 members took temporary membership of the library.

#### **Services:**

**Circulation:** More than 3606 publications have been circulated among the members. The library also maintains contacts with other research libraries for Inter-library loan transactions. 13 publications were borrowed on ILL and 22 were lent out to other institutes under this program.

**Reprographic Services:** The library provides photocopy services to its users. More than 47607 pages have been photocopied and made available to the permanent and temporary members. In addition to this, 107 articles have been downloaded in PDF format, attached to e-mail and sent to different users on request.

**Current Awareness Service:** The library issued twelve issues of the "Current Contents" to inform the members about the contents of the latest journals. The print copy as well as the electronic copy of the quarterly issue of "Newsletter" containing the recently added books to the library, was circulated.

**Online Full-text Access to Journals:** The library has provided services from more than 200 online journals and databases. The service is available from campus-wide network.

### *Library, Bangalore*

The Bangalore centre library is one of the distinguished libraries in the fields of mathematics, economics, statistical quality control and library and information science. The library caters to the information needs of users including students, teachers, research scholars, visiting scientists, researchers from other institution and employees of the Institute.

The activities of the library during this period are:

#### Research Activities

**Collection:** 430 books were purchased and added to the library collection totalling it to 27141. It has received 62 books as complimentary. The total collection of complimentary books in the library is 1838. The library has subscribed to 278 journal titles in this period and received 54 journals as complimentary. The library has 12685 bound volumes of journals in its collection.

About 810 books were classified and catalogued during this period.

**Membership:** 760 registered users availed of the library facilities during this period.  
**Services:**

**Circulation:** Around 17801 books and periodicals, including loose issues were circulated and around 6590 in house use of books and periodicals were recorded.

**Inter Library Loan:** About 52 inter library loan transactions were registered.

**Reprographic service:** The library provided 164000 photocopies to the users during the period under report.

**Current Awareness Service:** The library has issued a bimonthly list of books, monthly list of current periodicals and Current Content of journals.

#### Center for Soft Computing Research: A National Facility

The Department of Science and Technology (DST), New Delhi has established this Center under its IRHPA (Intensification of Research in High Priority Areas) scheme at the Indian Statistical Institute, Kolkata. The Center, which is the first of its kind, started functioning in August 2005. The main objectives of the Center are:

conducting basic research in pattern recognition, image processing, computer vision, neural networks, genetic algorithms, wavelets, support vector machines, data mining, hybrid techniques, rough sets, video image processing, fractals, etc.;

demonstrating applications to some focused areas like web mining, bioinformatics, medical image analysis, and VLSI layout design;

developing manpower;

organizing seminars/workshops/schools;

providing a forum of exchanging ideas or establishing a linkage among scientists of leading institutions and industry working in similar areas by inviting interested faculty/research personnel;

providing fellowships for helping faculty and scholars from less endowed institutions, especially from neighboring regions.

During the year under review work has begun in the following areas of research:

**Bioinformatics, Data Mining and Machine Learning:** Microarray data analysis; Rule mining; Semi-supervised learning  
**CBIR and Watermarking:** Feature detection and CBIR; Hard copy watermarking

**Medical Image Processing:** Deformation correction in brain MR images; Detection of hematological defects in blood cells

**Neural Computation:** Spiking neural networks

**Web Intelligence and Mining:** Topic detection; Web page classification

Collaborative projects with some of the IITs, Universities and Institutions have been taken up under the auspices of the center. The center has also given several fellowships during the year under review.

## Research Activities

### Computer and Statistical Services Centre

CSSC maintains Internet, ISI local network, network servers, IP list and e-mail user list of Baranagar Campus. During the year under review networks at Mahalanobis Archive, New Director's Office and Biological Anthropology Unit were renovated under CSSC's supervision.

The Centre provides computing facilities to faculty and students through servers – Sun Enterprise 3000 and Dec Alpha. A number of compilers and statistical packages like ArcGIS, BMDP, MATH, Mathematica, SAS, SHAZAM, TSP etc. are available for this purpose. A local network at CSSC Laboratory has been set up during this year for research and training on relational database management and the latest version of Oracle software has been acquired for this purpose.

CSSC provides theoretical and practical consultancy to scientists from within ISI or from other Institutions for carrying out research and analysis. Six scientists were similarly assisted during the current year. CSSC purchases, distributes and replaces Personnel Computers for CSSC Laboratory, for Faculty Personnel of ISI, Baranagar and for others on permission/request from Director. 114 PCs were acquired during the year.

In addition to regular replacements, additional PCs were provided for ISEC Laboratory and ISEC Hostels.

### 3. PROJECTS

#### Internally Funded Projects

##### Ongoing Projects

| Sl. no.   | Name of the project  | Principal Investigator(s)                     | Unit(s) involved |
|---|--|---|------------------|
| <b>Applied Statistics Division</b>                  |  |   |                  |
| 1.  | Robust Statistical Procedures and Inference for Directional Data   | A. Sengupta                                   | ASU, Kolkata     |
| <b>Computer and Communication Sciences Division</b> |  |   |                  |
| 2.  | Facility Location Problem  | S. C. Nandy                                   | ACMU, Kolkata    |
| 3.  | Checkpointing in Distributed Systems   | K. Mukhopadhyay                               | ACMU, Kolkata    |
| 4.  | Wireless Networks and Mobile Computing   | B. P. Sinha,<br>J. Duttagupta and<br>N. Das   | ACMU, Kolkata    |
| 5.  | Low-power Testing of VLSI Circuits   | B. B. Bhattacharya                            | ACMU, Kolkata    |
| 6.  | Parallel Algorithms Related to Fragment Assembly in DNA Sequencing   | S. Sur-Koley                                  | ACMU, Kolkata    |
| 7.  | Terrain Analysis   | S. Das  | ACMU, Kolkata    |
| 8.  | Document Analysis  | U. Pal  | CVPRU, Kolkata   |
| 9.  | Handwritten Character Recognition  | U. Bhattacharya                               | CVPRU, Kolkata   |
| 10.   | Natural Language Processing  | B. B. Chaudhuri                               | CVPRU, Kolkata   |
| 11.   | Speech Analysis and Synthesis  | B. B. Chaudhuri                               | CVPRU, Kolkata   |
| 12.   | Digital Data Compression and Security  | U. Garain                                     | CVPRU, Kolkata   |
| 13.   | Information Retrieval  | M. Mitra                                      | CVPRU, Kolkata   |
| 14.   | Image Compression Using BTC-VQ   | B. Chanda                                     | ECSU, Kolkata    |
| 15.   | Granular Computing for Knowledge Discovery in Bioinformatics   | S. Mitra                                      | MIU, Kolkata     |
| 16.   | Computational Analysis of Biochemical Pathways Related to Gene-activity                                      | R. K. De                                      | MIU, Kolkata     |
| 17.   | Soft Computing Approach to Protein Folding   | A. Ghosh                                      | MIU, Kolkata     |
| 18.   | Discovering Patterns from Large, Complex Data with Applications to Bioinformatics                            | S. Bandyopadhyay                              | MIU, Kolkata     |
| 19.   | Support Vector Machines and Web Page Ranking for Data Mining   | C. A. Murthy                                  | MIU, Kolkata     |
| 20.   | Integration of Spline and Neural Network Methodologies for Multiresolution Classification                    | S. N. Biswas                                  | MIU, Kolkata     |
| <b>Physics and Earth Sciences Division</b>          |  |   |                  |
| 21.   | Evolution of the Nallamalai Fold Belt-fault Reactivation and Kinematics in an Intracratonic Fold Belt        | D. Saha                                       | GSU, Kolkata     |
| 22.   | Precambrian Geodynamics in the East Indian Shield: Structural, Petrological and Geochronological Constraints | S. Bhattacharya                               | GSU, Kolkata     |
| 23.   | Mesozoic Tetrapod Faunas from the Satpura Basin and Pranhit - Godavari Basin                                 | D. P. Sengupta and<br>S. Bandyopadhyay        | GSU, Kolkata     |
| 24.   | Sedimentology and Palaeoclimatology of the Upper Gondwana Succession in the Satpura Basin                    | S. N. Sarkar,<br>P. Ghosh and<br>P. K. Maulik | GSU, Kolkata     |

Projects

|   |   |  |  |
|---|---|--|--|
| 26.   | Physicochemical Studies of Self-organized Systems Using Surfactant(s)/Co-surfactant(s)/ Oil(s)/Polar Solvents (Aqueous and Non aqueous) | B. K. Paul   | GSU, Kolkata                           |
| 26.   | Waves on Thin Flowing Film  | B. S. Dandapat   | PAMU, Kolkata                          |
| 27.   | Sediment Transportation and Deposition under Combined Wave and Unidirectional Currents: Experimental and Theoretical Studies            | B. S. Mazumder   | PAMU, Kolkata                          |
| <b>Biological Sciences Division</b>                                 |   |  |  |
| 28.   | Studies on Productivity, Stability and Sustainability of Rain-fed Agricultural Systems in the Eastern Plateau Area                      | P. Banik   | AERU, Kolkata                          |
| 28.   | Study of the Microbial Succession and Changing Microbial Molecular Diversity of a Bio-organic Composting System                         | S. Chanda  | AERU, Kolkata                          |
| 30.   | Ponds, Aquatic Weeds and Water Quality: An Investigative Study  | A. Dewanji   | AERU, Kolkata                          |
| 31.   | Adaptability and Yield Performance of Sugar Beet (Beta vulgaris L.) Varieties in Lower Gangetic Plains of West Bengal                   | S. Banik   | AERU, Kolkata                          |
| 32.   | Ecology and Physiological Studies on the Mangroves of Sundarbans  | M. Ghose   | AERU, Kolkata                          |
| 33.   | Mathematical Models on Ecology and Epidemiology   | J. Chattopadhyay   | AERU, Kolkata                          |
| 34.   | Health and Disease Among Populations Inhabiting Contrasting Ecological Niches   | S. Mukhopadhyay,<br>R. Gupta,<br>P. Bharati,<br>B. Mukhopadhyay<br>and S. K. Roy | BAU, Kolkata                           |
| 35.   | HLA Genes and Recurrent Spontaneous Abortions   | B. M. Reddy  | BAU, Kolkata                           |
| 36.   | Status of Austro-Asiatic Tribes in the Peopling of India  | B. M. Reddy  | BAU, Kolkata                           |
| 37.   | DNA Polymorphisms in the Castes and Tribes of Andhra Pradesh, India   | B. M. Reddy  | BAU, Kolkata                           |
| 38.   | Studies on Genetic Epidemiology and Diversity in Indian Populations   | P. P. Majumder   | HGU, Kolkata                           |
| 39.   | Studies on Genomic Diversity and Affinities in Ethnic Populations of Northeast India  | P. P. Majumder   | HGU, Kolkata                           |
| <b>Social Sciences Division</b>                                     |   |  |  |
| 40.   | Benefits of Market Access (PPRU)  | A. Mukhopadhyay  | Planning Unit, Delhi                   |
| 41.   | Micro Finance in India (PPRU)   | P. Roy Chowdhury   | Planning Unit, Delhi                   |
| <b>Statistical Quality Control and Operations Research Division</b> |   |  |  |
| 42.   | Service Quality Evaluation of Health Care Industries- A Survey  | U. H. Acharya and Sanjit Ray   | SQC&OR, Bangalore                      |
| 43.   | Statistical modeling and analysis for the study of product warranty   | D. K. Manna and S. Pal   | SQC&OR, Chennai                        |
| <b>Library, Documentation and Information Sciences Division</b>     |   |  |  |
| 44.   | Developing Archival Record Management System  | K. Bhattacharya  | Library-PCM Museum & Archives, Kolkata |

| <b>Center for Soft Computing Research: A National Facility</b> |  |                             |                                       |
|--|--|-----------------------------|---------------------------------------|
| 1.   | Soft-computing for Computational Media Aesthetics: Analysis Content for Meaning                  | S. Chaudhury*               | Dept. Elec. Engg., IIT, Delhi         |
| 2.   | An Object Oriented Fuzzy Data Model for Storage and Content Based Retrieval from Video Databases | A. K. Majumdar and S. Sural | Dept. Comp. Sc., IIT, Kharagpur       |
| 3.   | Automatic Feature Detection and Pose Recovery for Faces  | D. Majumdar and S. Mitra    | Electronic Res. & Dev. Corp., Kolkata |
| 4.   | Object Detection and Object Recognition Using Deformable and Evolving Models                     | P. K. Nanda and P. Kanungo  | Dept. Elec. Engg., REC, Rourkela      |
| 5.   | Image Processing, Analysis and Classification of Rocks in the Mizoram Hills                      | K. S. Rao and R. P. Tiwari  | Pachhunga Univ. College, Aizawl       |

\* Names printed in this font indicate personnel from outside the Institute.

#### Completed Projects

| Sl. No.   | Name of the project  | Principal Investigator(s)                      | Unit(s) involved           |
|---|--|--|----------------------------|
| <b>Computer and Communication Sciences Division</b>                 |  |  |                            |
| 1.  | Tracking Temporally Deformable Objects Using Level Set Analysis  | D. P. Mukherjee                                | ECSU, Kolkata              |
| 2.  | Digital Watermarking and Image/Video Compression Using Wavelets and Fractals   | M. K. Kundu                                    | MIU, Kolkata               |
| <b>Physics and Earth Sciences Division</b>                          |  |  |                            |
| 3.  | Integral Equations and Applications  | B. N. Mandal                                   | PAMU, Kolkata              |
| 4.  | Interaction of Flow and Sediment Suspension over Bedform Structures: Experimental and Theoretical Studies              | B. S. Mazumder, J. K. Ghosh and C. Chakraborty | PAMU, SMU and GSU, Kolkata |
| <b>Biological Sciences Division</b>                                 |  |  |                            |
| 5.  | Genetic and Epigenetic Changes Associated with Epithelial Cell Transformation and Invasion                             | B. Roy and S. Sengupta                         | HGU, Kolkata               |
| <b>Social Sciences Division</b>                                     |  |  |                            |
| 6.  | Political Economy of Well-being of West Bengal   | A. Sarkar                                      | ERU, Kolkata               |
| 7.  | Language Identification, Classification and Analysis In Children with Neuro-linguistic, Speech and Hearing Disorders   | M. Indu and A. Choudhry                        | LRU, Kolkata               |
| 8.  | Regional Economic Growth In India  | C. Ghate                                       | Planning Unit, Delhi       |
| 9.  | Determinants of Child Labour (PPRU)  | S. Das   | Planning Unit, Delhi       |
| 10.   | Forms of Market and Non-Market Discrimination: The Case of Rural Dalit Households                                      | V.K.Ramechandran and M. Swaminathan            | SRU, Kolkata               |
| 11.   | Constraints of Development of Scheduled Castes and Other Backward Castes/Communities In Rural Areas                    | T. Ghosh                                       | SRU, Kolkata               |
| 12.   | Role of Social Connections In Coping with the Changing Situation: An Exploratory Study on the Villagers of West Bengal | A. K. Chatterjee                               | SRU, Kolkata               |
| <b>Statistical Quality Control and Operations Research Division</b> |  |  |                            |
| 13.   | Annual Six Sigma Conference and Case Study Presentation  | A. K. Chaudhuri                                | SQC&OR, Bangalore          |



## Projects

## Externally Funded Projects

## Ongoing Projects

| Sl. no.  | Name of the project  | Principal Investigator(s)                             | Unit(s) Involved   | Funded by   |
|--|--|---|--|---|
| <b>Theoretical Statistics and Mathematics Division</b> |  |   |  |   |
| 1.   | Homogeneous Operators  | G. Misra  | SMU, Bangalore   | DST, Govt. of India                                   |
| 2.   | Extremal Structures In Banach Spaces   | V. Indurmathi,<br>B. L. Lin and<br>T. S. S. R. K. Rao | Pondicherry<br>University, India,<br>University of<br>Iowa, USA, and<br>SMU, Bangalore | DST, Govt. of India,<br>and NSF, USA                  |
| 3.   | Swamajayanti Fellowship Project  | B. V. Rajarama Bhat                                   | SMU, Bangalore   | DST, Govt. of India                                   |
| 4.   | Random Geometric Graphs  | R. Roy  | SMU, Delhi   | DST, Govt. of India                                   |
| 5.   | Quantum Markov Processes, Quantum Codes, Dilations and Hilbert Modules   | K. B. Sinha   | SMU, Delhi   | DST, Govt. of India and DAAD, Govt. of Germany        |
| 6.   | Improved Genome Annotation Through a Combination of Machine Learning and Experimental Methods: Plasmodium falciparum as a Case Study | R. L. Karandikar<br>And P. Chaudhuri                  | SMU, Delhi and<br>Kolkata  | CSIR, Govt. of India                                  |
| 7.   | Development of Grading System for CBSE (Income generating project)   | R. L. Karandikar                                      | SMU, Delhi   | CBSE  |
| 8.   | Development of Bioinformatics Tools and Methods  | P. Chaudhuri  | SMU, Kolkata   | DBT, Govt. of India                                   |
| <b>Applied Statistics Division</b>                     |  |   |  |   |
| 9.   | Development of Design Aid/Tool for Primitive Polynomial Over $GF(2^2)$   | B. Roy  | ASU, Kolkata   | CAIR, DRDO, Govt. of India                            |
| 10.  | Development of an Indigenous Block Cipher Schemes for ISRO   | P. Sarkar   | ASU, Kolkata   | Department of Space, Govt. of India                   |
| 11.  | Development of Indigenous Algorithm  | B. Roy  | ASU, Kolkata   | Sulech Security Product Services Pvt. Ltd., Bangalore |
| 12.  | R & D Cryptographic Protocols  | B. Roy  | ASU, Kolkata   | MIT, Govt. of India                                   |
| 13.  | Universal One-way Hash Family (UOWHF)  | B. Roy  | ASU, Kolkata   | WESEE, Ministry of Defence, Govt. of India            |
| 14.  | Reliability Assessment of a Solid Rocket Motor   | D. Sengupta   | ASU, Kolkata   | ISRO, Govt. of India                                  |
| 15.  | Statistical Classifiers for Encryption Algorithms  | A. Basu   | ASU, Kolkata   | DRDO, Govt. of India                                  |

## Projects

|   |  |  |                       |  |
|---|--|--|-----------------------|--|
| 16.   | Development of Algorithms for Robust Speaker Recognition by Statistical Methodology                  | A. Pal   | ASU, Kolkata          | DIT, Govt. of India  |
| 17.   | Software Development for Tiger Pug-mark Analysis   | D. Sengupta                                      | ASU, Kolkata          | Govt. of West Bengal   |
| 18.   | Visual Cryptographic Schemes   | B. Roy   | ASU, Kolkata          | ISRO, Govt. of India   |
| 19.   | Sample Survey of Elephant Population in Elephant Reserves of W.B.                                    | D. Sengupta                                      | ASU, Kolkata          | Govt. of West Bengal   |
| 20.   | Exploratory Paradigms in Visual Cryptography   | B. Roy   | ASU, Kolkata          | WESEE, Ministry of Defence, Govt. of India   |
| 21.   | Robust Implementation of a Variant of the Rijndael (AES)   | P. Sarkar  | ASU, Kolkata          | WESEE, Ministry of Defence, Govt. of India   |
| <b>Computer and Communication Sciences Division</b> |  |  |                       |  |
| 22.   | New Techniques of Fast Image Compression Based on Human Vision Systems and Geometric Data Structures | B. B. Bhattacharya, M. K. Kundu and C. A. Murthy | ACMU and MIU, Kolkata | Intel Corporation, USA   |
| 23.   | Delay Fault Modeling and Test Generation for Power Supply Noise                                      | S. Sur-Kolay and B. B. Bhattacharya              | ACMU, Kolkata         | Intel Corporation, USA   |
| 24.   | Computational Intelligence Based Remote Wading System  | N. R. Pal  | ECSU, Kolkata         | Board of Research in Nuclear Sciences (BRNS), Govt. of India   |
| 25.   | Knowledge-based Connectionist Data Mining System: Design and Applications                            | S. Mitra   | MIU, Kolkata          | CSIR, Govt. of India   |
| 26.   | Advanced Techniques for Remote Sensing Image Processing  | A. Ghosh   | MIU, Kolkata          | DST, Govt. of India, and Ministry of Foreign Affairs and Autonomous Province of Trento, Govt. of Italy |
| 27.   | Soft Computing for Medical Image Segmentation and Classification                                     | S. Bandyopadhyay                                 | MIU, Kolkata          | INSA, Govt. of India   |
| <b>Physics and Earth Sciences Division</b>          |  |  |                       |  |
| 28.   | Mafic Crustal Xenoliths in the Eastern Ghats Belt: A Window to Mantle Processes                      | S. Bhattacharya                                  | GSU, Kolkata          | DST, Govt. of India  |

Projects

|                                     |  |                 |  |  |
|-------------------------------------|--|-----------------|--|--|
| 29.                                 | Stratigraphic Analysis of the Proterozoic Sequences in the Pranhita-Godavari Valley, South India: Bearing on Proterozoic Evolutionary History of the South Indian Craton | A. K. Chaudhuri | GSU, Kolkata   | CSIR, Govt. of India                                       |
| 30.                                 | Water Wave Diffraction by Floating and Submerged Bodies  | B. N. Mandal    | PAMU, Kolkata  | CSIR, Govt. of India                                       |
| <b>Biological Sciences Division</b> |  |                 |  |  |
| 31.                                 | Studies on Environmental and Ecological Aspects of Mangrove Biology  | M. Ghose        | AERU, Kolkata  | University of Western Sydney, Australia                    |
| 32.                                 | Rice Based Cropping System and Micro Level Studies on Sustainability   | P. Banik        | AERU, Kolkata  | International Rice Research Institute                      |
| 33.                                 | Farm Household Survey (Purulia District) for Study of Agricultural Development and Poverty in Remote Rural Villages in Eastern India                                     | P. Banik        | AERU, Kolkata  | East-West Center, USA                                      |
| 34.                                 | Forest and Tree Resources for the Poor Urban Households in Developing Countries  | B. Mukhopadhyay | BAU, Kolkata   | DFID   |
| 35.                                 | People's Use of Forest Resources vis-à-vis Impact of Forest Depletion on Livelihood Issues of Local People in the Sikkim Himalaya  | B. Mukhopadhyay | BAU, Kolkata   | Ministry of Environment and Forests (MOEF), Govt. of India |
| 36.                                 | Genomic Diversity in the Tribal Populations of AP in the Broader Context of the Peopling of India  | B. M. Reddy     | BAU, Kolkata and CCMB, Hyderabad   | CSIR, Govt. of India                                       |
| 37.                                 | Physical Growth, Body Composition, and Nutritional Status of the Bengali School Aged Children, Adolescents and Young Adults of Calcutta, India                           | P. Dasgupta     | BAU, Kolkata   | Neyts-van Hoogstraten Foundation (NHF), The Netherlands    |
| 38.                                 | Single Nucleotide Polymorphisms: Validation and Identification in Ethnic Populations of India  | P. P. Majumder  | HGU, Kolkata   | DBT, Govt. of India  |
| 39.                                 | Molecular Genetic Studies on Type-2 Diabetes and Diabetic Retinopathy  | P. P. Majumder  | HGU, Kolkata in collaboration with Madras Diabetes Research Foundation and Indian Institute of Science | DBT, Govt. of India  |

|   |   |  |  |   |
|---|---|--|--|---|
| 40.   | DNA Sequence Variation in Human Populations of India: Assessing the Roles of Evolutionary History and Gene Function, with Special Reference to Complex Diseases | P. P. Majumder   | HGU, Kolkata   | DBT, Govt. of India                                 |
| 41.   | Statistical Methods for Mapping Multivariate Phenotypes   | S. Ghosh   | HGU, Kolkata in collaboration with Washington University School of Medicine, St. Louis, USA) | Fogarty International Centre, NIH                   |
| <b>Social Sciences Division</b>                                     |   |  |  |   |
| 42.   | Valuation of Ecological Services of Wetlands in India   | K. Mazumdar  | ERU, Kolkata   | Ministry of Environment and Forests, Govt. of India |
| 43.   | The Long Term Economic Impact of HIV/AIDS Epidemic in India   | S. Das, A. Mukhopadhyay and T. Ray   | Planning Unit, Delhi   | World Bank  |
| <b>Statistical Quality Control and Operations Research Division</b> |   |  |  |   |
| 44.   | Six Sigma training and Implementation   | A. K. Chaudhuri  | SQC&OR, Bangalore  | ACN-ORG MARG, Baroda                                |
| 45.   | Six Sigma Implementation  | A. K. Chaudhuri and P.K.Perumallu  | SQC&OR, Bangalore  | AFL, Hoshiarpur                                     |
| 46.   | Training & Implementation of TS 16949- 2002 & Six Sigma   | A. K. Chaudhuri U. H. Acharya and T. S. Rao  | SQC&OR, Bangalore  | AT & S, Nanjangud                                   |
| 47.   | Six Sigma Training and Implementation   | A. K. Chaudhuri P. K.Perumallu A. R. Chowdhury Somnath Ray Sanjit Ray E. V. Gijo and A. Sarkar | SQC&OR, Bangalore and Mumbai   | BHEL – Bhopal                                       |
| 48.   | Process development   | I. Islam and Somnath Ray   | SQC&OR, Bangalore  | BHEL – EPD, Bangalore                               |
| 49.   | Six Sigma Implementation  | U. H. Acharya  | SQC&OR, Bangalore  | CIPL, Nagpur  |
| 50.   | Six Sigma training and Implementation   | A. K. Chaudhuri U. H. Acharya and E. V. Gijo   | SQC&OR, Bangalore  | ELGI Equipments Ltd., Coimbatore                    |
| 51.   | Six Sigma Training and Implementation   | A. K. Chaudhuri A. R. Chowdhury T. S. Rao and Somnath Ray                                      | SQC&OR, Bangalore  | Ashok Leyland, Hosur                                |

Projects

|     |                                       |   |                                    |   |
|-----|---------------------------------------|---|------------------------------------|---|
| 52. | Six Sigma Training and Implementation | A.K.Chaudhuri<br>P. K. Perumallu<br>K. K. Chowdhury<br>A. R. Chowdhury<br>Somnath Ray<br>Sanjit Ray<br>A. Sarkar and<br>E. V. Gijo                | SQC&OR,<br>Bangalore and<br>Mumbai | Iran Khode<br>Company, Iran                   |
| 53. | Six Sigma Implementation              | Somnath Ray   | SQC&OR,<br>Bangalore               | IPL, Lucknow                                  |
| 54. | Six Sigma Implementation              | A. K. Chaudhuri   | SQC&OR,<br>Bangalore               | Ashok Leyland,<br>AEG                         |
| 55. | Six Sigma Implementation              | A. K. Chaudhuri<br>and Sanjit Ray   | SQC&OR,<br>Bangalore               | Ashok Leyland,<br>Marketing                   |
| 56. | Six Sigma Training and Implementation | A. K. Chaudhuri<br>and A. Sarkar  | SQC&OR,<br>Bangalore and<br>Mumbai | Ashok Leyland, PD,<br>Ennore                  |
| 57. | Six Sigma Training and Implementation | A. K. Chaudhuri<br>K. K. Chowdhury<br>P. K. Perumallu<br>A. R. Chowdhury<br>Somnath Ray<br>Sanjit Ray<br>E. V. Gijo<br>A. Sarkar<br>and T. S. Rao | SQC&OR,<br>Bangalore and<br>Mumbai | Ashok Leyland,<br>Chennai                     |
| 58. | Six Sigma Implementation              | A. K. Chaudhuri<br>and E. V. Gijo   | SQC&OR,<br>Bangalore               | Ashok Leyland,<br>Finance                     |
| 59. | Six Sigma Implementation              | A. K. Chaudhuri<br>K. K. Chowdhury<br>and P. K. Perumallu   | SQC&OR,<br>Bangalore               | Ashok Leyland,<br>PD-VVC                      |
| 60. | Six Sigma Implementation              | A. K. Chaudhuri and<br>T. S. Rao  | SQC&OR,<br>Bangalore               | Ashok Leyland,<br>COE-Ennore                  |
| 61. | Six Sigma Training and Implementation | A. K. Chaudhuri and<br>A. R. Chowdhury  | SQC&OR,<br>Bangalore               | L&T, Mysore                                   |
| 62. | Six Sigma Training and Implementation | U. H. Acharya<br>and T. S. Rao  | SQC&OR,<br>Bangalore               | L G Balakrishnan &<br>Brothers,<br>Coimbatore |
| 63. | Six Sigma Training & Implementation   | A. K. Chaudhuri<br>A. R. Chowdhury<br>and E. V. Gijo  | SQC&OR,<br>Bangalore               | Macmillan,<br>Bangalore                       |
| 64. | Six Sigma Training & Implementation   | A. K. Chaudhuri<br>A. R. Chowdhury<br>U. H. Acharya<br>E. V. Gijo<br>and T. S. Rao  | SQC&OR,<br>Bangalore               | MICO- Bangalore<br>(Aduvodi)                  |
| 65. | Six Sigma Implementation              | A. K. Chaudhuri<br>A. R. Chowdhury<br>and T. S. Rao   | SQC&OR,<br>Bangalore               | MICO -<br>Nagathapalli                        |
| 66. | Six Sigma Training & Implementation   | E. V. Gijo  | SQC&OR,<br>Bangalore               | MICO - Nasik                                  |
| 67. | Six Sigma Training & Implementation   | T. S. Rao   | SQC&OR,<br>Bangalore               | MICO - Jaipur                                 |

## Projects

|     |  |  |                                    |   |
|-----|--|--|------------------------------------|---|
| 68. | Six Sigma Implementation                         | A. K. Chaudhuri<br>And Sanjit Ray                            | SOC&OR,<br>Bangalore               | OPL, Orissa                                     |
| 69. | Six Sigma Training & Implementation              | A. K. Chaudhuri<br>and<br>A. R. Chowdhury                    | SOC&OR,<br>Bangalore               | RSL, Allahabad                                  |
| 70. | Six Sigma Training & Implementation              | A. K. Chaudhuri  | SOC&OR,<br>Bangalore               | Saint Gobain<br>Coated Abrasives,<br>Bangalore  |
| 71. | Six Sigma Training & Implementation              | A. K. Chaudhuri<br>U. H. Acharya<br>And T. S. Rao            | SOC&OR,<br>Bangalore               | Supplying<br>Automotive Parts<br>Co., Iran      |
| 72. | Six Sigma Training & Implementation              | A. K. Chaudhuri<br>And A. Sarkar                             | SOC&OR,<br>Bangalore and<br>Mumbai | SIPL, Silvasa                                   |
| 73. | Six Sigma Training & Implementation              | A. K. Chaudhuri<br>And Sanjit Ray                            | SOC&OR,<br>Bangalore               | Trienvi<br>Engineering,<br>Bangalore            |
| 74. | Quality Improvement                              | Sanjit Ray   | SOC&OR,<br>Bangalore               | Vikrami Tyres,<br>Mysore                        |
| 75. | Quality Improvement                              | B. John  | SOC&OR,<br>Bangalore               | Progeon,<br>Bangalore                           |
| 76. | Quality Improvement                              | B. John  | SOC&OR,<br>Bangalore               | WIPRO, Bangalore                                |
| 77. | Quality Improvement                              | B. John  | SOC&OR,<br>Bangalore               | ITC, Bangalore                                  |
| 78. | Software Development                             | B. John  | SOC&OR,<br>Bangalore               | SYSTAT,<br>Bangalore                            |
| 79. | ISO 9001/ QS/ TS 16949-2002 Audit                | A. K. Chaudhuri<br>K. K. Chowdhury<br>and<br>P. K. Perumallu | SOC&OR,<br>Bangalore               | NVT-QC,<br>Bangalore                            |
| 80. | QS 9000/ TS 16949-2002 Audit                     | P. K. Perumallu  | SOC&OR,<br>Bangalore               | AQA, Bangalore                                  |
| 81. | Process Optimization                             | A. K. Biswas   | SOC&OR,<br>Chennai                 | Rane Engine<br>Valves Ltd.                      |
| 82. | Implementation of Statistical Methods            | D. S. Ramen  | SOC&OR,<br>Chennai                 | Henkel SPIC India<br>Limited                    |
| 83. | Six Sigma Green Belt Training and Implementation | A. K. Biswas and<br>D. S. Ramen                              | SOC&OR,<br>Chennai                 | Rambal India<br>Limited                         |
| 84. | Six Sigma Implementation                         | G. Murali Rao  | SOC&OR,<br>Hyderabad               | Premier Explosives<br>Limited, Hyderabad        |
| 85. | Operational Risk Modeling & Minimization         | G. Murali Rao  | SOC&OR,<br>Hyderabad               | HSBC, Mumbai                                    |
| 86. | Quality Improvement Projects Phase I & II        | A. L. N. Murthy<br>and G. S. R. Murthy                       | SOC&OR,<br>Hyderabad               | ITC Ltd., PSPD,<br>Bhadrachalam                 |
| 87. | Six Sigma Implementation                         | A. L. N. Murthy  | SOC&OR,<br>Hyderabad               | Reliance Infocomm<br>Ltd., Mumbai               |
| 88. | ISO 9000 & SPC Implementation                    | S. M. Subhani  | SOC&OR,<br>Hyderabad               | Suryalatha<br>Spinning Mills Ltd.,<br>Hyderabad |
| 89. | Statistical Analysis of Clinical Trials          | G. S. R. Murthy  | SOC&OR,<br>Hyderabad               | Bharat Biotech<br>Limited, Hyderabad            |

Projects

|      |   |   |                                   |   |
|------|---|---|-----------------------------------|---|
| 90.  | ISO 90001:2000 Implementation   | S. M. Subhani                             | SQC&OR, Hyderabad                 | Mikrofil Filters Ltd.                   |
| 91.  | Quality & Productivity Improvement Projects                                   | A. L. N. Murthy and G. S. R. Murthy       | SQC&OR, Hyderabad                 | DART Manufacturing India Limited        |
| 92.  | ISO 90001:2000 Implementation   | S. M. Subhani                             | SQC&OR, Hyderabad                 | A P Foods                               |
| 93.  | Training and Implementation of Statistical Process Control                    | A. K. Chakraborty                         | SQC&OR, Kolkata                   | Hindustan Motors Ltd.                   |
| 94.  | Training and Implementation of Statistical Process Control                    | A. K. Chakraborty                         | SQC&OR, Kolkata                   | Ordnance Factory, Dum Dum               |
| 95.  | Implementation of ISO 9001:2000   | A. Majumdar                               | SQC&OR, Kolkata                   | Dum Dum Valves Ltd.                     |
| 96.  | Development of Warehouse Management System                                    | P. Das and S. Gouri                       | SQC&OR, Kolkata                   | Khadim Chain Stores Pvt. Limited        |
| 97.  | Development of a Model Approach for ASR Improvement                           | S. Adhikari and K. Mukharjee              | SQC&OR, Kolkata and ACMU, Kolkata | Videsh sanchar Nigam Ltd.               |
| 98.  | Implementation of ISO 14001:2004  | S. Sengupta and A. Gupta                  | SQC&OR, Kolkata                   | East India Pharmaceutical Works Limited |
| 99.  | Development of an Index for FMCG Product                                      | A. Majumdar, R. Sett, N. Das and A. Gupta | SQC&OR, Kolkata                   | AC Nielsen ORG-Marg Pvt. Limited        |
| 100. | Development of a Model for Distribution Prediction for Newly Launched Product | A. Majumdar, R. Sett, N. Das and A. Gupta | SQC&OR, Kolkata                   | AC Nielsen ORG-Marg Pvt. Limited        |
| 101. | Management of Finished Stock  | R. Sett                                   | SQC&OR, Kolkata                   | DIC India Limited, Kolkata              |
| 102. | Six Sigma   | S. Rath                                   | SQC&OR, Pune                      | Reliance Industries Limited, Hazira     |

Under India-Trento Programme for Advanced Research (ITPAR)

Completed Projects

| Sl. no   | Name of the project   | Principal Investigator(s) | Unit(s) Involved | Funded by                              |
|--|---|---------------------------|------------------|--|
| <b>Theoretical Statistics and Mathematics Division</b> |   |                           |                  |  |
| 1.   | Objectives and Targets  | S. Athreya                | SMU, Bangalore   | M/s. Systat Software Asia Pacific Ltd. |
| 2.   | Bayesian Automated Recognition of Targets from Remotely Sensed Airfield Images (BART) | S. Bose                   | SMU, Kolkata     | ISRO, Govt. of India                   |

| Computer and Communication Sciences Division                 |  |   |  |
|--|--|---|--|
| 3.   | Handwriting Recognition for Postal Automation  | B. B. Chaudhuri                                     | CVPRU, Kolkata's Indo-French Centre for the Promotion of Advance Research (IFCPAR) |
| Physics and Earth Sciences Division                          |  |   |  |
| 4.   | Turbulent and Incipient Suspensions Due to Bursting and Their Sedimentological Implications: An Experimental Study | B. S. Mazumder<br>J. K. Ghosh<br>and C. Chakraborty | PAMU, SMU and GSU, Kolkata DST, Govt. of India                                     |
| 5.   | Studies on the Effect of Multiple Scattering on the Shift of the Spectral Lines and Applications                   | S. Roy<br>H. C. Kandapal<br>And R. Mehrotra         | PAMU, Kolkata, and NPL, New Delhi DST, Govt. of India                              |
| 6.   | Algebraic Analysis of Some Exactly Solvable Quantum Models   | P. Parashar   | PAMU, Kolkata DST, Govt. of India  |
| Social Sciences Division                                     |  |   |  |
| 7.   | Spatial Dimensions of Reproductive Health Status and Services: An Analysis of RHS/NFHS                             | B. N. Bhattacharya                                  | PSU, Kolkata Indian Council of Medical Research, Govt. of India                    |
| Statistical Quality Control and Operations Research Division |  |   |  |
| 8.   | Six Sigma Training & Implementation for Software Development   | A. K. Chaudhuri and T. Sreenivasa Rao               | SQC&OR, Bangalore L&T EmSys, Mysore  |
| 9.   | Six Sigma Implementation   | P. K. Perumallu                                     | SQC&OR, Bangalore L & T Komatsu, Bangalore   |
| 10.  | Lean Six Sigma   | A. K. Chaudhuri                                     | SQC&OR, Bangalore TIMKEN, Bangalore  |
| 11.  | ISO/TS 16949-2002/SQC Implementation   | K. K. Chowdhury and Somnath Ray                     | SQC&OR, Bangalore Rao Insulating Company Ltd., Bangalore                           |
| 12.  | Statistical Methods in Software  | G. Ravindran and K. K. Chowdhury                    | SQC&OR, Bangalore Samsung India Ltd., Bangalore                                    |
| 13.  | Six Sigma Implementation   | A. Sarkar and A. K. Chaudhuri                       | SQC&OR, Bangalore and Mumbai Larsen & Toubro Ltd., Powai                           |
| 14.  | Implementation of ISO 2001:2000  | P. Mandal   | SQC&OR, Baroda ONGC, Baroda and Mehsana  |
| 15.  | Reduction of Variation of Gas Balancing Equations for a Transmission and Bulk Distribution Network                 | P. Mandal   | SQC&OR, Baroda Gujarat Gas Company Ltd., Surat                                     |
| 16.  | Estimation & Designing Model to Predict Availability of Hides and Skins  | V. V. Iyer, A. K. Blewas and D. S. Raman            | SQC & OR, Chennai Central Leather Research Institute, Chennai                      |
| 17.  | Six Sigma Green Belt Training and Associated Business Projects   | D. S. Raman and A. K. Blewas                        | SQC & OR, Chennai Sutherland Global Services                                       |



Projects

|    |   |  |                                   |  |
|----|---|--|-----------------------------------|--|
| 18 | Improvement of Productivity in Sales, Clinical & Non-Clinical Cases & Strengthening the Rural Network of Janani | B. Majumdar  | SQC & OR, Delhi                   | Janani, Patna, Bihar                           |
| 19 | Forecasting Monthly Consumption of Urea as Fertilizer in Each District  | A. Seth  | SQC & OR, Delhi and SMU, Delhi    | Indian Software Group (ISG), New Delhi         |
| 20 | Support on ISO 9001 & ISO 14001   | R. Sett  | SQC & OR, Kolkata                 | Surya Nepal Pvt. Ltd., Nepal                   |
| 21 | Implementation of ISO 9001:2000   | R. Sett  | SQC & OR, Kolkata                 | Surya Nepal Pvt. Ltd., Garment Division        |
| 22 | Up gradation to ISO 14001:2004  | R. Sett  | SQC & OR, Kolkata                 | IOC India Ltd., Kolkata                        |
| 23 | Implementation of ISO 14001:1996  | S. Sengupta and A. Gupta   | SQC & OR, Kolkata                 | East India Pharmaceuticals Works Ltd., Kolkata |
| 24 | Determination of Linking Factor for Calculation of Price Variation Claims                                       | S. Sengupta and S. Gouri   | SQC & OR, Kolkata                 | Tata Hydroelectric Project Authority, Bhutan   |
| 25 | Training and Follow up Projects on Multivariate Analysis  | A. Majumdar<br>S. Adhikari<br>D. Roy Chowdhuri<br>and B. Pradhan | SQC & OR, Kolkata                 | TISCO  |
| 26 | Prediction of Customer Satisfaction   | T. K. Dutta<br>A. R. Mukhopadhyay<br>and P. Das                  | SQC & OR, Kolkata                 | Techno Digital Service Pvt. Ltd.               |
| 27 | Modelling Traffic Movement  | S. Adhikari  | SQC & OR, Kolkata                 | VSNL, Kolkata                                  |
| 28 | Construction of Multi Commodity Index   | A. R. Mukherjee<br>A. Gupta and<br>B. Pradhan                    | SQC & OR, Kolkata                 | Multi Commodity Exchange of India Ltd., Mumbai |
| 29 | Construction of an Index for Trading through Centralized Exchange   | A. R. Mukherjee<br>A. Gupta and<br>B. Pradhan                    | SQC & OR, Kolkata                 | Multi Commodity Exchange of India Ltd., Mumbai |
| 30 | Implementation of Six Sigma   | P. Das<br>and A. R. Mukherjee                                    | SQC & OR, Kolkata                 | Durgapur Steel Plant, Durgapur                 |
| 31 | Developing Warehouse Management System  | P. Das<br>and S. Gauri   | SQC & OR, Kolkata                 | Khadim Chain Stores Pvt. Ltd., Kolkata         |
| 32 | Developing Supply Chain Management System   | R. Sett<br>and A. Banerjee                                       | SQC & OR, Kolkata                 | Usha Martin Ltd.                               |
| 33 | SPC Training & Implementation   | A. Sarkar  | SQC&OR, Mumbai                    | Crompton Greaves Ltd.                          |
| 34 | Implementation of Six Sigma   | S. Rath, A. Seth<br>and K. K. Chaudhury                          | SQC&OR, Pune, Delhi and Bangalore | Reliance, Hazira                               |

## North-East Projects

## Ongoing Projects

| Sl. no.                                    | Name of the project  | Principal Investigator(s)   | Unit(s) involved |
|--|--|-----------------------------|------------------|
| <b>Physics and Earth Sciences Division</b> |  |                             |                  |
| 1.   | River Dynamics of the Sub-Himalayan Alluvial Plain in Northeastern India: A Study of Interaction between Tectonics and Climate in a Foreland Setting | P. Ghosh and T. Chakraborty | GSU, Kolkata     |
| <b>Biological Sciences Division</b>        |  |                             |                  |
| 2.   | Studies on the Ecology, Conservation, Propagation, and Utilization of Palms with Special Reference to Rattans  | M. Ghose                    | AERU, Kolkata    |
| 3.   | Adolescent Reproductive Health: Biocultural Dimensions   | S. Mukhopadhyay             | BAU, Kolkata     |
| 4.   | Genetic Affinity and Diversity among the Adi Tribe of Arunachal Pradesh: Population Structure and Genetic Differentiation of Adi-Pasi Tribe          | T. S. Vasutu                | BAU, Kolkata     |
| 5.   | Health and Disease: Comparison between Two Ecological Settings   | S. K. Roy                   | BAU, Kolkata     |
| <b>Social Sciences Division</b>            |  |                             |                  |
| 6.   | Poverty and Household Decisions – An Exploration of Possible Interdependence   | D. Coondoo                  | ERU, Kolkata     |
| 7.   | Agricultural Growth in Assam since Independence  | M. R. Gupta                 | ERU, Kolkata     |
| 8.   | Techno-Economic Adaptation of the Mizos of Hill Forest Ecology of Mizoram  | A. Chakraborty              | SRU, Kolkata     |

## Completed Projects

| <b>Biological Sciences Division</b> |   |                           |                  |
|-------------------------------------|---|---------------------------|------------------|
| Sl. no.                             | Name of the project   | Principal Investigator(s) | Unit(s) involved |
| 1.                                  | HPV Infection and Cervical Cancer in the Northeastern State of Sikkim and Manipur | S. Sengupta               | BAU, Kolkata     |
| <b>Social Sciences Division</b>     |   |                           |                  |
| 2.                                  | Study on Some Health Economic Issues in the North-East                            | S. Mitra                  | ERU, Kolkata     |
| 3.                                  | Valuation of Deepor Beel: An Environmental Economic Approach                      | K. Chattopadhyay          | ERU, Kolkata     |
| 4.                                  | Cognitive-Moral Development of Children in the North-Eastern                      | A. Ghosh                  | PRU, Kolkata     |

Projects

|   |   |                                     |                     |
|---|---|-------------------------------------|---------------------|
|   | Region of India   |                                     |                     |
| 5.  | A Study on Preference to Different Reading and Writing Motives of Tribal Children in Primary Education of Tripura and Manipur   | D. Dutta Roy                        | PRU, Kolkata        |
| 6.  | A Study of Health Care Expenses in West Tripura   | S. Dihadar                          | PSU, Kolkata        |
| 7.  | Process of Empowerment of Women in Rural Areas: Case Studies in Two North-Eastern States  | B. N. Ghosh                         | SRU, Kolkata        |
| <b>Statistical Quality Control and Operations Research Division</b> |   |                                     |                     |
| 8.  | Quality Initiative for development  | A. K. Chaudhuri                     | SQC & OR, Bangalore |
| 9.  | Role of SQC & OR for Quality Improvement in Industries Concepts and Practices through Application of Computer Software, Shilong | P. Das, N. Das, A. Das and A. Gupta | SQC & OR, Kolkata   |

#### 4. SYMPOSIA, CONFERENCES, WORKSHOPS, LECTURES AND SEMINARS ORGANISED

##### *Symposia and Conferences*

- International Conference on "Probability and Statistics": Stat-Math Unit, Kolkata, January 4-6, 2006.
- International Conference and Instructional Workshop on "Recent Advances in Operator Theory and Operator Algebra – III": Stat-Math Unit, Bangalore and Department of Mathematics, Indian Institute of Science, Bangalore, December 12-22, 2005.
- International Conference on "Reliability and Survival Analysis": Stat-Math Unit, Delhi, December 20-22, 2005.
- 9<sup>th</sup> Asian Test Symposium: ACMU, Kolkata, December 18-21, 2005.
- First International conference on "Pattern Recognition and Machine Intelligence": MIU, Kolkata, December 18-22, 2005.
- National Symposium on "Sustainable Agricultural Development in Fragile Eastern Plateau Ecosystem and Farmers' Workshop": AERU, March 21-23, 2006 at Giridih Agricultural Experimental Farm of ISI.
- Conference on "Models and Methods in Economics": ERU, Kolkata, December 28 – 30, 2005 at ISI, Kolkata.
- International Conference on "Liberalization Experiences in Asia: A Normative Appraisal": ERU, Kolkata, January 12 – 13, 2006 at ICSSR, New Delhi.
- Conference on "Economic Growth and Development": Planning Unit, Delhi, January 10 – 12, 2006.
- Conference on "Educational Testing, Counseling and Guidance": PRU, Kolkata, January 03, 2006.
- Six Sigma Project Presentation Contest: SQC & OR Unit, Bangalore jointly with Quality Council of India and National Institution for Quality and Reliability, November 29-30, 2005.

##### *Workshops and Training Programmes*

- Refresher Course on "Applied Stochastic Processes": Stat-Math Unit, Delhi, December 5-17, 2005.
- Summer School on "Stochastic Processes": Stat-Math Unit, Bangalore, July 4-16, 2005.
- Workshop on "North-East Training: Statistics in MS-Excel for Business Research": ASU, Kolkata, October 24-29, 2005, at the Department of Commerce, Dibrugarh University, Dibrugarh, Assam.
- Workshop on "North-East Training Programme: on Statistics using MS-Excel": ASU, Kolkata, February 27 – March 2, 2006, at the Centre for Science Education, NEHU, Shillong.
- Workshop on "North-East Training Programme: on Applied Statistics": ASU, Kolkata, February 28 – March 2, 2006, at the Department of Statistics, Gauhati University, Guwahati.
- Winter School on "Pattern Recognition for the Forensic Sciences": ASU, Kolkata, January 30-February 3, 2006.
- International Workshop on "Algorithms": ACMU, Kolkata, December 15-16, 2005.
- Workshop on "Image Processing in Forensic Science": CVPRU, Kolkata, and GEQD, Directorate of Forensic Science, Ministry of Home Affairs, January 27-29, 2006.
- Workshop on "Computational Information Processing" (under North-East Program): ECSU, Kolkata, December 28-30, 2005, at SMIT, Rangpo, Sikkim.
- ISI-TU Winter School on "Pattern Recognition and Machine Intelligence"(under North-East Program): MIU, Kolkata, January 17-21, 2006, at Tripura University, Agartala.

## Conferences and Seminars

Winter School on "Soft Computing Tools: Simulation and Applications" : Center for Soft Computing Research: A National Facility, Kolkata, January 10-14, 2006.

Workshop on "Geology of the Sub-Himalayan Alluvium and Numerical Simulation of River Dynamics" : GSU, Kolkata, June 24-25, 2005.

Workshop on "Quantitative Analysis of North East Indian Economy" : ERU, Kolkata, December 19 - 24, 2005 at Manipur University, Imphal, Manipur.

Workshop on "Labour Economics" : ERU, February 7, 2006.

Workshop on "Cognitive Moral Development of Children" : PRU, Kolkata, September 21, 2005 at Agartala.

Workshop on "Semi Definite Linear Complementarity Problem" : SOC & OR Unit, Bangalore, June 27-28, 2005.

National Workshop on "Matrices and Applications" : DST, Govt of India, SOC & OR Unit, Hyderabad, January 05-12, 2006.

A Training programme on "Master Black Belt" : SOC & OR unit, Bangalore, February 1-11, 2006.

A general training programme on "Executive Overview of Six Sigma" : SOC & OR Unit, Pune, January 11-12, 2005.

Two general training programmes on "Black Belt – 1<sup>st</sup> phase" : SOC & OR Unit, Mumbai, October 3-5, 2005 and October 15-17, 2005.

A general training programme on "Black Belt – 2<sup>nd</sup> phase" : SOC & OR Unit, Mumbai, November 21-24, 2005.

A general training programme on "Black Belt – 3<sup>rd</sup> phase" : SOC & OR Unit, Mumbai, January 18-21, 2006.

Three training programmes on "Six Sigma Green Belt and Black Belt" : SOC & OR Unit, Mumbai, for Reliance Group Manufacturing, April, May and July, 2005.

Training programme "Statistical Process Control" : SOC & OR Unit, Mumbai for Foseco Ltd, Pune, July, 2005.

Training programme "Statistical Techniques for Quality Assurance Engineer" : SOC & OR Unit, Mumbai for Hindustan Construction Co. Ltd., May, 2005.

Training programme "Statistical Process Control for cell Assistants" : SOC & OR Unit, Mumbai for Foseco Ltd, Pune, August 20, 2005.

Training programme "Statistical Techniques for Call Centres" : SOC & OR Unit, Mumbai for Intelen Ltd., Mumbai, September 28-28, 2005.

Training programme "Internal Audit" : SOC & OR Unit, Mumbai for WIMCO Ltd., Mumbai, November 25, 2005.

Training programme "Black Belt- 4<sup>th</sup> Phase" : SOC & OR Unit, Mumbai for Larsen and Toubr, Mumbai, March 13-16, 2006.

Training programme "Statistical Methods for Finance Blackbelts" : SOC & OR Unit, Hyderabad for HSBC, Mumbai, May 24-26, 2005.

Training programme "Six Sigma Green Belt" : SOC & OR Unit, Hyderabad for Applebe Technologies Ltd., May-July, 2005.

Training programme "Basic Statistics" : SOC & OR Unit, Hyderabad for VIMTA Laboratories, June, 2005.

#### Conferences and Seminars

- Training programme "Six Sigma Green Belt" : SQC & OR Unit, Hyderabad for Goe Glass Fibre Ltd., July 4-6, 2005.
- Training programme "Internal Audit" : SQC & OR Unit, Hyderabad for Suryalata Spinning Mills, April 7-8, 2005.
- Training programme "Statistical Process Control" : SQC & OR Unit, Hyderabad for Kabeon Gas Equipment Ltd., April 18, 2005.
- Training programme "Statistical Process Control" : SQC & OR Unit, Hyderabad for Effem India (P) Ltd., July 18-19, 2005.
- Training programme "Six Sigma" : SQC & OR Unit, Hyderabad for Centre for Electronic Test Engineering, July 28-29, 2005.
- Training programme "ISO 9000 (In Telugu)" : SQC & OR Unit, Hyderabad for Suryalata Spinning Mills, August 26-27, 2005.
- Training programme "Design for Six Sigma" : SQC & OR Unit, Hyderabad for Satyam-Ventures Ltd., July 8, 2005.
- Training programme "Statistical Process Control" : SQC & OR Unit, Hyderabad for ITC Ltd., PSPD, Bhadrachalam, September 14-17, 2005.
- Training programme "Statistical Techniques for Software Quality" : SQC & OR Unit, Hyderabad for Wipro Technologies, September 8-9, 2005.
- Training programme "Measurement System Analysis" : SQC & OR Unit, Hyderabad for VEM Technologies Ltd., October 17-18, 2005.
- Training programme "ISO 9000, Internal Quality Audit, Six Sigma" : SQC & OR Unit, Hyderabad for Manaksia Ltd., January 7-9, 2006.
- Training programme "Statistical Techniques for Quality Improvement" : SQC & OR Unit, Hyderabad for Dart Manufacturing Ltd., February 18-23 and March 11-19, 2006.
- Training programme "Statistical Process Control and Design of Experiments" : SQC & OR Unit, Hyderabad for Dr.Reddy's Laboratories Ltd., January 27-March 25, 2006.
- Training programme "Six Sigma Champions Awareness Programme" : SQC & OR Unit, Hyderabad for Reliance Telecom Ltd., February 8, 2006.
- Training programme "Introduction to Six Sigma" : SQC & OR Unit, Chennai for students of Sathagiri College of Engineering, Dharmapuri, September 28, 2005.
- Training programme "Introduction to Six Sigma" : SQC & OR Unit, Chennai for students of Thiagarajar College of Engineering, Madurai, October 3, 2005.
- Training programme "Process Capability" : SQC & OR Unit, Chennai, November 11, 2005.
- Training programme "Design of Experiments" : SQC & OR Unit, Chennai, November 18, 2005.
- Training programme "Measurement System Analysis" : SQC & OR Unit, Chennai, November 25, 2005.
- Training programme "Six Sigma" : SQC & OR Unit, Chennai, December 16, 2005.
- Training programme "Product Warranty" : SQC & OR Unit, Chennai, December 10, 2005.
- Training programme "Six Sigma – for Industries" : SQC & OR unit, Chennai, December 20, 2005.

#### Conferences and Seminars

A programme on "Prevalence Prediction Model for HIV-AIDS in India" : SQC & OR Unit, Chennai, October 20, 2005 at IFMR, Chennai.

A programme on "Statistical Applications in Industries" : SQC & OR Unit, Chennai, October 21, 2005 at IIT, Chennai.

Besides these several other training programmes : for Reuters India Ltd, Bangalore; Senner Engineering Company, Chennai and Trichy; SODET, Bangalore; Timken, Jamshedpur; L&T-Eteay; L&T-Marketing; Ultratech, Tadipatri; Standard Chartered, Chennai; Progeon, Bangalore; Office Tiger, Chennai; Cranes Software, Chennai; TUV academy, Iran-Germany; Effem India Ltd.

#### Lectures and Seminars

The Lectures/Seminars organized by the Institute and delivered by visiting scientists are listed below :

#### Theoretical Statistics and Mathematics Division

##### Stat-Math Unit, Kolkata

Arasu, K.T., Wright State University, Ohio, USA (November 28, 2005): *Perfect Sequence Constructions.*

Asanuma, T., Toyama University, Japan (February 16, 2006): *Purely inseparable  $k$ -forms of affine algebraic curves.*

\_\_\_\_\_ (February 27, 2006): *Valuation rings of algebraic function fields.*

Athreya, K.B., Iowa State University, USA ( July 26, 2005): *Entropy maximisation, measure free martingales and weak convergence of Gibbs measures.*

Babu, G. Jogesh, Penn., State University, U.S.A. (October 20, 2005): *Weak convergence for additive functions on random permutations.*

Bandyopadhyay, Antar, Chalmers Institute of Technology Gothenburg, Sweden (January 12, 2008) : *Discrete time motion in evolving random environment.*

Banerjee, Moulinath, University of Michigan, USA ( July 18, 2005) : *Confidence sets for split points in decision trees.*

Bhatwadekar, S.M., School of Mathematics, TIFR (February 22, 24,28 & March 02, 2006): *Projective modules over smooth real affine algebras - I,II,III, & IV*

Biswas, Kingshook, University of California, Los Angeles (August 09, 2005): *On log-Riemann surfaces and transcendental Dedekind-Weber theory.*

Brahmachari Brahmachaitanya, Ramakrishna Mission Vidyamandira, Belur (April 19, 2005): *Geometrization of 3 manifolds – A survey.*

Chaudhuri Nirmalendu, Centre for Mathematics and Its Applications, Australian National University, Canberra, Australia (January 17, 2006): *On twice differentiability of certain non-convex functions.*

Chaudhuri, Sanjoy, National University of Singapore (December 12, 2005): *A two-step empirical likelihood approach for combining sample and population data in regression estimation.*

Das, Kalyan, Calcutta University (August 29, 2005): *In quest of a general class of models for rate variation.*

## Conferences and Seminars

Das, Kishore K., Gauhati University, Assam (July 27, 2005): *On some aspects of generalized quasi-fractional series distributions.*

Dutta, Sudipta, Ben-Gurion University of the Negev, Beer-Sheva, Israel (October 03, 2005): *Uniform and Lipschitz structure of separable Banach spaces.*

Fialowski, Alice, Eotvos Lorand University, Budapest, Hungary (September 20, 2005): *Moduli space of low dimensional Lie algebras.*

Guha, Apratim, University of California, Berkeley (May 27, 2005): *Some neurological data analysis using mutual information hood approach for combining sample and population data in regression estimation.*

Keane, Michael S., Wesleyan University (January 02, 2006): *On spontaneous emergence of opinions: towards a better understanding of stochastic processes with infinite memory.*

Kulkarni, R., HRI, Allahabad (April 29, 2005): *Dynamical types of transformations in classical geometry.*

Kumaresan, S., University of Mumbai (May 26, 2005): *A topological proof of the Cayley-Hamilton theorem*

Lahiri, S.N., Department of Statistics, Iowa State University, USA (December 29, 2005): *Running head: expansions for studentized statistics.*

Mandrekar, V., Michigan State University, USA (December 06, 2005): *SPDEs: Existence and uniqueness of solutions.*

\_\_\_\_\_ (December 07, 2005): *Asymptotic behavior of the solutions of SPDEs.*

Mukherjee, Rahul, Indian Institute of Management, Kolkata (September 19, 2005): *Optimal factorial designs for cDNA microarray experiments.*

Mukherjee, Avijit, Nagoya University, Japan (October 31, 2005): *Homological mirror symmetry (after Kontsevich) and new notions of stability.*

Mukherjee, Kanchan, The University of Liverpool, UK (September 05, 2005) : *On the alignment and merging of multiple time series fragments.*

Mukhopadhyay, Anirban, IMSc, Chennai (September 30, 2005): *Zero density estimate for a general Dirichlet series.*

Munshi, Ritabrata, Princeton University, USA (August 16, 2005): *L-functions-primes and rational points.*

Nadkarni, M.G., C.M.I., Chennai (October 21, 2005): *On Good Sets: Rana Barua's remark and rest of the story.*

Nadkarni, M.G., University of Mumbai (May 25, 2005): *Good sets.*

Pal, Soumik, Columbia University, USA (August 17, 2005): *A unified view of hedging and risk management.*

Prasad, Amritanshu, Institute of Mathematical Sciences, Chennai (May 08, 2005): *Reduction of matrices with entries modulo a prime power.*



Conferences and Seminars

Reeves, Lawrence, University of Melbourne, Australia (February 22, 2006): *Non-positive curvature and decision problems in group theory.*

Roy, Amit, Department of Mathematics, University of Mumbai (December 02, 2005): *Central simple algebras.*

Roy, Parthana, Cornell University, USA (August 24, 2005): *On the structure of stationary symmetric a stable random fields.*

Sabnis, Sanjeev, IIT, Mumbai (June 28, 2005): *Construction of reliability test plans in the presence of covariables.*

Sankaran, P., IMSC, Chennai (April 27, 2005): *Equivariant Schubert calculus.*

Sarkar, Diip, University of Miami, Coral Gables (December 23, 2005): *Convergence in the calculation of the Handoff arrival rate: A log-time Iterative algorithm.*

Sen, Anusharka, Concordia University, Canada (August 06, 2005): *Some approaches to estimation under bivariate random censoring.*

Sengupta, Jyoti, School of Mathematics, TIFR, Mumbai (February 03, 2006): *Sign changes of Hecke eigenvalues of new forms.*

Shorey, T.N., School of Mathematics, TIFR (January 18, 20, 25, 27, February 01, 03, 2006): *Some methods in Diophantine equations I – VI.*

\_\_\_\_\_ (January 30, 2006): *Powers in arithmetic progression.*

Silvapulle, Mervyn, Monash University, Melbourne, Australia (September 15, 2005): *Constrained statistical inference in parametric models - an overview.*

Singh, Bahwan, IIT Mumbai ( June 18, 2005) : *The Jacobian Problem, Epimorphism Theorem and expansion techniques I.*

\_\_\_\_\_ (June 21, 2005) : *The Jacobian problem, epimorphism theorem and expansion techniques II.*

\_\_\_\_\_ (June 22, 2005) *The Jacobian problem, epimorphism theorem and expansion techniques III.*

Singh, Suji, Texas State University, San Marcos, Texas (November 29, 2005): *Geometric topology: A perspective.*

Sridharan, Srihari, IMSc, Chennai (September 06, 2005): *Distribution of periodic points of a rational map.*

\_\_\_\_\_ (September 09, 2005): *A counting result on hyperbolic Julia sets.*

\_\_\_\_\_ (September 14, 2005): *Non-vanishing derivatives of Lyapunov exponents.*

Swaroop, Ananda University of Melbourne, Australia (October 02, 2005): *3-Manifolds and geometric group theory.*

*Stat-Math Unit, Delhi*

Aravinda, C. S., Chennai Mathematical Institute, Chennai (February 22, 2006): *On the poincare conjecture.*

Conferences and Seminars

- Biswas, Indranil, Tata Institute of Fundamental Research, Mumbai (August 24 & 25, 2005): *Principal bundles on complex manifolds.*
- Dey, Arijit, Institute of Mathematical Sciences, Chennai (September 9, 2005): *Donaldson-Uhlenbeck compactification of parabolic vector bundles over surfaces.*
- Elbarmi, Hammou, Baruch College, New York, USA (April 27, 2005): *Consistent estimation of distributions with type II bias with applications in competing risks problem.*
- Lakshmbai, V., Northeastern University, Boston, USA (March 1, 2006): *Schubert varieties – classical and affine.*
- Langlands, Robert, Institute for Advanced Study, Princeton, USA (February 10, 2006): *Reflections on the legacy of Harish-Chandra.*
- Mandrekar, Vidyadhar, Michigan University, USA (November 22, 2005): *Existence and uniqueness of the solutions of SPDE's.*
- \_\_\_\_\_ (November 24, 2005): *Asymptotic behaviour of the solutions of SPDE's.*
- Mukherjee, Rahul, Indian Institute of Management, Kolkata (January 23, 2006): *Empirical-type likelihood allowing posterior credible sets with frequentist validity : Higher-order asymptotics.*
- \_\_\_\_\_ (January 25, 2006) : *Optimal factorial designs for cDNA microarray experiments.*
- Passi I. B., HRI, Allahabad (September 14, 2005): *Cyclic homology of group rings.*
- \_\_\_\_\_ (September 21, 2005) *Geometric group theory.*
- Prabhakar, M., Indian Institute of Technology, Delhi (August 10, 2005): *Minimal degree sequence for knots.*
- Pramanik, Malabika, California Institute of Technology, USA (July 1, 2005): *Some applications of an inequality of Wolff.*
- Ramaseshan, Karthik, University of Rochester, USA (June 30, 2005): *The linearized attenuated radon transform.*
- Sengupta, Ambar, Louisiana State University, USA (August 3, 2005): *Gaussian integrals through pictures.*
- Seihuraman, Jayaram, Florida State University, USA (November 8, 2005): *Are tests based on super-efficient estimators super-powerful?*
- \_\_\_\_\_ (November 9, 2005) : *Frequencies of patterns in Bernoulli sequences.*
- Srinivasan, Murali K., Indian Institute of Technology, Mumbai (September 28, 2005): *The Eulerian generating function of q-derangements.*
- \_\_\_\_\_ (September 29, 2006) : *The polytope of degree partition.*
- Ārutradha, Brajendra, Memorial University of Newfoundland, Canada (July 26, 2005) : *Generalized method of moments versus generalized quasi-likelihood inferences in binary panel data models.*
- Swarup, G. A., University of Melbourne, Melbourne, Australia (October 28, 2005): *Gromov convergence in metric spaces.*

## Conferences and Seminars

### *Stat-Math Unit, Bangalore*

Athreya, K.B., Iowa State University, USA (June 16, 2005) : *Entropy maximization and measure martingales.*

\_\_\_\_\_ (February 23, 2006) : *Branching markov processes.*

Bhattacharya, Siddhartha, TIFR, Mumbai (May 17, 2005) : *Measurable conjugacy of algebraic dynamical systems.*

Chanillo, Segun, Rutgers University, USA (July 12, 2005) : *The Composite membrane problem*

Dalawat, C.S., Harish-Chandra Research Institute, Allahabad (August 11, 2005 and August 9, 2006) : *Good Reduction, bad reduction & Serre's modularity conjecture.*

Dani, S.G., TIFR, Mumbai (August 23, 2005) : *Roots and factors of measures on Lie groups.*

Gedgil, Sulochana, CAOS, Indian Institute of Science, Bangalore (July 26, 2005) : *Physics of an Indian monsoon.*

Hairer, Martin, Warwick University, UK (December 22, 2005) : *Sampling from SDE's conditional observations.*

Keane, Michael, Wesleyan University, USA (January 12, 2006) : *The essence of the law of large numbers.*

\_\_\_\_\_ (January 13, 2006) : *Finitary orbit equivalence.*

Kulkarni, Manisha, Poornaprajna Institute of Scientific Research, Bangalore (December 6, 2005) : *The Bili-Titch theorem and its Applications to the Diophantine Equations.*

Kulkarni, Ravi, HRI, Allahabad (May 26, 2005) : *Introduction to Teichmüller theory.*

Langlands, Robert P., Institute for Advanced Study, Princeton, USA (March 23, 2006) : *On the transition from planar lattice models in statistical mechanics to conformally invariant field.*

Lejeune, Michel, University Grenoble 2, France (March 3, 2006) : *Calibration estimators in sure sampling: limits and efficiency.*

Li, Xue-Mei, Loughborough University, UK (December 22, 2005) : *On perturbed stochastic Hamiltonian systems.*

Lin, B.L., University of Iowa, USA (January 9, 2006) : *Unbounded nested sequences of balls in Banach spaces.*

Manjunath, Krishnapur, University of California, Berkeley (January 12, 2006) : *Zeros of random analytic Functions and Determinantal (Fermionic) point processes in two dimensions.*

Mattheij, R.M.M., Technische Universiteit Eindhoven, Netherlands (January 27, 2006) : *Seminar master's program in computational science and engineering.*

Narayana, D., Indian Institute of Science, Bangalore (December 1, 2005) : *On quasi-Chebyshev subspaces of Banach spaces.*

Narayanan, E.K., Indian Institute of Science, Bangalore (September 8, 2005) : *A support theorem to the twisted spherical means on  $C^n$ .*

Prajapat, Jyotshana, Indian Institute of Technology, Mumbai (December 29, 2005) : *Symmetry and classification of solutions of semilinear equations in Heisenberg group.*

Conferences and Seminars

Prasad, Dipendra, Tata Institute of Fundamental Research, Mumbai (September 27, 2005) : *Automorphic forms, Galois representations, and L-functions.*

\_\_\_\_\_ (September 29, 2005) : *Period Integrals and L-functions.*

Rajeevan, M., India Meteorological Department, Pune (July 26, 2005) : *Prediction of the summer monsoon rainfall.*

Ramachandra, K., Tata Institute of Fundamental Research, Bangalore (September 22, 2005) : *Riemann Hypothesis: Prospects and Retrospects.*

Ramaseshan, Karthik, University of Rochester, USA (June 24, 2005) : *The linearized attenuated Radon transform.*

Rao, C.R., Professor, University of Pittsburgh, USA (January 24, 2006) : *Antieigenvalues and applications to statistics.*

Seshadri, Harish, Indian Institute of Science, Bangalore (October 27, 2005) : *Intrinsic metrics in complex analysis – II.*

Sethuraman, B.A., California State University, USA (July 15, 2005) : *Division Algebras and Wireless Communication.*

Shirali, Shailesh, Amber Valley School, Chikmagalur, Karnataka (September 28, 2005) : *Maurits Cornelius Escher and his Mathematical Art.*

Singh, Sujit, Texas State University, Texas, USA (December 13, 2005) : *A Perspective on Geometric Topology.*

Srinivas, V., Tata Institute of Fundamental Research, Mumbai (November 23, 2005) : *Derived categories: some new directions.*

\_\_\_\_\_ (November 24, 2005) : *Complete intersections and zero cycles.*

Srinivasan, R., University of Tokyo, Japan (August 2, 2005) : *Stochastic integration with respect to Quasi-exponential.*

Sujatha, R., Tata Institute of Fundamental Research, Mumbai (January 31, 2006) : *Elliptic curves and rational points.*

\_\_\_\_\_ (February 2, 2006) : *Elliptic curves and Hasse's theory.*

\_\_\_\_\_ (February 24, 2006) : *A lecture on Voevodsky's work – Part I.*

\_\_\_\_\_ (March 1, 2006) : *A lecture on Voevodsky's work – Part II.*

Tandon, Rajal, University of Hyderabad, Hyderabad (December 28, 2005) : *Distinguished Representations.*

Varadarajan, K., Professor Emeritus, University of Calgary, Canada (November 28, 2005) : *Clean Rings, Exchange Rings, Potent Rings, Almost Clean Rings.*

Vani, Madhavan, C.E., Indian Institute of Science, Bangalore (November 24, 2005) : *Integer Factorization - Mathematics, Algorithms and Computation.*

Varma, Kaushal, Indian Institute of Science, Bangalore (October 26, 2005) : *Invariant metrics in complex analysis: a survey.*

## Conferences and Seminars

Vinroot, Christopher R., TIFR, Mumbai (May 17, 2005) : *Character degree sums of finite groups of Lie type.*

Viswanath, K., University of Hyderabad & TCS, Hyderabad (April 21, 2005) : *A New Theory of Computability.*

## Applied Statistics Division

### *Applied Statistics Unit*

Benerjee, Tathagata, Indian Institute of Management, Ahmedabad and University of Calcutta (March 15, 2006) : *Analysis of mixed binary-continuous outcomes: Binary outcomes misclassified and covariates subject to measurement error.*

Ghosh, Pulak., Georgia State University, USA (June 14, 2005) : *Semiparametric Bayesian modeling of Bivariate random change point.*

Maitra, Ranjan., Iowa State University, USA (May 24, 2005) : *Reliability assessment in functional magnetic Resonance imaging studies: A test-retest reliability approach.*

Pal, Sanghamitra, Irrigation and Waterways Department, West Bengal (August 30, 2005) : *On adjustments needed to employ Rao and Wu's (1998) bootstrap when size varies across samples and standard variance estimator.*

Sarkar, Sanat K., Temple University, USA (July 1, 2005) : *Generalized Simes test.*

Sen, Pranab K., University of North Carolina at Chapel Hill, USA (July 5, 2005) : *Robust R-estimator of a consensus value in Multi-center experiments.*

Silvapulle, Mervy, Monash University, Melbourne, Australia (September 20, 2005) : *Semiparametric estimation of a multivariate distribution using copulas when each variable satisfies a regression model.*

Wand, Matt, University of New South Wales, Australia (October 18, 2005) : *Penalized spline support vector classifiers: computational issues.*

## Computer and Communication Sciences Division

### *Advanced Computing and Microelectronics Unit*

Bhowmick, A. and Punyamurtula, S., Indian Design Center, India (January 19, 2006): *AMD microprocessor: Design methodologies.*

Biswas, R., NASA Ames Research Centre, USA (August 4, 2005): *Large-scale NASA science application on the Columbia supercluster.*

Chakraborty, K., Duke University, USA (December 26, 2006): *Automated design of microfluidics-based biochips.*

Chakraborty, G., Iwate Prefectural University, Japan (January 5, 2006): *Chaotic time series and its prediction internet traffic : A case study.*

Guha, R., University of Central Florida, USA (January 17, 2006): *Delivering a few seminar lectures on his recent research.*

Laskar, R., Clemson University, USA (January 10, 2006): *Fall colorings and B-colorings of certain classes of graphs.*

#### Conferences and Seminars

- Madhoo, U., University of California, Santa Barbara, USA (November 8, 2005): *Discussion on collaborative research.*
- Saha, B., Intel Corporation, USA (January 3, 2006): *McRT-STM: Implementing a high performance software transactional memory.*
- Sen, A., Arizona State University, USA (January 5, 2006): *Coverage, connectivity and routing problems in networks.*
- Seth, S. C., University of Nebraska, USA (March 13 2006): *Recognizing unsegmented text by symbolic indirect correlation.*

#### Computer Vision and Pattern Recognition Unit

- Dhir, C. S., Korea Advanced Institute of Science & Technology (KAIST), Korea (February 14, 2006): *Performance improvement of filterbank ICA with sound localization.*
- Ghosh, R., University of Ballarat, Australia (July 12, 2005): *Modular artificial neural networks.*
- Leedham, G., Nanyang Technological University, Singapore (March 1, 2006): *Some challenges in image processing and pattern recognition.*
- Vladimir, P., Nanyang Technological University, Singapore (March 3, 2006): *Handwriting analysis for forensic science.*

#### Electronics and Communication Sciences Unit

- Calee, J., General Motors, USA, and Mangalgiri, P., GM India Sc. Lab., Bangalore, India (February 28, 2006): *Techniques to assess customer desires with feasibility/cost models.*
- Das, S., IIT, Madras, India (August 12, 2005): *Wavelet based separable analysis of 3-D textures.*
- Dasgupta, P., Arizona State University, USA (June 20, 2005): *Identity assurance in electronic transactions.*
- Dasgupta, P., University of Nebraska, USA (March 16, 2006): *Building small worlds in unstructured peer-to-peer network.*
- Ghosh, R., University of Ballarat, Australia (July 15, 2005): *A fully automated breast cancer recognition system using discrete gradient based clustering and multi category feature selection.*
- Ghosh, S., University of Ballarat, Australia (July 8, 2005): *Hybrid neural learning algorithm.*
- Jana, D., Pricewater House, India (April 27, 2005): *Object oriented modeling through UML.*
- Pal, P. K., SAC, Ahmedabad, India (February 1, 2006): *Tracking of atmospheric objects using satellite data.*

#### Machine Intelligence Unit,

- Ray, S., Monash University, Australia (December 07, 2005): *A compact feature representation and image indexing in CBIR.*
- Satadhikari, S. N., Amrita Vishva Vidyapeetham, India (January 02, 2006): *Integration of informatics tools for biomedical research.*

## Conferences and Seminars

### Physics And Earth Science Division

#### *Geological Studies Unit*

Basu, A. R., Rochester University, USA (August 19, 2005): *Himalayan tectonics, global seawater chemistry and arsenic release mechanism in the Bengal basin ground water.*

Chatterjee, Sankar, Texas Tech University, USA (December 14, 2005): *Flights of birds.*

Ghosh, Prosenjit, California Institute of Technology, USA (March 13, 2006): *Rapid uplift of Atlapeno revealed through  $^{13}\text{C}$  -  $^{18}\text{O}$  bonds in palaeosol carbonates.*

Mitra, Sumit K., Geological Survey of India, Kolkata (November 18, 2005): *Racnet Barren Volcanism.*

#### *Physics and Applied Mathematics Unit*

Abraham, Ralph, University of California, USA (December 29, 2005): *Morphogenesis in cellular dynamical systems.*

Bagchi, Arunabha, University of Twente, The Netherland (May 5, 2005): *Rare event simulation of stochastic hybrid system with application to air traffic management.*

Balan, Vladimir, University Politehnica of Bucharest, Romania (December 26, 2005): *CMC surface-building modulii via Loop Group Theory.*

Datta, B. K., ICSC-World Laboratory, Lausanne, Switzerland (January 27, 2006): *Real Dirac algebra: Dirac equation without complex numbers.*

\_\_\_\_\_ (February 23, 2006): *Geometric algebra and its applications to quantum mechanics II.*

\_\_\_\_\_ (March 30, 2006): *Geometric algebra and its applications to quantum mechanics III.*

Ghosh, Sibasish, The University of York, UK (January 10, 2006): *Entangling power of permutations.*

Nield, D. A., University of Auckland, New Zealand (December 13, 2005): *Some recent investigations of convection in porous media.*

Purkait, B., Geological Survey of India, Kolkata (March 28, 2006): *On river hydraulics and sedimentary structures of Usri river.*

\_\_\_\_\_ (March 29, 2006): *On the coastal erosion at Seger Islands.*

Roy, Maitreyee, The University of Sydney, Australia (November 23, 2005): *Unraveling and using the mysteries of light: geometric phase and its applications.*

### Biological Sciences Division

#### *Agricultural and Ecological Research Unit*

Chandra, Subhash, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Andhra Pradesh, (July 22, 2005): *Bioinformatics and biometrics at ICRISAT*

Pandey, H.N., North Eastern Hill University (NEHU), Shillong, Meghalaya, (March 27-29, 2006): *Plant diversity status and community structure of sacred forests of Meghalaya*

\_\_\_\_\_ *Dynamics of sacred forest ecosystem,*

\_\_\_\_ *Ecological analysis of agro forestry systems of Meghalaya.*

Sarafis, Vassilios, Visiting Professor, University of Western Sydney, Australia, (June 1 & 2, 2005): *Microscopy: past, present and future-1 & 2.*

#### **Human Genetics Unit**

Basu, Analiaha, University of California, San Francisco, U.S.A (August 22, 2005): *Self-identified ethnicity and genetic structure*

Chakravarty, Bomeli, Welch Postdoctoral Fellow in Biochemistry and Molecular Biology, Baylor College of Medicine, Houston, Texas, U.S.A., (December 12, 2005): *Human fatty acid synthase: structure and substrate selectivity of the thioesterase domain.*

Dey, Dipak K., Department of Statistics, University of Connecticut, Storrs, U.S.A. (December 13, 2005): *Hierarchical Bayesian modelling in genetically structured data*

Kochhar, Rajesh, National Institute of Science, Technology and Development Studies (NISTADS), New Delhi, (December 1, 2005): *The Vedic people: their history and geography*

Khan, Saleem A., Department of Molecular Genetics and Biochemistry, University of Pittsburgh School of Medicine, USA (January 5, 2006): *Gene expression analysis of human papilloma virus-associated human cancers*

Nath, Swapan K., Oklahoma Medical Research Foundation, U.S.A (August 8, 2005): *Gene identification in Lupus*

Stats, Herman, Laboratory of Mucosal Immunity, Duke University, USA (September 9, 2005): *Delivery of vaccines without needles: Strategies to develop nasally-administered vaccines*

#### **Social Sciences Division**

##### ***Economic Research Unit***

Ahmed, Sadie, Sector Director, Poverty Reduction and Economic Management, South Asia Region, World Bank (January 9, 2006): *Explaining South Asia's development performance: A puzzle or good policies?*

Banerjee, Anurag Narayan, Durham Business School, University of Durham, Durham, UK (February 14, 2006) : *Discriminating of short and long memory in small samples using sensitivity analysis : An application to growth convergence.*

Banerjee, Priyodorshi, Ohio State University, Columbus, USA (July 14, 2005): *Auctions with ceilings.*

Basu, Deepankar, Department of Economics, Ohio State University, Columbus, USA (September 15, 2005): *Dynamic multinomial ordered choice.*

Bhattacharya, Anindya, Department of Economics, University of York, UK (September 22, 2005): *Stable and efficient networks with farsighted players: The largest consistent set.*

Bhattacharjee, Arnab, School of Economics and Finance, University of St. Andrews, UK (January 12, 2006) : *Estimation of the spatial weights matrix in the spatial error model, with an application to diffusion in housing demand.*



#### Conferences and Seminars

Bhattacharya, Mita, Department of Economics, Monash University, Australia (September 8, 2006): *Determinants of domestic competition: A comparative study between Japanese and Taiwanese manufacturing.*

Chakrabarty, Suparna, Department of Economics and Finance, Baruch, CUNY, USA (January 18, 2006): *Business cycles in a neoclassical growth model: How important are technology shocks as a propagation mechanism?*

Dasg, Debabrata, Department of Economics, Asutosh College, Calcutta (June 16, 2005): *Strategic use of price information to avoid bertrand paradox.*

Ghatak, Maitreesh, Department of Economics, London School of Economics, UK (September 8, 2005): *The economics of corporate social responsibility.*

Ghosh, Parikshit, Department of Economics, University of British Columbia, Canada (January 5, 2006): *Efficient equilibria and information aggregation in common interest voting games.*

Ghosh, Sayantani, University of Rochester, Rochester, NY, USA (August 11, 2005): *Corporate governance and over investment.*

Ghosh, Sudeep, Department of Economics and Finance, City University of Hong Kong, Hong Kong (May 26, 2005): *Cognition, knowledge and convention formation in repeated coordination games: An experimental investigation.*

Gravel, Nicolas, Centre de Sciences Humaines (CSH), Delhi & IDEP-GREQAM (October 27, 2006): *Ethically Fairst comparisons of distributions of two individual attributes.*

Majumder, Dipjoyo, Concordia University, Montreal, Canada (July 7, 2005): *Ordinal bayesian incentive compatible stable matchings.*

Marjit, Sugata, Centre for Studies in Social Sciences, Kolkata (June 9, 2005): *Trade policy, informal sector and unemployment-revisiting harris-todaro.*

Mishra, Debats, Indian Institute of Science, Bangalore (February 1, 2006): *On computing the shapley value in queues.*

Ray, Indrajit, University of Birmingham, Birmingham, UK (August 18, 2005): *Do players follow recommendations?*

Raju, Dhushyanth, Cornell University, Ithaca, NY, USA (July 21, 2005): *Do wages compensate for harmful child labour? Evidence from the Philippines.*

Roy, Raja, A.B. Freeman School of Business, Tulane University, New Orleans, USA (June 2, 2006): *Technological capabilities and response of incumbents during market fusion in the U.S. machine tool industry, 1975-1995.*

Rübbelke, Dirk T.G., Fakultät für Wirtschaftswissenschaften/Technische Universität Chemnitz, Chemnitz, Germany (March 2, 2006): *Impure public goods and technological interdependencies.*

Sarkar, Sudipto, DeGroote School of Business, McMaster University, Hamilton, ON, Canada (April 1, 2005): *Management stock ownership and the over under-investment problem.*

Sen, Abhijit, Past President, Bengal Chamber of Commerce (March 9, 2006): *Inflow of foreign capital into Indian industry under the New Policy Regime.*

Sen, Debapriya, SUNY at Stony Brook, New York, USA (August 4, 2005): *Offshore outsourcing induced by domestic providers.*

## Conferences and Seminars

Sengupta, Jait K., University of California, USA (November 3, 2005): *Innovation and efficiency: Non-parametric model.*

### *Economic Analysis Unit*

Deshpande, R.S., ISEC, Bangalore, (May 2005) : *Treatment of social issues and data in economics.*

Ganesh Kumar, A., IGIDR, Mumbai, (December, 2005) : *Panel data analysis, CGE models.*

Kadskodi, Gopal, Director, ISEC, Bangalore, (December, 2005) : *Ecological and environmental policy in India*

Madheswaran, Institute for Social and Economic Change (ISEC), Bangalore, (July, 2005) : *Labour markets in India: A case study of Beedea Industry in Karnataka.*

——— (November and December, 2005): *Econometric applications.*

Ramachandran, M., ISEC, Bangalore, (July, 2005) : *Monetary policy in India.*

——— (November and December, 2005) : *VAR and VEC Models.*

Vithal, M.P., Director, Institute for Infrastructure Development, Bangalore, (November, 2005): *Financial markets in India.*

### *Planning Unit*

Assaad, Ragui, University of Minnesota (March 20, 2006): *The effect of child work on schooling: Evidence from Egypt.*

Amparo Castello Climent, Universidad Carlos III de Madrid (July 18, 2005): *A reassessment of the relationship between inequality and growth.*

Banerjee, Priyodorshi, Rutgers University – Newark (July 19, 2005): *Ceiling in common value auctions.*

Bhalotra, Sonia, University of Bristol (December 06, 2005): *Health and Aggregate Wealth: The Indian evidence.*

Bhattacharya, Anindya, The University of York (November 11, 2005): *Stable and efficient networks with farsighted players.*

Chakraborty, Sujoy, IIM, Ahmedabad (August 26, 2005): *Are you risk averse over other people's money.*

Dasgupta, Amil, London School of Economics (January 06, 2006): *The price of confirmism.*

Dhillon, Amrita, University of Warwick (August 31, 2005): *Games of status and discriminatory contracts.*

Friedman, Daniel, University of California (April 1, 2005): *Risky Curves: From unobservable utility to observable opportunity sets.*

Ghosh, Parikshit, University of British Columbia (December 14, 2005): *Efficient equilibria and information aggregation in common interest voting games.*

Gulati, Sumeet, University of British Columbia (August 24, 2005): *Time inconsistent resource conservation contracts.*

Honorata, Sosnowska, Leon Kozminski Academy of Enterpren (November 18, 2005): *Four different approaches to the normalized Banzhaf value of games with a priori unions.*

#### Conferences and Seminars

Innes, Robert, University of Arizona (October 7, 2005): *A theory of consumer boycotts under symmetric information and imperfect competition.*

Mathew, O. Jackson, Center for Advanced Studies in the Behavioral Sciences (December 27, 2005): *Network games.*

Misra, Santosh, Oregon State University, USA (August 18, 2005): *Distance based approach to a parametric regression estimators.*

Mukhopadhyay, Bappaditya, Management Development Institute (April 7, 2005): *Reputation building through unsolicited ratings.*

Murthy, Sridhar, University of Toronto, Canada (October 27, 2005): *Measuring brand value in an equilibrium framework: A structural approach.*

Raghavan, T.E. S., University of Illinois, USA (March 7, 2006): *The contribution of Robert Aumann to game theory.*

Richard, P., McLean, Rutgers University, USA (August 12, 2005): *Implementation with interdependent valuations preliminary and incomplete.*

Sarma, Mandira, Visitor to ISI (November 07, 2005): *Value-at-Risk and expected shortfall: Comparing the two.*

Sethi, Rajiv, Columbia University, USA (December 13, 2005): *Race crime and location.*

Singh, Gurbachan, Jawaharlal Nehru University, New Delhi (August 5, 2005): *Real assets, financial assets, liquidity, and lemon problem.*

Singh, Manisha, University of Maryland, USA (September 9, 2005): *Labor adjustment in an evolving marketplace – An empirical investigation.*

Slutsky, Steven, University of Florida, USA (February 24, 2006): *Partial commitment in optimal nonlinear income taxation.*

Tranjoy, Alain, EHESS, GRQAM, IDEP Marseille (April 21, 2005): *Harder times for heirs? Social background and income in France 1979-2000.*

Vijaya, B. Marisetty, Monash University, Australia (September 23, 2005): *Corporate ownership informativeness of Indian firms.*

#### Sociological Research Unit

Aithreya, Venkatesh, M.S. Research Foundation, Chennai (July 25, 2005) : *Gender and survival in the decade of reforms.*

Gupta, Swarupa, School of Oriental & African Studies, University of London, UK (October 4, 2005) : *Bengali treatment of neighbouring ethnicities: perspective on Samaj, 1867-1905.*

#### Library, Documentation and Information Sciences Division

##### Documentation Research and Training Centre

Andrew, J., CN-Prati Ginstad Professor of Inf. Studies, McGill University, Montreal, Quebec, Canada (September 13, 2005) : *Library and information science education system in Canada.*

Gopinath, M. A., visiting Professor, North Carolina Central University, USA (February 21, 22, 27, 28, 2006) : *Recent advances in information resource management.*

#### Conferences and Seminars

Jamadagni, Suresh, Professor, Dept. of Computer Science, PES Institute of Technology, Bangalore (March 3, 10, 17, 31, 2006) : *Data mining and text mining.*

Mahesh, Kavi, Professor, Dept. of Computer Science, PES Institute Of Technology, Bangalore (January 18, 2006) : *What is knowledge management?*

— (January 19, 2006) : *Knowledge management processes.*

— (January 25, 2006) : *Technology for knowledge management.*

Suresh, J. K., Infosys, Bangalore (January 27, 2006) : *Quality and measurement in knowledge management.*

— (February 01, 2006) *Knowledge management journey and maturity.*

Shepherd, Michael, Professor, Faculty of Computer Science, Dalhousie University, Canada (March 9, 2006) : *Accessing tacit knowledge.*

— (March 14, 2006) : *Genre and task for web filter.*

Watters, Carolyn, Professor, Faculty of Computer Science, Dalhousie University, Canada (March 10, 2006) : *Interface design for small screen devices.*

— (March 20, 2006) *Web information retrieval.*

#### Center for Soft Computing Research : A National Facility

Roy, Siddheswar, Monash University, Melbourne, Australia (December 07, 2005) : *A compact feature representation and image indexing in CBIR.*

Seth, Sharad, University of Nebraska-Lincoln, USA (March 17, 2006) : *Recognizing unsegmented text by symbolic indirect correlation.*

Zadeh, Lotfi A., University of California, Berkeley, USA and Director, Berkeley Initiative in Soft Computing (BISC), Berkeley, USA (February 16, 2006) : *Computation with information described in natural language: The concept of generalized constraint-based computation.*

## 5. Sankhya

The internationally renowned journal Sankhya was founded by Professor P.C. Mahalanobis in 1933 and began publication under his editorship. It is devoted to original research articles in Applied Statistics, Mathematical Statistics and Probability. Reviews and discussion articles in areas of current research activity are also published. Many seminal articles in the above areas have appeared in Sankhya and these include contributions from scientists within the Institute as well as outside. Sankhya receives articles from all over the world and publishes only those, which pass the rigorous peer review process. The Editorial Board of Sankhya includes internationally reputed scholars in all relevant areas from all over the world. The compositions of the Editorial Committees serving during 2005-06 appear in Part II, Section 10 of the Report.

From 2003, Sankhya has been publishing in one combined series, four times a year in February, May, August and November. Certain issues come out as a special issue devoted to a particular field.

The following issues have been published during April 2005 to March 2006.

May 2005 : Volume 67 Part II (Special issue on Quantile Regression and Related Methods)  
August 2005 : Volume 67 Part III  
November 2005: Volume 67 Part IV  
February 2006 : Volume 68 Part I.

## 6. SCIENTIFIC PAPERS AND PUBLICATIONS

### Books Published

#### Theoretical Statistics and Mathematics Division

##### *Stat.Math. Unit, Delhi*

Parthasarathy, K.R. : *Probability Measures on Metric spaces*, AMS, Chelsea Publishing, 2005.

Parthasarathy, K.R. : *Quantum Computation, Quantum Error Correcting Codes and Information Theory*, Tata Institute of Fundamental Research and Narosa, 2005.

#### Computer and Communication Sciences Division

##### *Electronics and Communication Sciences Unit, Kolkata*

Mukherjee, D.P., and Jana, D. (eds.) : *Changing Focus of Computing – Emerging Applications of IT 2006*. Reed Elsevier, New Delhi, pages 419, 2006.

Pal, N.R., and Jain, L.C. (eds.) : *Advanced Techniques in Data Mining and Knowledge Discovery*, Springer Verlag, London, pages 254, 2005.

##### *Machine Intelligence Unit, Kolkata*

Apolloni, B., Ghosh, A., Alpaalan, F., Jain, L.C. and Patnaik, S. : *Machine Learning and Robot Perception*, Springer, Berlin, pages 351, 2005.

Bandyopadhyay, S., Naulik, U., Holder, L.B., and Cook, D.J. (eds.) : *Advanced Methods for Knowledge Discovery from Complex Data*, Springer, London, pages 369, 2005.

Pal, S.K., Bandyopadhyay, S., and Biswas, S., (eds.) : *Pattern Recognition and Machine Intelligence*, Springer, Berlin, pages 808, 2005.

#### Social Sciences Division

##### *Economic Research Unit*

Bharati, P and Pal, M. : *Gender Disparity: Its Manifestations, Causes and Implications*, Anmol Publications, New Delhi, pages 302, 2006.

Dasgupta, D. : *Growth Theory: Solow and his Modern Exponents*, Oxford University Press, New Delhi, pages 284, 2005.

Ghosh, B. and De, Prabir : *India Infrastructure Database: Volumes I & II*, Bookwell Publishers Pvt. Ltd., New Delhi, pages 727 and 872, 2005.

Lahiri, Sajal and Maiti, Pradip (eds.) : *Economic Theory in a Changing World: Policy Making for Growth*, Oxford University Press, New Delhi, pages 263, 2005.

##### *Linguistic Research Unit*

Dash, N.S. : *Bhasangsha Sangraha O Adhunik Bhasabijnan* (Language Corpora and Modern Linguistics). Kolkata: Dakshabharati, 2006.

Publications

**Sociological Research Unit**

Ghosh B.N. : *Tribal Farmers and New Agricultural Technology*, Akansa Publishing House, New Delhi, 2005.

**Statistical Quality Control and Operations Research Division**

**SQC & OR Unit, Kolkata**

Chakraborty, A.K. and Chaudhuri, S.K. : *Management Tools for Improvement*, Asian Books Ltd., New Delhi, 2006.

**Library, Documentation and Information Sciences Division**

**Documentation Research and Training Centre (DRTC), Bangalore**

Raghavan, K.S. and Prasad, K.N. (eds.) : *Knowledge Organisation, Information Systems and Other Essays : Prof. A. Neelameghan Festschrift*, Ess Ess Publication, New Delhi, pages 520, 2006.

**Computer and Statistical Services Centre**

Bagchi, A., Acharya, A. and Chattopadhyay, S. (eds.) : *Proceedings of Fourth Asian International Mobile Computing Conference 2006*, Tata McGraw-Hill Publishing Co. Ltd., India, ISBN 0-07-0608342.

**Papers Published in Journals**

**Theoretical Statistics and Mathematics Division**

**Stat-Math Unit, Kolkata**

Acharya, B.D., Rao, S.B., Walikar, H.B., Ramane, H.S., Hampoholi, P.R., Jog, S.R. and Gutman, I. : Spectra and energies of the iterated line graphs of regular graphs, *Applied Mathematics Letters*, 16(3), 679-682, 2005.

Alberverio, S., Pei, S.M. and Goswami, Debashish : Local invariants for a class of mixed states, *Phys. Lett. A*, 340(1-4), 37-42, 2005.

Barua, Rana, Chakravarty, Satya R. and Roy, Sonali : On Coleman indices of voting power, *European Journal of Operation Research*, 171, 273-289, 2006.

Barua, R., Chakravarty, S.R. and Roy, S. : Measuring power in weighted majority games, *Homeo Oeconomicus*, 22 ( 4), 459-486, 2005.

Barua, R., Chakravarty, S.R. and Roy, S. : A new characterization of Banzhaf index of power, *International Game Theory Review*, 7(4), 1-9, 2005.

Basak, G.K. and Dasgupta, A. : A functional central limit theorem for a class of urn models, *Proceedings of Indian Academy of Sciences (Math. Sci.)*, 115(4), 493-498, 2005.

Basu, A., Chaudhuri, P. and Majumdar, P.P. : Identification of polymorphic motifs using probabilistic search algorithms, *Genome Research*, 15, 67-77, 2005.

## Publications

- Bose, A., Gangopadhyay, S. and Sarkar, A. : Partial sum process for records, *Extremes*, 8, 43–56, 2005.
- Chatterjee, S. and Bose, A. : Generalised bootstrap for estimating equations, *Annals of Statistics*, 33(1), 414-436, 2005.
- Chaudhuri, P. and Dasgupta, A. : On some stochastic models for replication of character strings, *Statistics and Probability Letters*, 75, 230-236, 2005.
- Chaudhuri, P. and Dasgupta, A. : Stationarity and mixing properties of replicating character strings, *Statistica Sinica*, 16, 29-43, 2006.
- D'Ambrósio, G. and Datta, Mahuya : Sotropic  $\mathbb{S}^2$ -immersions in a pseudo-Riemannian manifold, *Differential Geometry and its applications*, 24 (2), 142-149, 2006.
- Dasgupta, R. and Ghosh, J. K. : Optimal assembly problem of Rotor Blades : A Heuristic Approach, *Calcutta Statistical Association Bulletin*, 57, 1-18, 2005.
- Ghosh, A.K. and Chaudhuri, P. : Data depth and distribution free discriminant analysis using separating surfaces, *Bernoulli*, 11, 1-27, 2005.
- Ghosh, A.K. and Chaudhuri, P. : On maximum depth and related classifiers, *Scandinavian Journal of Statistics*, 32, 327-350, 2005.
- Ghosh, A.K., Chaudhuri, P. and Murthy, C.A. : On visualization and aggregation of nearest neighbour classifiers, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 27, 1592-1602, 2005.
- Ghosh, A.K., Chaudhuri, P. and Sengupta, D. : Classification using Kernel density estimates : Multi-scale analysis and visualization, *Technometrics*, 48, 120-32, 2006.
- Goswami, A. and Sinha B.K. : Some probabilistic aspects in the discovery of species, *Sequential Analysis*, 25, 103-115, 2006.
- Maulik K. and Zwart, Bert : Tail asymptotics of exponential functionals of Lévy processes, *Stochastic Processes and their Applications*, 116(2), 156-177, 2006.
- Rao, P.S.S.N.V.P., Rao, S.B. and Sinha, B.K. : Improved bounds for group testing designs, *Journal of Statistical Planning and Inference*, 136(1), 260-269, 2006.
- Sarkar, Rudra P. and Silaram, A. : The Helgason Fourier transform for semisimple Lie group I : the case of  $SL(2, \mathbb{R})$ , *Bull. Austral. Math. Soc.*, 73, 413-432, 2006.
- Sarkar, Rudra P. and Thangavelu, S. : On theorems of Beurling and Hardy for the Euclidean motion group, *Tohoku Math. J.*, 57(3), 335–351, 2005.
- Stat-Math Unit, Delhi**
- Averous, J., Genest, C. and Kocher, S. : On the dependence structure of order statistics, *Journal of Multivariate Analysis*, 95, 159-171, 2005.
- Bapat, R.B. : Distance matrix and Laplacian of a tree with attached graphs, *Linear Algebra and its Applications*, 411, 295-308, 2005.



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- Bapat, R.B., Kirkland, S. and Neumann, M. : On distance matrices and Laplacians, *Linear Algebra and Its Applications*, 410, 193-209, 2005.
- Bapat, R.B., Catral, M. and Neumann, M. : On functions that preserve M-matrices and inverse M-matrices, *Linear and Multilinear Algebra*, 53(3), 193-201, 2005.
- Bapat, R.B. and Das, K.C. : A sharp upper bound on the largest Laplacian eigenvalue of weighted graphs, *Linear Algebra and Its Applications*, 409, 153-165, 2005.
- Bapat, R.B. and Somasundaram, K. : Cramer's rule for generalized matrix functions, *Bulletin of Kerala Mathematical Association*, 2(2), 1-7, 2005.
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- Bhatia, R. : Interpolating the arithmetic-geometric mean inequality and its operator version, *Linear Algebra and Applications*, 413, 355-363, 2006.
- Bhatia, R. and Holbrook, J. : Riemannian geometry and matrix geometric means, *Linear Algebra and Applications*, 413, 594-618, 2006.
- Bhatt, A.G. and Borikar, V.S. : Existence of optimal Markov solutions of ergodic control of Markov processes, *Sankhya*, Vol. 67(1), 1—18, 2005.
- Bhatt, A.G., Karandikar, R.L. and Rao, B.V. : On characterization of Markov processes via martingale problems, *Proc. Indian Acad. Sci. (Math. Sci.)*, 116(1), 83—96, 2006.
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- Das, A., Dey, A., Kageyama, S. and Sinha, K. : A-efficient balanced treatment incomplete block designs, *Australas. Jour. Combin.*, 32, 243-252, 2005.
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- Dey, A., Suen, C. and Das, A. : Asymmetric fractional factorial plans optimal for main effects and specified two-factor interactions, *Statistica Sinica*, 15, 751-765, 2005.
- Gasbarra, D., Kulathinal, S.B., Dewan, I. and Nissinen, Aulikki : Testing dependence between the failure time and failure modes : An application of enlarged filtration, *J. Statistical Planning and Inference*, 136, 1669-1686.
- Ghosh, H. and Das, A. : Optimal designs for best linear unbiased prediction in diallel crosses, *Commun. Statist. -Theory-Meth.*, 34, 1579-1586, 2005.
- Ghosh, H., Das, A. and Misra, C.K. : Optimal designs for estimation of ratio of variance components in diallel crosses, *Sankhya*, 67, 788-797, 2005.
- Khaledi, B. and Köcher, S. : Dependence orderings for generalized order statistics, *Statistics and Probability Letters*, 73, 357-367, 2005.

- Kocher, S., El Barmi, Hammou and Tsamikas, John : Likelihood ratio tests for and against ordering of the cumulative incidence functions in multiple competing risks and discrete mark variable models, *J. Statist. Plan. Inf.*, 138, 1588-1607, 2006.
- Kocher, S., Jeon, Jongwoo and Park, C.G. : Dispersive ordering - Some applications and examples, *Statistical Papers*, 47, 227-247, 2006.
- Kocher, S. and Khaledi, B. : Dependence, dispersiveness and multivariate hazard rate ordering, *Probability in Engineering and Information Sciences*, 19, 427-446, 2005.
- Konno, N., Masuda, N., Roy, R. and Serkar, A. : Rigorous results on the threshold network model, *Journal of Physics : (A) Math & General*, 38, 6277-6291, 2005.
- Kundu, D. and Nandi, S. : Estimating the number of components of the fundamental frequency model, *Journal of the Japan Statistical Society*, 35(1), 41-59, 2005.
- Kundu, D. and Nandi, S. : On discrete domain multidimensional sinusoidal models, *Statistics*, 40(2), 129-147, 2006.
- Sinha, K.B. and Ji, D.C. : Integral representation of quantum martingales, *Infinite Dim. Anal. and Quant. Prob. World Scientific*, 8 (1), 55-72, 2005.
- Sinha, K.B., Goswami, D. and Sahu, L. : Dilation of a class of quantum dynamical semigroups with unbounded generators on a UHF-algebra, *Ann. I. Henri Poincare, Probability and Statistics*, PR 41 505-522, 2005.

#### Stat-Math Unit, Bangalore

- Athreya, Siva and Winter, Anita : Coupling of neutral measure-valued population models. *Stochastic Process, Stochastic Processes and their applications*, 115(6), 891-906, 2005.
- Athreya, Siva, Bass, Richard, Gordina, Masha and Perkins, Edwin : Infinite dimensional stochastic differential equations of the Ornstein-Uhlenbeck type, *Stochastic Processes and their applications*, 116(3), 381-406, 2006.
- Bagchi, B. and Dutta, B. : Combinatorial triangulations of homology spheres, *Discrete Math.*, 305, 1-17, 2005.
- Bhattacharyya, T. and Misra, G. : Contractive and completely contractive homomorphisms of planar algebras, *Illinois Journal of Mathematics*, 49(4), 1181-1201, 2005.
- Douglas, R.G. and Misra, G. : On quasi-free Hilbert modules, *New York J. Math.*, 11, 547-561, 2005.
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- Mc Laughlin, James and Sury, B. : Powers of a matrix and combinatorial identities, *Integers, Electronic Journal of Combinatorial number theory*, 5, Article A 13, 2005.

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- Narayana, D. and Rao, T.S.S.R.K. : Transitivity of proximity and norm attaining functionals, *Colloq.Math.*, 104(1), 1-19, 2006.
- Ramasubramanian, S. : An Insurance network: Nash equilibrium, *Insurance: Mathematics and Economics*, 38, 374 – 390, 2006.
- Rao, T.S.S.R.K. : Local surjective isometries of  $L(X,C(K))$ , *Proceedings of the American Mathematical Society*, 133(9), 2729-2732, 2005.
- Rao, T.S.S.R.K. : Remarks on a result of Khali and Saleh, *Proceedings of the American Mathematical Society*, 133(5), 1721-1722, 2005.
- Sethuraman, B.A. and Sury, B. : A note on the special unitary group of a division algebra, *Proceedings Amer.Math. Soc.*, 134, 351-354, 2006.
- Singh, A. and Thakur, M. : Reality properties of conjugacy classes in  $G_2$ , *Israel Journal of Mathematics*, 145, 157-192, 2005.

### Applied Statistics Division

#### Applied Statistics Unit

- Adhikari, A.K. : Small area estimation -- a review, *Journal of the Indian Society of Probability and Statistics*, 9, 1-18, 2005.
- Atkinson, A. C. and Biswas, A. : Adaptive biased-coin designs for skewing the allocation proportion in clinical trials with normal responses, *Statistics in Medicine*, 24, 2477-492, 2005.
- Biswas, A. and Coad, D.S. : A general multi-treatment adaptive design for multivariate responses, *Sequential Analysis*, 24, 139-158, 2005.
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- Bose, M. and Shah, K.R. : Estimation of residual effects in repeated measurements designs, *Cebutta Statistical Association Bulletin*, 56 (Special 5<sup>th</sup> Triennial Proceedings Vol.), 106-122, 2005.
- Chakraborti, A. : Optimality of AIC in inference about Brownian motion, *Annals of the Institute of Statistical Mathematics*, 58, 1-20, 2006.
- Chakraborti, D., Maitra, S. and Roy, B. : Clique size in sensor networks with key pre-distribution based on transversal design, *International Journal of Distributed sensor Networks*, 13-4, 345-354, 2005.
- Chaudhuri, A. Bose, M. and Dithdar, K. : Sample-size restrictive adaptive sampling, *Journal of Statistical Planning and Inference*, 134, 254-267, 2005.
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- Shekar, S.N., Bandyopadhyay, T. and Biswas, A. : Does effect of cadmium on glutathione content of red blood corpuscles depend on gene? A statistical investigation based on data generated from a twin study, *Twin Research and Human Genetics Journal*, 9, 73-75, 2006.

## Computer and Communication Sciences Division

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