

INDIAN STATISTICAL INSTITUTE

51. Name of the Project : Cervical Neoplasia : Host Genetic Factor (Non-NE Project)
Principal Investigator : S. Sengupta
Unit involved : Biochemistry
52. Name of the Project : HPV-infection and Cervical Cancer (NE Project)
Principal Investigator : C. Duttagupta
Unit involved : Biochemistry and Stat-Math
53. Name of the Project : Studies on Hepatoprotective Activity of Neem (*Azadirachta indica*) leaves
Project leader : R.R. Chattopadhyay
Unit involved : Biometry Research
54. Name of the Project : Mathematical Ecology and Epidemiology
Principal Investigator : J. Chattopadhyay
Unit involved : Embryology
55. Name of the Project : A Study of Optimality in the Allocation of Public Amenities across Villages in India
Principal Investigator : R. Somanathan and S. Athreya
Unit involved : Planning, Delhi
56. Name of the Project : Local Governance, Poverty and Local Forest Resources
Principal Investigator : S. Das
Unit involved : Planning, Delhi
57. Name of the Project : India's Environment
Principal Investigator : E. Somanathan
Unit involved : Planning, Delhi
58. Name of the Project : Commodity Futures Markets and price Stabilization
Principal Investigator : B. Ramaswami
Unit involved : Planning, Delhi
59. Name of the Project : Study of the Knowledge, Attitude and participation of Elected Panchayat members in Health and Family Welfare Programmes in West Bengal
Project leader : S. Barman
Unit involved : Population Studies
60. Name of the Project : Determination of Risk Factors associated with Maternal Morbidity : An In-depth Study in Calcutta Metropolitan Area
Project leader : P. De
Unit involved : Population Studies
61. Name of the Project : Health Care Practices and HIV/AIDS Awareness Level among Sex Workers – A Case Study in North 24 Parganas
Project leader: R. Deb Roy, S. Gupta and P. De
Unit involved : Population Studies
62. Name of the Project : Study of the results of H.S., CBSE and ICSE in West Bengal.
Project leaders : S. K. Mitra and R. Gupta.
Unit involved : Psychology Research
63. Name of the Project : Economic Reform and Rural Development : A Study of Agricultural Labour in Eastern India
Principal investigator : V.K. Ramachandran
Unit involved : Sociological Research

SEVENTY FIRST ANNUAL REPORT : 2002-2003

64. Name of the Project : The Burden of Child Labour : Assessing the Impact of work on Child Nutrition and Development.
Principal investigator : M. Swaminathan
Unit involved : Sociological Research
65. Name of the Project : Nationalism, Modernity and the Indian Statistical Institute
Principal investigator : U. Dasgupta
Unit involved : Sociological Research
66. Name of the Project : Patterns of social relations : an exploratory social network analysis in two villages in Jharkhand.
Principal investigator : A. Chaudhuri
Unit involved : Sociological Research
67. Name of the Project : Gender and Labour : a study of mica industries of Giridih
Principal investigator : M. Chattopadhyay
Unit involved : Sociological Research
68. Name of the Project : Agrarian change in Southern Tamil Nadu 1977-2000
Principal investigator : V.K.Ramachandran
Unit involved : Sociological Research
69. Name of the Project : The study of socio-economic impact of Total Literacy Campaign in a district of Tripura
Principal investigator : A. Dasgupta
Unit involved : Sociological Research

Completed Projects

1. Name of the Project : Social Mobility Index with Application in SC Populations in Districts in West Bengal
Project leader : A. Dewanji
Unit involved : Applied Statistics
2. Name of the Project : Risk Analysis of a long-Term Agreement
Project leader : D. SenGupta
Unit involved : Applied Statistics
3. Name of the Project : A study on Post Graduates in West Bengal
Project leader : D.K. Chaturvedi
Unit involved : Applied Statistics, Economic Research and Psychology Research
4. Name of the Project : Test Response Comparison for Embedded Cores/System-on-a-chip (SoC)
Principal investigator : B. B. Bhattacharya
Unit involved : Advanced Computing and Microelectronics
5. Name of the Project : Multi-Mesh Architecture Phase - II
Principal investigator : B. P. Sinha
Unit involved : Advanced Computing and Microelectronics
6. Name of the Project : Label Placement in Maps and Graphs
Principal investigator : S. Das
Unit involved : Advanced Computing and Microelectronics
7. Name of the Project : Floorplanning in Deep Submicron integrated Circuits
Principal investigator : S. Sur-Kolay
Unit involved : Advanced Computing and Microelectronics

INDIAN STATISTICAL INSTITUTE

8. Name of the Project : Document Analysis
Principal investigator : U. Pal
Unit involved : Computer Vision and Pattern Recognition
9. Name of the Project: Information Retrieval
Principal investigator : M. Mitra
Unit involved : Computer Vision and Pattern Recognition
10. Name of the Project: Methodology Development.
Principal investigator : B.B. Chaudhuri
Unit involved : Computer Vision and Pattern Recognition
11. Name of the Project : Study of Geometric Data Analysis Using artificial neural networks.
Principal investigator : S. Pal
Unit involved : Electronics and Communication Sciences
12. Name of the Project : Genetic Algorithms for Classification: Algorithms and Theories
Principal investigators : S. Bandyopadhyay, C. A. Murthy and S. K. Pal
Unit involved : Machine Intelligence
13. Name of the Project : Talchir sedimentation in the Satpura Basin, central India
Project coordinator : C. Chakraborty
Unit involved : Geological Studies
14. Name of the Project : Problems of Wave Propagation in Fluid
Principal investigator : B. N. Mandal
Unit involved : Physics and Applied Mathematics
15. Name of the Project : Influence of bed roughness in suspension grain size distributions
Principal investigator : B. S. Mazumder
Co - investigator : J. K. Ghosh
Unit involved : Physics and Applied Mathematics and Stat-Mat
16. Name of the Project : Health of mother and Child
Principal investigator : P. Bharati
Unit involved: Anthropology and Human genetics
17. Name of the Project : Chemical characterization & microbial, chemical and mechanical conversion of lignocellulosic plant wastes and soil enzyme biology.
Principal investigator : S. Chanda
Unit involved : Plant Chemistry
18. Name of the Project : Relationship between aquatic weed growth and water quality in ponds.
Principal investigator : A. Dewanji
Unit involved : Plant Chemistry
19. Name of the Project : Economic problems of illiteracy
Project leaders : M. R. Gupta and D. Mukherjee
Unit involved : Economic Research
20. Name of the Project : Fresh look at the agricultural price statistics
Project leader : S. Mitra
Unit involved : Economic Research Unit
21. Name of the Project : Methods in Quantitative Linguistics and Cognitive Science
Project leader : A. Choudhry
Unit involved : Linguistic Research

SEVENTY FIRST ANNUAL REPORT : 2002-2003

22. **Name of the Project :** Interference of L1 (Bangla) in the learning of L2 (English) An Item Response Theoretic Approach
Project leaders : A. Choudhry, S. Mitra and D. Bandyopadhyay
Unit involved : Linguistic Research and Psychology Research
23. **Name of the Project :** Conservation of Linguistic Ecology in the Indian Plurilingual Milieu
Project leader : D. Bandyopadhyay
Unit involved : Linguistic Research
24. **Name of the Project :** The Glottopolitics of Linguistic Subalternity (North East)
Project leader : D. Bandyopadhyay
Unit involved : Linguistic Research
25. **Name of the Project :** Democracy and Development
Principal investigators : R. Somanathan and J. Dreze
Unit involved : Planning, Delhi
26. **Name of the Project :** Power Sector Reforms : Learning from different State Initiatives
Principal investigator : A. Sarma
Unit involved : Planning, Delhi
27. **Name of the Project :** Undocumented migration from Bangladesh to West Bengal
Project leaders : P. Datta, S. Sadhu, B.N. Bhattacharya and P.K. Majumdar
Unit involved : Population Studies
28. **Name of the Project :** Health Problems in Kolkata Slums and means of its Financial management
Project leader : P. Pathak
Unit involved : Population Studies
29. **Name of the Project :** The Success and the Failure of the Indian Population Control Programme in the North-East
Project leader : P. Pathak
Unit involved : Population Studies
30. **Name of the Project :** Development of questionnaire for assessment of reading and writing motivation of Boys and Girls of Grades III & IV
Project leader : D. Dutta Roy
Unit involved : Psychology Research
31. **Name of the Project :** Entrepreneurial Behaviour and Individualism-Collectivism
Project leader : A. Ghosh
Unit involved : Psychology Research
32. **Name of the Project :** A study on Socio-Psychological Aspects of Mental Retardation
Project leader : S. N. Banerjee
Unit involved : Psychology Research
33. **Name of the Project :** Status of Application of Quantitative Techniques in Automobile Industries
Project Coordinator : B. Majumdar and S.S. Handa
Unit involved : Statistical Quality Control and Operations Research, Delhi

Externally Funded Projects

Ongoing Projects

1. **Name of the Project :** Banach algebra techniques and the geometry of Banach spaces.
Principal Investigators : TSSRK Rao, P. Bandyopadhyay, and K Jarosz of SIUE
Units involved : Stat-Math, Bangalore and Kolkata
Funded by : Department of Science & Technology (DST) and NSF.

INDIAN STATISTICAL INSTITUTE

2. Name of the Project : Studies in geometry of Banach spaces
Principal Investigators : TSSRK Rao, P. Bandyopadhyay, G. Godefroy and Daniel Li
Units involved : Stat-Math, Bangalore and Kolkata
Funded by : Indo-French Centre for the promotion of Advanced Research (IFCPAR)
3. Name of the Project : Developing Audit Sampling Tools II
Principal Investigators : T.J. Rao and A. Chaudhuri
Units involved : Stat-Math, Applied Statistics, Physics and Applied Mathematics and Psychology Research
Funded by : Govt. of West Bengal.
4. Name of the Project : Non-Commutative Markov Processes and Operator Spaces
Project Coordinators : K. B. Sinha, and S. Attal
Units involved : Stat-Math
Funded by : Indo-French Centre for the promotion of Advanced Research (IFCPAR).
5. Name of the Project : Spatial Stochastic processes and random minimal spanning trees
Principal Investigator : R. Roy
Unit involved : Stat-Math, Delhi
Funded by : Department of Science & Technology (DST)
6. Name of the Project : Software implementation of symmetric key block cipher system- a technology demonstrator
Principal Investigator : R. L. Karandikar
Unit involved : Stat-Math, Delhi
Funded by : WESEE Indian Navy
7. Name of the Project : Tensor product systems of Hilbert Modules
Principal investigator : B.V. Rajarama Bhat
Unit involved : Stat-Math, Bangalore
Funded by : Department of Science & Technology (DST), New Delhi
8. Name of the Project : Geometric Invariants for Quotients Modules
Principal investigator : G. Misra
Unit involved : Stat-Math, Bangalore
Funded by : Department of Science & Technology, New Delhi (DST) and NSF
9. Name of the Project : Cryptanalysis of complex LFSR based systems
Project leader : B. K. Roy
Unit involved : Applied Statistics
Funded by : Defense Research and Development Organisation (DRDO)
10. Name of the Project: Visual cryptographic schemes
Project leader : B. K. Roy
Unit involved : Applied Statistics
Funded by : Indian Space Research Organisation (ISRO)
11. Name of the Project : Design aid/tool for selecting & testing of connection polynomials
Project leader : B. K. Roy
Unit involved : Applied Statistics
Funded by: Centre for Artificial Intelligence & Robotics (CAIR)
12. Name of the Project: Steganographic Schemes for Satellite Images for ISRO
Project leader : S. Maitra
Unit involved : Applied Statistics
Funded by : Indian Space Research Organisation (ISRO)

SEVENTY FIRST ANNUAL REPORT : 2002-2003

13. Name of the Project: Development of an Indigenous Block Cipher Scheme for ISRO
Project leader : P. Sarkar
Unit involved : Applied Statistics
Funded by: Indian Space Research Organisation (ISRO)
14. Name of the Project : Study about the Steel Sector (Medium and Small Scale) Units of West Bengal
Principal Investigator : Ajay Adhikari
Unit involved : Applied Statistics and Economic Research
Funded By : The West Bengal Financial Corporation (WBFC)
15. Name of the Project : New Techniques of Fast Image Compression based on Human Vision Systems and Geometric Data Structures
Principal Investigators : B. B. Bhattacharya and M. K. Kundu
Co-Investigator : C. A. Murthy
Unit Involved : Advanced Computing & Microelectronics and Machine Intelligence
Funded by: Intel Corporation, USA
16. Name of the Project : Delay Fault Modeling and Test Generation for Power Supply Noise
Principal Investigator : S. Sur-Kolay
Co-Investigator : B. B. Bhattacharya
Unit Involved : Advanced Computing & Microelectronics
Funded by : Intel Corporation, USA
17. Name of the Project: Handwriting recognition for postal automation
Principal investigator: B. B. Chaudhuri
Unit involved : Computer Vision and Pattern Recognition
Funded by : Indo-French Centre for the promotion of Advance research (IFCPAR)
18. Name of the Project: Resource Centre for Indian Language Technology Solutions – Bengali.
Principal investigator : B. B. Chaudhuri
Unit involved : Computer Vision and Pattern Recognition
Funded by : Department of Information Technology, Govt. of India.
19. Name of the Project: Sharing Capability in Localisation and Human Language Technologies
Principal investigator : B. B. Chaudhuri
Unit involved : Computer Vision and Pattern Recognition
Funded by : ASI@IT&C of the European Commission (EC)
20. Name of the Project : Knowledge-based Connectionist Data Mining System: Design and Applications
Project coordinators : S. K. Pal and S. Mitra
Units involved : Machine Intelligence
Funded by:- Council for Industrial & Scientific Research (CSIR)
21. Name of the Project : Soft Computing for Medical Image Segmentation and Classification
Project coordinator : S. Bandyopadhyay
Unit involved : Machine Intelligence
Funded by - Indian National Science Academy (INSA)
22. Name of the Project : Web Mining
Project coordinator: S.K. Pal
Units involved : Machine Intelligence
Funded by : INSEAD, France
23. Name of the Project : Tectonic setting of alkaline intrusives: a case study for two such complexes around Rairakhol and Koraput in the Orissa sector of the Eastern Ghats belt
Project Coordinator : S. Bhattacharya
Unit involved : Geological Studies Unit
Funded by : Council of Scientific and Industrial Research (CSIR)

INDIAN STATISTICAL INSTITUTE

24. **Name of the Project :** Depositional Motifs of Satpura Gondwana Succession: their spatial and temporal variability in relation to Basin Tectonics
Principal Investigator : T. Chakraborty
Unit involved : Geological Studies Unit
Funded by : Department of Science and Technology (DST), Government of India.
25. **Name of the Project :** Turbulent and incipient suspensions due to bursting and their sedimentological implications: An experimental study
Principal Investigator : B. S. Mazumder
Co- Investigators : J. K. Ghosh and Chandan Chakraborty
Unit involved : Physics & Applied Mathematics, Stat-Math and Geological Studies
Funded by : Department of Science and Technology (DST), New Delhi
26. **Name of the Project :** Water Waves Scattering by Obstacles & Surface Discontinuities
Project leader : B. N. Mandal
Unit involved : Physics & Applied Mathematics
Funded by : Department of Atomic Energy, Govt. of India, Mumbai (National Board for Higher Mathematics)
27. **Name of the Project :** Pattern-forming Instabilities & Interface Waves
Project leader : K. Kumar
Unit involved : Physics & Applied Mathematics
Funded by : Department of Science & Technology, New Delhi
28. **Name of the Project :** Large Amplitude Ion Acoustic Double Layers in Multispecies Relativistic Plasma
Project leader : R. K. Roychoudhury
Unit involved : Physics & Applied Mathematics
Funded by : Council of Scientific & Industrial Research (CSIR), New Delhi
29. **Name of the Project :** Algebraic Analysis of some Exactly Solvable Quantum Models
Project leader : P. Parashar
Unit involved : Physics & Applied Mathematics
Funded by : Department of Science & Technology, New Delhi
30. **Name of the Project :** Researchable constraints to the use of forest and tree resources by poor urban and peri-urban households in developing countries
Principal Investigator : D.K. Bagchi
Units involved : Agricultural Science and Anthropology & Human Genetics
Funded by the : Department of Foreign International Development (DFID)
31. **Name of the Project :** Rice based cropping system studies in rainfed regions of eastern Indian plateau
Principal Investigator : D.K. Bagchi
Unit involved : Agricultural Science
Funded by : The International Rice Research Institute (IRRI), Manila
32. **Name of the Project :** Work on Abiotic and Biotic Stress response in Jute Plant
Principal investigator : A. Goswami
Unit involved : Agricultural Science
Funded by : Indian Council of Agricultural Research, Govt. of India.
33. **Name of the Project :** Genetic predisposition to anti-tubercular drug-induced hepatotoxicity
Principal investigator : B. Roy
Unit involved : Anthropology and Human Genetics
Funded by : Indian Council of Medical Research

SEVENTY FIRST ANNUAL REPORT : 2002-2003

34. Name of the Project : Human Genomic Diversity and Continuity from West Asia to India
Principal Investigator : P. P. Majumdar
Unit involved : Anthropology and Human Genetics
Funded by : Department of Biotechnology, Govt. of India
35. Name of the Project : A genetic study of the Totos and Bhuaias
Principal Investigator : P. P. Majumdar
Unit involved : Anthropology and Human Genetics
Funded by : Indian Council of Medical Research
36. Name of the Project : Genome Diversity Interlink Project
Principal Investigator : P. P. Majumdar
Unit involved : Anthropology and Human Genetics
Funded by : Department of Biotechnology
37. Name of the project : Single Nucleotide Polymorphisms Project
Principal investigator : P. P. Majumdar
Unit involved : Anthropology and Human Genetics
Funded by : Department of Biotechnology
38. Name of the Project : Uterine Cervical Cancer Prevention: A low cost screening program
Principal Investigator : C. Duttagupta
Units involved: Biochemistry, Stat-Math and Sociological Research
Funded by : West Bengal DST
39. Name of the Project : Feasibility of screening for cervical cancer among Maria Gond tribal women
Principal Investigator : C. Duttagupta
Units involved : Biochemistry, and Stat-Math
Funded by : Indian Council of Medical Research
40. Name of the Project : Environmental Management Capacity Building Assistance Project :
Environmental Economics Component
Principal Investigator : D. Coondoo
Unit involved : Economic Research
Funded by : World Bank
41. Name of the Project : Solid Waste Management in Baranagar Municipal Area
Principal Investigator : S. Chakrabarti
Unit involved : Economic Research
Funded by : World Bank
42. Name of the Project : External Evaluation of Total Literacy Campaign (TLC) in Kamrup District of Assam
Principal Investigator : P.K. Majumdar
Unit involved : Population Studies
Funded by : Zila Saksharata Samity, Kamrup, Assam/Dept. of Adult Education, National Literacy Mission, Ministry of HRD, Govt. of India
43. Name of the Project : Empirical study on the labour-related problems of tea gardens in West Bengal
Project Coordinator : A. Dasgupta
Unit involved : Sociological Research
Funded by : Labour Department, Govt. of West Bengal
44. Name of the Project : Study on Status of Women in West Bengal
Project Coordinators : A. Dasgupta and S. Bandyopadhyay
Unit involved : Sociological Research
Funded by : State Women's Commission, Govt. of West Bengal

INDIAN STATISTICAL INSTITUTE

45. Name of the Project : Proficiency Testing Programme on Egg Powder Testing
Project coordinators : S.R. Moban, S.K. Neogy and A. Seth
Unit involved : Statistical Quality Control and Operations Research, Delhi
Funded by : NABL, Department of Science and Technology, Govt. of India
46. Name of the Project : Minimization of heat rate in power generation
Project coordinator : B. Majumdar
Unit involved : Statistical Quality Control and Operations Research, Delhi
Funded by : NTPC, Dadri
47. Name of the Project : Statistical Applications
Project Coordinators : S. Pal, A.K. Biswas and D.K. Manna
Unit involved : Statistical Quality Control and Operations Research, Chennai
Funded by : Sterlite Industries Ltd.
48. Name of the Project : Bought Leaf Operations
Project coordinator : D.K. Mazna
Unit involved : Statistical Quality Control and Operations Research, Chennai
Funded by : Parry Agro Industries Ltd.

Completed Projects

1. Name of the Project : Estimation of Denomination wise Age of Currency Notes in Circulation for Reserve Bank of India
Project leader : A. K. Adhikari and P. Chaudhuri
Units involved : Applied Statistics and Stat-Math
Funded by : Reserve Bank of India
2. Name of the Project : A Study of Health and Nutritional Status in Relation to some biosocial functions among the Kora and Mahali Tribes of West Bengal
Principal Investigator : R. Gupta
Unit involved : Anthropology and human Genetics
Funded by : Indian Council of Medical Research
3. Name of the Project : Glutathione S-transferase (GSTM1 and GSTT1) null mutations and incidences of tobacco related oral cavity precancer and cancer in India
Principal Investigator : B. Roy
Unit involved : Anthropology and Human Genetics
Funded by : Department of Science and Technology
4. Name of the Project : Health Sector Reforms : An Evaluation of Impact Upon Patterns of Utilisation among Vulnerable groups in three Indian States (1997-2000)
Project Coordinators : S. Guha Roy and B.N. Bhattacharya
Unit involved : Population Studies
Funded by : European Commission
5. Name of the Project : State Development Report
Project coordinators : V.K. Ramachandran and M. Swaminathan
Unit involved : Sociological Research
Funded by : Planning Commission, Govt. of India, New Delhi
6. Name of the Project : Physical Verification of Food grain in FCI Godowns
Project Leaders : B. Majumdar and S.S. Handa
Unit involved : Statistical Quality Control and Operations Research, Delhi
Funded by : Food Corporation of India

SEVENTY FIRST ANNUAL REPORT : 2002-2003

7. **Name of the Project :** Development of Genetic Algorithm for path optimization in PCB manufacturing
Project coordinators : S.R. Mohan, S.K. Neogy and A. Seth
Unit involved : Statistical Quality Control and Operations Research, Delhi
Funded by : R Systems International Limited, Noida

8. **Name of the Project :** Implementation of Statistical Process Control
Project coordinators : V.V. Iyer and S. Pal
Unit involved : Statistical Quality Control and Operations Research, Chennai
Funded by : Unimech Industries Ltd.

9. **Name of the Project :** Quality Improvement Projects
Project coordinators : D. Sampangi Raman and D.K. Manna
Unit involved : Statistical Quality Control and Operations Research, Chennai
Funded by : Rane (Madras) Ltd.

10. **Name of the Project :** Implementation of Statistical Process Control
Project coordinators : A.K. Biswas
Unit involved : Statistical Quality Control and Operations Research, Chennai
Funded by : Jaihind Engineering

11. **Name of the Project :** Application of Statistical Methods
Project Leaders : A.K. Biswas and D.K. Manna
Unit involved : Statistical Quality Control and Operations Research, Chennai
Funded by : General Optics (Asia) Ltd.

12. **Name of the Project :** Computer Software Support and Training on Multiple Regression Analysis
Project Leader : S. Pal
Unit involved : Statistical Quality Control and Operations Research, Chennai
Funded by : TAFE Ltd.

5. SYMPOSIA, CONFERENCES, WORKSHOPS, LECTURES AND SEMINARS ORGANISED

Symposia and Conferences

Symposium on "Mathematical Programming, Game Theory and related Topics" was organised by SQC & OR Unit, Delhi in association with Stat-Math Unit during December 13-14, 2002.

"R.C. Bose Centenary Symposium on Discrete mathematics and Applications" was organised by Stat-Math Unit and Applied Statistics Unit, Kolkata during December 20-23, 2002 at ISI, Kolkata.

Conference on "Models and Methods in Economics" was organised by Economic Research Unit, Kolkata during March 5-7, 2003 at ISI, Kolkata.

Conference on "Effects of undocumented migration from Bangladesh to West Bengal" was organised by Population Studies Unit, Kolkata on January 10, 2003 at ISI, Kolkata.

Workshops and Training Programmes

Workshop on "Experimental Designs – Theory and Application" was organized by Stat-Math Unit, Kolkata during November 25-29, 2002 at ISI, Kolkata.

Workshop for *North-East Region* on "Sample Surveys Methodology Algorithm" was organized by Stat-Math Unit, Kolkata during October 26-31, 2002 at Manipur University, Imphal.

"R. C. Bose Centenary Workshop on Discrete Mathematics and Applications" was organized by Stat-Math Unit and Applied Statistics Unit, Kolkata during December 15 – 19, 2002 at ISI, Kolkata.

International Bayesian Workshop was organized by Stat-Math Unit, Kolkata during January 6-8, 2003 at ISI, Kolkata.

Nurture Programme for the 1998 Indian National Mathematical Olympiad (INMO) batch was organized by Stat-Math Unit, Bangalore in June 2002 at Bangalore.

Instructional Workshop and International Conference on "Geometric Group Theory" was organized by Stat-Math Unit, Bangalore and Indian Institute of Technology, Guwahati during December 2-21, 2002 at Indian Institute of Technology, Guwahati.

Workshop on "Free Probability and Applications" was organized by Stat-Math Unit, Bangalore during February 3-14, 2003 at Bangalore.

North East Training Programme was organized by Applied Statistics Unit, Kolkata during 2nd and 20th September, 2002 at Applied Statistics Unit, Kolkata.

Workshop on "e-Systems in Statistical Presentations" was organized by Applied Statistics Unit, Kolkata during February 11-15, 2003 at State Council of Educational Research and Training, Aizawl.

A school on "Elementary Statistics and Computer Applications" was organized by Applied Statistics Unit, Kolkata during March 24-29, 2003 at State Institute of Panchayat and Rural Development, Kalyani.

A short course for the North-East on "Pattern Recognition : Algorithms, Architectures and Applications" was organized by Advanced Computing & Microelectronics Unit, Computer Vision & Pattern Recognition Unit, Electronics & Communication Sciences Unit and Machine Intelligence Unit during January 13-17, 2003 at ISI, Kolkata.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

Workshop on "Indian Language Spell-Checker Design" was organised by Computer Vision and Pattern Recognition Unit, Kolkata during July 18-19, 2002 at ISI, Kolkata.

International Workshop on "Technology Development on Indian Language" was organised by Computer Vision and Pattern Recognition Unit, Kolkata during March 24-26, 2003 at ISI, Kolkata.

CIMPA-UNESCO-INDIA School on "Soft Computing Approach to Pattern Recognition and Image Processing" was organised by Machine Intelligence Unit, Kolkata during December 2-13, 2002 at ISI, Kolkata.

Workshop on "Quantitative Analysis of North East Indian Economy" was organised by Economic Research Unit, Kolkata during February 24-March 01, 2003 at Gauhati University, Guwahati.

"Six Sigma Black Belt Training Programme" was organised by SQC & OR Unit, Hyderabad during June -October, 2002 at ISI, Hyderabad.

A Winter School on "Design of Experiments and Taguchi Methods" was organised by SQC & OR Unit, Delhi during December 9-27, 2002.

A four week Workshop on "Recent Advances in Operations Research" was organised by SQC & OR Unit, Delhi during January 20, 2003 to February 14, 2003.

A two day workshop was organised to assess the perception of the industry regarding role and need of SDP and QMP programs of SQC & OR Division during March 13 and 14, 2003.

Lectures and Seminars

P. C. Mahalanobis Memorial Lectures

On the occasion of the Golden Jubilee of the Indian Statistical Institute, it was decided to institute P. C. Mahalanobis Memorial Lecture Series to be delivered once in two years. Till now there were ten series of lectures delivered by eminent statisticians as given below. From the current year, it has been decided to have the lecture series every year. The lectures are delivered at the Kolkata, Bangalore and Delhi Centres of the Institute.

<u>Series no.</u>	<u>Year</u>	<u>Lectures delivered by</u>
1.	1983	Professor S. Karlin, Stanford University
2.	1985	Professor T. W. Anderson, Stanford University
3.	1988	Sir David Cox, Imperial College of Science & Technology, UK
4.	1992	Professor Peter G. Hall, Australian National University
5.	1995	Professor A. P. Dawid, University College, London
6.	1997	Professor J. Berger, Duke University
7.	1999	Professor C.F.J. Wu, University of Michigan
8.	2000	Professor Ildar Ibragimov, The Russian Academy of Sciences
9.	2001	Professor Peter Mc Cullagh, University of Chicago.

During the year under review, Professor Keith J. Worsley, Department of Mathematics and Statistics, McGill University, Montreal, Canada, delivered the P.C. Mahalanobis Memorial Lectures on the following topics :

- The geometry of random image in astrophysics and brain mapping.
- Detecting changes in brain shape, scale and connectivity via the geometry of random fields.
- Recent advances in random field theory
- The statistical analysis of fMRI data.

INDIAN STATISTICAL INSTITUTE

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

Theoretical Statistics and Mathematics Division

Stat-Math Unit, Kolkata

- Abhyankar, S, Shreeram, Purdue University, U.S.A. (7.12.2002): A survey of affine geometry.
- Abhyankar, S, Shreeram, Purdue University, U.S.A. (9.12.2002): Jacobian problem.
- Abhyankar, S, Shreeram, Purdue University, U.S.A. (10.12.2002 and 11.12.2002): Affine Geometry – II and III.
- Abhyankar, S, Shreeram, Purdue University, U.S.A. (12.12.2002): Resolution of singularities in algebraic geometry: History, ancient and new results.
- Abhyankar, S, Shreeram, Purdue University, U.S.A. (13.12.2002): Constructive Galois Theory: Nice Equations for nice Groups.
- Averous Jean, Paul Sabatier University, France (10.02.2003): Quantile functions and spread for multivariate distributions.
- Banerjee, Moulinath, University of Michigan (17.6.2002): Monotone functions: nonstandard limit theory for the likelihood ratio statistic.
- Basak, K. Gopal, Bristol University, U.K. (23.09.2002): Asymptotic properties of estimates of coefficients of nonstationary processes.
- Bhattacharyya, Tirthankar, IISc, Bangalore (12.11.2002): Dilation of contractive tuples.
- Bhattacharjee, M. C., New Jersey Institute of Technology, U.S.A. (30.12.2002): The fine structure of the time to extension in branching processes.
- Babu, G. J., The Pennsylvania State University, U.S.A. (03.01.2003): Goodness-of-fit tests when parameters are estimated.
- Balslev, Erik, University of Aarhus, Denmark (02.01.2003): Perturbation of Laplacians on Riemann surfaces.
- Biswas, Indranil, School of Mathematics, TIFR (09.09.2002): Principal bundles with flat connection on a Riemann surface.
- Chatterjee, Snigdhasu, University Minnesota (30.09.2002): Parametric bootstrap confidence interval in small area estimation problems.
- Chakraborty, Biman, National University of Singapore (19.12.2002): On a measure of multivariate scatter.
- Pensky, Marianna, University College, London (11.11.2002): Some characterization of null sets in Banach spaces.
- Datta, B, IISc, Bangalore (13.6.2002): Hundred years of triangulations.
- Datta, B, IISc, Bangalore (15.6.2002): Equivelar polyhedral 2-manifolds with few vertices.
- Datta, Mahuyn, Calcutta University (05.11.2002): Isometric C^1 – immersions for pairs of Riemannian Metric.
- DeBlasi, S. Francesco, University of Rome II (18.12.2002): Baire category theorems and Michael type selection theorems.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Deshouillers, Jean-Marc, University of Bordeaux, France (14.02.2003): Some connections between probability and number theory.
- Ganguli, Bhaswati, IIM, Calcutta (07.10.2002): Feature significance in geostatistics.
- Ji Un Cig, Chungbuk National University, South Korea (29.01.2003): Quantum martingale representation with explicit integrands.
- Kayal, Neeraj, I.I.T., Kanpur (19.12.2002): Polynomial time algorithm for primality testing.
- Keskar, P.H., Birla Institute of Science & Technology, Pilani (09.12.2002): Linear Groups as arithmetic Galois groups.
- Koranyi, Adam, Lehman College, City University of New York, U.S.A. (09.01.2003): Liouville - type - theorems in parabolic geometries.
- Kundu, Sukhamay, Louisiana State University, U.S.A. (14.01.2003): Computer converter placement in an optimal tree network.
- Kundu, Sukhamay, Louisiana State University, U.S.A. (16.01.2003): Finite-state Modeling in Software Design.
- Lahiri, S.N., Iowa State University (08.08.2002): Optimal block sizes for a spatial subsampling method.
- Loh, Wei-Liem, National University of Singapore (15.04.2002): Estimating structured correlation matrices in smooth gaussian random field models.
- Loday, Jean-Louis, CNRS, Strasbourg, France (28.01.2003): Types of algebras and operads.
- Loday, Jean-Louis, CNRS, Strasbourg, France (30.01.2003): Breaking associativity and Hopf algebras.
- Mohari, Anilesh, S. N. Bose National Centre for Basic Sciences, Kolkata (03.03.03): Time-reversible criteria for strong mixing.
- Munshi, Ritabrata, Princeton University (08.08.2002): Langland's programme- an introduction.
- Olsen, Lena Ringstad, University of Tromsøe, Norway (25.02.2003): Detecting short and long range non-stationarities in time series.
- Pal, Debashis, Stanford University, U.S.A. (25.09.2002): An overview of linear inverse problems and an interesting result on the difficulty of blind deconvolution.
- Pati, T., Institute of Mathematics & Applications, Bhubaneswar (07.10.2002) : Tauberian theorems.
- Paurat, Ian, Institut Fourier, Grenoble, France (24.01.2003): Approximations of quantum stochastic calculus by the toy Fock Space.
- Ramakrishnan, S, University of Miami (01.08.2002): Discrete-Time cyclic queueing networks with several types of nodes.
- Ramakrishnan, S, University of Miami (12.08.2002): Probabilities, integrals and expectations.
- Sankaran, P, IMSc, Chennai (6.5.2002): Cohomology of toric bundles.
- Sankaran, P, IMSc, Chennai (8.5.2002): A coincidence theorem for holomorphic maps to GP .
- Srinivas, V, TIFR, Mumbai (15.04.2002): Modules of finite length and finite projective dimension, and algebraic K -theory.

INDIAN STATISTICAL INSTITUTE

- Sen, Siddhartha, Trinity College, Dublin (26.02.2003): Morse Theory and symmetry breaking.
- Thangadurai, R., Visiting Scientist, ISI, Kolkata (22.04.2002): Zero-Sum Problems.
- Worsley, Keith J, McGill University, Canada (17.03.2003) : P.C. Mahalanobis memorial lecture series on The geometry of random image in astrophysics and brain mapping.
- Worsley, Keith J, McGill University, Canada (19.03.2003) : Detecting changes in brain shape scale and connectivity via the geometry of random fields.
- Worsley, Keith J, McGill University, Canada (20.03.2003) : Recent advances in random field theory.
- Worsley, Keith J, McGill University, Canada (21.03.2003) : The Statistical analysis of fMRI data.
- Stat-Math Uniü, Delhi*
- Borkar V., TIFR, Mumbai (17.03.2003) : Pseudo-stom construction in stochastic control.
- Borkar V., TIFR, Mumbai (20.03.2003) : Adaptive importance sampling using stochastic Approximation.
- Deshouillers Jean-Marc, Université Victor, Segalen Bordeaux 2 (18.02.2003) : Some connections between probability and number theory.
- Dharmadhikari A. D., Univ. of Pune, (23.10.2002) : Planning of an experiment to improve the reliability.
- Dharmadhikari A. D., Univ. of Pune, (24.10.2002) : An algorithm for the estimation of minimal path sets from the field data.
- Dhar Deepak, TIFR, Mumbai (11.11.2002 and 12.11.2002) : Sandpiles and related models of self-organised criticality – I and II.
- Dhar Deepak, TIFR, Mumbai (14.11.2002 and 15.11.2002) : Sandpiles and related models of self-organised criticality – III and IV.
- Dhar Deepak, TIFR, Mumbai (13.11.2002) : Modelling complex systems with sandpiles.
- Dubey P., SUNY Stony Brook (25.9.2002) : Strategic substitutes and potential games.
- Gore A. P., University of Poona (25.7. 2002) : Measurement of biodiversity.
- Keller Gerhard, University of Erlangen (19.02.2003) : Spectral perturbation theory for hyperbolic dynamical systems.
- Khaledi B., Razi University, Iran (3.04.2002) : Multivariate hazard rate orders.
- Koranyi Adam, City University of New York (3.01.2003) : Liouville-type theorems in parabolic geometries.
- Kuku Aderemi O., ICTP, Italy (21.10.2002) : Non-commutative Chern characters of Lie group C^* -algebras and quantum groups.
- Laskar Renu, Clemson University (3.06.2002) : Results on chordal graphs.
- Mohari Anillesh, S. N. Bose National Centre for Basic Sciences, Kolkata (12.09.2002) : Ergodicity of homogenous Brownian flows.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Mukerjee Rahul, IIM, Kolkata (8.01.2003) : On expected lengths of predictive intervals.
- Mukerjee Rahul, IIM, Kolkata (9.01.2003) : Optimal selection of augmented pairs designs for response surface modeling.
- Nanda V. C., Punjab University (1.04.2002) : A fresh look at elementary matrix theory.
- Neeraj Kayal, IIT, Kanpur (4.12.2002) : A tutorial on computational complexity.
- Palis Jacob, IMPA, Brazil (18.10.2002) : A global view of dissipative dynamics.
- Ramanan Kavita, Carnegie Mellon University (5.02.2003) : On reflected diffusion approximations of stochastic networks.
- Saxena Nitin, IIT, Kanpur (4.12.2002) : Polynomial-time primality testing.
- Singh Dinesh, Delhi University (14.08.2002) : The maximality theorem of Werner.
- Swart Jan, University of Erlangen (12.03.2003) : The trimmed tree of a super-Wright-Fisher diffusion.
- Thorisson Hermann, Science Institute, University of Iceland (27.12.2002) : Coupling.
- Venkatraman Geeta, St. Stephen's College, Delhi (9.10.2002) : Enumerating finite groups : a brief survey.
- Worsley Keith J., McGill University, Canada (27.03.2003) : The statistical analysis of fMRI data.
- Worsley Keith J., McGill University, Canada (28.03.2003) : The geometry of random image in astrophysics and brain mapping.
- Stat-Math Unit, Bangalore*
- Adhikari, S.D., Harish-Chandra Research Institute, Allahabad (03.04.2002) : Transcendence of infinite sums and related questions.
- Aravinda, C.S., Chennai Mathematical Institute (13.09.2002) : Exotic structures on locally symmetric spaces versus rigidity.
- Aravinda, C.S., Chennai Mathematical Institute (31.03.2003) : Topological rigidity of non-positively curved manifolds.
- Athreya, J., University of Chicago (31.07.2002) : Unique Ergodicity of interval exchange maps.
- Athreya, K.B., Cornell University and Iowa State University (08.01.2003) : Invariant measures for Random maps on \mathbb{R}_+ .
- Athreya, K.B., Iowa State University & Cornell University (30.05.2002) : Stationary measures for Markov chains in Economics and Ecology.
- Babri, Abbas, Rutgers University (13.01.2003) : Recent progress's in conformal Geometry.
- Bhattacharyya, Tirthankar, Indian Institute of Science, Bangalore (27.03.2003) : Dilation of contractive tuples.
- Cowling, M., University of New South Wales, Australia (23 & 24.12.2002) : Fourier Multiplier Theorems on Lie groups.
- Daniel, Benoit, Ecole Normale Supérieure, Paris (16.08.2002) : Bryant Surfaces.

INDIAN STATISTICAL INSTITUTE

- Gastesi, Pablo Ares, Tata Institute of Fundamental Research, Mumbai (30.01.2003) : Teichmüller space of holomorphic.
- Giacomoni, Jacques, Ceremath, Toulouse (16.12.2002) : Bifurcation problems for indefinite elliptic equations in unbounded domains.
- Gore, A.P., University of Pune (19.02.2003) : Modelling the number of seeds in a pod.
- Gouezel, Sébastien, Ecole Normale Supérieure, Paris (16.08.2002) : Statistical properties of deterministic maps.
- Jarosz, Krzysztof, Southern Illinois University (24 & 30.01.2003) : Small perturbations of Banach Algebras and almost multiplicative functionals, Isomorphisms of function modules and generalized approximation in modulus.
- Koranyi, A., City University of New York, USA (23.01.2003) : Liouville-type theorems in parabolic geometries.
- Krishna, M.B., Freelance Ecologist, Bangalore (22.05.2002) : Estimating animal abundance with special reference to the line transect method – An appraisal of field problems and options.
- Krishnapur, Manjunath, University of California, Berkeley (27.12.2002) : Spanning forests : an overview.
- Narayanan, E.K., Harish-Chandra Research Institute, Allahabad (09.10.2002) : Injectivity of convolution operators on L^p spaces.
- Nayak, Suresh, Chennai Mathematical Institute, (14.11.2002) : Grothendieck Duality.
- Nayak, Suresh, Chennai Mathematical Institute, (15.11.2002) : Grothendieck Duality – Part II.
- Nisure, Nitin, Tata Institute of Fundamental Research (08.05.2002) : Representability of GL_n .
- Pradeep, C.R., Indian Institute of Science, Bangalore (20.02.2003) : Gorenstein surfaces dominated by \mathbb{P}^2 .
- Radha, R., Anna University, Chennai (09.01.2003) : Finite dimensional approximations of a tridiagonal operator equation.
- Raghunathan, M. S., Tata Institute of Fundamental Research, Mumbai (06.02.2003) : Three theorems of Euler.
- Ramamorthi, R.V., Michigan State University (15.11.2002) : Nonparametric Bayesian Analysis of censored data.
- Saradha, N., Tata Institute of Fundamental Research, Mumbai (25 & 26. 03. 2003) : Perfect powers in arithmetic progression – I and II.
- Schroer, Stefan, Ruhr-Universität, Germany (12.09.2002) : Existence of vector bundles and global resolutions on singular surfaces.
- Sengupta, J., Tata Institute of Fundamental Research, Mumbai (26.12.2002) : Spectral analysis on Riemannian symmetric spaces.
- Shukla, R.P., University of Allahabad (04.07.2002) : The Steinberg representation.
- Sundar Rajan, B., Indian Institute of Science, Bangalore (20.03.2003) : Mathematics in Wireless communication.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Sunder, V.S., Institute of Mathematical Sciences, Chennai (11.10.2002) : The Reisz representation theorem revisited.
- Thakur, Maneesh, Harish-Chandra Research Institute, Allahabad (27.06.2002) : Triality and G_2
- Veni Madhavan, C.E., Indian Institute of Science, Bangalore (24.05.2002) : Complexity of Cryptographic Computations.
- Verma, J.K., Indian Institute of Technology, Mumbai (02.04.2002) : Rings of invariants of finite subgroups of the general linear group.
- Wilkinson, Leland, Northwestern University (04.02.2003) : Galton's bend: An undiscovered nonlinearity in Galton's 1886 family stature regression data and a probable explanation based on Pearson's 1903 stature data.
- Worsley, Keith J., McGill University, Canada (24 & 25.03.2003) : The geometry of random image in astrophysics and brain mapping. Detecting changes in brain shape, scale and connectivity via the geometry of random fields.

Applied Statistics Division

Applied Statistics Unit

- Averous, Jean, Laboratory of Statistics & Probability Paul Sabatier University, Toulouse, France (11.02.2003) : SI, LTD and RTI orderings applied to bivariate vectors of order statistics or censored and non censored life distributions.
- Banerjee, Moulinath, University of Michigan, USA (18.06.2002) : Likelihood Ratio Inference for Current Status Data and Related Models Involving Non-parametric Estimation of a Monotone Function.
- Basak, Gopal K., University of Bristol, U.K. (27.08.2002) : Stochastic Approximations and Applications.
- Beran, Jan, University of Konstanz, Germany (23.04.2002) : SEMIFAR Models.
- Bouza, Carlos N., University of Havana, (02.07.2002) : Some Non-response Problems and Ranked Set Sampling.
- Chakraborty, Soubhik, T.M. Bhagalpur University (20.11.2002) : On the Statistical Least Upper Bound of Time Complexity of Algorithms.
- Chaudhuri, Gopal, Indian Institute of Management, Ahmedabad (26.07.2002) : A New Approach to System Reliability.
- Loh, Wei-Liem, National University of Singapore (18.04.2002) : On the Asymptotic Distribution of Scrambled Net Quadrature.
- Nanda, Asok, Indian Institute of Technology (11.07.2002) : Estimation of Age Replacement Policies.
- Roy Choudhury, Kingshuk, UCC, Cork, Ireland (10.12.2002) : Regularity of Wave patterns.
- Ugwuowo, Fidelis I., University of Nigeria (02.05.2002) : Semi-Markov Modeling Using a Parametric Approach with Applications.

Computer and Communication Sciences Division

Advanced Computing and Microelectronics Unit

- Basu, S.K., Banaras Hindu University (30.05.2002) : Computer Modeling of Ecosystem.
- Dhar, Subhankar, San Jose State University, USA (03.01.2003) : Routing in Ad Hoc Networks

INDIAN STATISTICAL INSTITUTE

- Laskar, Renu, Clemson University, U.S.A (20.05.2002) : Channel Assignment Problem and Graph Colouring.
- Maodal, Mrinal, University of Alberta, Canada (27.12.2002) : Robust Transmission of JPEG2000 Images over Noisy Channels.
- Mitra, Tulika, National University of Singapore (04.07.2002) : Timing Analysis of Embedded Software for Speculative Processors.
- Mitra, Subhashis, Intel Corporation, U.S.A & Stanford University (06.08.2002) : 2002 Test Odyssey How to test the Monster.
- Roychoudhury, Abhik, National University of Singapore (04.07.2002) : Specifying Multithreaded Java Semantics for Program Verification.
- Sen, Malay Kumar, North Bengal University (05.11.2002) : Homogeneously Representable Interval Bigraph
- Trivedi, Kishore K., Duke University, USA (16.01.2003) : Performability Analysis of Wireless Cellular Networks.

Computer Vision and Pattern Recognition Unit

- Neogi, Anil, University of Hyderabad (14.05.2002) : Investigations in Cursive Script Segmentation.
- Seagupta, Probal, Alumnus Software, Kolkata (29.10.2002) : Cellular Communication Fundamentals.

Electronics and Communication Sciences Unit

- Deshpande, Ashok W., University of California, Berkeley, USA (28.03.2003) : Fuzzy Logic Application to River Water Quality Classification : Case Study.
- Dutta, Kaushik, Georgia Institute of Technology, USA (30.04.2002) : Proxy-Based acceleration of Dynamically Generated Content on the World Wide Web : An Approach and Implementation.
- Mukhopadhyay, Supratik, University of Pennsylvania, USA (01.01.2003) : Dynamic Message Sequence Charts.
- Usui, Shiro, Lab. for Neuroinformatics RIKEN BSI, Japan (27.02.2003) : VISIOME Platform : Neuroinformatics in Vision Science.

Machine Intelligence Unit

- Kittler, Josef, University of Surrey, UK (03.12.2002) : Multiple Classifier Fusion.
- Mitra, Debasish, Florida Institute of Technology, USA (07.07.2002) : Quantitative Reasoning with Arbitrary Angular Directions.
- Pedrycz, Witold, University of Alberta, Canada (02.12.2002) : Unsupervised and Supervised Learning in Pattern Recognition : A Computational Intelligence Perspective.
- Zurada, Jacek, University of Louisville, USA (10.12.2002) : How to Write Technical Papers.

Physics and Earth Sciences Division

Physics and Applied Mathematics Unit

- Daripa Prabir, Texas A & M University, College Station, USA (31.12.2002) : Modern Trends in Modeling Porous Media Flows.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Das, S.K., Central Water & Power Research Station, Pune (26.07.2002) : Mathematical Modelling of Salinity intrusion, Chilika Lake.
- Hazra, Subhendu Bikash, University of Trier, Germany (12.09.2002) : Parameter Identification in Non-isothermal Multiphase Multicomponent Flow through Porous Media.
- Hwang, Chii-Ruey, Academia Sinica, Taipei (19.12.2002) : Monte-Carlo Markov Processes.

Biological Sciences Division

Biochemistry Unit

- Basu, J., Albert Einstein Coll. Med., NY, USA (21.06.2002) : Lipooxygenase in Ovulation.
- Das Sarma, J., University of Pennsylvania. School of Medicine (03.04.2002) : Connexin Assembly and Trafficking : Insight from Dominant Negatives.

Social Sciences Division

Economic Research Unit

- Banerjee, Anurag N., University of Southampton, U.K (04.04.2002) : On the "Hirshleifer Effect" of Unscheduled Monetary Policy Announcements.
- Basak, Gopal K., University of Bristol, U.K. (19.09.2002) : A Direct Test for Mean - Variance Efficiency of a Portfolio.
- Bera, Anil, University of Illinois at Urbana Champaign, USA (04.07.2002) : Adjustments of Rao's Score Test for Distributional and Local Parametric Misspecifications.
- Bhaduri, Saumitra, GE Capital International Services (11.07.2002) : Determinants of Capital Structure : A Study of the Indian Corporate Sector.
- Bhargava, Aloke, University of Houston, USA (03.01.2003) : Modeling the Effects of Health on Economic Growth.
- Bhaumik, Suman, Centre for New and Emerging Markets, London Business School, U.K.(28.11.2002) : Does Concentration of Ownership Alleviate Agency Problems? Some Evidence from the Market for Corporate Control in India.
- Chatterjee, Kalyan, The Pennsylvania State University, USA (08.08.2002) : Technology Diffusion by Learning from Neighbours.
- Dasgupta, Indraneel, University of Nottingham, U.K. (22.08.2002) : How Workers Get Poor because Capitalists Get Rich: Community and the Class Basis of Income Distribution.
- Folmer, Henk, Wageningen University, The Netherlands (30.01.2003) : Environmental Regulations and New Plant Location Decisions: Evidence from a Meta Analysis.
- Ghatak, Maitreesh, University of Chicago, USA (26.07.2002) : Inequality, Market Imperfections, and the Voluntary Provision of Collective goods.
- Ghosh, Jayati, Centre for Economic Studies and Planning, Jawaharlal Nehru University, Delhi (27.03.2003) : Macroeconomic reforms and a labour policy framework for India.

INDIAN STATISTICAL INSTITUTE

- Ghosh, M.K., Centre of Mining Environment, Indian School of Mines, Dhanbad. (25.07.2002) : Assessment of Socio-Economic and Environmental Impact of Coal Washery Project.
- Ghosh, Saswati, Calcutta University, Kolkata (23.05.2002) : Differential Outcome of Economic and Cultural Factors on IMRs and USMRs for the SCs and STs: A disaggregation by gender and residence.
- Kumbhakar, Subal, State University of New York, Binghamton, USA (16.12.2002) : The Econometric Issues on Efficiency and Productivity Measurement.
- Lahiri, Kajal, State University of New York, Albany, USA (16.01.2003) : An Analysis of GDP Forecasts and Propagation of Shocks.
- Mallick, Indrajit, Centre for Studies in Social Sciences, Kolkata (9.05.2002) : Firm Capital Structure in General Equilibrium.
- Mallick, Indrajit, Centre for Studies in Social Sciences, Kolkata (16.05.2002) : Finance and Development.
- Mallick, Indrajit, Centre for Studies in Social Sciences, Kolkata (02.05.2002) : Competition and Regulation in Banking.
- Marjit, Sugata, Centre for Studies in Social Sciences, Kolkata (12.12.2002) : Structural Reform and Informal Wage in a General Equilibrium Model – Theory and Evidence.
- Marjit, Sugata, Centre for Studies in Social Sciences, Kolkata, (05.09.2002) : Monitoring Success: An Exploration Towards a Theory of Governance.
- Rakshit, Mihir K. Investment Information and Credit Agency, Kolkata (12.09.2002) : Food Policy in India: Some Longer Term Issues.
- Sen, Abhijit, Centre for Economic Studies and Planning, Jawaharlal Nehru University, Delhi (24.03.2003) : The Burden of Proof: nature of statistical inference in recent debates on biotechnology and poverty.
- Sen, Debapriya, State University of New York, Stony Brook (29.08.2002) : General Licensing Schemes for a Cost - Reducing Innovation.
- Sen, Kunal, University of East Anglia, UK (13.03.2002) : Caste, Ethnicity and Poverty in Rural India.
- Sen, Kunal, University of East Anglia, UK (20.03.2003) : Sunk Costs, Investment and the Decision to Export: An Analysis of Indian Manufacturing Firms.
- Sengupta, Jai, University of California, Santa Barbara (10.10.2002) : Entry and Exit Behavior of Firms under Competition.

Economic Analysis Unit, Bangalore

- Pendakur, Krishna, Simon Fraser University, Canada (08.11.2002) : Equivalence Scales and Income Distribution in Demand Theory.
- Sivakumar, S., University of Madras (06.11.2002) : Macro Economics.

Planning Unit, Delhi

- Anand, Paul, Open University, U.K. (23.01.2003) : Why Rational Agents Don't Need Transitive Preferences.
- Balakrishnan, Pulpre, Indian Institute of management, Kozhikode (28.03.2003) : Industrial Development in the 90's.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Bhargava, Alok, University of Houston (30.07.2002) : Modelling the Effects of Health on Economic Growth.
- Chakravarty, Debajyoti, University of Bonn (29.11.2002) : Poverty Trap and Growth in a Model of Endogenous Time Preference.
- Chakravorty, Ujjayant, Emory University (09.08.2002) : Does Openness Lead to Good Governance Infrastructure provision in a Trading Economy.
- Dasgupta, Indraneel, University of Nottingham (26.07.2002) : How workers get poor because capitalists get Rich : A General equilibrium model of labour supply, community and the class distribution of income.
- Haeringer, Guillaume, University Autonoma de Barcelona (03.01.2003) : Decentralized Job Matching.
- Kala, Krishna, Pennsylvania State University and NBER (08.11.2002) : When Does Trade Hurt? Market, Transition and Developing Economies.
- Kolstad, Charles, UC Santa Barbara and MIT (14.02.2003) : Learning in Self Enforcing International Environmental Agreements.
- Mare, David, Motu Research, Wellington NZ (24.02.2003) : Paying for the Past : Wages and Life History.
- Mclean, Richard, Rutgers University (30.12.2002) : Implementation with Interdependent valuations.
- Mehta, Ghanshyam, University of Queensland (31.01.2003) : Recent Developments in Preference and Utility Theory.
- Misra, Smita, The World Bank, Delhi (21.03.2003) : Fighting Arsenic : Listening to Rural Communities- Willingness to pay for arsenic-free 'safe' drinking water in Bangladesh.
- Mitra, Manipushpak, University of Bonn (27.09.2002) : Simple Sequencing problems with Interdependent Costs.
- Murthy, Sridhar, University of Toronto (23.12.2002) : Price-Matching Guarantees.

Sociological Research Unit

- Ghosh, Jayati, Jawaharlal Nehru University (27.03.2003) : Macroeconomic Reforms and a Labour Policy Framework for India.
- Sen, Abhijit, Jawaharlal Nehru University (24.03.2003) : The Burden of Proof : The Nature of Statistical Inference in Recent Debates on biotechnology and Poverty.

Statistical Quality Control & Operations Research Division

SQC & OR Unit, Delhi

- Dubey, Pradeep, State University of New York at Stony Brook (14.12.2002) : Monetary Equilibrium with Missing Markets.
- Chandra, Suresh, I.I.T., Delhi (14.12.2002) : Support Vector Machines for data Classification.
- Puri, M.C., I.I.T., Delhi (14.12.2002) : On a type of non-convex transportation problem.

SQC & OR Unit, Chennai

- Achuthan, N.R., Curtin University of Technology, Perth, Western Australia (12.12.2002) : Vehicle Routing Problems.

INDIAN STATISTICAL INSTITUTE

Achuthan, N.R., Curtin University of Technology, Perth, Western Australia (01.01.2003) : Inventory Routing Problems.

SQC & OR Unit, Hyderabad

Mathew, Thomas (12.06.2002) : Applied Multivariate Calibration.

Murthy, Katta G., (25.09.2002) : Application of Histogram Techniques to Decision making in industry.

Library, Documentation and Information Sciences Division

Documentation Research and Training Centre (DRTC), Bangalore

Asundi, A.Y., Bangalore University (1.09.2002) : Information Transfer and Dissemination.

Gohale, Aditya, C-DAC, Pune (31.03.2003) : Introduction to Indian Language Computing and OCR Technology as Developed by C-DAC.

Haravu, J. (20 -24.01.2003) : Knowledge Management.

Karan, Bhaskar, BITS, Mesra, Ranchi (11 & 12.06.2002) : Basics of Fuzzy sets and Fussy logic and its applications to information Retrieval.

Kochikar, V.P., Infosys Technologies Ltd., Bangalore (25.11.2002) : Knowledge Management : The Infosys Experience

Lancaster, F.W., Univ. of Illinois, Urbana-Champaign, USA (10.06.2002) : Digital Libraries and its Evaluation

Sarkhel, Juran Kumar, Vidyasagar University, Medinipur (23-27.12.2002) : Indexing Techniques and Vocabulary Control Device.

Shewale, Nanaji Gopinath, British Library, Pune (21.11.2002) : Compatibility study of AACR2 rules with MARC21.

Suresh, J.K., Infosys Technologies Ltd., Bangalore (22.11.2002) : Enterprise Knowledge Management.

6. PUBLICATION OF SANKHYĀ

The internationally renowned journal *Sankhyā* was founded by P. C. Mahalanobis in 1933 and began publication under his editorship. Till 2002, *Sankhyā* was published in two series, Series A and Series B. From 2003, *Sankhyā* is being published in one combined series, four times a year, in February, May, August and November.

The following issues have been published during April 2002 to March 2003 : *Sankhyā*

April	2002	: Volume 64, Series B,	Part 1.
June	2002	: Volume 64, Series A,	Part 2 (Special Issue on Selected articles of San Antonio Conference in honour of C.R.Rao).
August	2002	: Volume 64, Series B,	Part 2.
October	2002	: Volume 64, Series A,	Part 3 (Special Issue in memory of D.Basu).
December	2002	: Volume 64, Series B,	Part 3.
February	2003	: Volume 65,	Part 1

A new website <http://www.sankhya.isical.ac.in>, has been launched in May 2002. The recent issues of the journal have been made available free on the website. The website also has other features such as searching and online submission.

Journal Committee as on March 31, 2003

Editors: Arup Bose, Aloke Dey and B.V. Rao

Technical Editor: Debasis Sengupta

Co-Editors: Barry Arnold, Krishna B. Athreya, G.J. Babu, Z.D. Bai, Probal Chaudhuri, Anirban Dasgupta, Mohan Delampady, Sanpei Kageyama, Wei Liem Loh, S.R. Mohan, Rahul Mukerjee, S. Ramakrishnan, R.V. Ramamoorthi, S. Ramasubramanian, Rahul Roy, Debapriya Sengupta, Jun Shao, Kesar Singh and Winfried Stute.

Advisory Members: Somesh Dasgupta, G. Kallianpur, K. R. Parthasarathy, C. R. Rao and S. R. S. Varadhan.

7. SCIENTIFIC PAPERS AND PUBLICATIONS

Books published

Theoretical Statistics and Mathematics Division

Stat.-Math Unit, Kolkata

Ghosh, J.K. and Ramamoorthi, R.V. : *Bayesian Nonparametrics*, Springer, New York, 2003.

Sinha, B. K., Liski, Erkki, Mandal, N. K. and Shah, K.R. : *Topics in Optimal Design*, Springer-Verlag Lecture Notes Series in Statistics, 163, 2002.

Stat.-Math Unit, Delhi

Bhatia, R. : *Fourier Series*, 2nd Edition, Hindustan Book Agency, New Delhi, 175 pages, 2003.

Stat-Math Unit, Bangalore

Sury, B. : *The congruence subgroup problem*, Hindustan Book Agency, New Delhi, India, 301 pages, 2003.

Applied Statistics Division

Applied Statistics Unit

Sengupta, D. and Sreenivas Rao, Jammalamadaka : *Linear Models: An Integrated Approach*, World Scientific Publishing Co., Singapore, 2003.

Computer and Communication Sciences Division

Machine Intelligence Unit

Ghosh, A. and Tsutsui, S. : *Advances in Evolutionary Computing : Theory and Applications*, Springer-Verlag, Berlin, 1006 pages, 2003.

Ghosh, A. and Pal, S. K. : *Soft Computing Approach to Pattern Recognition and Image Processing*, World Scientific, Singapore, 349 pages, 2002.

Zhang, D. and Pal, S.K. : *Neural Networks and Systolic Array Design*, World Scientific, Singapore, 405 pages, 2002.

Biological Sciences Division

Anthropology and Human Genetics Unit

Adak, D.K., Bhattacharya, B.N., Ghosh, R., Pal, M., Bharati, P. and Vasulu, T.S. (eds.): *Demographic and Health Profile of the Tribals : A study of Madhya Pradesh*, Anmol Publication, New Delhi, 300 pages, 2003.

Ghosh, A. K., Ghosh, J.K. and Mukhopadhyay, B. (eds.) : *Sustainable Environments : A Statistical Analysis*, Oxford University Press, New Delhi, 207 pages, 2003.

Social Sciences Division

Economic Research Unit

Bagchi, A. K., Chattopadhyay, M. and Khasnabisa, R. : *Economy and the Quality of Life: Essays in Memory of Ashok Rudra*, Dasgupta & Co. (P) Ltd., Kolkata, XVIII + 307, 2003.

Chakravarty, S. R. : *Microeconomics*, Allied Publishers, New Delhi, 781 pages, 2002.

Mazumdar, K. : *Determinants of Human Well-Being*, Nova Science Publishers, New York, 253 pages, 2003.

Mukherjee, M. and Chattopadhyay, K. : *Kolkata - The City of Wetlands*, Department of Fisheries, Govt. of West Bengal in Collaboration with Ministry of Agriculture, Govt. of India, Kolkata, 239 pages, 2002.

Planning Unit

Das, S. P. : *Introductory Microeconomics*, NCERT, New Delhi, 170 pages, 2002.

Sarma, A. and Mehta, P. K. : *Exploring Indo ASEAN Economic Partnership in Globalising World*, Bookwell Publishers, New Delhi, 648 pages, 2002.

Sarma, A. and Narayanan, E. : *Restructuring Urban Finance : Accessing Capital Market*, Manak Publications Private Ltd., New Delhi, 448 pages, 2002.

Population Studies Unit

Adak, D. K., Bhattacharya, B.N., Ghosh, R., Pal, M., Bharati, P. and Vasulu, T.S. (eds.) : *Demography and Health Profile of the Tribal : A study of M.P.*, Anmol Publications Pvt. Ltd., New Delhi, 401 pages, 2003.

Sociological Research Unit

Dasgupta, Uma : *Rabindranath Tagore and Prasanta Chandra Mahalanobis*, Ananda publishers and ISI, 2002.

Dasgupta, Uma : *A Difficult Friendship : Letters of Edward Thompson and Rabindranath Tagore 1913-1940*, Oxford University Press, New Delhi, 2003

Ghosh, Bhola Nath : *Rural Women Leadership*, Mohit Publications, New Delhi, 2002.

Ramachandran, V.K. : *Agrarian Studies : Essays on Agrarian Relations in Less Developed Countries*, (edited with Madhura Swaminathan), Zed Press, London, 2003.

Papers Published in Journals

Stat-Math Unit, Kolkata

Bandyopadhyay, P., Fonf, V. P., Lin, B. L. and Martin, M. : Structure of Nested Sequence of Balls in Banach Spaces, *Houston J. Math.*, 29, 173-193, 2003.

Basu, S., Chaudhuri, P. and Burma, D. P. : Words in DNA Sequences : Some Case Studies Based on their Frequency Statistics, *Journal of Mathematical Biology*, 46, 2003.

INDIAN STATISTICAL INSTITUTE

- Behara, B. : Estimation of dimension functions of band-limited wavelets, *Appl. Comput. Harmon. Anal.* 13, 277-282, 2002.
- Bhandari, S. K. and Basu, A. : On Gaussian Correlation inequalities for rectangles and symmetric sets, *Cal. Stat. Assoc. Bulletin*, 53, 211-212, 245-248, 2002.
- Bhandari, S.K. and Bose, M. : Efficiencies of two-stage procedures for selecting the normal population with largest mean, *Sankhya, Series B*, 64, pt. 3, 339-349, 2002.
- Bose, A. and Chatterjee, S. : Dimension asymptotics for the uncorrelated weight bootstrap in linear regression, *Annals of the Institute for Statistical Mathematics*, 54, 367-381, 2002.
- Bose, A. and Chatterjee, S. : Comparison of different resampling techniques in regression: second order results, *Statistica Sinica*, 12, 575-598, 2002.
- Bose, A., Dasgupta, A. and Rubin, H. : A contemporary review and bibliography of infinitely divisible distributions, *Sankhya, Series A, Special Issue in memory of D. Basu*, 64, 763-819, 2002.
- Bose, A. and Mitra, J. : Limiting spectral distribution of a special circulant, *Statistics and Probability Letters*, 60, 111-120, 2002.
- Bose, A. and Sen, A. : Asymptotic distribution of the Kaplan-Meier U-statistics, *Journal of Multivariate Analysis*, 7 83, 84-123, 2002.
- Bose, S. : Classification Using splines, *Computational Statistics and Data Analysis*, 42, 685-701, 2003.
- Chaudhuri, P. and Chakraborty, B. : On the Use of Genetic Algorithm with Elitism in Robust and Nonparametric Multivariate Analysis, *Austrian Journal of Statistics*, 32, 13-27, 2003.
- Chaudhuri, P. and Das, S. : SWORDS : A Statistical Tool for Analyzing Large DNA Sequences, *Journal of Biosciences*, 27, 1-6, 2002.
- Chaudhuri, P., Hati, A.K., Purkayastha, S., Mitra, N.K., Mondal, B., Sengupta, S., Mukherjee, H. and Mukhopadhyay, A.K. : A Study of Transmission Dynamics of Vivax and Falciparum Malaria in an Endemic Area in Kolakata, *Calcutta Statistical Association Bulletin*, 53, 133-144, 2002.
- Chaudhuri, P. and Loh, W. Y. : Nonparametric Estimation of Conditional Quantiles Using Quantile Regression Trees, *Bernoulli*, 8, 561-576, 2002
- Chaudhuri, P., Marron, J.S., Godtkeisen, F. : Significance of Scale Space for Bivariate Density Estimation, *Journal of Computational and Graphical Statistics*, 11, 1-22, 2002.
- Ghosh, J. K., Berger, J.O. and Mukhopadhyay, N. : Approximation and consistency of Bayes factors as model dimension grows, *Journal of Statistical Planning and Inference*, 112, 241-258, 2003.
- Ghosh, J.K. and Samanta, T. : Nonsubjective Bayes testing --- an overview, *Journal of Statistical Planning and Inference*, 103, 205-223, 2002.
- Goswami, D. and Albeverio, S. : A mark on the structure of symmetric quantum dynamical semigroups on von Neumann algebras, *Infinite dimensional Analysis, Quantum Probability and Related Topics*, 5, 571-579, 2002.
- Goswami, D., Chakraborty, P.S and Sinha, K.B. : Probability and Geometry on some noncommutative manifolds, *Journal of Operator Theory*, 49, 187-203, 2003.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Mukherjee, G. and Mazumdar, A. : Deformation Theory of dialgebras, *K-theory*, 27, 33-60, 2002.
- Mukherjee, G. and Naolekar, A. C. : On the notion of residual finiteness for G-space, *Journal of Aust. Math. Soc.* 73, 347-355, 2002.
- Purkayastha, S., Ghosh, J.K., Bhanja, J, Samanta, T. and Sengupta, S. : A statistical approach to geological mapping, *Mathematical Geology*, 34, 505-528, 2002.
- Ray, R. Saha and Bhandari, S.K. : DS-optimal design in one-way ANOVA, *Metrika*, 57, 115-125, 2003.
- Sarkar, R. P. : A complete analogue of Hardy's theorem on semisimple Lie groups, *Colloq. Math.* 93, 27-40, 2002.
- Sarkar, R. P. : A complete analogue of Hardy's theorem on $SL(2, R)$ and characterization of the heat kernel, *Proc. Indian Acad. Sci. Math. Sci.* 112, 579-593, 2002.
- Sinha, B. K., Lacayo, H. and Neerchal, N. K. : Ranked Set Sampling from a Dichotomous population, *Journal of Applied Statistical Science*, 11, 83-90, 2002.
- Sinha, B.K., Lawrence, Lin, Hedayat, A.S., and Yang, Min : Statistical Methods in Assessing Agreement: Models, Issues and Tools, *Journal of American Statistical Association*, 97, 257-270, 2002.
- Sinha, B. K. and Sinha, Bimal K. : On Some Aspects of MCDM with Environmental Applications, *Journal of Statistical Studies, Special Volume in Honour of 65th Birthday of Professor Mir Masoom Ali*, 139-144.
- Tripathi, T.P., Singh, H. P. and Upadhyaya, L.N. : A general method of estimation and its application to the estimation of coefficient of variation, *Statistics in Transition*, 5, 1081-1102, 2002.

Stat-Math Univ, Delhi

- Athreya, S. : On a Singular Semilinear Elliptic Boundary Value Problem and the Boundary Harnack Principle, *Potential Analysis*, 17, 293-301, 2002
- Athreya, S., Martin, Barlow, Rich, Bass and Perkins, Edwin : Degenerate Stochastic differential equations and super-Markov chains, *Probability Theory and Related Fields*, 123, 484-520, 2002.
- Bapat, R. B. : Outer inverses: Jacobi type identities and nullities of submatrices, *Linear Algebra and its Applications*, 361, 107-120, 2003.
- Bapat, R. B. and Bing, Zheng : Generalized inverses of bordered matrices, *Electronic Journal of Linear Algebra*, 10, 16-30, 2003.
- Bhatia, R., Silva, J.A. and Dias, da.: Variation of induced linear operators, *Linear Algebra and Applications*, 341, 391-402, 2002.
- Bhatia, R., Kahan, W. and Li, R.-C. : Pinchings and norms of scaled triangular matrices, *Linear and Multilinear Algebra*, 50, 15-21, 2002.
- Bhatt, A. G. and Karandikar, R. L. : Robustness of the nonlinear filter: The correlated case, *Stoch. Proc. Appl.*, 97, 41-58, 2002.
- Bruno, Bassan, Kochar, S. and Fabio, Spizzichino : Some bivariate notions of IFR and DMRL and related properties, *Journal of Applied Probability*, 39, 533-544, 2002.

INDIAN STATISTICAL INSTITUTE

- Chatterjee, K., Das, A. and Dey, A. : Quasi-Orthogonal arrays and optimal fractional factorial plans, *Statistica Sinica*, 12, 905-916, 2002.
- Choi, K.C., Chatterjee, K., Das, A. and Gupta, S. : Optimality of Orthogonally Blocked Diagonals with Specific Combining Abilities, *Statist. Probab. Letters*, 57, 145-150, 2002.
- Das, A., Dey, A. and Midha, C.K. : On a property of orthogonal arrays and optimal blocking of fractional factorial plans, *Metrika*, 57, 127-135, 2003.
- Dey, A. and Suen, C. : Optimal fractional factorial plans for main effects and specified two-factor interactions : A projective geometric approach, *Annals of Statistics*, 30, 1512-1523, 2002.
- Dey, A. : Optimal designs for diallel crosses (Technical Address delivered at the 55th Conference of the Indian Society of Agricultural Statistics), *Journal of the Indian Society of Agricultural Statistics*, 55, 1-16, 2002.
- Dewan, I. and Rao, B. L. S. P. : Central limit theorem for U-statistics of associated sequences, *Statist. Probab. Lett.*, 57, 9-15, 2002.
- Hu, X., Kochar, S., Mukerjee, H. and Samaniego, F. : Estimation of two ordered mean residual life functions, *Journal of Statist. Plan. Inf.*, 107, 321-341, 2002.
- Khaledi, B. and Kochar, S. C. : Stochastic Orderings among Order Statistics and Sample Spacings, *Uncertainty and Optimality--- Probability, Statistics and Operations Research*, 167-203, 2002. (edited by J.C. Misra. World Scientific Publications, Singapore).
- Khaledi, B. and Kochar, S. C. : Dispersive ordering among linear combinations of uniform random variables, *Journal of Statistical Planning and Inference*, 100, 13-21, 2002.
- Kochar, S., Lam, Eddy and Paul, Y. : Generalized supremum tests for the equality of cause specific hazard rates, *Lifetime Data Analysis*, 8, 277-288, 2002.
- Li, X., Kochar, S. and Shaked, M. : The Total Time on Test Transform and the Excess Wealth Stochastic Orders of Distributions, *Advances in Applied Probability*, 34, 826-845, 2002.
- Mukerjee, R., Dey, A. and Chatterjee, K. : Optimal Main Effect Plans with Nonorthogonal Blocking, *Biometrika*, 89, 225-229, 2002.
- Parthasarathy, K. R. : A remark on the unitary group of a tensor product of n finite dimensional Hilbert spaces, *Proc. Indian Acad. Sci. (Math. Sci.)*, 113, 3-13, 2003.
- Parthasarathy, T., Sampangi, Raman and Sreeparna, B. : Relationship between strong monotonicity property, P-2 property and the GUS property in SDLCP, *Math. OR*, 27, 326-333, 2002.
- Rao, B. L. S. P. : Hajek-Renyi type inequality for associated sequences, *Statist. Probab. Lett.*, 57, 139-143, 2002.
- Rao, B. L. S. P. : Application of Whittle's inequality for Banach space valued martingales, *Statist. Probab. Lett.*, 57, 133-137, 2002.
- Rao, B. L. S. P. : Minimum distance estimation for some stochastic partial differential equations, *J. Korean Stat. Soc.*, 31, 213-228, 2002.
- Rao, B. L. S. P. : Nonparametric inference for a class of stochastic partial differential equations based on discrete observations, *Sankhya, Ser.A*, 64, 1-15, 2002.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Rao, B. L. S. P. : Whittle type inequality for demisubmartingales, *Proc. Amer. Math. Soc.*, 130, 3719-3724, 2002.
- Rao, B. L. S. P. : Another Esseen-type inequality for multivariate probability density functions, *Statist. Probab. Lett.*, 60,191-200, 2002.
- Rao, B. L. S. P. and Mishra, M.N. : Approximation of maximum likelihood estimator for diffusion processes from discrete observations, *Stochastic Analysis and Applications*, 20, 1309-1329, 2002.
- Rao, B. L. S. P. : On some problems of estimation for some stochastic partial differential equations, *Uncertainty and Optimality*, J.C.Misra (ed.), World Scientific, Singapore, 71-154, 2002.
- Roy, R. and Tanemura, Hideeki : Critical intensities of Boolean models with different underlying convex shapes, *Advances in Applied Probability*, 34, 48-57, 2002.
- Roy, R. and Sarkar, A. : High density asymptotics of the Poisson random connection model, *Physica A*, 318, 230-242.

Stat-Math Unit, Bangalore

- Angers, Jean-Francois and Delampady, M. : Hierarchical Bayesian locally smoothed curve fitting, *Journal of Statistical Research*, 36, 15-28, 2002.
- Bagchi, B. and Inamdar, S.P. : Projective geometrical codes, *Journal of Combinatorial Theory*, Series A, 99, 128-142, 2002.
- Bilu, Y., Kulkarni, M. and Sury, B. : The Diophantine equation $x(x+1)\dots(x+m-1) = y^2$, *Acta Arithmetica*.
- Birindelli, I. And Prajapat, J. : Monotonicity and symmetry results for degenerate elliptic equations on nilpotent Lie groups, *Pacific Journal of Mathematics*, 204, 1-17, 2002.
- Biswas, J., Dayal, G., Paranjape, K. H. and Ravindra, G. V. : Higher Abel-Jacobi Maps, *Proceedings of the International Colloquium on Algebra, Arithmetic and Geometry*, 2000, 159-169, 2002.
- Graczyk, P. and Raja, C.R.E. : Classical theorems of probability on Gelfand paris-Khinchin's theorems and Cramer theorem, *Israel Journal of Mathematics*, 132, 61-107, 2002.
- Jarosz, K. and Rao, T.S.S.R.K. : Local isometries of Banach spaces, *Math.Z.*, 243, 449-469, 2003.
- Kulkarni, M. and Sury, B. : On the vanishing of cubic recurrences, *Comptes Rendus of the Royal Soc. Canada*, 24, 72-76, 2002.
- Kulkarni, M. and Sury, B. : On the Diophantine equation $x(x+1)\dots(x+m-1) = g(y)$, *Indagationes Mathematicae*.
- Nagaraj, D.S. and Sury, B. : On the commutativity of rings, *Journal of the Ramanujan Math. Soc.*, 18, 1-5, 2003.
- Raja, C.R.E. : Identity excluding groups, *Bull. Sci. Math.*, 126, 763-772, 2002.
- Rajaram Bhat, B.V. and Bhattacharyya, T. : A model theory for q -commuting contractive types, *Journal of Operator theory*, 47, 97-116, 2002.
- Ramasubramanian, S. : Reflected backward stochastic differential equations in an orphant, *Proceedings of Indian Academy of Sciences (Math. Sci.)*, 112, 347-360, 2002.

INDIAN STATISTICAL INSTITUTE

Ramasubramanian, S. : On reflected backward stochastic differential equations, *Calcutta Statistical Association Bulletin*, 52 (Special 4th triennial proceedings volume), 251-260, 2002.

Rao, T.S.S.R.K. : Very smooth points of spaces of operators, *Proc. Indian Acad. Sci., (Math. Sci.)*, 113, 53-64, 2003.

Sastry, N.S.N. and Sin, Peter : On doubly transitive permutation representatives of $Sp(2n, F_3)$, *Journal of Algebra*, 257, 509-527, 2002.

Sury, B. and Thangadurai, R. : Gao's conjecture on zero-sums in finite abelian groups, *Proceedings of Indian Acad. Sciences*, 112, 399-414, 2002.

Applied Statistics Division

Applied Statistics Unit

Bandyopadhyay, U. and Biswas, A. : Test of Bernoulli success probability in inverse sampling for nearer alternatives using adaptive allocation, *Statistica Neerlandica*, 56, 387-399, 2002.

Banerjee, T. and Biswas, A. : A new formulation of stress-strength reliability in a regression set-up, *Journal of Statistical Planning and Inference*, 112, 147-157, 2003.

Biswas, A. : Generalized delayed response in randomized play-the-winner rule, *Communications in Statistics - Simulation and Computation*, 32, 259-274, 2003.

Biswas, A. and Angers, J.-F. : A Bayesian adaptive design in clinical trials for continuous responses, *Statistica Neerlandica*, 56, 400-414, 2002.

Biswas, A. and Hwang, J.-S. : A new bivariate binomial distribution, *Statistics and Probability Letters*, 60, 23-240, 2002.

Biswas, A. and Chaudhuri, P. : An Efficient Design for Model Discrimination and Parameter Estimation, *Biometrika*, 89, 709-718, 2002.

Bose, M. and Mukherjee, B. : Optimal crossover designs under a general, *Statistics and Probability Letters*, 62, 413-418, 2003.

Bose, M. and Bhandari, S.K. : Efficiencies of two-stage procedures for selecting the normal population with largest mean, *Sankhya, Series B*, 64, 3, 2002.

Bose, M., Mukhopadhyay, S., Pal, B. and Adhikary, A. : A study on gender difference in Job-satisfaction in an Urban Setting, *Journal of Indian Anthropological Society*, 37, 287-291, 2002.

Chaudhuri, A. : Estimating sensitive proportions from randomized responses in unequal probability sampling, *Calcutta Statistical Association Bulletin*, 52, 315-322, 2002.

Chaudhuri, A. and Pal, S. : Estimating proportions from unequal probability samples using randomized responses by Warner's and other devices, *Pakistan Journal of Statistics*, 55, 174-182, 2002.

Chaudhuri, A. and Pal, S. : On certain alternative mean square error estimators in complex survey sampling, *Journal of Statistical Planning & Inference*, 104, 363-375, 2002.

Chaudhuri, A. and Pal, S. : On a version of cluster sampling and its practical use, *Journal of Statistical Planning & Inference*, 113, 25-34, 2003.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Dewanji, A : A test of homogeneity across groups using Poisson count data with arbitrary means, *Calcutta Statistical Association Bulletin*, 53, 19-32, 2002.
- Dewanji, A. and Moolgavkar, SH : Choice of stratification in Poisson process analysis of recurrent event data with environmental covariates, *Statistics in Medicine*, 21, 3383-3393, 2002.
- Dewanji, A., Mohanto, P.P., Ganguly, K.S., Samanta, T., and Sinha, B.K. : Analysis of adjustment period data for a therapeutic treatment, *Calcutta Statistical Association Bulletin*, 53, 289-302, 2002.
- Ghosh, and Samanta, T. : Nonsubjective Bayes testing – an overview, *Journal of Statistical Planning and Inference*, 103, 205-223, 2002.
- Ghosh, J.K., Bhanja, J., Purkayastha, S., Samanta, T. and Sengupta, S. : A statistical approach to geological mapping, *Mathematical Geology*, 34, 505-528, 2002.
- Maitra, S. and Pasalic, E. : Further constructions of resilient Boolean functions with very high nonlinearity, *IEEE Transactions on Information Theory*, 48, 1825-1834, 2002.
- Maitra, S. : Highly nonlinear balanced Boolean functions with good local and global avalanche characteristics, *Information Processing Letters*, 83, 281-286, 2002.
- Maitra, S. and Sarkar, P. : Maximum Nonlinearity of Symmetric Boolean Functions in Odd Number of Variables, *IEEE Transactions on Information Theory*, 48, 2626-2630, 2002.
- Maitra, S. and Sarkar, P. : Characterization of Symmetric Bent Functions – An Elementary Proof, *Journal of Combinatorial Mathematics and Combinatorial computing*, 43, 227-230, 2002.
- Maitra, S. and Sarkar, P. : Cryptographically Significant Boolean Functions with Five Valued Walsh Spectra, *Theoretical Computer Science*, 276, 133-146, 2002.
- Maitra, S. and Sarkar, P. : Cryptographic Modifications of Patterson-Weidemann functions, *IEEE Transactions on Information Theory*, 48, 278-284, 2002.
- Pasalic, E. and Maitra, S. : Linear codes in generalized construction of resilient functions with very high nonlinearity, *IEEE Transactions on Information Theory*, 48, 2182-2191, 2002.
- Sarkar, P. and Carlet, Claude : Spectral Domain Analysis of Correlation Immune and Resilient Boolean functions, *Finite Fields and their Applications*, 8, 120-130, 2002.
- Sarkar, P. and Maitra, S. : Cross-Correlation Analysis of Nonlinear Combining Functions and S-Boxes, *Theory of Computing Systems*, 35, 39-57, 2002.
- Sarkar, P. and Maitra, S. : Efficient Implementation of Cryptographically Useful Large Boolean Functions, *IEEE Transactions on Computers*, 52, 410-417, 2003.
- Sarkar, P. : Computing Shifts in 90/150 Cellular Automata Sequences, *Finite Fields and their Applications*, 9, 175-186, 2003.
- SenGupta, A., Bhattacharyay, S. and Basu, T. : Evaluation of expected absolute error affecting the maximum specific growth rate for random relative error of cell concentration, *World Journal of Microbiology & Biotechnology*, 18, 285-288, 2002.
- SenGupta, A. : Prediction of hazards in coal mines through directional change-point analyses, *Journal of Nepal Geological Society*, 27 (Special issue), 65-68, 2002.

INDIAN STATISTICAL INSTITUTE
Computer and Communication Sciences Division

Advanced Computing and Microelectronics Unit

- Asano, T., Hernandez-Barrera, A. and Nandy, S.C. : The Minkowski sum of a convex polygon and a polygonal terrain. *Computational Geometry: Theory and Applications*, 23, 257-269, 2002.
- Bhattacharya, B.B., Dmitriev, A., Gossel, M. and Chakrabarty, K. : Synthesis of single-output space compactors for scan-based sequential circuits. *IEEE Transactions on Computer-Aided Design*, 21, 1171-1179, 2002.
- Chaudhuri, J., Nandy, S.C. and Das, S. : Largest empty rectangle among a point set. *Journal of Algorithms*, 46, 54-78, 2003.
- Das, N., Bhattacharya, B.B. and Bezrukov, S. : Permutation admissibility in optical MIN's with minimum number of stages. *Journal of Systems Architecture*, 48, 311-323, 2003.
- Dasgupta, P., Pan, P., Nandy, S.C. and Bhattacharya, B.B. : Monoxone bipartitioning problem in a planar point set with applications to VLSI. *ACM Transactions on Design Automation of Electronic Systems*, 2003, 7, 231-248, 2002.
- Dey, S., Bhattacharya, B.B., Kundu, M.K. and Acharya, T. : A simple architecture for computing moments and orientation of an image. *Fundamenta Informaticae*, 52, 285-295, 2002.
- Jana, P.K., Naidu, B.D., Kumar, S., Arora, M. and B. P. Sinha : Parallel prefix computation on extended Multi-Mesh network. *Information Processing Letters*, 84, 295-303, 2002.
- Nandy, S.C., Asano, T. and Harayama, T. : Shattering a set of objects in 2D. *Discrete Applied Mathematics*, 122, 183-194, 2002.
- Rahaman, H., Das, D.K. and Bhattacharya, B.B. : BIST design for detecting multiple stuck-open faults in CMOS circuits using transition count. *Journal of Computer Science and Technology*, 17, 731-737, 2002.

Computer Vision and Pattern Recognition Unit

- Bhattacharya, U., Das, T. K., Datta, A., Parui, S. K. and Chaudhuri, B. B. : A hybrid scheme for handprinted numeral recognition based on a self-organizing network and MLP classifiers. *International Journal for Pattern Recognition and Artificial Intelligence*, 16, 845-864, 2002.
- Chaudhuri, B. B., Pal, U. and Mitri, M. : Automatic Recognition of Printed Oriya Script. *Sadhana. a Journal of Indian Academy of Sciences*, 27, 23-34, 2002.
- Chowdhury, S., Datta, A. K. and Chaudhuri, B. B. : Intonation Patterns for Text Reading in Standard Colloquial Bengali. *Journal of Acoustic Society of India*, 30, 160-163, 2002.
- Das, N.S. and Chaudhuri, B. B. : Corpus generation and text processing. *International Journal of Dravidian Linguistics*, 31, 25-44, 2002.
- Datta, A. and Parui, S. K. : A neural network model for minimum spanning circle: its convergence, architecture and Applications. *International Journal for Pattern Recognition and Artificial Intelligence*, 16, 797-815, 2002.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Garain, U. and Chaudhuri, B. B. : Segmentation of Touching Characters in Printed Devnagari and Bangla Scripts using Fuzzy Multifactorial Analysis. *IEEE Transactions on Systems, Man and Cybernetics, Part C*, 32, 449-459, 2002.
- Pal, U., Belaïd, A. and Choisy, Ch. : Touching numeral segmentation using water reservoir concept, *Pattern Recognition Letters*, 24, 261-272, 2003.
- Pal, U. and Chaudhuri, B. B. : Identification of different script lines from multi-script documents, *Image and Vision computing*, 20, 945-954, 2002.
- Pal, U. and Chaudhuri, B. B. : Script line separation from Indian multi-script documents, *IETE Journal of Research*, 49, 3-11, 2003.
- Sengupta, R., Dey, N., Nag, D., Datta, A.K. and Parui, S. K. : Perceptual Evaluation of Tanpura from the Sound Signals and its Objective Quantification using Spectral Features. *Journal of Acoustic Society of India*, 30, 143-146, 2002.
- Electronics and Communication Sciences Unit**
- Bagui, S.C., Bagui, S., Pal, K. and Pal, N. R. : Breast cancer detection using rank-nearest classification rules, *Pattern Recognition*, 36, 25-34, 2003.
- Chakraborty, D. and Pal, N. R. : A novel training scheme for multilayered perceptrons to realize proper generalization and incremental learning, *IEEE Trans. Neural Networks*, 14, 1-14, 2003.
- Chakraborty, S., Pal, K. and Pal, N. R. : A neuro-fuzzy framework for inferencing, *Neural Networks*, 15, 247-261, 2002.
- Das, A.K., Saha, S.K. and Chanda, B. : An empirical measure of performance of document image segmentation algorithm, *International Journal of Document Analysis and Recognition*, 4, 183-190, 2002.
- Datta A, Pal S. and Chakraborti S. : Image thinning by neural networks, *Neural Comput. & Applic.*, 11, 122-128, 2002.
- Mukherjee, A., Adhikary, P.P., Nandi, P.K., Pal, P. and Das, J. : Estimation of atmospheric boundary layer using Kalman filter technique, *Signal Processing*, 82, 1763-1771, 2002.
- Mukhopadhyay, S. and Chanda, B. : An edge preserving noise smoothing technique using multiscale morphology, *Signal Processing*, 82, 527-544, 2002.
- Pal, K., Mudi, R. and Pal, N. R. : A new scheme for fuzzy rule based system identification and its application to self-tuning fuzzy controllers, *IEEE Trans. Systems Man and Cybern. - B*, 32, 470-482, 2002.
- Pal, N. R. and Pal, S. : Computational Intelligence for Pattern Recognition, *Int. Jour. Patt. Recogn. Artificial Intell.*, 16, 773-779, 2002.
- Pal, N. R. and Bezdek, J.C. : Complexity reduction for large image processing, *IEEE Trans. on Sys., Man and Cybern. - B*, 22, 598-611, 2002.
- Pal, N. R., Vijay Kumar, E. and Mandal, G. : Fuzzy logic approaches to structure preserving dimensionality reduction, *IEEE Trans. Fuzzy Systems*, 10, 277-286, 2002.

INDIAN STATISTICAL INSTITUTE

- Pal, S., Das, J., Sengupta, P. and Banerjee, S. K. : Short term prediction of atmospheric temperature using neural networks, *Mausam*, 53, 471-480, 2002.
- Raha, S., Pal, N.R. and Ray, K. S. : Similarity based approximate reasoning : methodology and application, *IEEE Trans. Systems, Man and Cybern - A*, 32, 541-547, 2002.
- Ray, K S and Dinda, T. K. : Pattern Classification using fuzzy relational calculus, *IEEE Trans on SMC*, Part B, 33, 1-16, 2003.
- Singh, S., and Chanda, B. : Tree-Structured Index Grouping Algorithm for Lossless Coding of VQ Index Map, *IETE Journal of Research*, 48, 211-215, 2002.
- Machine Intelligence Unit*
- Acharyya, M. and Kundu, M. K. : Document segmentation using wavelet scale-space features, *IEEE Trans on Circuits and Systems for Video Technology*, 12, 1117-1127, 2002.
- Acharya, C. and Pal, S. K. : Probabilistic Graphical Model Based Approach to Genetic Algorithm Design. *J. Inst. Electron and Telecom. Engrs.*, (Special Issue on Evolutionary Computation in Engineering Science), 48, 339-347, 2002.
- Bandyopadhyay, S. : Contour Extraction Using Genetic Algorithms, *Journal of Institute of Electronics and Telecommunication Engineers (IETE)*, 48, 369-376, 2002.
- Biswas, S. : Segmentation based graylevel Image data compression, *Pattern Recognition*, 36, 1501-1517, 2003.
- De, R. K, Basak, J and Pal S. K. : Unsupervised Feature Extraction using Neuro-fuzzy Approaches, *Fuzzy Sets and Systems*, 126, 277-291, 2002.
- Ghosh, S. Ghosh, A. and Pal, S. K. : Incorporating ancestors' influence in genetic algorithms, *Applied Intelligence*, 18, 7-25, 2003.
- Ghosh, S. and Ghosh, A. : Image ambiguity optimization for object extraction : a soft computing approach, *International Journal of Fuzzy Systems*, 4, 673-679, 2002.
- Kundu, M. K. and Acharyya, M. : M-Band wavelets: Application to texture segmentation for real life image analysis, *International Journal of Wavelets, Multiresolution and Information Processing (IJWMIP)*, 1, 115-149, 2003.
- Mitra, S. Konwar, K. M. and Pal S. K. : A Fuzzy decision tree, linguistic rules and fuzzy knowledge-based network: Generation and evaluation, *IEEE Transactions on Systems, Man, and Cybernetics, Part C: Applications and Reviews*, 32, 328-339, 2002.
- Mitra, P., Murthy, C. A and Pal S. K. : Density based multiscale data condensation, *IEEE Trans. on Pattern Analysis and Machine Intelligence*, 24, 734-747, 2002.
- Mitra, P., Pal, S. K. and Siddiqi, M. A. : Nonconvex Clustering Using Expectation Maximization Algorithm with Rough Set Initialization, *Pattern Recognition Letters (Special Issue on Rough Sets, Pattern Recognition and Data Mining)*, 24, 863-873, 2003.
- Pal, S. K., Mitra, S. and Mitra, P. : Rough Fuzzy MLP: Modular evolution, rule generation and evaluation, *IEEE Transactions on Knowledge and Data Engineering*, 15, 14-25, 2003.
- Pal, S. K, Talwar, V.K. and Mitra, P. : Web Mining in Soft Computing Framework: Relevance, State of the Art and Future Directions, *IEEE Trans. on Neural Networks*, 13, 1163-1177, 2002.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Pal, S. K and Mitra, P. : Multispectral Image Segmentation using Rough Set Initialized EM Algorithm, *IEEE Trans. on Geoscience and Remote Sensing*, 40, 2495-2501, 2002.
- Roy, S., Bandyopadhyay, S., Maulik, U. and Sikdar, B. K.: A Genetic Algorithm Based State Assignment Scheme for Synthesis of Testable, FSMs Targeting Area and Delay, *International Journal of Engineering Intelligent Systems*, 10, 45-52, 2002.
- Roy, A. and Pal S. K. : Fuzzy Discretization of Feature Space for a Rough Set Classifier, *Pattern Recognition Letters (Special Issue on Rough Sets, Pattern Recognition and Data Mining)*, 24, 895-902, 2003.
- Zhang, D., Peng, H., Zhou, J. and Pal, S. K. : A Novel Face Recognition System using Hybrid Neural and Dual Eigenspaces Methods, *IEEE Trans. Syst., Man and Cyberns., Part A : Systems and Humans*, 32, 787-793, 2002.

Physics and Earth Sciences Division

Geological Studies Unit

- Bhattacharya, S. : Nature of crustal tri-junction between the Eastern Ghats Mobile belt, Singhbhum craton and Bastar craton around Paikmal, Western Orissa. Structural Evidence of oblique collision, *Gondwana Research*, 5, 53-62, 2002.
- Bhattacharya, S. : High-temperature dehydration melting and decompressive P-T Path in a granulite complex from the Eastern Ghats, India, *Contributions to Mineralogy & Petrology*, 143, 175-191, 2002.
- Bhattacharya, S., Deomurari, M.P. and Teixeira, W. : Grenvillian thermal event and remnant charnockite: Isotopic evidence from the Chikka Lake granulite-migmatite suite in the Eastern Ghats belt, India, *Proceedings, Indian Academy of Sciences*, 111, 391-399, 2002.
- Bhattacharya, S., Kar, R., Teixeira, W. and Basei, M. : High-temperature crustal anatexis in a clockwise P-T-t path: isotopic evidence from a granulite-migmatoid suite in the Eastern Ghats belt, India, *Journal of the Geological Society, London*, 160, 39-46, 2003.
- Chaudhuri, A. K. : Stratigraphy and paleogeography of the Godavari supergroup in the south-central Pranhita-Godavari valley, S. India, *Journal of Asian Earth Sciences*, 21, 595-611, 2003.
- Chaudhuri, A. K., Mukhopadhyay, J. : Shallow to deep-water deposition in a cratonic basin: an example from the Proterozoic Penganga Group, Pranhita-Godavari valley, *Journal of Asian Earth Sciences*, 21, 613-622, 2003.
- Das, S. S. : Two new pleurotomariid (Gastropoda) species including the largest *Bahrotomaria* from the Bernianian (Early Cretaceous) of Kutch, western India, *Cretaceous Research*, 23, 99-109, 2002.
- Ghosh, G. and Saha, D. : Deformation of the Proterozoic Somanpalli Group, Pranhita-Godavari valley, south India -- implication for a Mesoproterozoic basin inversion, *Journal of Asian Earth Science*, 21, 579-594, 2003
- Jana, S. K. and Das, S. S. : A report of a 157.8 m. y. old dinosaur bone from the Jurassic marine Chari Formation, Kutch, Gujarat and its taphonomic significance, *Current Science*, 82, 85-88, 2002.
- Paranabis-Deb, S. : Proterozoic felsic volcanism in the Pranhita-Godavari valley, India: its implication on the origin of the basin, *Journal of Asian Earth Science*, 21, 623-631, 2003.
- Ray, S., and Chakraborty, T. : Lower Gondwana Fluvial Succession in the Pench- Kanham Valley, India: Stratigraphic Architecture and Depositional controls, *Sedimentary Geology*, 151, 243-271, 2002.

INDIAN STATISTICAL INSTITUTE

- Ray, S. and Bandyopadhyay, S. : Late Permian vertebrate community of the Pranhita-Godavari valley, *Journal of Asian Earth Sciences*, 21, 643-654, 2003.
- Saha, D. : Multi-stage deformation in the Nallamalai Fold Belt, Cuddapah Basin, South India - implications for Mesoproterozoic tectonism along southeastern margin of India, *Gondwana Research*, 701-719, 2002.
- Saha, D., Chaudhuri, A. K. : Deformation of the Proterozoic successions in the Pranhita-Godavari basin, south India – a regional perspective, *Journal of Asian Earth Science*, 21, 557-565, 2003.
- Samanta, S. K., Mandal, N., Chakraborty, C. and Mazumdar, K. : Numerical simulations of inclusion trail patterns of syntectonic porphyroblasts, *Computers and Geosciences*, 28, 297-308, 2002
- Samanta, S. K., Mandal, N. and Chakraborty, C. : Development of different types pull-aparts in mylonites, *Journal of Structural Geology*, 24, 1345-1355, 2002
- Samanta, S. K., Mandal, N. and Chakraborty, C. : Development of structures under the influence of heterogeneous strain field around inclusions: insights from theoretical and numerical models, *Earth Science Reviews*, 57, 85-119, 2002.
- Samanta, S. K., Mandal, N. and Chakraborty, C. : Flow patterns around rigid inclusions in a multiple inclusion system undergoing bulk simple shear deformation, *Journal of Structural Geology*, 25, 209-221, 2003.
- Sengupta D. P. : Indian metoposaurid amphibians revised, *Paleontological Research*, 6, 41-65, 2002
- Sengupta D. P. : Triassic temnospondyls of the Pranhita – Godavari basin, *Journal of Asian Earth Sciences*, 21, 655-662, 2003.

Physics and Applied Mathematics Unit

- Banerjee, R., Chakraborty, B., Ghosh, S. : Non-commutativity in open String : A gauge independent analysis, *Phys. Lett. B*, 537, 340-350, 2002.
- Banerjee, R. and Ghosh, S. : Seiberg-Witten Map and the axial anomaly in Noncommutative field theory, *Phys. Lett. B*, 533, 162-167, 2002.
- Basu, B., Bandyopadhyay, P. and Pal, D. : High Temperature Superconductivity and Berry Phase, *Int. Journal of Modern Physics B*, 17, 293-305, 2003.
- Bhattacharyya, S., De, Bhaskar, Guptaroy, P. and Dasgosh, A. C. : Total Cross-Section from Particle accelerators, Colliders and Cosmic Ray Phenomena, *Czechoslovak Journal of Physics*, 52, 781-787, 2002.
- Dhar, S., Basu, B. and Bandyopadhyay, P. : Magnus Force on Quantum Hall Skyrmions and Vortices, *Phys. Lett. A*, 309, 262-266, 2003.
- Dandapat, B. S. and Mukhopadhyay, A. : Waves on the surface of a falling power-law fluid film, *Int. J. Non-linear Mech.*, 38, 21-38, 2002.
- Das, P. K. : Coherent States and squeezed states in interacting Fock space, *International Journal of Theoretical Physics*, 41, 1099-1106, 2002.
- Das, P. K. : Quasiprobability distribution and phase distribution in interacting Fock space, *International Journal of Theoretical Physics*, 41, 2033-2044, 2002.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- De, B., Bhattacharyya, S. and Guptaroy, P. : Transverse Momentum Spectra of Pions in Particle and Nuclear Collisions and Some Ratio-Behaviours : Towards A Combinational Approach, *Journal of Physics G*, 28, 2963-2981, 2002.
- De, B., Bhattacharyya, S. and Guptaroy, P. : Studies in Rapidity and p_T-spectra of Pions in High Energy NN, NA and AA Collisions : A Comprehensive Approach, *International Journal of Modern Physics A*, 17, 4615-4634, 2002.
- De, B., Bhattacharyya, S. and Guptaroy, P. : Antideuteron Production and the Physics of Coalescence : Implications of a New Approach, *International Journal of Modern Physics E*, 11, 387-401, 2002.
- De, B., Bhattacharyya, S. and Guptaroy, P. : Composite Particle Formation in Au + Au Reactions at 11.6A GeV/c : Towards a New Approach, *International Journal of Modern Physics E*, 11, 289-301, 2002.
- Ghosh, S. : Gauge invariance and Duality in the Non-commutative Plane, *Phys. Lett. B*, 558, 245-249, 2003.
- Ghosh, S. : Covariantly Quantized Spinning Particle and its Possible Connection to Non-commutative Space-time, *Phys. Rev. D*, 66, 1-9, 045031, 2002.
- Ghosh, S. : "Gauging" The Fluid, *J. Phys. A*, 35, 10747-10757, 2002.
- Ghosh, S. : A New Interpretation of the Seiberg-Witten Map, *J. Phys. A*, 36, L321-L328, 2003.
- Ghosh, S. : Bosonization in the Non-commutative Plane, *Phys. Lett. B*, 563, 112-116, 2003.
- Guptaroy, P., De, B., Bhattacharyya, S. and Bhattacharyya, D. P. : Nature of Antiproton Production in High Energy Nuclear Collisions : Assorted Data vs. Specific Models, *International Journal of Modern Physics A*, 17, 1159-1173, 2002.
- Guptaroy, P., De, B., Bhattacharyya, S. and Bhattacharyya, D. P. : Multiple Pion and Kaon Production in High Energy Nucleus-Nucleus Collisions : Measurement Versus Specific Models, *Fizika B*, 11, 115-134, 2002.
- Ho, Choon-Lie and Roy, P. : Quasi exact solvability of the Pauli equation, *J. Phys. A*, 36, 4617-4627, 2003.
- Kanoria, M. and Mandal, B. N. : Water waves scattering by a submerged circular arc shaped plate, *Fluid Dynamics Research*, 31, 317-331, 2002.
- Kandpal, H. C., Roy, S. and Kafatos, M. : Experimental verification of screen effect and dynamic multiple scattering theory, *SPIE, International Society for Optical Engineering*, 4929, 74-79, 2002.
- Mandal, B. N. and Gayen, R. : Water wave scattering by two circular arc shaped plates, *J. Engng. Math.*, 44, 297-303, 2002.
- Mamaloukas, C., Halder, K. and Mazumdar, H. P. : Application of double decomposition to pulsatile flow, *J. Appl. Math. Comput.*, 10, 193-207, 2002.
- Mazumdar, B. S. and Ghoshal, K. : Velocity and suspension concentration in sediment mixed fluid, *International Journal of Sediment Research*, 17, 220-232, 2002.
- Pal, D., Basu, B. and Bandyopadhyay, P. : Magnus Force in High Temperature Superconductivity and Berry Phase, *Phys. Lett. A*, 299, 304-308, 2002.
- Parashar, P. : Induced representations of $U_q SO(5)$, *Journal of Mathematical Physics*, 44, 864-881, 2003.

INDIAN STATISTICAL INSTITUTE

- Poría, S., Chakraborty, B. K. and Mazumdar, H. P.: Some aspects of Rikitake system of dynamical equations, *Int. J. of Appl. Mech. & Engng.*, 5, 87-96, 2002.
- Roychoudhury, R.: Arbitrary Amplitude Solitary Kinetic Alfvén Waves in a non-thermal Plasma. *Journal of Plasma Physics*, 6, 199-204, 2002.
- Roychoudhury, R. and Mitra, S.: Pseudopotential Approach to Non-linear Dust Acoustic Waves in Dusty Plasma, *Physics of Plasmas*, 9, 4160-4165, 2002.
- Roy, B. and Roy, P.: A Lie algebraic approach to effective mass Schrödinger equations, *J. Phys. A*, 35, 3961, 2002.
- Roy, P. and Roy, B.: Gazeau-Klauder Coherent State for the Morse potential and some of its properties, *Phys. Lett. A*, 296, 187-191, 2002.
- Sinha, A. and Roychoudhury, R.: Isospectral partner for complex PT invariant complex potentials, *Phys. Lett. A*, 301, 163-172, 2002.
- Sinha, A., Roychoudhury, R. and Varshni, Y. P.: Wentzel-Kramers-Brillouin Quantization Rules for two-dimensional Quantum dots, *Physica B*, 325, 214-223, 2002.
- Tapanidis, T., Tsagas, G. and Mazumdar, H. P.: On the symmetries of differential equation governing damped harmonic vibration, *Nonlinear Funct. Anal. & Appl.*, 7, 473-480, 2002.

Biological Sciences Division

Agricultural Sciences Unit

- Banik, P., Mandal, A. and Rahman, M. S.: Markov chain analysis of weekly rainfall data in determining drought-proneness, *Discrete Dynamics in Nature and Society*, 7, 231-239, 2002.
- Das, S.: On the ontogeny of stomata and glandular hairs in some mangroves, *Acta Botanica Croatica*, 61, 199-205, 2002.
- Ghosh, S.S., Das, S. and Ghose, M.: Biology of *Nypa fruticans* (Thunb.) Wurm. - an endangered mangrove palm of Sundarbans, India, *Advances in Plant Sciences*, 15, 71-78, 2002.
- Nandy, P. and Ghose, M.: Estimation of osmotic potential and free amino acids in some mangroves of Sundarbans, India, *Acta Botanica Croatica*, 62, 37-45, 2003.
- Sarkar, R. K. and Banik, P.: Effect of planting geometry, direction of planting and sulphur on growth and productivity of sesame (*Sesamum indicum*), *Indian Journal of Agricultural Sciences*, 72, 70-73, 2002.
- Singh, S., Sehgal, A., Goswami, A., Waghmare, S., Chakraborty, T. and Sharma, S.: Surface expression of the conserved ribosomal protein P0 on parasite and other cells, *Molecular Biochemical Parasitology*, 119, 114-121, 2002.

Anthropology and Human Genetics Unit

- Adak, D. K., Tiwari, M. K., Randhwa, M., Bharati, S. and Bharati, P.: Pattern of adolescent growth among the Brahmin girls - Rural-Urban variation, *Collegium Anthropologicum*, 26, 501-507, 2002.
- Chakraborty, C. S., Roy, M., Sengupta, N. K., Lalchandluanga, R., Majumder, P. P.: Genetic relationships among some tribal groups inhabiting the north-eastern, eastern and sub-Himalayan regions of India, *Annals of Human Genetics*, 66, 361-368.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Chattopadhyay, P., Vasulu, T.S. and Kashyap, V.K. : Genetic affinity among eight ethnic populations of W. Bengal and Manipur, India: A study based on six polymorphic functional loci (HLADQA1, LDLR, GYPA, HBCG, D7S8 and GC), *International Journal of Human Genetics*, 2, 233-242, 2002.
- Dutta, R., Kashyap, V.K., Trivedi, R., and Vasulu, T.S. : Genomic diversity in North-East India. Genetic relationship among five ethnic populations from Manipur based on VNTR polymorphism, *International Journal of Human Genetics*, 3, 21-27, 2003.
- Dutta, R., Reddy, B.M., Chattopadhyay, P., Kashyap, V.K., Sun, G. and Deka, R.: Patterns of Genetic Diversity at the 9 Forensically Approved STR Loci Among the Indian Populations, *Human Biology*, 74, 33-49, 2002.
- Edwin, D., Vishwanathan, H., Roy, S., Usha Rani, M.V., Majumder, P.P. : Mitochondrial DNA diversity among five tribal populations of southern India, *Current Science*, 83, 158-162, 2002.
- Ghosh, S., Reich, T., Majumder, P.P. : Linkage mapping of quantitative trait loci in humans: an overview, *Annals of Human Genetics*, 66, 431-438, 2002.
- Karmakar, B., Yakovenko, K. and Kobylansky, E. : Dermatoglyphic sexual dimorphism : Finger and palmar qualitative characters in five endogamous populations of West Bengal, India, *Anthropologischer Anzeiger*, 60, 273-292, 2002.
- Karmakar, B., Yakovenko, K. and Kobylansky, E. : Multivariate analysis of sexual dimorphism in two types of dermatoglyphic traits in five endogamous populations of West Bengal, India, *Homo*, 53, 263-278, 2002.
- Kaur, I., Roy, S., Chakrabarti, S., Sarhadi, V.K., Majumder, P.P., Bhanwer, A.J.S., Singh, J.R. : Genomic diversities and affinities among four endogamous groups of Punjab (India) based on autosomal and mitochondrial DNA polymorphisms, *Human Biology*, 74, 819-836, 2002.
- Mitra, M., Kumar, P.V., Ghosh, R. and Bharati, P. : Growth patterns of the Kamars- A primitive tribe of Chattisgarh, India, *Collegium Anthropologicum*, 26, 485-499, 2002.
- Mukhopadhyay, S., Ray, S., Ghosh, S., Mukhopadhyay, B., and Bhatia, J.C. : Obstetric Morbidity and Socio-demographic factors in Rural West Bengal, India, *European Journal of Contraception and Reproductive Health Care*, 7, 41-52, 2002.
- Mukhopadhyay, S., Bose, M., Pal, B., Adhikary, A. : A Study on Gender Difference in Job-satisfaction in an urban Setting, *Journal of the Indian Anthropological Society*, 37, 287-291, 2002.
- Vishwanathan, H., Edwin, D., Usha Rani, M.V., Majumder, P.P.: A survey of haplotype frequencies and linkage disequilibrium at the DRD2 locus in the Nilgiri hill tribes, South India, *Current Science*, 84, 566-570, 2003.

Biochemistry Unit

- Bhattacharya, P., Duttagupta, C. and Sengupta, S. : Proline homozygosity in codon 72 of p53, a risk genotype for human papillomavirus related cervical cancer in Indian women, *Cancer Letters*, 188, 207-211, 2002.
- Duttagupta, C., Sengupta, S., Roy, M., Sengupta, D., Chakraborty, S., Bhattacharya, P., Roy, S., and Ghosh, S. : Oncogenic Human Papillomavirus infection and cervical cancer: a strategy in the perspective of rural India, *European Journal of Cancer prevention*, 11, 447-456, 2002.

Chemistry Unit

- Bhattacharya, S.K. : Iron, Manganese, Zinc and Copper in some surface soils of West Bengal, *Journal of Industrial Chemistry*, 74, 39-40, 2002.

INDIAN STATISTICAL INSTITUTE

Embryology Unit

- Beiragi, N. and Chattopadhyay, J. : Pelican at risk in Salton Sea- a delay induced eco-epidemiological model, *Mathematical and Computer Modelling of Dynamical System*, 8, 257-272, 2002.
- Chattopadhyay, J., Sarkar, R.R. and Pal, S. : Dynamics of nutrient-phytoplankton interaction in the presence of viral infection, *BioSystems*, 68, 5-17, 2003.
- Chattopadhyay, J. and Sarkar, R.R. : Chaos to order; preliminary experiments with a population dynamics models of three trophic levels, *Ecological Modelling*, 163, 45-50, 2003.
- Chattopadhyay, J., Mukhopadhyay, A. and Roy, P.K. : Effect of viral infection on the generalised Gause model of predator- prey system, *Journal of Biological System*, 11, 19-26, 2003.
- Chattopadhyay, J. and Pal, S. : Viral infection of phytoplankton zooplankton system - a mathematical modelling, *Ecological Modelling*, 151, 15-28, 2002.
- Chattopadhyay, J., Sarkar, R.R. and Mandal, S. : Toxin producing plankton may act as a biological control for planktonic blooms- field study and mathematical modelling, *Journal of Theoretical Biology*, 215, 333-344, 2002.
- Chattopadhyay, J., Sarkar, R.R. and Ghosal, G. : Removal of infected prey prevent limit cycle oscillations in an infected prey predator system- a mathematical study, *Ecological Modelling*, 156, 113-121, 2002.
- Chattopadhyay, J., Sarkar, R.R. and El abdllaoui, A. : A delay differential equation model on harmful algal blooms in the presence of toxic substances, *IMA Journal of Mathematics Applied in Medicine and Biology*, 19, 137-161, 2002.
- El abddllaoui, A., Chattopadhyay, J. and Arino, O. : Comparisons, by models, of some basic mechanisms acting on the dynamics of the zooplankton-toxic phytoplankton system, *Mathematical Models and Methods in Applied Sciences*, 12, 1421-1451, 2002.
- Mukhopadhyay, A., Tapaswi, P. K. and Chattopadhyay, J. : A space time state-space model of phytoplankton allelopathy, *Nonlinear Analysis: Series B Real World Applications*, 4, 437-456, 2003.

Plant Chemistry Unit

- Majumdar, P. and Chanda, S. : A study on chemical profile of four lignocellulosic crop residues, *Indian Journal of Agricultural Biochemistry*, 14, 29-33, 2001 (journal received in 2002).
- Barik, S. : Strategies to check falling sugar concentration of sugar beet, *Indian Journal of Agricultural Biochemistry*, 14, 47-50, 2001 (journal received in 2002).

Social Sciences Division

Economic Research Unit

- Bhattacharya, K., Sarkar, N. and Mukhopadhyay, D. : Stability of the Day of the Week Effect in Return and in Volatility at the Indian Capital Market: A GARCH Approach with Proper Mean Specification, *Applied Financial Economics*, 2003.
- Bhattacharya, S. and Sarkar, A. : Foreign Investment, Economic Reforms and the Size of the Domestic Market, *Arkanitii*, 1, 132-148, 2002.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Bhaumik, S. K., Bose, S. and Coondoo, D.: The Emerging India Bond Market, *Journal of Global Financial Markets*, 34-43, 2003.
- Chakravarty, S.R.: Why Measuring Inequality by the Variance Makes Sense From Theoretical Point of View, *Journal of Income Distribution*, 10, 82-96, 2002.
- Chakravarty, S.R.: A Generalized Human Development Index, *Review of Development Economics*, 7, 99-114, 2003.
- Chattopadhyay M. and Sengupta, A.: Farm Size and Sharecropping Efficiency: Some Theoretical Issues, *Keio Economic Studies*, 38, 65-73, 2001 (published in July 2002).
- De, P. and Ghosh, B.: Productivity, Efficiency and Technological Change in Indian Ports, *International Journal of Maritime Economics*, 4, 348- 368, 2002.
- De, P. and Ghosh, B.: Causality between performance and traffic: an investigation with Indian ports, *Maritime Policy and Management*, 30, 5-27, 2003.
- Gupta, M.R.: Trade Sanctions, Adult Unemployment and the Supply of Child Labour: A Theoretical Analysis, *Development Policy Review*, 20, 317-332, 2002.
- Gupta, M.R.: Child Labour, Skill formation and Capital Accumulation: A Theoretical Analysis, *Keio Economic Studies*, 38, 23-40, 2001 (Published in July 2002).
- Kabiraj, T and Marjit, S.: Protecting Consumers Through Protection: The role of tariff-induced technology transfer, *European Economic Review*, 47, 113-124, 2003.
- Kabiraj, T: The P-MC Relationship: Can it be Non-monotone?, *Indian Economic Journal*, 49, 85-89, 2002.
- Kabiraj, T. and Banerjee, K.: Will all Southern Countries Extend Patent Protection to Northern Innovations?, *Keio Economic Studies*, 39, 85-96, 2002.
- Majumder, A.: On the Distributional Effect of Commodity Tax Reform, *Journal of Economic Research*, 7, 105 – 116, 2002.
- Majumder, A., and Chakrabarty, M.: Relative Cost of Children - A Demand System Approach: The Case of Rural Maharashtra, India, *Journal of Policy Modeling*, 25, 61 – 76, 2003.
- Mitra, M: Achieving the First Best in Sequencing Problems, *Review of Economic Design*, 7, 75-91, 2002.
- Mukherjee, P., Bose, S. and Coondoo, D.: Foreign Institutional Investment in the Indian Equity Market: An Analysis of Daily Flows during January 1999 - May 2002, *Money & Finance, ICRA Bulletin*, 2, 21-51, 2002.
- Sarkar, N.: Day of the Week Effect of Stock Returns in India: Effect of Economic Reforms, *The Asian Economic Review*, 44, 103-110, 2002.
- Sinha, U.B.: Licensing, Imitation and Subsidiary Under Government Policy Uncertainty, *Keio Economic Studies*, 38, 1-22, 2001 (published in July 2002).

Economic Analysis Unit, Bangalore

- Narayana, N.S.S.: State-wise patterns of SC/ST welfare expenditure in India, *Social Sciences Research Journal*, 10, 97-117, 2002.

INDIAN STATISTICAL INSTITUTE

Linguistic Research Unit

- Dattamajumdar, S. : Verbs reduplication in Asamiya, *International Journal of Dravidian Linguistics*, 30, 217-226, 2002.
- Dattamajumdar, S. : Expressives and echo formations as a stylistic device in Sukumar Roy, *Indian Journal of Linguistics*, 21, 54-66, 2002.
- Dattamajumdar, S. : Language attitude of the Indian expatriates in the United Arab Emirates : A Socio-economic perspective, *International Journal of Dravidian Linguistics*, 30, 37-44, 2003.
- Ganguly, S. : Brand name intervention and fuzziness : A pilot study of the language of television advertisements, *Indian Journal of Linguistics*, 21, 32-35, 2002.
- Indu, M. and Dattamajumdar, S. : Development status of bangla diphthongs in the language acquisition of hearing impaired children, *Indian Journal of Linguistics*, 21, 41-49, 2002.

Planning Unit, Delhi

- Jalan, J. and Ravallion, M. : Estimating the benefit incidence of an antipoverty program by propensity score matching, *Journal of Business Economics and Statistics*, 2003.
- Jalan, J. and Ravallion, M. : Does piped water improve child health for poor families in rural India, *Journal of Econometrics*, 112, 153-173, 2003.
- Jalan, J. and Ravallion, M. : Geographic poverty traps, *Journal of Applied Econometrics*, 17, 329-346, 2003.
- Ramaswami, B., Andersson, H. and Ramamurtie, B.S. : Labour income and risky investments, *Journal of Economic Behavior and Organization*, 50, 477-493, 2003.
- Ramaswami, B. and Balakrishnan, P. : Food prices and the efficiency of public intervention : The case of the public distribution system in india, *Food Policy*, 27, 419-436, 2002.
- Ramaswami, B. : Understanding the seed industry : contemporary trends and analytical issues, *Indian Journal of Agricultural Economics*, 57, 417-429, 2002.
- Ramaswami, B., Pray, C. and Kelley, T. : Dissemination of private hybrids and crop yields in the semi-arid tropics of India, *Indian Journal of Agricultural Economics*, 57, 39-51, 2002.
- Sen, A., Dutta, B. and Peters, H. : Strategy-proof probabilistic mechanisms in economies with pure public, *Journal of Economic Theory*, 106, 392-416, 2002.
- Somanathan, E. and Sethi, R. : Understanding reciprocity, *Journal of Economic Behavior and Organization*, 50, 1-27, 2003.

Population Studies Unit

- Dihidar, S., Bhattacharya, B.N. and Mukherjee, K.L. : Description of breast feeding practices among weaker sections in Calcutta Metropolitan Area and its impact on post-parum in fecundable period, *Journal of Child Health Care*, 6, 203-219, 2002.

Psychology Research Unit

- Banerjee S.N. : A study on the vernacular competencies of the Primary school dropouts in the line of minimum level of learning, *Journal of Education and Psychology*, 59 & 60, 2002.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Chattopadhyay, R. and Ghosh, A.: Predicting Entrepreneur success : A Socio-Psychological Study, *The Journal of Entrepreneurship*, 11, 21-31, 2002.
- Chattopadhyay, R. and Ghosh, A. : Role of Demographic and Socio-Cultural variables on Entrepreneurial success : A study based on a group of Entrepreneurs from West Bengal, *Social Science International*, 18, 83-93, 2002.
- Chattopadhyay, R and Ghosh, A.: Effect of locus of Control on Individualism-Collectivism and Achievement value in a group of college students, *Indian Journal of Psychological Issues*, 10, 75-79, 2002.
- Dutta Roy, D. and Paul, M.: Reading motivation of children in grades III and IV, *Indian Education Review*, 38, 43-51, 2002.
- Dutta Roy, D.: Computer programming job analysis, *Management and Labour Studies*, 27, 255-262, 2002.
- Dutta Roy, D.: Correspondence between item and rating on the checklist of relative importance of computer programming tasks, *Journal of Psychometry*, 16, 67-76, 2002.
- Dutta Roy, D.: Aptitude Importance Profile Similarity of Computer Programmers Across Different Organizations, *Indian Journal of Psychological Issues*, 10, 129-132, 2002.
- Ghosh, A.: Development of Entrepreneurial Task Motivation Scale, *Psychological Studies*, 47, 153-158, 2002.

Sociological Research Unit

- Bharati, S. : Pattern of adolescent growth among brahmin girls-rural-urban variation, *Collagium Anthropology*, 26, 501-507, 2002.
- Chaudhury, A.K. : An observation on socio-economic data collection in survey research using structured questionnaire technique, *Everyman's Science*, 36, January-March 2002.
- Chaudhury, A.K : Socio-economic mechanism of the survival of landless agricultural labour in rice area of West Bengal: A case study, *Journal of Indian Anthropological Society*, 37, 2002.
- Dasgupta, U. : Rabindranath Tagore in an East West Encounter', *EVAM : Forum on Indian Representations*, New Delhi, 1, 73-102, 2002.
- Dasgupta, U. : In pursuit of a different freedom : Rabindranath Tagore's world university at Santiniketan', *IIC Quarterly*, 29, New Delhi , 25-38, 2003.
- Dasgupta, U. : Indian Statistical Institute, *Banglamedia : National Encyclopedia of Bangladesh*, 5, 248-249, Asiatic Society of Bangladesh, Dhaka, 2003.
- Dasgupta, U. : Santiniketan, *Banglamedia : National Encyclopedia of Bangladesh*, : Asiatic Society of Bangladesh, Dhaka, 9, 64-66, 2003.
- Dasgupta, A., Ghosh, A. and Sengupta, D. : Literacy movement in West Bengal: decentralisation and people's participation, *West Bengal (Special Number)*, 7, XLIV, 68-72, 2002.
- Ghosh, B.N. : Socio-economic life of Tribal women and children, *South Asian Journal of Socio-political studies*, 3, 9-34 & 52, 2002.
- Ghosh, B.N. : Role of women in the self-help group : An emerging possibility to cooperatization at grass root, *Man in India*, 92, 441-451, 2002.

INDIAN STATISTICAL INSTITUTE

- Swaminathan, M. : Excluding the Needy : The Public Provisioning of food in India, *Social Scientist*, 30, 34-58, 2002.
- Swaminathan, M. and Ramachandran, V.K. : Rural Banking and Landless Labour Households : Institutional Reform and Rural Credit Markets in India, *Journal of Agrarian Change*, 2, 502-544, 2002.
- Swaminathan, M., Ramachandran, V.K. and Rawal, V. : How Have Hired Workers Fared ? A Case Study of Women Workers from a Tamil Nadu Village, 1977 to 1999. *Indian Journal of Labour Economics*, 45, 311-325, 2002.

Statistical Quality Control and Operations Research Division

- Anis, M. Z. : Determination of Specification for Tensile Strength of Castings, *Economic Quality Control*, 17, 135-144, 2002.
- Anis, M.Z. : Determination of the Best Mean Fill, *Quality Engineering*, 15, 407-410, 2003.
- Bhattacharya, A. and Biswas, A.K. : Stability of the core in a class of NTU Games : A. Characterization, *International Game Theory Review*, 4, 165-172, 2002.
- Dasgupta, T., Sarkar, N.R. and Tamankar, K.G. : Using Taguchi methods to improve a control scheme by adjustment of changeable setting, *Total Quality Management*, 13, 2002.
- Dasgupta, T. : An economic inspection interval for control of defective items in a hot rolling mill, *Journal of Applied Statistics*, 30, 2003.
- Lakshminantan, P.R. : Statistical techniques in Six Sigma, *Productivity*, 43, 182-191, 2002.
- Majumdar, B. : Process variation & Six Sigma, *Productivity*, 43, 203 - 207, 2002.
- Parthasarathy, T., Sampangi Raman, D. and Sriparna, B. : Relationship between Strong Monotonicity Property, P-property, and GUS-property in Semi definite Linear Complementarity Problems, *Mathematics of Operations Research*, 27, 326-331, 2002.
- Ramamurthy, K.G., Seth, A. and Sadegh, M.K. : A combinatorial approach for component importance, *Communications in Statistics*, 32, 497-507, 2003.

Library, Documentation and Information Sciences Division

Library, Kolkata

- Basak, N. : Copyright-er-jabab-e copyleft | (Copyleft in reply to copyright!)(Bengali), *RBU Journal of Library and Information Science*, 6, 30-32, 2002.

Library, Bangalore

- Krishnamurthy, M. : Digital library gateway for Library and Information Science : A Study, *SRELS Journal of Information Management*, 39, 245-254, 2002.

Papers published in Conference Proceedings

Theoretical Statistics and Mathematics Division

Stat-Math Uni, Kolkata

- Barua, R. and Misra, J. : Binary arithmetic for DNA computer, *Proceedings of 8th International Conference on DNA-based Computers (DNA-8)*, M. Hagiya and A. Ohuchi (eds), Springer-Verlag, LNCS, 2568, 124-132, 2003.

Stat-Math Unit, Bangalore

- Dasgupta, A. and Ramasubramanian, S. : On reflected symmetric stable Levy processes, *Advances in Stochastic Modelling*, J.R. Artalejo and A. Krishnamoorthy (eds), Notable Publications, Inc., New Jersey, USA, 23-28, 2002.
- Jarosz, K. and Rao, T.S.S.R.K. : Weak*-extreme points of injective tensor product spaces, *Function spaces IV*, K. Jarosz (ed), American Mathematical Society, Contemporary Mathematics, Vol 328, 2003.
- Nagaraj, D.S. and Sury, B. : A quick introduction to algebraic geometry and elliptic curves, *Elliptic curves, modular forms and cryptography*, A.K. Bhandari, D.S. Nagaraj, B. Ramakrishnan and T.N. Venkataramana (eds), Hindustan Book Agency, New Delhi, 3-29, 2003.
- Nagaraj, D.S. and Sury, B. : Mordell-Weil theorem, *Elliptic curves, modular forms and cryptography*, A.K. Bhandari, D.S. Nagaraj, B. Ramakrishnan and T.N. Venkataramana (eds), Hindustan Book Agency, New Delhi, 73-84, 2003.
- Sury, B. : Elliptic curves over finite fields, *Elliptic curves, modular forms and cryptography*, A.K. Bhandari, D.S. Nagaraj, B. Ramakrishnan and T.N. Venkataramana (eds), Hindustan Book Agency, New Delhi, 31-45, 2003.

Applied Statistics Division*Applied Statics Unit*

- Biswas, A. : Theoretical and computational issues in the Bayesian analysis of multivariate ordinal data. *Recent Advances in Statistical Methods (Proceedings of Statistics 2001 Canada Conference)*, (Ed. Chaubey, Y.P.), World Scientific Publishing Co., London, 2002.
- Bandyopadhyay, U. and Biswas, A. : Optimal choice of design parameter in an adaptive design, *Calcutta Statistical Association Triennial Conference Proceedings*, 2002.
- Clark, J., Jacob, J., Stepney, S., Maitra, S. and Millan, W. : Evolving Boolean Functions Satisfying Multiple Criteria. *INDOCRYPT 2002., Lecture Notes in Computer Science*, 2551, 246-259, Springer Verlag, December 2002.
- Das, T.K. and Maitra, S. : Cryptanalysis of Correlation Based Watermark using Single Copy, *IEEE Information Theory Workshop, ITW 2002*, 204, Bangalore, India, October 2002.
- Das, T.K. and Maitra, S. : A Robust Block Oriented Watermarking Scheme in Spatial Domain, *ICICS 2002, Lecture Notes in Computer Science*, 2513, 187-196, Springer Verlag, December 2002.
- Das, T.K. and Maitra, S. : Cryptanalysis of Optimal Differential Energy Watermarking (DEW) and a Modified Robust Scheme, *INDOCRYPT 2002, Lecture Notes in computer Science*, 2551, 135-148, Springer Verlag, December 2002.
- Gangopadhyay, S. and Maitra, S. : Further results related to Generalized Nonlinearity, *INDOCRYPT 2002, Lecture Notes in Computer Science*, 2551 260-274, Springer Verlag, December 2002.
- Gupta, K.C. and Sarkar, P. : Improved Construction of Nonlinear Resilient S-Boxes, *Proceedings of Asiacrypt, LNCS 2501*, 466-483, 2002
- Maitra, S. Gupta, K.C. and Venkateswarlu, A. : Multiples of Primitive Polynomials and Their Products over GF(2), *Selected Areas in Cryptography, SAC 2002, August 2002., Lecture Notes in Computer Science*, Springer Verlag, 2595, 214-23, 2003.

INDIAN STATISTICAL INSTITUTE

- Pal, P. and Sarkar, P. : PARSHA-256: A parallelizable Hash function and a Multithreaded Implementation, *Proceedings of Fast Software Encryption*, 2003
- Pasalic, E. and Maitra, S. : A Maiorana-McFarland type Construction for Resilient Boolean Functions on n Variables (n Even) with Nonlinearity $>2^{n-1} - 2^n + 2^{n/2}$, *Workshop on Coding and Cryptography - WCC*, France, 365-374, 2003.
- Sarkar, P. : The Filter-Combiner Model for Memoryless Synchronous Stream Ciphers, *Proceedings of CRYPTO, LNCS 2442*, 535-548, 2002
- Venkateswarlu, A. and Maitra, S. : Further Results on Multiples of Primitive Polynomials and Their Products over GF (2), *ICICS 2002, Lecture Notes in Computer Science*, 2513, 231-242, Springer Verlag, December 2002.

Computer and Communication Sciences Division

Advanced Computing and Microelectronics Unit

- Banerjee, P. and Sur-Kolay, S. : An Accelerator for Initial Placement, *Progress in VLSI Design and Test (VLSI Design and Test Workshop)*, Bangalore, 340-347, 2002.
- Bhattacharya, B.B., Seth, S. C. and Zhang, S. : Low-energy BIST design for scan-based logic circuits, *Proc. International Conference on VLSI Design*, IEEE CS Press, USA, 546-551, 2003.
- Bhowmik, P., Bishnu, A., Bhattacharya, B. B., Kundu, M. K., Murthy, C.A. and Acharya, T. : Determination of minutiae scores for fingerprint image applications, *Proc. Third Indian Conf. on Computer Vision, Graphics and Image Processing (ICVGIP 2002)*, Allied Publishers Pvt. Ltd., New Delhi, 463-468, 2002.
- Bishnu, A., Bhowmik, P., Dey, J., Bhattacharya, B. B., Kundu, M. K., Murthy, C. A. and Acharya, T. : Combinatorial classification of pixels for ridge extraction in a gray scale finger print image, *Proc. Third Indian Conf. on Computer Vision, Graphics and Image Processing (ICVGIP 2002)*, Allied Publishers Pvt. Ltd., New Delhi, 451-456, 2002.
- Bishnu, A., Bhattacharya, B.B., Bhunre, P. K., Kundu, M. K., Murthy, C. A. and Acharya, T. : Content based image retrieval : related issues using Euler vector, *Proc. Int. Conf. on Image Processing (ICIP-2002)*, IEEE PRESS, Piscataway, N.J., USA, 585-588, 2002.
- Bishnu, A., Bhattacharya, B.B., Kundu, M.K., Murthy, C. A. and Acharya, T. : Euler vector: A combinatorial signature of gray-tone images, *Proc. Int. Conference on Information Technology: Coding and Computing (ITCC'2002)*, Las Vegas, USA, 121-126, 2002.
- Chakraborty, A. and Sur-Kolay, S. : Quantum operators and gates - a review, *IETE Annual Technical Convention on Nanotechnology*, Chandigarh, Nov. 2002.
- Chakraborty, A. and Sur-Kolay, S. : Two-register model for solving quantum factoring problem, *Horizons of Telecommunications*, Kolkata, February 2003.
- Das, N. : More on rearrangeability of $(2 \log N - 1)$ -stage combined networks, *Proc. 6th International Conference on High Performance Computing, Asia Pacific Region (HPC-Asia 2002)*, Bangalore, December 16-19, 2002.
- Ghosh, S. C., Sinha, B. P. and Das, N. : An Efficient Channel Assignment Technique for Hexagonal Cellular Networks, *Proc. of 6th International Symposium on Parallel Architectures, Algorithms, and Networks (I-SPAN 2002)*, IEEE CS Press, 318-323, 2002.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Ghosh, S. C., Sinha, B. P. and Das, N. : Optimal Channel Assignment in Cellular Networks with Non-Homogeneous Demands, *Proc. of 56th IEEE Vehicular Technology Conference, 2002, (VTC)*, Vol. 3, 1739-1743.
- Ghosh, S. C., Sinha, B. P. and Das, N. : More on Lower Bounds for Channel Assignment Problem, *Proc. of 6th International Conference/Exhibition on High Performance Computing in Asia Pacific Region, (HPC-Asia 2002)*, December 16-19, Bangalore, 522-527.
- Goswami, P. P., Das, S. and Nandy, S.C. : Simplex range searching and K nearest neighbors of a line segment in 2D, *Proc. Scandinavian Workshop on Algorithmic Theory (SWAT-2002)*, LNCS-2369, 69-79, 2002.
- Laha, A., Sen, A. and Sinha, B.P.: Parallel algorithms for identification of basis polygons in an image, *Lecture Notes in Computer Science (Springer)*, No. 2552, *Proceedings of the 9th International Conference on High Performance Computing*, December 18-20, 2002, Bangalore, 302-312.
- Mandal, P.S. and Mukhopadhyaya, K. : Mobile Agent based Checkpointing and Recovery Algorithms on a Distributed System, *Proc. of 6th International Conference/Exhibition on High Performance Computing in Asia Pacific Region (HPC-2002)*, Bangalore, 492-499, Dec.2002.
- Mukhopadhyaya, S. and Mukhopadhyaya, K. : A 2-D random walk based mobility model for location tracking, *Proc. High Performance Computing-2002*, LNCS 2552, 357-366, 2002.
- Roy, S., Goswami, P. P., Das, S. and Nandy, S. C. : Optimal algorithm for a special point labeling problem, *Proc. Scandinavian Workshop on Algorithmic Theory, (SWAT-2002)*, LNCS-2369, 110-120, 2002.

Computer Vision and Pattern Recognition U ni

- Bhattacharya, U., Das, T.K. and Chaudhuri, B. B. : A cascaded scheme for recognition of handprinted numerals, *Proceedings of the 3rd Indian Conference on Computer Vision*, Allied Publishers Private Limited, Ahmedabad, 137 – 142, 2002.
- Chowdhury, S. and Datta, A.K. : A study of Jitter in Continuous Speech in Bangla, *Proceedings of Frontiers of Research on Speech and Music (FRSM-2003)*, IIT Kanpur, 154-159, 2003.
- Dash, N. S. and Chaudhuri, B. B. : Using text corpora for understanding polysemy in Bangla., *Proceedings of Language Engineering Conference (LEC-2002)*, K. Narayan Murthy and B.B. Chaudhuri (eds.), IEEE Computer Society, Los Alamitos, California, 99-109, 2003.
- Garain, U. and Chaudhuri, B. B. : Input of Handwritten Mathematical Expressions into machine coded Indian Language Documents, *The Indo European Conference on Multilingual Technologies (IECMT)*, R. K. Arora, M. Kulkarni, H. Darbari (eds.), Tata McGraw-Hill Publishing Company Limited, New Delhi, India, 3-12, 2002.
- Garain, U. and Chaudhuri, B. B. : A Novel Approach for Machine Recognition of Online Handwritten Mathematical Symbols and Automatic Interpretation of Mathematical Expressions, *Proceedings of the 90th Indian Science Congress, Section: Information and Communication Sciences*, Bangalore, Part-III, 39-40, 2003.
- Garain, U., Chaudhuri, B. B. and Pal, T. : Online Handwritten Indian Script Recognition: A Human Motor Function based Framework, *The 16th Int. Conf. on Pattern Recognition (ICPR)*, Vol. III, R. Kasturi, D. Laurendeau, C. Suen (eds.), IEEE Computer Society, USA., 164-167, 2002.
- Mandal, M. K., Parui, S.K. and Datta, A. K. : Automatic spoken digit recognition: a time domain approach, *Proceedings of Frontiers of Research on Speech and Music (FRSM-2003)*, IIT Kanpur, 209-215, 2003.

INDIAN STATISTICAL INSTITUTE

- Pal, U., Belaid, A. and Chaudhuri, B. B. : A System for Bangla Handwritten Numeral Recognition, *Proceedings of International Conference on Knowledge Based Computing Systems*, 433-443, 2002.
- Pal, U., Sinha, S. and Chaudhuri, B. B. : Multi-Oriented Text lines Detection and Their Skew Estimation, *Proceedings of Indian Conference on Computer Vision*, Allied Publishers Private Limited, Ahmedabad, India, 270-275, 2002.
- Singh, Y. K. and Parui, S. K. : Speech encryption using Simplet and Meitei Lock Sequence, *Proc. Frontiers of Research on Speech and Music (FRSM-2003)*, IIT Kanpur, 144-153, 2003.

Electronics and Communication Sciences Unit

- Chakraborty, D., and Pal, N. R. : Making a multiplayer perceptron say "Don't Know" when it should, *Proc. International Conference on Neural Information Processing, ICONIP 2002*, 1, 45-49, Dec. 18-22, 2002, Singapore.
- Laha, A., Pal, N. R. and Das, J. : Satellite image analysis with fuzzy rules and theory of evidence. *Proc. Conference on Fuzzy Set Theory and its Mathematical Aspects and Applications*, Allied Publishers Pvt. Ltd., 33-39, Benaras, 2002.
- Mohanta, P., Mukherjee, D. P. and Acton, S. : Agglomerative clustering for image segmentation, *ICPR2002*, R. Kasturi, D. Laurendeau and C. Suen (eds.), IEEE Computer Society, Quebec City, Canada, 2002.
- Mohanta, P., Sen, A. and Mukherjee, D. P. : Segmentation of images using level set analysis, *ICVGIP2002*, Allied Press, New Delhi, 2002.
- Mukherjee, D. P. and Acton, S. : Conditional anisotropic diffusion for leukocyte identification, *45th MidWest Symposium*, IEEE Circuits and System Society, Tulsa, USA, 2002.
- Mukhopadhyay, S. and Chanda, B. : Hue preserving color image enhancement using multi-scale morphology, *Proc. ICVGIP'02*, Ahmedabad, 179-184, Dec. 16-18, 2002 .
- Pal P. and Chanda, B. : A symmetry based clustering technique for multi-spectral satellite Imagery, *Proc. ICVGIP'02*, Ahmedabad, 282-286, Dec. 16-18, 2002
- Tang, J., Acton, S. and Mukherjee, D. P. : Retrieving similar images in an image database using a relational matrix, *45th MidWest Symposium*, IEEE Circuits and System Society, Tulsa, USA, 2002.

Machine Intelligence Unit

- Bandyopadhyay, S., Maulik, U., Cook, D. J., Holder, L. B., and Ajmerwala, Y. : Enhancing Structure Discovery for Data Mining in Graphical Databases Using Evolutionary Programming, *Florida Artificial Intelligence Research Symposium, FLAIRS-2002*, Pensacola, Florida, USA, 232-236, 2002.
- Maity, S. P. and Kundu, M. K. : Robust and blind spatial watermarking in digital image, *Proc. Indian Conf. on Computer Vision, Graphics and Image Processing (ICVGIP 2002)*, Ahmedabad, 388 -393, 2002.
- Maity, S. P. and Kundu, M. K. : Information theoretic approach in spatial image watermarking, *Proc. International Conf. on Computer Vision and Graphics (ICCVG 2002)*, Zakopane, Poland, 524-529, Sep. 25-29, 2002.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Pal, S. K. : Soft Computing Pattern Recognition, Case Generation and Data Mining. *Fuzzy Set Theory and Its Mathematical Aspects and Applications*. Arun K. Srivastava (ed.), Allied Publishers Pvt. Ltd., New Delhi, 51-60, 2003.
- Pal, S. K., Dasgupta, B and Mitra, P. : Rough Sets, Fuzzy Discretization and Self Organizing Maps. *Fuzzy Set theory and Its Mathematical Aspects and Applications*. Arun K. Srivastava (ed.), Allied Publishers Pvt. Ltd., New Delhi, 155-160, 2003.
- Roy, S., Bandyopadhyay, S., and Maulik, U. : A Search Scheme to Solve the Complex Triangle Elimination (CTE) Problem for Un-weighted Adjacency Graphs. *VLSI Design and Test Workshop*, Bangalore, 309-317, August, 2002.
- Roy, S., Maulik, U., Bandyopadhyay, S., Basu, S., and Sikdar, B. K. : Efficient BIST Design for Sequential Machines Using FiF-FOF Values in Machine States. *Asia and South Pacific Design Automation Conference, (ASP-DAC)*, Kitakyushu, Japan, 875-878, January 21-24, 2003.

Physics and Earth Sciences Division

Geological Studies Unit

- Bhattacharya, S. : Thermo-tectonic modeling in earth sciences: a new approach using mathematics of stochastic processes, Extended Abstract, *Chapman Conference on Exploration Geodynamics*, Perth, Australia, 2002.
- Chaudhuri, A. K. and Patranabis Deb, S. : Platform-slope-basinal environment in a Neoproterozoic mixed siliciclastic carbonate sequence in South Indian craton, Extended Abstract, *16th International Sedimentological Congress*, Rand Afrikaans University, Johannesburg, South Africa, 2002.

Physics and Applied Mathematics Unit

- Dandapat, B. S., Daripa, P. and Ray, P.C. : Thin Liquid Film Flow on a Rotating Annular Disk : Asymptotic Solution, ASME Paper, *Fifth Intl. Symp. on Num. Methods for Multiphase Flow*, Montreal, Canada, July 14-18, 2002.
- Kanoria, M. and Mandal, B. N. : Reflection by slotted thick barriers under oblique wave attack – a numerical study, *IUTAM Symp. on Diffraction and Scattering in Fluid Mechanics and Elasticity*, Manchester, U. K., I. D. Abrahams, P. A. Martin and M. J. Simon (eds), Kluwer Academic Publishers, 35-49, 2002.
- Kanoria, M. and Mandal, B. N. : Interface wave scattering by an elliptic arc, *Proc. 16 IWWWFB*, R. C. T. Rainy and S. F. Lee (eds), Cambridge, U. K., 69-72, 14-17 April, 2002.
- Mazumder, B. S., Ghoshal, K. and Dalal, D.C. : Influence of bed roughness on sediment suspension : Experimental and theoretical studies, *Conference on Hydraulics, Water Resources & Ocean Engineering, HYDRO-2002*, Indian Society for Hydraulics, Pune, 45-50, 2002.
- Parashar, P., Ballestenos, A. and Herrenz, P.J. : Schrödinger Lie bialgebras, *Proc. of the 6th International Wigner Symposium, Istanbul, Turkey*, Vol. 2, 723-735, 2002.

Biological Sciences Division

Agricultural Sciences Unit

- Das, S. : Seed morphology and germination pattern of some mangroves from Sundarbans, West Bengal. *Trees*, 16: 240, (Abstract No. 3), 2002.
- Joshi, H. and Ghose, M. : Estimation of quadrat size, above ground biomass and community structure of mangroves in Sundarbans, India. *Trees*, 16: 241, (Abstract No. 6), 2002.

INDIAN STATISTICAL INSTITUTE

Plant Chemistry Unit

- Chanda, S., Ghosh K. and Majumdar (Chaudhuri), P. : Population Dynamics of Protocytic Bacteria of Rice fields of West Bengal, with special stress on Protease Production by *Bacillus licheniformis* S-Ch-5. *Biotechnology in Agriculture, Industry and Environment* (Proceedings of International Conference on Biotechnology for SAARC countries), A.M. Deshmukh (ed.), Microbiologists Society, Karad, Maharashtra, 301-316, 2002.
- Majumdar (Chaudhuri), P. and Chanda, S. : Morphological and biochemical characterization of two cellulolytic Streptomyces, screened from a compost. *Biotechnology in Agriculture, Industry and Environment* (Proceedings of International Conference on Biotechnology for SAARC countries), A.M. Deshmukh (ed.), Microbiologists Society, Karad, Maharashtra, 9-14, 2002.
- Mukhopadhyay, G. and Dewanji, A. : Aquatic macrophytes and water transparency in two tropical ponds. *Proceedings of the 11th EWRS International Symposium on aquatic weeds*, Cemagrif (ed.), Moilets et Maas, France, 179-182, 2002.

Social Sciences Division Division

Population Studies Unit

- Datta, P. : Nepali Migration to India. *IUSSP Regional Population Conference 2002*, Vipan Prachubomh (ed.), International Union for the Scientific Study of Population (IUSSP), Paris, France, Chulalongkorn University, Bangkok, Thailand, 77, 2002.
- De, P., Bhattacharya, B.N. and Mukherjee, K.L. : Status of ARI and Diarrhoea among children and their health seeking behaviour in Kolkata Metropolitan area. *Proceedings of Nineteenth Annual Conference of Indian Society for Medical Statistics*, C.M. Pandey, Pradeep Mishra and Uttam Singh (eds), Prakashan Kendra, Lucknow, 91-100.
- Pathak, P. : Socio-economic, cultural, demographic and health issues in stabilisation of population in North-East India. *Population Stabilisation and Development*, G. Pattanaik (ed.), Council of Cultural Growth and Cultural Relations, Cuttack, 25-42, 2002.
- Pathak, P. : Demographic profile of Meghalaya in the perspective of Socio-economic, cultural and health development. *Dynamics of population and reproductive health : emerging issues of North-Eastern region of India*, Dilip C. Nath (ed.), Capital Publishing Co., Guwahati, 31-50, 2003.
- Sadhu, S., Bhattacharya, B.N., Majumdar, P.K. and Mukherjee, K.L. : Gynaecological and some common morbidities among women beyond childbearing age and their health seeking behaviour in Kolkata Metropolitan Area. *Proceedings of 19th Annual Conference of Indian Society for Medical Statistics*, C.M. Pandey, Pradeep Mishra and Uttam Singh (eds), Prakashan Kendra, Lucknow, 101-108, 2002.
- Saha, A.K. and Roy, D. : Generating life tables for the districts of West Bengal : A model approach, SCRA, 2002- *FIMIX*, Allahabad University, Allahabad, U.P., 65, 2002.

Psychology Research Unit

- Banerjee, S.N. : A study on the Minimum Level of Learning of the lower and backward class pupils at the end of their Primary Education. *Proceedings of the second social science congress*, vol-2, Asish Basu and Debi Chatterjee (eds.), Indian Academy of Social Sciences, West Bengal Unit, Hooghly, 185, 2002.
- Banerjee, S.N. : A study on Mental Retardation Among the Primary school pupils of Darjeeling Hill Region. *Proceedings of the 90th Indian Science Congress*, section of Anthropological and Behavioural Sciences, (including Archaeology, Psychology and Educational Sciences), vol-90, L.J. Bhushan (ed.), Indian Science Congress Association, Bangalore, 41-42, 2003.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

- Banerjee, S.N. : A study on Mental Retardation among the Primary School Pupils of West Bengal. (Bengali). *West Bengal State Science & Technology Congress, vol-10*, West Bengal State Council of Science & Technology and West Bengal Bigyan Mancha, Vidyasagar University, Midnapur, 126, 2003.
- Bhattacharya, H. : A study on the identification of subnormal pupils enrolled in the Primary Schools of Hooghly District, West Bengal. *Proceedings of the National Seminar on Applied Psychology*, S.K. Dasgupta (ed.), University of Calcutta, 14, 2003.
- Dutta Roy, D. : What do computer programmers want for job satisfaction? Problem of Human resource management. *Proceedings of the National Seminar on Applied Psychology*, S.K. Dasgupta (ed.), University of Calcutta, 6, 2003.
- Dutta Roy, D. : Predicting academic achievement with writing motives. *Proceedings of the 90th Indian Science Congress*, section of Anthropological and Behavioural Sciences, (including Archaeology, Psychology and Educational Sciences), vol-90, L.I. Bhushan (ed.), Indian Science Congress Association, Bangalore, 64, 2003.
- Maitra, M. : Development of a computer – aided test for assessment of minimum strong duration with successive decrease in stimulus presentation time. *Proceedings of the National Seminar on Applied Psychology*, S.K. Dasgupta (ed.), University of Calcutta, 17, 2003.
- Mukhopadhyay, S. and Dutta Roy, D. : Spiritual health of organization : A new vision of organizational change in rural bank development. *Proceedings of the National conference on Yoga and Indian Approaches to Psychology*, Pondicherry Psychology Association, Pondicherry, 32, 2002.
- Mukhopadhyay, S. : A study of personal value structure of the rural bank employees. *Proceedings of the 90th Indian Science Congress*, section of Anthropological and Behavioural Sciences, (including Archaeology, Psychology and Educational Sciences), vol-90, L.I. Bhushan (ed.), Indian Science Congress Association, Bangalore, 18, 2003.
- Mukhopadhyay, S. : Value importance as a moderator of the organizational awareness – mental health relationship. *Proceedings of the National Seminar on Applied Psychology*, S.K. Dasgupta (ed.), University of Calcutta, 7, 2003.
- Paul, M. and Dutta Roy, D. : Development of an Instrument to assess reading motive preferences of children in primary education. *Proceedings of the National Seminar on Applied Psychology*, S.K. Dasgupta (ed.), University of Calcutta, 16, 2003.
- Paul, M. : Reading Motive : Identification, assessment and predicting academic achievement of children in primary education. *Proceedings of the 90th Indian Science Congress*, section of Anthropological and Behavioural Sciences, (including Archaeology, Psychology and Educational Sciences), vol-90, L.I. Bhushan (ed.), Indian Science Congress Association, Bangalore, Young scientist abstract, 13, 2003.

Library, Documentation and Information Sciences Division

Documentation Research and Training Centre

- Das, J. and Prasad, A.R.D. : Installing Greenstone Digital Library on Linux. *Digital Libraries: Theory and Practice*, A.R.D. Prasad (ed.), ISI/DRTC, Bangalore, R, 231-234, 2003.
- Krishnamurthy, M. : Subject gateways to Library and Information Science. ILA Conference. Bangalore, 343-347, 2003.
- Madali, D. P., Prasad, A.R.D. and Tripathi, A. : Organized Display of Internet Search results: ASP based model for retrieved resources using Dublin Core Metadata Element set, *IATED Applied Modeling and Simulation Conference*, Cambridge, 8, 2002.

INDIAN STATISTICAL INSTITUTE

- Madalli, D. P. : Digital Libraries and Digital Libraries Initiatives, *Digital Libraries: Theory and Practice*, A.R.D. Prasad (ed.), ISI/DRTC, Bangalore, A, 1-8, 2003.
- Madalli, D.P. : Design and Implementation of Networked Digital Libraries: Best Practices, *Digital Libraries: Theory and Practice*, A.R.D. Prasad (ed.), ISI/DRTC, Bangalore, G, 79-87, 2003.
- Prasad, A.R.D. : Creation of Digital libraries in Unicode using Indian Languages, *Digital Libraries: Theory and Practice*, A.R.D. Prasad (ed.), ISI/DRTC, Bangalore, I, 105-114, 2003.
- Prasad, A.R.D. : Installing and Running Harvest on Linux Platform, *Digital Libraries: Theory and Practice*, A.R.D. Prasad (ed.), ISI/DRTC, Bangalore, T, 271-275, 2003.
- Sahoo, B. and Prasad, A R D : A Tutorial on WWWISIS, *Digital Libraries: Theory and Practice*, A.R.D. Prasad (ed.), ISI/DRTC, Bangalore, P, 199-214, 2003.
- Sahoo, B. and Rao, I.K. Ravichandra. : Need a change in the curriculum for Manpower Development in Library and Information Science, *9th IATLIS National Seminar on Manpower Development*, N. Laxman Rao (ed.), IATLIS, Hyderabad, 175-179, 2002.
- Sahoo, B. and Rao, I.K. Ravichandra : Planning and Designing of Digital Library, *XX National Seminar of IASLIC* ; IASLIC, Kolkata, 1-8, 2002.
- Sahoo, B. B. and Rao, I.K. Ravichandra : Copyright and Digital Libraries, *Digital Libraries: Theory and Practice*, A.R.D. Prasad (ed.), ISI/DRTC, Bangalore, K 129-140, 2003.

Computer and Statistical Service Centre

- Bagchi, A. : Declarative specification of gene regulatory networks and query evaluation in PathSys, *Proceedings of Workshop on Bioinformatics in IEEE International Conference in Data Engineering*, March 2003.
- Bagchi, A. : From association rule to classification, data mining efforts with statistical methods, *Triennial Conference on Statistical Methods and Applications*, Aligarh Muslim University, December 2002.

Papers Published in Books

Stat-Math Unit, Kolkata

- Bose, A. : U statistics and M_n estimates, *Uncertainty and optimality-Probability and Operations Research*, I.C. Misra (ed.), World Scientific, Singapore, 257-292, 2002.
- Dutta, A.K. : Some results on Affine Fibrations, *Advances in Algebra and Geometry*, 7-24, 2003.
- Ghosh, J.K. and Mukhopadhyay, N. : Parametric empirical Bayes model Selection – some theory, methods and simulation, *IMS Lecture Notes*.
- Goswami, A. and Sengupta, A. : Polynomially Harmonizable Processes and finitely Polynomially Determined Levy Processes, *Probability, Statistics and their applications : Papers in honour of Rabi Bhattacharya*, *IMS Lecture Notes*, Krishna Athreya, Mukul Majumdar, Madan Puri, Edward Waymire (eds), Institute of Mathematical Statistics, USA, 41, 153-168, 2003.
- Rao, B.V. and Chakraborty, S. : θ -expansions and the generalized Gauss map, *Probability, Statistics, and their Applications : Papers in honour of Rabi Bhattacharya*, *IMS Lecture Notes*, Krishna Athreya, Mukul Majumdar, Madan Puri, Edward Waymire (eds), Institute of Mathematical Statistics, USA, 41, 49-64, 2003.
- Sinha, K.B. : Geometry in Non-Commutative Language and Quantum Mechanics, *Applicable Mathematics in the golden Age*, J.C. Misra (ed.), Narosa, New Delhi, 276-285, 2003.

Stat-Math Univ, Delhi

Parthasarathy, K.R. : Impriimitivity systems and quantum codes, *Stochastic Analysis and Mathematical Physics II*, Trends in Mathematics, R. Rebolledo (ed.), Birkhauser Verlag, Basel, 147-154, 2003.

Parthasarathy, K.R. and Ravindran, G. : Univalence and the Jacobian Conjecture, *Applicable Mathematics*, J.C. Mishra (ed), (Golden Jubilee Volume, IIT, Kharagpur), Narosa Publishers, 2002.

Applied Statistics Division

Applied Statistics Unit

Ghosh, J.K. and Samanta, T. : Towards a nonsubjective Bayesian paradigm, *Uncertainty and Optimality*, J.C. Misra (ed.), World Scientific Publishing Company, Singapore, 1-69, 2002.

Computer and Communication Sciences Division

Computer Vision and Pattern Recognition Unit

Parui, S.K. and Datta, A. : On convergence of a neural network model computing MSC, *Advances in Soft Computing - AFSS 2002*, N.R. Pal and M. Sugeo (eds.), Springer Verlag, 221-227, 2002.

Electronics and Communication Sciences Unit

Bezdek, J. C. ., Pal, N. R., Runkler, T., and Pal, K. : Should tendency assessment precede rule extraction by clustering? (No!), *Advances in Computational Intelligence and Learning: Methods and Applications*, H. Zimmermann, G. Tsentis, M. V. Someren and G. Douinis (eds.), Kluwer, Norwell, MA 17-41, 2002.

Karmeshu and Pal, N. R. : Uncertainty, entropy and maximum entropy principle – An Overview, *Entropy Measures, Maximum Entropy Principle and Emerging Applications*, Karmeshu (ed.), Springer-Verlag, 1-53, 2003

Mandal, D. P. and Pal, N. R. : On the utility of different entropy measures in image thresholding, *Entropy Measures, Maximum Entropy Principle and Emerging Applications*, Karmeshu (ed.), Springer-Verlag, 177-198, 2003.

Machine Intelligence Unit

Bandyopadhyay, S., Srivastava, A. and Pal, S. K. : Multi-objective Variable String Genetic Classifier: Application to Remote Sensing Imagery, *Lecture Notes in Soft Computing, Image Processing and Pattern Recognition*, A. Ghosh and S. K. Pal (eds.), World Scientific, Singapore, 307-327, 2002.

Ghosh, A. and Sen, A. : Self-organizing neural network for multi-level image segmentation, *Soft Computing Approach to Pattern Recognition and Image Processing*, A. Ghosh and S. K. Pal (eds), World Scientific, Singapore, 129-144, 2002.

Mitra, S., Ghosh, A and Phukan, G : Protein structure prediction using soft computing, *Soft Computing Approach to Pattern Recognition and Image Processing*, A. Ghosh and S. K. Pal (eds), World Scientific, Singapore, 307-327, 2002.

Pal, S. K. : Pattern Recognition : Soft Computing Approach and Data Mining, *Computing and Information Sciences: Recent Trends*, J.C. Misra (ed.), Narosa Publishing House, New Delhi, 110-125, 2003.

Pal, S.K., Mitra, S. and Mitra, P. : Soft computing pattern recognition, data mining and Web intelligence, *Handbook of Intelligent Information Technology*, N. Zhong (ed), IOS Press, N.Y, USA, 2003.

INDIAN STATISTICAL INSTITUTE

- Sarbadhikari, S. N., and Pal, S.K. : Automated Techniques for Identifying Depression from EEG, *Handbook of Computational Methods in Biomaterials, Biotechnology & Biomedical Systems*, C. T. Leondes (ed.), Kluwer Academic Publishers, Boston, USA, 51-81, 2002.
- Tsutsui, S. and Ghosh, A. : Robust solution searching by genetic algorithms, *Advances in Evolutionary Computation*, A. Ghosh and S. Tsutsui (eds), Springer, 351-365, 2003.
- Zhang, D. and Pal, S.K. : Neural Networks and Systolic Arrays: Models and Integration, *Neural Networks and Systolic Array Design*, D. Zhang and S.K. Pal (eds), World Scientific, Singapore, 1-21, 2002.
- Zhang, D. and Pal, S.K. : Parallel ANN Architecture for Fuzzy Patterns, *Neural Networks and Systolic Array Design*, D. Zhang and S.K. Pal (eds), World Scientific, Singapore, 229-251, 2002.
- Zhang, D. and Pal, S.K. : Pipelined Systolic Arrays for Time-Delay Neural Networks, *Neural Networks and Systolic Array Design*, D. Zhang and S.K. Pal (eds), World Scientific, Singapore, 253-277, 2002.

Biological Sciences Division

Agricultural Sciences Unit

- Ghose, M. : Present and Future Scenario of Environmental Impact Assessment, *Prospects and Problems of Environment in the New Millennium*, Daya Publishing House, Delhi, M.N. Madhyastha, K.R. Sridhar and A. Lakshmi (eds.), 181-191, 2003.
- Ghose, M. : Environmental impact in the mangroves of Sundarbans and Orissa, *Prospects and Problems of Environment in the New Millennium*, M.N. Madhyastha, K.R. Sridhar and A. Lakshmi (eds), Daya Publishing House, Delhi, 28-34, 2003.
- Joshi, H. and Ghose, M.: Structural variability and biomass production of mangroves in Lothian Island of Sundarbans, India, *Research and Management options for Mangroves and saltmarsh Ecosystems*, Javed, Salim and Soyya Amrita G. de (eds), Environmental Research and Wildlife Development Agency, Abu Dhabi, UAE, 146-158, 2002.

Anthropology and Human Genetics Unit

- Ghosh, B.N., Bharati, P. and Vasulu, T.S. : Gender differentials in socio-cultural, political and health aspects in rural West Bengal, India, *Dimensions of Researches in Indian Anthropology*, Vol. I, Vijoy S Sahay and Pradip K. Singh (eds), Serials Publications, New Delhi, 256-269, 2003.
- Gupta, R. : A tribe in transition : The Sherpas of eastern Himalaya, *The Dying Earth*, M. Desai and M.K. Raha (eds), ABC Publication, Kolkata, 101-105, 2003.
- Panda, C.K., Chakraborty, S.B., Tripathi, A., Roy, A., Sengupta, A., Roy, B. and Roychoudhury, S. : Analysis of genetic alterations associated with the development of head and neck squamous cell carcinoma from Indian patients, *Proceedings of World Assembly on Tobacco Counters Health*, A. K. Varma (ed.), vol-2, Watch 2002, 256-258, 2002.

Social Sciences Division

Economic Research Unit

- Chattopadhyay, K. and Mazumdar, K. : Economics of Environmental Degradation - The Case of East Kolkata Wetlands, *Kolkata - the city of wetlands*, Mukherjee, M. and Chattopadhyay, K. (eds.), Department of Fisheries, Govt. of West Bengal in collaboration with Ministry of Agriculture, Govt. of India, 239, August 2002.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

Chattopadhyay, K. and Mazumdar, K. : Kolkata - the city of wetlands, *Kolkata - the city of wetlands*, Mukherjee, M. and Chattopadhyay, K. (eds.), Department of Fisheries, Govt. of West Bengal in collaboration with Ministry of Agriculture, Govt. of India, 169 - 208, 2002.

Chattopadhyay, M. : Farm Size and Productive Efficiency, *Economy and the Quality of Life: Essays in Memory of Ashok Rudra*, Bagchi, A.K., Chattopadhyay, M. and Khasnabis, R. (eds.), Dasgupta & Co (P) Ltd., Kolkata, 31 - 56, 2003.

Mazumdar, K. : Divergence and Convergence of International Development: A Socio-Economic Approach, *Rich and Poor: Disparities, Perceptions and Concomitants*, Wolfgang Glatzer (ed.), Kluwer Academic Publishers, The Netherlands, 59-72, 2002.

Linguistic Research Unit

Choudhry, A. : Linguistic complexity and the 'Three language formula' : language and education in India, *World Yearbook of Education : Language Education*, Euan Reid and Jill Bourne (eds.), Kogan Page, London, 227-238, 2003.

Population Studies Unit

Adak, D.K., Bhattacharya, B.N., Ghosh, R., Pal, M., Bharati, P. and Vasulu, T.S. : The tribes of Madhya Pradesh : A brief Ethnographic Note, *Demography and Health Profile of the Tribal : A study of M.P.*, D.K. Adak, B.N. Bhattacharya, R. Ghosh, M. Pal, P. Bharati and T.S. Vasulu (eds.), Anmol Publications Pvt. Ltd., New Delhi, 30-49, 2003.

Sociological Research Unit

Ramachandran, V.K. and Swaminathan, M. : Financial Liberalisation and Rural Credit in India: the Impact on Landless Labour Households, *Work and Well-being in the Age of Finance*, C.P. Chandrasekhar and Jayati Ghosh (eds.), Tulika Books, 2002.

Ramachandran, V.K. : Aspects of Poverty and Living Standards, *Bombay and Mumbai: The City in Transition*, Sujata Patel and Jim Masselos (eds.), Oxford University Press, 81-109, 2003.

Ramachandran, V.K. : Compulsory school education and the law in India, *Behind the Blackboard : Contemporary Perspectives on Indian Education*, Abhay Kumar and Samik Lahiri (eds.), Vol.1, SFI Publications, New Delhi, 2002.

Swaminathan, M. : Policies of Food Security : An Agenda for Change, *Agenda for North East India*, B. Datta Ray (ed.), Concept Publishing, New Delhi, 2002.

Swaminathan, M. : Poverty and Development in Mumbai, *Bombay's Future*, J. Masselos and S. Patel (eds.), Oxford University Press, Mumbai, February 2003.

Statistical Quality Control and Operations Research Division

Chakraborty, A.K., Pichumani, R. and Mondal, S. : Developing Marketing Strategy Using Survey Data, *Statistics for Quality Improvement*, 14-28, 2002, Indian Association for Productivity Quality and Reliability, in collaboration with Forum for Interdisciplinary Mathematics.

Part II. VISITING SCIENTISTS, HONOURS AND AWARDS, ASSIGNMENTS

8. VISITING SCIENTISTS

A number of distinguished scientists from abroad and India participated in the research, training and other scientific activities of the Institute during the year. Some of them came to the Institute on invitation and spent fairly long periods in the Institute to assist in the regular research and teaching programmes, while others came for short periods and gave lectures and seminars. Most of them were available for consultation by the faculty members of the Institute. Names of the visiting scientists are given below.

1. Abhyankar, S.S., Purdue University, U.S.A., December 7 – 13, 2002, *Stat-Math Unit, Kolkata.*
2. Acharya, B.D., DST, Government of India, December 24 – 31, 2002, *Stat-Math Unit, Kolkata.*
3. Acharya, Tinku, Intel Corp., USA, April 22, 2002, *Computer Vision and Pattern Recognition Unit, Kolkata.*
4. Achuthan, N.R., Curtin University of Technology, Perth, Western Australia, December 2002 – January 2003, *Statistical Quality Control and Operations Research Division.*
5. Adhikari, S.D., Harish-Chandra Research Institute, March 18 – April 4, 2002, *Stat-Math Unit, Bangalore.*
6. Asundi, A.Y., Bangalore University, September 2002 to March 2003, *Documentation Research and Training Centre, Bangalore.*
7. Athreya, J., University of Chicago, July 31, 2002, *Stat-Math Unit, Bangalore.*
8. Athreya, K.B., Iowa State University & Cornell University, May 30, 2002, *Stat-Math Unit, Bangalore.*
9. Averous, Jean, Laboratoire de Statistique et Probabilités, Université Paul Sabatier, France, January – March, 2003, *Stat-Math Unit, Kolkata.*
10. Bahadur, Bir, Kakatiya University, Warangal, March 25-28, 2003, *Agricultural Science Unit, Kolkata.*
11. Bahri, Abhas, Rutgers University, January 13, 2003, *Stat-Math Unit, Bangalore.*
12. Balakrishnan, Pulepre, Indian Institute of Management, Kozikode, March 22 – April 1, 2003, *Planning Unit, Delhi.*
13. Basak, Gopal K., University of Bristol, U.K., July 1 – September 30, 2002, *Stat-Math Unit, Kolkata.*
14. Basu, S.K., Banaras Hindu University, May 27 – June 5, 2002, *Advanced Computing and Microelectronics Unit, Kolkata.*
15. Bhattacharya, Manish C., New Jersey Institute of Technology, U.S.A., November 7, 2002 – April 30, 2003, *Stat-Math Unit, Kolkata.*
16. Bhattacharyya, Tirthankar, Indian Institute of Science, Bangalore, March 27, 2002, *Stat-Math Unit, Bangalore.*
17. Bhattacharya, Binay, Simon Fraser University, Canada, December 17 – 20, 2002, *Advanced Computing and Microelectronics Unit, Kolkata.*
18. Bhattacharyya, G., *Documentation Research and Training Centre, Bangalore.*

SEVENTY FIRST ANNUAL REPORT : 2002-2003

19. Bing, Zheng, Shanghai Normal University, Sanghai, China, July 2001 - June 2002, *Stat-Math Unit, Delhi*.
20. Biswas, Indrani, T.I.F.R., Mumbai, August 13 - September 15, 2002, *Stat-Math Unit, Kolkata*.
21. Borkar V. S., TIFR, Mumbai, March 16 - 20, 2003, *Stat-Math Unit, Delhi*
22. Carter, Michael, University of Canterbury, October 16 - November 30, 2002, *Planning Unit, Delhi*.
23. Chakraborty, Partha Sarathi, August 1 - October 31, 2002, *Stat-Math Unit, Kolkata*.
24. Chakraborty, Partha Sarathi, November 8, 2002 - February, 2003, *Stat-Math Unit, Delhi*.
25. Chakraborty, Soubhik, T.M. Bhagalpur University, July 1 - 31, 2002, *Stat-Math Unit, Bangalore*.
26. Chakraborty, T., Institute of Agriculture, Visva Bharati, March 26, 2003, *Agricultural Science Unit, Kolkata*
27. Chatterjee, Snigdhasu, University of Minnesota, USA, May 20 - October 14, 2002, *Stat-Math Unit, Kolkata*.
28. Chatterjee, Kalyan, Penn State University, USA, July 2002, *Planning Unit, Delhi*.
29. Chii-Ruey, Hwang, Academia Sinica, Taipei, Taiwan, December 17 - 19, 2002, *Physics and Applied Mathematics Unit, Kolkata*.
30. Cig, Ji, Un, Chungbuk National University, Korea, January - February, 2003, *Stat-Math Unit, Kolkata*.
31. Cowling, M., University of New South Wales, Australia, December 23 - 24, 2002, *Stat-Math Unit, Bangalore*.
32. Daniel, Benoit, Ecole Normale Supérieure, Paris, August 16, 2002, *Stat-Math Unit, Bangalore*.
33. Das, S.K., Central Water & Power Research Station, Pune, July 25 - 26, 2002, *Physics and Applied Mathematics Unit, Kolkata*
34. Das, Mausumi, Delhi School of Economics, January - February, 2003, *Planning Unit, Delhi*.
35. Datta, Mahuya, Calcutta University, February 1, 2002 - March 31, 2003, *Stat-Math Unit, Kolkata* and May 19 - June 19, 2002, *Stat-Math Unit, Bangalore*.
36. Deshouillers, Jean-Marc, Université Victor, Segalen Bordeaux 2, February 16 - 21, 2003, *Stat-Math Unit, Delhi*.
37. Dey, Rukmini, Harish-Chandra Research Institute, Allahabad, June 2002, *Stat-Math Unit, Bangalore*.
38. Dhar, Deepak, Tata Institute of Fundamental Research, Mumbai, November 10 - 16, 2002, *Stat-Math Unit, Delhi*.
39. Dhar, Subhankar, San Jose State University, USA, December 21, 2002 - January 15, 2003, *Advanced Computing and Microelectronics Unit, Kolkata*.
40. Dharmadhikari, A. D., University of Pune, October 19 - 25, 2002, *Stat-Math Unit, Delhi*.
41. Dobmeier, C., Freie University, Berlin, Germany, October 29 - November 5, 2002, *Geological Studies Unit, Kolkata*.

INDIAN STATISTICAL INSTITUTE

42. Dubey, Pradeep, University of Stony Brook, USA, August 01 – December 15, 2002, *Planning Unit, Delhi.*
43. Folmer, Henk, Wageningen University, The Netherlands, January 25 – February 01, 2003, *Economic Research Unit, Kolkata.*
44. Fuwa, Nobu Huko, International Rice Research Institute, Philippines (International Organization), January 10 – 30, 2003, *Agricultural Sciences Unit, Kolkata.*
45. Gastesi, Pablo Ares, TIFR, Mumbai, January 30, 2003, *Stat-Math Unit, Bangalore.*
46. Giacomoni, Jacques, Ceremath, Toulouse 1, December 16, 2002, *Stat-Math Unit, Bangalore.*
47. Gopinath, M.A., North Carolina Central University, Durham, USA, *Documentation Research and Training Centre, Bangalore.*
48. Gore, A.P., University of Pune, February 19, 2003, *Stat-Math Unit, Bangalore.*
49. Goswami, Debashish, October 21 - 28, 2002, *Stat-Math Unit, Delhi.*
50. Gouezel, Sebastien, Ecole Normale Supérieure, Paris, August 16, 2002, *Stat-Math Unit, Bangalore.*
51. Graczyk, P., Université d' Angers, September 24 – 28, 2002, *Stat-Math Unit, Bangalore.*
52. Gupta, Abhik, Dept. of Ecology & Environmental Science, Assam University, March 26, 2003, *Agricultural Science Unit, Kolkata.*
53. Gupta, Poonam, International Monetary Fund, January 1 – April 30, 2003, *Planning Unit, Delhi.*
54. Gupta, Bidyut, Southern Illinois University, USA, November 18, 2002 – January 10, 2003, *Advanced Computing and Microelectronics Unit, Kolkata.*
55. Haldar, Sibsankar, November 21, 2002 – July 31, 2003, *Applied Statistics Unit, Kolkata.*
56. Haravu, L.J., Trustee, Kesavan Institute of Information and Knowledge Management, *Documentation Research and Training Centre, Bangalore.*
57. Hazra, S.B., University of Trier, Germany, September 16 – 18, 2002, *Physics and Applied Mathematics Unit, Kolkata.*
58. Jarosz, K., Southern Illinois University, January 22 – February 5, 2003, *Stat-Math Unit, Bangalore.*
59. Jayrani, Cheeneebash, University of Mauritius, January 2003, *Stat-Math Unit, Bangalore.*
60. Kam, Suan Pheng, International Rice Research Institute, Philippines (International Organization), January 24 – 26, 2003, *Agricultural Sciences Unit, Kolkata.*
61. Khaledi, Baha-Eldin, Razi University, Iran, March 6 - April 15, 2002, *Stat-Math Unit, Delhi.*
62. Khaledi, Baha-Eldin, Razi University, Iran, December 31, 2002 - January 15, 2003, *Stat-Math Unit, Delhi.*
63. Kolstad, Charles, University of California, USA, February 9 – 25, 2003, *Planning Unit, Delhi.*
64. Koranyi, Adam, City University of New York, January 2003, *Stat-Math Unit, Bangalore.*

SEVENTY FIRST ANNUAL REPORT : 2002-2003

65. Krishna, M.B., Preelance Ecologist, Bangalore, May 22, 2002, *Stat-Math Unit, Bangalore.*
66. Krishnan, T., Systat Software Asia Pacific Pvt. Ltd., December 1, 2001 - November 30, 2002, *Stat-Math Unit, Bangalore.*
67. Kulkarni, S.H., Indian Institute of Technology, Chennai, January 22 – 25, 2003, *Stat-Math Unit, Bangalore.*
68. Kumar, Ravinder, Dayalbagh Educational Institute, Agra, June 1 - 30, 2002, *Stat-Math Unit, Delhi.*
69. Kundu, Sukhamsay, Louisiana State University, U.S.A., December 25, 2002 – January 17, 2003, *Stat-Math Unit, Kolkata.*
70. Lahiri, Soumendra Nath, Iowa State University, U.S.A., July 24 – August 20, 2002, *Stat-Math Unit, Kolkata.*
71. Lancaster, F.W., University of Illinois, Urbana-Champaign, Ill., USA, July 8 - 10, 2002, *Documentation Research and Training Centre, Bangalore.*
72. Laskar, Renu, Clemson University, USA, May 20 – 21, 2002, *Advanced Computing and Microelectronics Unit, Kolkata.*
73. Levai, Gezza, Institute of Nuclear Research, Academy of Science, Hungary, November 20 – December 10, 2002, *Physics and Applied Mathematics Unit, Kolkata.*
74. Loday, Jean-Louis, Institut de Recherche Mathématique Avancée, Centre National de la Recherche Scientifique, France, January 20 – 31, 2003, *Stat-Math Unit, Kolkata.*
75. Madhavan, C.E. Veni, IISc., Bangalore and DRDO, New Delhi, May 24, 2002, *Stat-Math Unit, Bangalore.*
76. Mazjima, Wataru, Osaka City University, Japan, February 8, 2003, *Geological Studies Unit, Kolkata.*
77. Majumder, Subhashis, IIT, Kolkata, February 26 – March 31, 2003, *Advanced Computing and Microelectronics Unit, Kolkata.*
78. Mandal, Mrinal, University of Alberta, Edmonton, Canada, December, 27, 2002, *Advanced Computing and Microelectronics Unit, Kolkata.*
79. Mare, David, University of Essex, February 20 – 25, 2003, *Planning Unit, Delhi.*
80. Mathew, Thomas, University of Maryland at Baltimore, USA, June 10 –16, 2002, *Statistical Quality Control and Operations Research Division.*
81. Mishra, M. N., Institute of Mathematics & Applications, Bhubaneswar, August 12 - 31, 2002, *Stat-Math Unit, Delhi.*
82. Mitra, Manishupak, University of Bonn, September 2002, *Planning Unit, Delhi.*
83. Mitra, Tulika, National University of Singapore, July 4, 2002, *Advanced Computing and Microelectronics Unit, Kolkata.*
84. Mitra, Subhashis, Intel Corporation, USA & Stanford University, August 6, 2002, *Advanced Computing and Microelectronics Unit, Kolkata.*

INDIAN STATISTICAL INSTITUTE

85. Mohanty, Sara, Scientist, Indian Statistical Institute, Bangalore, March 2000 – March 2003, *Stat-Math Unit, Bangalore.*
86. Mukherjee, Amiya, December 01, 2002 – November 30, 2003, *Stat-Math Unit, Kolkata.*
87. Mukherjee, Rahul, Indian Institute of Management, Kolkata, Second week of January, 2003, *Stat-Math Unit, Delhi* and April 1, 2002 – March 31, 2003, *Stat-Math Unit, Kolkata.*
88. Mukherjee, R.N., Burdwan University, August 15, 2002, *Physics and Applied Mathematics Unit, Kolkata.*
89. Muralidharan, K., Bhavnagar University, Gujrat, May 6 - 9, 2002, *Stat-Math Unit, Delhi.*
90. Murty, K.G., The University of Michigan, Ann Arbor, U.S.A., *Statistical Quality Control and Operations Research Division.*
91. Murthy, Katta G., University of Michigan, Ann Arbor, USA, September 25, 2002, *Statistical Quality Control and Operations Research Unit, Hyderabad.*
92. Narang, Gitu, Guru Nanak Dev University, Amritsar, September 1 – 30, 2002, *Physics and Applied Mathematics Unit, Kolkata.*
93. Narayanan, E.K., Harish-Chandra Research Institute, October 1 – 11, 2002, *Stat-Math Unit, Bangalore.*
94. Nayak, Suresh, Chennai Mathematical Institute, November 12 – 15, 2002, *Stat-Math Unit, Bangalore.*
95. Negi, Atul, University of Hyderabad, May 1 – 31, 2002, *Computer Vision and Pattern Recognition Unit, Kolkata.*
96. Nitsure, Nitin, TIFR, Mumbai, August 8, 2002, *Stat-Math Unit, Bangalore.*
97. Olssen, Lena Ringstad, University of Tromsø, Norway, November 2002 – February 2003, *Stat-Math Unit, Kolkata.*
98. Pal, Tandra, R.E. College, Durgapur, April 1, 2002 – March 31, 2003, *Electronics and Communication Sciences Unit, Kolkata.*
99. Pandey, Neeta, B.K.C. College, Kolkata, June 18, 2002 – June 17, 2003, *Stat-Math Unit, Kolkata.*
100. Parthasarathy, K.R., February 23 – March 1, 2003, *Stat-Math Unit, Bangalore.*
101. Potters, Jos, A.M., University of Nijmegen, Netherlands, January 11 – 20, 2003, *Statistical Quality Control and Operations Research Division.*
102. Pradeep, C.R., Indian Institute of Science, Bangalore, February 20, 2003, *Stat-Math Unit, Bangalore.*
103. Raghavachari, M., Decision Sciences & Engineering Systems, Rensselaer Polytechnic Institute, USA, December 2002 – March 2003, *Statistical Quality Control and Operations Research Division.*
104. Raghunathan, M.S., TIFR, Mumbai, February 2003, *Stat-Math Unit, Bangalore.*
105. Rajan, B. Sundar, Indian Institute of Science, Bangalore, March 20, 2003, *Stat-Math Unit, Bangalore.*
106. Ramanan, Kavita, Carnegie Mellon University, February 4 - 6, 2003, *Stat-Math Unit, Delhi.*
107. Ramakrishnan, Radha, Anna University, January 6 – 10, 2003, *Stat-Math Unit, Bangalore.*

SEVENTY FIRST ANNUAL REPORT : 2002-2003

108. Ramakrishnan, S., University of Miami, August 2002, *Stat-Math Unit, Bangalore.*
109. Ramamoorthi, R.V., Michigan State University, December 15, 2002, *Stat-Math Unit, Bangalore.*
110. Rao, S. Srinivasa, North Maharashtra University, June 20 – 29, 2002, *Stat-Math Unit, Bangalore.*
111. Rao, Dattatreya, Nagارجuna University, February 3 – March 31, 2003, *Applied Statistics Unit, Kolkata.*
112. Roychoudhury, Abhik, National University of Singapore, July 4, 2002, *Advanced Computing and Microelectronics Unit, Kolkata.*
113. Rudrini, N., Department of Mathematics, Bangalore, August 15, 2002, *Physics and Applied Mathematics Unit, Kolkata.*
114. Saradha, N., TIFR, Mumbai, March 24 – 28, 2003, *Stat-Math Unit, Bangalore.*
115. Sarkhel, Juran Kumar, Vidyasagar University, Medinipur, *Documentation Research and Training Centre, Bangalore.*
116. Sastry, Pramathnath, University of Toronto, December 2002, *Stat-Math Unit, Bangalore.*
117. Schroeder, Stefan, Ruhr-Universität, Germany, September 12, 2002, *Stat-Math Unit, Bangalore.*
118. Sen, Kunal, University of East Anglia, U.K., January 29 – April 2, 2003, *Economic Research Unit, Kolkata.*
119. Sen, Malsy Kumar, North Bengal University, October 28 – November 7, 2002, *Advanced Computing and Microelectronics Unit, Kolkata.*
120. Sengupta, J., TIFR, Mumbai, December 20 – 30, 2002, *Stat-Math Unit, Bangalore.*
121. Sertel, Murat, Bogazici University, Istanbul, January 10 – 15, 2003, *Planning Unit, Delhi.*
122. Seshadri, Harish, September 2002 to March 2003, *Stat-Math Unit, Bangalore.*
123. Sharma, Tridib, Indira Gandhi Institute of Development Research, Mumbai, April 23 – May 4, 2003, *Planning Unit, Delhi.*
124. Shukla, Ravindra, University of Allahabad, May – June, 2002, *Stat-Math Unit, Bangalore.*
125. Singh, S.K., Pt. Ravishankar Sukla University, Raipur, October, 5 – 9, 2002, *Statistical Quality Control and Operations Research Division.*
126. Sinha, Kishore, Birla Agricultural University, July 22 – August 11, 2002, *Stat-Math Unit, Bangalore.*
127. Srimani, P.K., Clemson University, USA, June 28 – July 12, 2002, *Advanced Computing and Microelectronics Unit, Kolkata.*
128. Sunder, V.S., Institute of Mathematical Sciences, Chennai, October 11, 2002, *Stat-Math Unit, Bangalore.*
129. Swart, Jan, Perleberger Strabe 31, Germany, February 8, 2003 - March, 2003, *Stat-Math Unit, Delhi.*
130. Thakur, Maneesh, Harish-Chandra Research Institute, Allahabad, May – June, 2002, *Stat-Math Unit, Bangalore.*

INDIAN STATISTICAL INSTITUTE

131. Thangadurai, R., The Institute of Mathematical Sciences, Chennai, September 11, 2002 – March 10, 2003, *Stat-Math Unit, Kolkata.*
132. Tripathi, Satish K., University of California, USA, December 30, 2002, *Advanced Computing and Microelectronics Unit, Kolkata.*
133. Trivedi, Kishore, Duke University, USA, January 16, 2003, *Advanced Computing and Microelectronics Unit, Kolkata.*
134. Uma, B., North Maharashtra University, June 20 – 29, 2002, *Stat-Math Unit, Bangalore.*
135. Varman, H.J., Bangalore University, July 16, 2001 – May 31, 2002, *Stat-Math Unit, Bangalore.*
136. Varma, Mahendra, I.I.T., Kanpur, May 20 – June 2, 2002, *Physics and Applied Mathematics Unit, Kolkata.*
137. Verma, D. N., TIFR, Mumbai, January 2 - 13, 2003, *Stat-Math Unit, Delhi.*
138. Wadhawan Anup, Economic Advisor, Prime Minister's Office, March – April, 2003, *Planning Unit, Delhi.*
139. Wilima Wadhwa, Society for Economic Research and Financial Analysis, August 1 – December 15, 2002 and January 15 – March 31, 2003, *Planning Unit, Delhi.*
140. Wilkinson, Leland, Northwestern University, February 4, 2003, *Stat-Math Unit, Bangalore.*
141. Worstley, Keith J., McGill University, Canada, March 24 – 25, 2003. *Stat-Math Unit, Kolkata, Bangalore and Delhi.*

9. HONOURS AND AWARDS

Theoretical Statistics and Mathematics Division

Stat-Math Unit, Kolkata

Bose, Arup, was elected Fellow of The Institute of Mathematical Statistics, USA.

Chaudhuri, Probal, was elected Fellow of the Indian Academy of Sciences.

Goswami, Debashish, was elected to Junior Associateship of the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy.

Rao, T.J., acted as Chairman of Governing Council, NSSO.

Sinha, K.B., was elected Fellow of the Third World Academy of Sciences, Trieste, Italy.

Stat-Math Unit, Bangalore

Bhat, B.V. Rajarama, was awarded Swarnajayanti Fellowship of Department of Science & Technology, India.

Thangavelu, S. received the Shani Swarup Bhainagar Award of Council of Scientific and Industrial Research (CSIR).

Computer and Communication Sciences Division

Advanced Computing and Microelectronics Unit

Bhattacharya, B.B., received the 1999 VASVIK Award for Electronic Sciences and Technology.

Electronics and Communication Sciences Unit

Chanda, Bhabatosh, received Hari Om Ashram Perit Vikram Sarabhai Research Award of the Physical Research Laboratory and was elected a Fellow of the National Academy of Sciences, India.

Machine Intelligence Unit

Bandyopadhyay, S., received Young Engineers Award in Computer Science, 2002 of Indian National Academy of Engineering (INAE).

Kundu, M.K., and Murthy, C.A. received the 1999 VASVIK Industrial Research Award of Vividhaxmi Audyogik Samshodhan Vikas Kendra, Mumbai in the field of Electronic Sciences and Technology.

Pal, S.K., was elected a Fellow of the International Association for Pattern Recognition (IAPR), USA.

INDIAN STATISTICAL INSTITUTE
Physics and Earth Sciences Division
Physics and Applied Mathematics Unit

Mazumder, B.S., and Ghoshal, K. received the G.M. Nawathe Award for best paper in HYDRO-2002 of the Indian Society for Hydraulics Research, Pune.

Biological Sciences Division
Anthropology and Human Genetics Unit

Kumar, Vikramt, received the Young Scientist Award of the Indian Society of Human Genetics for the year 2002

Majumder, Partha P., received the G.D. Birla Award for Scientific Research from the K.K. Birla Foundation for the year 2001.

Social Sciences Division
Psychology Research Unit

Dutta Roy, D., received "Best Poster Presentation Award" of the Indian Science Congress Association in 2003 and Professor T.E. Shanmugam Award for excellence in research for 1999 and 2000 from the Madras Psychology Society.

Library, Documentation and Information Sciences Division

Library (Kolkata)

Basak, Nandadulal, received Tincori Datta Memorial Award/Medal for the best article published in "Granthagar" for 1407 B.S. from Bengal Library Association.

Documentation Research and Training Centre (DRTC)

Madali, Devika P., was awarded Fulbright Fellowship by USEFI, New Delhi.

10. EDITORIAL AND OTHER SCIENTIFIC ASSIGNMENTS

The faculty of the Institute have undertaken various scientific and other assignments in different organizations including Central and State Governments, like : working as Editor of a journal, teaching in Summer/Winter Schools, Refresher and other courses organized by various organizations, organizing and chairing sessions in Conferences, evaluating theses and conducting viva-voce examinations, working in Selection Committees and as judges for academic competitions and awards, working as members of Executive Committees/Councils of various national bodies, etc. A few such activities are reported here.

EDITORIAL ASSIGNMENTS (IN INDIA AND ABROAD)

Theoretical Statistics and Mathematics Division

Stat-Math Unit, Kolkata

Bose, Arup, was Editor, *Sankhya*.

Chaudhuri, Probal, was Co-Editor, *Sankhya*, Associate Editor, *Calcutta Statistical Association Bulletin* and Editor, *Texts and Readings in Mathematics Series*.

Rao, B.V., was Editor, *Sankhya*.

Rao, T.J., was Associate Editor, *Survey Methodology*, *Statistics Canada*, *Calcutta Statistical Association Bulletin*, *Aligarh Journal of Statistics*, *Assam Statistical Review* and *Sarvekshana*.

Sengupta, Debapriya, was Co-Editor, *Sankhya*.

Sinha, K.B., was Member, Editorial Boards of *Infinite dimensional Analysis* and *Quantum Probability*, *Reviews in Mathematical Physics* and *Proceedings of the Indian Academy of Sciences (Math. Sciences)*.

Tripathi, T.P., was Member of the Editorial Board of *Aligarh Journal of Statistics* and the Advisory Editorial Board of *Bhartiya Samajik Chintan* published by Indian Academy of Social Sciences, Allahabad and Kolkata, XXV(1), 2002.

Stat-Math Unit, Delhi

Bhatia, R., served on the editorial boards of the international journals *Linear Algebra and Its Applications* published from New York and *SIAM Journal on Matrix Analysis and Applications* published from Philadelphia. He also served as Managing Editor of the series *Texts and Readings in Mathematics and Culture and History of Mathematics* published by Hindustan Book Agency, New Delhi.

Dey, Aloke, served as an Editor of *Sankhya*.

Kochar, S.C., served as Associate Editor of *Journal of Statistical Planning & Inference* and *International Journal of Reliability & Applications*.

Parthasarathy, T., served as Associate Editor in *International Game Theory Review*, published by World Scientific.

Roy, R., served on the editorial boards of *Sankhya* and the *Journal of Applied Mathematics* published from New York.

INDIAN STATISTICAL INSTITUTE

Stat-Math Unit, Bangalore

Delampady Mohan, was member of the Editorial Board of Resonance and Co-editor of Sankhya.

Mishra, Gadadhar, was an Editor of Proc. Indian Acad. Sci. (Math Sci.) published from Bangalore.

Sury, B., acted as an Associate Editor of Resonance.

Applied Statistics Division

Applied Statistics Unit

SenGupta, Ashis, was Associate Editor of Journal of Statistical Planning and Inference, Stochastic Modelling and Applications and Journal of Indian Statistical Association.

Sengupta, Debasis was Technical Editor, Sankhya.

Computer and Communication Sciences Division

Computer Vision and Pattern Recognition Unit

Chaudhuri, B.B. was member of Program Committee for (i) 7th International Conference on Document Analysis and Recognition (ICDAR-2003), U.K., 2003, (ii) Indian Conference on Computer Vision, Graphics and Image Processing, Ahmedabad, 2002, (iii) International Conference on Knowledge Based Computer Systems, Mumbai, 2002 and (iv) National Conference on Document Analysis and Recognition, Mandya, India, 2003.

Mitra, M., was Member of Program Committee for (i) 12th International World Wide Web Conference, Budapest, 2003 and (ii) 26th Annual International ACM SIGIR Conference, Toronto, 2003.

Pal, U., was Member of Program Committee for 7th International Conference on Document Analysis and Recognition (ICDAR-2003), UK, 2003.

Parui, S.K., was Member of Program Committee for Symposium on Frontiers of Research on Speech and Music, IIT, Kanpur, 2003.

Electronics and Communication Sciences Unit

Mukherjee, Dipri Prasad, acted as an Associate Editor of *IEEE Signal Processing Letters* since October, 2002.

Pal, N. R., continued to act as Associate Editor of (i) *IEEE Trans. on Fuzzy Systems*, IEEE, (ii) *IEEE Trans. on Syst. Man & Cybern. Part B*, IEEE, (iii) *International Journal of Approximate Reasoning*, North-Holland, (iv) *International Journal of Fuzzy Systems*, CFS, Taiwan. He was an area editor of *Fuzzy Sets and Systems*, North-Holland and a member of Steering Committee of *Applied Soft Computing*, Elsevier. He was also invited to join the editorial board of (i) *International Journal of Knowledge Based Intelligent Engineering Systems* and (ii) *Journal of Intelligent and Fuzzy Systems*.

Machine Intelligence Unit

Bandyopadhyay, S., was a Guest Editor of a special issues of (i) *IEEE Transactions on Systems, Man and Cybernetics, Part B*, on "Distributed and Mobile Data Mining" and (ii) *Institute of Electrical and Telecommunication Engineers (IETE) Journal of Research*, on "Evolutionary Computation in Engineering Sciences", vol.48, no.5.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

Ghosh, A., was a Guest Editor of a special issue of *Information Sciences* on Soft computing data Mining published at Amsterdam.

Mitra S., was a Guest Editor of a special issue of *Fuzzy Sets and Systems* on "Web Mining using Soft Computing" published at Amsterdam.

Pal, S. K., was an Editor of IEEE Trans. Pattern Analysis and Machine Intelligence (TPAMI), IEEE CS Press. He was an Associate Editor of IEEE Trans. Neural Networks (TNN), IEEE Press, Pattern Recognition Letters, North-Holand, Int. J. Pattern Recognition and Artificial Intelligence, World Scientific, Information Sciences, North-Holand. He was a Guest Editor of a special issue on Rough Sets, Pattern Recognition and Data Mining for the journal Pattern Recognition Letters, North-Holand, a special issue on Soft Case Based Reasoning for the journal Applied Intelligence. He was also a Member of Editorial Board of Neurocomputing, Elsevier, Fuzzy Sets and Systems, North-Holand, Fundamenta Informaticae, IOS Press, Int. J. Computational Intelligence and Applications, Imperial College Press, Int. Journal of Image and Graphics, World Scientific. He was an Executive Advisory Editor of IEEE Trans. on Fuzzy Systems, IEEE Press and Int. Journal of Approximate Reasoning, North-Holand.

Physics and Earth Sciences Division

Geological Studies Unit

Chaudhuri, A. K., was a Guest Editor of Asian Journal of Earth Sciences, Special Issue "Geology of the Pranhita-Godavari Valley, India", v. 26(6), 2003. He was Joint Editor of Special Issue of Gondwana Research on "Basin Development and Evolution in Relation to Rodinia, Gondwana and Asian Tectonics" and Special Issue, Proceedings of Indian Academy of Sciences, Prof. S.K. Chanda Memorial Volume.

Saha, D., was a Guest Editor of Asian Journal of Earth Sciences, Special Issue "Geology of the Pranhita-Godavari Valley, India" v. 26(6), 2003.

Physics and Applied Mathematics Unit

Mandal, B.N., served as a member of the editorial board in International Journal of Mathematics & Mathematical Sciences, USA and as Associate Editor for Advances in Fluid Mechanics Book Series, WIT Press, Southampton, U.K.

Biological Sciences Division

Anthropology and Human Genetics Unit

Reddy, B.M., has been a member of the Editorial Board of Human Biology, USA, Journal of Human Ecology, India and Indian Journal of Human genetics.

Social Sciences Division

Economic Research Unit

Chakravarty, Satya R. has been a Member of the Editorial Board of The Journal of Economic Inequality, The Netherlands.

Mazumdar, Krishna has been a Member of the Editorial Board of Social Indicators Research, The Netherlands.

Planning Unit, Delhi

Somanathan, E., has been an Associate Editor of the Journal of Economic Behavior and Organization, Elsevier Press.

INDIAN STATISTICAL INSTITUTE

Population Studies Unit

Bhattacharya, B.N., was an Editor of *Demography India* published by Indian Association for the Study of Population, New Delhi in 2002.

Pathak, Prasanta, was a Member of the Editorial Board of *Indian Journal of Regional Science*, New Delhi in 2002.

Library, Documentation and Information Sciences Division

Documentation Research and Training Centre (DRTC), Bangalore

Prasad, A.R.D., was Editor of 'Digital Libraries : Theory & Practice' published by Indian Statistical Institute, Bangalore, in 2003.

SCIENTIFIC ASSIGNMENTS/ACADEMIC VISITS ABROAD

Theoretical Statistics and Mathematics Division

Stat-Math Unit, Kolkata

Bandyopadhyay, Pradipta, visited Southern Illinois University at Edwardsville (SIUE), USA during May 12 – June 9, 2002 for research collaboration with Professor K. Jarosz. He attended the Fourth Conference on Function Spaces at SIUE held during May 14-19, 2002 and talked on "Weighted Chebyshev centres and intersection properties of balls in Banach spaces". He also visited University of Paris VI during February 8-28, 2003 for collaboration with Professor G. Godefroy and gave a seminar on "Structure of nested sequences of balls in Banach space" and University of Granada, Spain during March 1-6, 2003 and gave a seminar on "Unitaries in Banach space".

Bose, Smarajit, visited UC Santa Barbara, California, USA as a Visiting Associate Professor for teaching and research during September 2002 – June 2003.

Chaudhuri, Probal, visited National University of Singapore (June 2002), University of Wisconsin, Madison, University of Illinois, Urbana-Champaign (August 2002) and University of Tromsø, Norway (October 2002).

Goswami, Ajok, visited the Mathematics Department of Indiana University, Bloomington, Indiana, U.S.A. during August 2001 - August 2002.

Mukherjee, Goutam, participated in ICM 2002 at Beijing during August 20 - 28, 2002.

Purkayastha, Sumitra, was nominated by Director of National Brain Research Centre (NBRC) to attend "Indo-US Roundtable on Neurosciences" and "Annual Meeting of Society for Neurosciences", Orlando, Florida during November 1 – 7, 2002.

Rao, T.J., represented India in the Workshop on "Forging Partnerships in Statistical Training in Asia and the Pacific" held in Bangkok during November 25 - 26, 2002 and gave a lecture.

Sinha, B.K., visited USA, Canada and Finland for collaborative research and for attending Conference.

Sinha, K.B., attended the International Mathematical Union Assembly meeting in Shanghai, China and Satellite meeting on Probability after ICM 2002 in Sino-German Institute, Beijing during August 17 - 18, 2002 and during August 29 – September 3, 2002. He also participated as alternate delegate from India and gave an invited talk.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

Stat-Math Unit, Delhi

Athreya Siva, attended the meeting of Statistics Society of Canada in Toronto and York University in Toronto during May 26 – June 1, 2002. He visited the (i) University of British Columbia, Vancouver, Canada during June 1 – July 3, 2002, (ii) University of Washington, Seattle, Washington, U.S.A. during July 3 – July 7, 2002 and (iii) University of California, Berkeley, CA, U.S.A. during September 21 – October 3, 2002.

Bapat, R.B., visited Department of Mathematics, University of Connecticut, Storrs, Connecticut during August 22, 2002 – May 21, 2003.

Bhatia, R., visited the Universities of Lisbon and Coimbra in Portugal for two weeks in April 2003 and gave invited talks. He was also Visiting Professor at Yale University, USA in June 2003.

Dewan, Isha, visited Imperial College, London and gave a talk "On testing dependence between time to failure and cause of failure" in July 2002 and also visited Department of Actuarial Science and Statistics, City University London and gave a seminar on "U-statistics for associated random variables".

Dey, Aloke, visited the Institute of Statistical Science, Academia Sinica, Taiwan to participate in and deliver an invited talk at the "2002 Taipei International Statistical Symposium and Bernoulli Society EAPR Conference" during July 2002. He also visited the University of Hong Kong during July 2002.

Kocher, S.C., visited Concordia University, Canada during November 8–18 and Laval University, Canada during November 19 – December 17, 2002 to do collaborative work with Christian Genest and give seminars. He also gave a colloquium talk at Carleton University, Canada in December 2002.

Parthasarathy, T., visited Catholic University, Nijmegen during June – July 2002 and attended an International Conference in honour of Stef Tijs (65th Birthday celebration) at Tilburg University.

Rao, B.L.S.P., visited University of Siegen and Humboldt University, Berlin in Germany during June 23–29, 2002 and delivered lectures on statistical inference for stochastic partial differential equations. He delivered a series of lectures on inference for stochastic processes in the summer school at Torgnon organised by Bocconi University, Milan, Italy during June 29, 2002 – July 21, 2002. He visited China under the Scientific Exchange program between the Indian National Science Academy and the Chinese Academy of Sciences during October 14, 2002 – November 9, 2002. As a part of the exchange program he also visited Institute of Systems Science, Chinese Academy of Sciences, Beijing during October 14 – 20, 2002 and Nanjing University and Nanjing University of Science and Technology, during October 20 – 27, 2002 and delivered lectures on Spatial data analysis, Nonparametric functional estimation and Introduction to inference for stochastic processes. He also visited University College of Science and Technology, Hefei, Anhui during October 27, 2002 - November 9, 2002 and delivered a lecture on the Theory of competing risks and a series of lectures on inference for stochastic processes.

Roy, Rahul, visited University Autònoma de Barcelona during October 2002.

Sarkar, Anish, visited the Instituto de Matemática e Estatística (IME), the Universidade de São Paulo, Brazil and worked with Prof. P.A. Ferrari, Prof. L.R.G. Fontes, Prof. F. Machado and Prof. S. Popow during August - October, 2002.

Stat-Math Unit, Bangalore

Bhat, B.V. Rajarama, visited (i) St Fourier Institute, Grenoble (France) during October 1 – November 30, 2002 for research collaboration with Prof. Stéphane Aïtal under Indo-French project, (ii) Brandenburg University, Cottbus (Germany) during December 1 – 19, 2002 for research collaboration with Prof. W. Freudenberg, M. Skeide & V. Liebscher under DST-DAAD project, (iii) Nottingham University, Nottingham (United Kingdom) during December 20, 2002 – March 30, 2003 for research collaboration with Prof. M. Lindsay as an INSA-Royal Society Exchange visitor and (iv) EMA University, Greifswald (Germany) during March 9 – 22, 2003 and gave a series of lectures at 'A school on Quantum Independent Increment Processes'.

INDIAN STATISTICAL INSTITUTE

Jaganathan, P., visited Yale University during December 2 –14, 2002 and gave lectures at Department of Economics.

Misra, G., visited the Texas A&M University, College Station during November 15 – 24, 2002 and gave a lecture.

Prajapat, Jyotsna, visited Beijing, China during August 19 – 29, 2002 and attended the International Congress of Mathematicians 2002.

Raja, C.R.E., visited (i) Abdus Salam ICTP, Trieste, Italy as a Guest Scientist during May 12 – August 7, 2002, and (ii) University of Rome, Italy and gave a seminar talk on "strong convergence of averages of unitary representations" during July 2002.

Rao, T.S.S.R.K., visited University of Paris VI during April 2002 to carry out research relating to the Indo-French project.

Sastry, N.S.N., visited the University of Florida, during March 3 – 17, 2003 to speak at the conference "Finite Groups – 2002".

Thangavelu, S., visited the University of Tokyo during January 24 – 27, 2003 and attended a conference.

Applied Statistics Division

Applied Statistics Unit

Bose, Mausumi, visited the University of Waterloo, Canada for collaborative research work during May 2002.

Dewanji, Anup, visited the University of Ottawa, Canada for work on population risk assessment during April – May, 2002.

Maitra, Subhomoy, visited St. Johns, Newfoundland, Canada to attend the conference on Selected Areas in Cryptography SAC 2002 during August 15 - 16, 2002 and Versailles, France to attend the Workshop on Coding and Cryptography, WCC 2003 during March 24 - 28, 2003.

SenGupta, Ashis, visited the (i) Northern Illinois University – DeKalb, Illinois, USA during June 14 - 16, 2002 as a Chairman, Organizer and invited Speaker in invited session on Directional Data Analysis, International Conference of IISA, (ii) Department of Statistics, University of Chicago, USA during June 17 - 19, 2002 and presented a seminar and had research discussions, (iii) Beckman Research Institute, California, USA during July and August 2002 and advised on statistical issues related to cancer research, (iv) Loma Linda University, California, USA during July, 2002 for conducting joint research work on statistical issues related to optimal drug administration, (v) University of California, Riverside, USA during June - August, 2002 for conducting academic activities including joint research work with faculty members of University of California.

Computer and Communication Sciences Division

Advanced Computing and Microelectronics Unit

Bhattacharya, Bhargab B., visited the Dept. of Computer Science, University of Nebraska, Lincoln, USA during April 2002 - May 2002 and served as a Program Committee member and as a Steering Committee member of the International Conference on VLSI Design, New Delhi, 2003.

Das, Nabanita, served as a Program Committee member of the International Workshop on Distributed Computing (IWDC 2002) held in Calcutta in December 2002.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

Das, Sandip, visited the (i) University of Helsinki, Finland during June 2 - July 2, 2002, (ii) University of Turku, Finland during July 3-5, 2002 for attending *Scandinavian Workshop on Algorithmic Theory* and (iii) Bristol University, UK during July 6 - 15, 2002.

Nandy, Subhas C., visited the School of Information Sciences, Japan, *Advanced Institute of Science and Technology*, Ishikawa, Japan during February 25, 2003 - March 10, 2003.

Sinha, Bhabani P., visited the Department of Computer Science, *Clemson University*, Clemson, USA during April 2002 - August 2002. He served as the Program Committee Co-chair of (i) the *International Conference on Information Technology : Prospects and Challenges (ITPC 2003)*, held in Kathmandu, Nepal, (ii) the 9th *International Conference on High Performance Computing (HiPC '02)*, Bangalore during December 18 - 20, 2002.

Sur-Kolay, Susmita, visited the (i) Intel Corporation, Austin, Texas, USA during August 2002 - January, 2003, (ii) Iowa State University, Ames, USA during February 4 - 5, 2003, (iii) University of Kitakyushu, Japan during February 8 - 14, 2003 and (iv) Tokyo Institute of Technology, Japan on February 14, 2003. She also served on the Programme Committee of the *International Conference on VLSI Design*, New Delhi, 2003.

Computer Vision and Pattern Recognition Unit

Chaudhuri, B.B., participated in "Langtech - 2002" *International Conference on Language Technology* during September 26 - 29, 2002 at Berlin, Germany.

Electronics and Communication Science Unit

Mukherjee, Dipri Prasad, visited *Virginia Image and Video Analysis, Electrical and Computer Engineering Department, University of Virginia, USA* to do research in video image processing during January - August, 2002 and attended 45th *IEEE MidWest Symposium*, Tulsa, USA to chair an invited session during August 4 - 7, 2002.

Pal, N. R., continued as (i) an independent theme chair of *World Federation of Soft Computing* and (ii) a *Governing Board member of Asia Pacific Neural Network Assembly*. He visited the *National Chiao Tung University, Taiwan*, *Yonsei University, Korea* and the *Korean Advanced Institute of Science and Technology (KAIST), Korea* during October 16 - December 18, 2002 to conduct research and gave seminars. He also gave (i) the keynote speech at the *Seventh Conference on Artificial Intelligence and Applications, Taiwan, 2002*; (ii) the *Conference lecture (inaugural lecture) at the 7th Conference on Artificial Intelligence and Applications, Taiwan, 2002*; (iii) a talk in a *One day workshop on Computational Intelligence on Structure Preserving Dimensionality Reduction and Feature Analysis, National Chiao Tung University, Taiwan.*; (iv) a talk on *online feature selection in neural and neuro-fuzzy frameworks at the Academia Sinica, Taiwan*; (v) a seminar on *decision trees for real valued data at the National Taiwan University, Taiwan*, (vi) a seminar on *computational intelligence for finding "universal systems" at the Yonsei University, Korea* and the *Korean Advanced Institute of Science and Technology (KAIST)*. He served as an area co-chair of the *10th International Conference on Neural Information Processing, ICONIP 2003* and on the *Program Committees of (i) 2003 International Conference on Fuzzy Systems, St. Louis, USA, (ii) 2003 IEEE International Conference on Systems Man and Cybernetics*, and (iii) the *Seventh International Conference on Knowledge-Based Intelligent Information & Engineering Systems, KES'2003*.

Machine Intelligence Unit

Ghosh, A., served as a member of the *Program Committee of DaWak 2002, Aix-en-Provence, France* during September 4 - 6, 2002.

Mitra, S., visited the *Computer Science Dept. of Aalborg University Esbjerg, Denmark* during May - July 2002 and delivered several invited talks in *Aalborg University* and in a *summer school on Data Mining* at *Esbjerg, Denmark*. She also served as a member of the *Program Committee of DaWak 2002, Aix-en-Provence, France* during September 4 - 6, 2002.

INDIAN STATISTICAL INSTITUTE

Murthy, C. A., served as a member of the Program Committee DaWaK 2002 of Aix-en-Provence, France during September 4 - 6, 2002.

Pal, S. K., served as a Visiting Professor of (i) La Trobe University, Melbourne, Monash University, Melbourne and Australian National University, Canberra, Australia during June 1, 2002 - July 13, 2002 and (ii) Hong Kong Polytechnic University, Hong Kong, Hong Kong Baptist University, Hong Kong; Hong Kong City University, Hong Kong during December 26, 2002 - January 20, 2003 and delivered lectures. He acted as a member of the Expert Committee of the Research Grant Council, Hong Kong during April, 2002 - March, 2003 and acted as a Member of Int. Program Committee/Advisory Committee of (i) IEEE International Conference on Machine Learning and Cybernetics, Beijing, China during November 4 - 5, 2002, (ii) the 2002 IEEE International Conference on Data Mining (ICDM'02), Maebashi Terra, Maebashi City, Japan during December 9 - 12, 2002, (iii) Joint Third International Conference on Intelligent Technologies and Third VJ Fuzzy 2002 Symposium on Fuzzy Systems and Applications in Hanoi during December 3 - 5, 2002, (iv) 4th Int. Conf. on Recent Advances in Soft Computing (RASC 2002), Nottingham, United Kingdom during December 12 - 13, 2002, (v) 9th International Workshop on Rough Sets, Fuzzy Sets, Data Mining and Granular Computing (RSFD'2002), Malvern, PA, USA during October 14 - 16, 2002, (vi) 2nd International Conference on Hybrid Intelligent Systems (HIS'02), Santiago, Chile during December 1-4, 2002, (vii) Sixth International Conference on Knowledge-Based Intelligent Information & Engineering Systems (KES'2002), Italy during September 16 - 18, 2002 and (viii) 7th Online World Conference on Soft Computing in Industrial Applications (WSC7'2002), Granada, Spain during September 23 - October 4, 2002.

Physics and Earth Sciences Division

Geological Studies Unit

Chaudhuri, A.K., visited the Department of Geology, Rand Afrikaans University, Johannesburg, South Africa during July 3 - September 17, 2002 for attending the 16th International Sedimentological Congress and for collaborative research on Archean Pongola Supergroup.

Saha, Dilip was elected as a member of the Steering Committee of the International Association of Gondwana Research, Japan for 2002 - 2004.

Physics and Applied Mathematics Unit

Das, P.K., visited the Volterra Centre, Rome, Italy for academic collaboration and research.

Roy, P., visited the University of Valladolid, Spain and University of Tamkang, Taiwan for academic collaboration and research.

Biological Sciences Division

Agricultural Sciences Unit

Ghose, M., visited the Dhaka University and gave a seminar talk and visited Bangladesh Sundarbans during April 17 - 26, 2002.

Anthropology and Human Genetics Unit

Majumder, Partha P., visited Paris during April and July, 2002, Montreal during November 26 - 28, 2002 and Monte-Carlo during February 27 - March 2, 2003 in connection with work on a committee of the UNESCO, on which he has been serving as an Expert Member.

Mukhopadhyay, Susmita, visited Stockholm, Sweden and presented a paper "Women and Work in Dual-Earner Families: An Indian Experience" in the Third International Congress on Women, Work & Health during June 2 - 5, 2002.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

Biochemistry Unit

Duttagupta, C., was a Visiting Assistant Professor of Albert Einstein College of Medicine, New York, USA during July 2002 – June 2003.

Embryology Unit

Chattopadhyay, Joydev, visited the Institute of Research and Development (IRD), Paris, France under an IRD grant during June 3 - August 1, 2002 to work on ecological and eco-epidemiological system with Professor O. Arino. He was invited to deliver a talk on "Recent trends on eco-epidemiological systems" in the International Conference on Applied Mathematics and Mathematical Physics during January 6 - 9, 2003 at the Department of Mathematics, Shahjalal University of Science and Technology, Sylhet, Bangladesh.

Mandal, Suparna, visited Tsukuba, Japan during August 26 - 30, 2002 to attend the Third International Congress on Allelopathy and delivered a talk.

Sarkar, Ram Rup, was invited to deliver a talk on "A Bioeconomic fishery model with stochastic fluctuation" in the International Conference on Applied Mathematics and Mathematical Physics during January 6 - 9, 2003 at the Department of Mathematics, Shahjalal University of Science and Technology, Sylhet, Bangladesh. He also visited the Abdus Salam International Centre for Theoretical Physics, Trieste, Italy to attend the workshop on Theoretical Ecology, Natural Resource Management and Conservation Biology during April 22 - May 3, 2002 and presented a poster on "A technique for optimal harvesting in a noise induced bioeconomic fishery model".

Plant Chemistry Unit

Majumdar, Priyanka, visited University of Toronto, Canada during November 2002 to learn sophisticated techniques of research in Mycology, carbohydrate decomposition and nutrient cycling in Prof. David Malloch's Laboratory, University of Toronto. She also visited Royal Ontario Museum, Laboratory of Prof. John C. Krug of University of Toronto to learn innovative techniques of mycological research, species identification and several curatorial techniques.

Mukherjee, Goutam, visited Laboratory de Phytoécologie, Université de Metz and Institut de Botanique, Université Louis Pasteur, Strasbourg, France during 9 - 13 September, 2002 and delivered a talk entitled "The potential of aquatic plants as bioindicators of pond water quality" and had academic discussions. He also participated in field survey in the Rhine Alsace floodplain, other regional rivers, ponds and gravel pits for aquatic macrophyte collection and identification.

Social Sciences Division

Economic Research Unit

Chakravarty, Satya R. visited the Bocconi University, Milan, Italy during May 30 - June, 1, 2002 to deliver an invited lecture at the international workshop 'Income Distribution and Welfare'. He was also a Visiting Professor there during September 1, 2002 - March 1, 2003.

Mukherjee, Diganta, visited the Institute for Social and Economic Research, University of Essex, U.K. during May 27, 2002 - April 26, 2003 for research.

Linguistic Research Unit

Choudhry, Amitav, visited South Africa to carry out a sociolinguistic study on transplanted communities from the Indian sub-continent, (a stochastic approach) on behalf of the Dept. of Tourism, Gauteng Province, with special emphasis on implications of bilingual and multilingual education during July - August, 2002.

INDIAN STATISTICAL INSTITUTE

Planning Unit, Delhi

Das, Satya P., visited the University of Konstanz for research and teaching during May – June, 2002 and the Southern Methodist University for research and teaching during January – May, 2003.

Sen, Arunava, visited the (i) California Institute of Technology for teaching and research during April – June, 2002, (ii) Instituto Tecnológico Autónomo de México (ITAM) for research during July – August, 2002 and (iii) Université de Namur (FUNDP), Belgium for research in March 2003.

Somanathan, E., visited the (i) University of Michigan, Ann Arbor, USA for research during May 2002 (ii) University of Siena, Italy and delivered lecture at workshop (iii) Santa Fe Institute, USA for research during June – July, 2002 and (iii) BRAC centre for development management, Bangladesh for presenting paper at workshop in December, 2002.

Somanathan Rohini, visited the University of Namur in Belgium for research during 13 –16 December, 2002.

Population Studies Unit

Data, Pranati, visited the Chulalongkorn University, Bangkok, Thailand during June 09 – 14, 2002 and participated in Regional Population Conference 2002 on South Asia's Population in a Changing Asian Context organised by IUSSP and presented a paper on "Nepali Migration to India"

Psychology Research Unit

Ghosh, Anjali, visited and presented papers at the International Congress of Applied Psychology at Singapore and at the International Association for Cross Cultural Psychology at Yogyakarta, Indonesia during July 7 – 12 and 15 – 19, 2002.

Sociological Research Unit

Swaminathan, Madhura delivered lectures on Poverty and Economic Mobility at the Institute of Social Sciences, Ho Chi Mina City, Vietnam. She presented a paper at the Conference of the International Association of Feminist Economics, Oslo, Norway and attended the meeting of Board of Trustees of the International Potato Centre, Lima, Peru in March 2003.

Statistical Quality Control and Operations Research Division

Acharya, U.H., visited Iran in connection with Six Sigma implementation.

Chaudhuri, A.K., visited (i) Iran, Thailand, Mexico and Philippines in connection with the training and guidance to the industries in these countries regarding implementation of Six Sigma methodology and (ii) Philippines, Thailand and Hong Kong, with regard to QS-9000 Audits on behalf of NVTQC in the Philips Company in these countries.

Chowdhury, K.K., visited Indonesia with regard to training on Six Sigma implementation.

Mahesh, C., visited USA to present papers at the "Ninth Annual Research Seminar" held at New York during February 24 - 25, 2003.

Majumdar, S.K., visited the Northern Illinois University, Dekalb, USA during June 14 – 16, 2002 and presented an invited paper. He also interacted with Prof. B. Abraham, Director, Institute for Improvement in Quality & Productivity, University of Waterloo, Canada on invitation.

Mohan, S.R., visited Canada for collaborative research work with Prof. S. Kabadi and Prof. Nair, University of New Brunswick, Faculty of Administration and Business Management.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

Perumallu, P.K., visited Philippines, Thailand, Hong Kong, Malaysia and Taiwan with regard to QS-9000 Audits on behalf of NVTQC in the Philips Company in these countries and Turkey with regard to the QS-9000 audits on behalf of AQA (India).

Seth, A., visited Japan to attend ISO/TC 69 workshop on Application of Statistical methods in Industries as a part of Indian delegation during July 7 - 12, 2002.

Library, Documentation and Information Sciences Division

Documentation Research and Training Centre (DRTC), Bangalore

Madalli, Devika P., visited the (i) Carnegie Mellon University, Pittsburg during October 3 - 4, 2002, (ii) MIT, Cambridge during October 4 - 5, 2002, (iii) Tufts University, Medford, MA on October 6, 2002, (iv) American Library Association on November 8, 2002, (v) University of Illinois at Urbana Champaign on November 9, 2002, (vi) University of Michigan, Ann Arbor on November 12, 2002, (vii) National Library of Medicine on December 23, 2002, (viii) Library of Congress on December 23, 2002, (ix) Cal Tech, Pasadena on January 3, 2003, (x) University of California, Los Angeles on January 7, 2003, (xi) Stanford University on January 9, 2003 and (xii) University of California, Berkeley on January 10, 2003 on Fulbright Fellowship sponsored by The United States Educational Foundation in India (USEFI), New Delhi.

Rao, I.K Ravichandra, visited the (i) Goethe Institut Inter Nationes (HQ) at Munich and the Bavarian State Library to study the National Document Delivery System on October 21, 2002 (ii) University of Applied Science at Stuttgart and Waslmbegische Landesbibliothek on October 22, 2002, (iii) Mediatech Library, Stuttgart Public Library, the Dept. of Information Science of the University of Applied Science at Cologne and the Library Network of North Rhine-Westphalia on October 24, 2002, (iv) Cologne Public Library on October 25, 2002 and (v) State and University Library at Hamburg and University of Applied Sciences at Hamburg on October 28, 2002 in connection with the delegation to Germany sponsored by Max Muller Bhavan, New Delhi

SCIENTIFIC ASSIGNMENTS/ACADEMIC VISITS IN INDIA

Theoretical Statistics and Mathematics Division

Stat-Math Unit, Kolkata

Bandyopadhyay, Pradipta, was one of the invited speakers at the National Seminar on Recent Trends in Mathematics, Burdwan University, West Bengal, December 26 - 28, 2002 and spoke on "Structure of nested sequences of balls in Banach spaces".

Bose Arup, visited the Dept. of Statistics, M.S. University, Vadodara during July 27 - 29, 2002 and delivered the N.M. Bhatt lecture Series.

Bose, Smarajit, visited the ADRIN, Hyderabad, for discussions on a joint project.

Dutta, Amartya Kumar, visited the School of Mathematics, TIFR during March 01 - May 31, 2002.

Parkasyastha, Sumitra, was invited by National Brain Research Centre to attend "International Conference on Theoretical Neurobiology" held at New Delhi during February 24 - 26, 2003 and presented a poster. He was Joint Convener of International Bayesian Workshop/Conference held at Indian Statistical Institute, Kolkata during January 6 - 8, 2003.

Rao, T.J., gave lectures at Kalyani University on January 5, 2003 and at a conference for North-East Region on Sample Surveys Methodology and Algorithm at Manipur University during October 26 - 30, 2002.

INDIAN STATISTICAL INSTITUTE

Saha Ray, Rita, attended XXIII Annual Conference of the Indian Society for Probability and Statistics during August 11 - 14, 2002 and talked on DS-optimal Designs in one-way ANOVA. She participated in National Symposium on Planning of Experiments and Analysis of data; organized by the Department of Statistics, University of Kalyani and Department of Statistics, University of Kolkata during October 4 - 5, 2002 and talked on Critical sets in orthogonal arrays.

Sarkar, Rudra, P., visited the Institute of Mathematical Sciences, Chennai for four days to attend and lecture in Harmonic Analysis meet.

Tripathi, T.P., visited the Aligarh Muslim University, Aligarh to attend International Symposium on Optimization and Statistics, during December 28 - 30, 2002 and presented an invited research paper, "A new estimator for the mean vector". He also chaired a session. He visited BCKV, Mohanpur, Nadia, West Bengal on 11 November 2002 and delivered two invited talks on Sampling Techniques before the Winter School on Computation Stat. in Agri. Sci. organized by the Department of Statistics, BCKV and sponsored by ICAR.

Stat-Math Uni, Delhi

Bhunia, R., has been convener of the Northern Region Library Committee and runs the Delhi Mathematics Awareness Programme of the National Board for Higher Mathematics. He gave talks at I.I.T. Roorkee, Jesus and Mary College, Delhi, St. Stephen's College, Delhi and University of Delhi, South Campus.

Karandikar, R.L., was the National Co-ordinator for Indian National Mathematics Olympiad and was a member of the National Board for Higher Mathematics.

Stat-Math Unit, Bangalore

Gupta Biswas, Jishnu, visited (i) TIFR, Mumbai during August 26 - September 6, 2002 for research, (ii) Harish Chandra Research Institute during December 22, 2002 - January 4, 2003 and gave 8 lectures in a winter school on Arithmetic Geometry and (iii) Indian Institute of Technology, Kanpur during January 4 - 7, 2003 and gave one lecture.

Inamdar, S.P., visited (i) Harish Chandra Research Institute, Allahabad during December 24, 2002 - January 4, 2003 and participated in a workshop and (ii) Indian Institute of Technology, Kanpur during January 4 - 7, 2003 for research.

Misra, Gadadhar, visited the University of Jammu during February 20 - 23, 2003 and gave a lecture at the Annual Meeting of Jammu Mathematical Society.

Prajapat, Jyotshana, visited the Ehime University, Japan and NCTS, Taiwan during February 3 - 28, 2003 for research collaboration and gave a talk in a conference.

Raja, C.R.E., visited (i) Tata Institute of Fundamental Research, Mumbai during May 8 - 11, 2002 for research, (ii) Tata Institute of Fundamental Research, Mumbai during September 6 - 23, 2002 and attended the TIFR-CIMPA school on "Probability measures on groups - recent trends and directions" and gave a seminar talk on "average operators" and (iii) Institute of Mathematical Sciences, Chennai during December 30, 2002 - January 1, 2003 and attended the meeting of Harmonic Analysis and gave a talk on "type R Lie groups"

Rajeev, B., visited the Cochin University of Science and Technology during December 17 - 21, 2002 and gave an invited Lecture at International Conference on Stochastic Modelling.

Ramasubramanian, S., visited (i) Punjab University, Chandigarh during November 6 - 10, 2002 and gave an invited talk at the Annual meeting of the Indian Academy of Sciences and (ii) Cochin University of Science and Technology, Kerala during December 15 - 21, 2002 and gave an invited talk at the International Conference on Stochastic Modelling.

SEVENTY FIRST ANNUAL REPORT : 2002-2003

Sastry, N.S.N., visited Harish Chandra Research Institute, Allahabad during August 12-16, 2002 and gave a lecture.

Sury, B., visited the Institute of Mathematical Sciences, Chennai during February 17 – March 14, 2003 for collaboration research.

Applied Statistics Division

Applied Statistics Unit

Bandyopadhyay, Shibdas, delivered invited talk on Research Methodology for Rural Development in UGC Refresher Course on Rural Development and Administration, Kalyani University during January 2-22, 2003. He was a member of the Technical Committee for Coordination and Improvement of Statistical System in the State of West Bengal, constituted by the Govt. of West Bengal.

Bose, Mausumi, visited the Pt. Ravi Shankar University, Raipur during November 17 - 19, 2002 and delivered an invited talk at National Conference on Recent Development in Statistical Research.

SenGupta, Ashis, delivered a lecture series on Optimization Techniques in Statistics at Workshop conducted by Forum for Interdisciplinary Mathematics, Allahabad University during December 18 - 20, 2002, and was (i) Chairman, Organizer and Invited Speaker of Invited session on Directional Data Analysis at International Conference on Statistics, Combinatorics and Related Areas, Allahabad during December 21- 23, 2002, (ii) Chairman of Invited session and Invited Speaker at International Conference on Ranking and Selection, Multiple Comparisons, Reliability and their Applications, Chennai, during December 28 - 30, 2002, (iii) Chairman and Invited Speaker at the International Conference on Statistics in Industry and Business, Cochin University of Science and Technology, Cochin, during January 2 - 4, 2003 and (iv) Chairman of Invited session and Invited Speaker at National Seminar on Statistics for Industry, Business and Finance, Calcutta University, during March 21 - 22, 2003. He also Delivered Invited lectures at National Symposium on Planning of Experiments and Analysis of Data, Kalyani University during October 4 - 5, 2002; National Seminar on Quality of Life, Visva-Bharati, Shantiniketan, during November 16 - 18, 2002; and International Symposium on Pure and Applied Mathematics, Calcutta Mathematical Society during December 14 - 16, 2002 and International Bayesian Workshop/Conference, ISI, Kolkata during January 6 - 8, 2003.

Sengupta, Debasis delivered invited lectures at International Conference on Statistics in Industry and Business, Cochin University of Science and Technology, Cochin, during January 2 - 4, 2003 and National Symposium on Planning of Experiments and Analysis of Data, Kalyani University during October 4 - 5, 2002.

Computer and Communication Sciences Division

Advanced Computing & Microelectronics Unit

Das, Nabanita, served as a session chair of the International Workshop on Distributed Computing (TWDC 2002) held in Calcutta in December 2002.

Dattagupta, J., acted as external expert of the Board of Studies of the Department of Computing Science and Engineering, Jadavpur University.

Mukhopadhyaya, Krishnendu, served as a Session Chair of the of 6th International Conference/Exhibition on High Performance Computing in Asia Pacific Region (HPC-2002), Bangalore, in December 2002.

Nandy, Subhas C., visited the Tata Institute of Fundamental Research, Mumbai during May 6 - 17, 2002.

Sinha, Bhabani P., visited the (i) Benaras Hindu University during October 28 - 31, 2002 and delivered two lectures and (ii) Dept. of Computer Science, Indian School of Mines, Dhanbad during January 22 - 24, 2003 and delivered two seminar lectures. He attended the 9th International Conference on High Performance Computing (HiPC '02), Bangalore, during December 18 - 20, 2002, presented a paper and chaired a session.

INDIAN STATISTICAL INSTITUTE

Computer Vision and Pattern Recognition Unit

Chaudhuri, B.B., visited the (i) International Conference on Universal Knowledge and Language (ICUKL, 2002) during November 27 – 29, 2002 and delivered an invited talk on spell checker design, (ii) Language Engineering Conference (LEC 2002), Hyderabad during December 13 – 15, 2002 and delivered the keynote address, (iii) IEEE ACE, Kolkata, during December 20-22, 2002 and chaired a session at the conference and (iv) Electronics Niketan, Dept. of Information Technology, Govt. of India on June 28, 2002. He visited ER&DCI, Noida during September 5 - 7, 2002 for attending the workshop-cum-evaluation/demonstration of OCR software developed at CVPR unit of ISI. The meeting was organized by Ministry of Information Technology (MIT), Govt. of India and he delivered the keynote address at this workshop. He visited IIT, Guwahati during April 1 - 2, 2002 for attending Review meeting on Indian Language OCR development.

Garain, Utpal, visited the ER&DCI, Noida during September 5 - 7, 2002 for attending the workshop-cum-evaluation/demonstration of OCR software developed at CVPR unit. The meeting was organized by Ministry of Information Technology (MIT), Govt. of India.

Mitra, M., visited IIT, Guwahati during April 1 - 2, 2002 for attending Review meeting on Indian Language OCR development.

Machine Intelligence Unit

Bandyopadhyay, S., delivered a tutorial on "Soft Computing" at International Conference on Information Technology, Bhubaneswar, 2002 where she also served as a session chair.

Ghosh, A., served as the co-ordinator of CIMPA-UNESCO-INDIA School, Calcutta, India during December 2 - 13, 2002. He delivered a series of lectures at Utkal University, Bhubaneswar on "Neural Pattern Recognition", and a seminar at a national workshop at IBSC, Bhubaneswar. He also gave a tutorial lecture on (i) "Association Rule Mining using GAs" at International Conference on Information Technology, Bhubaneswar in 2002 and (ii) on Genetic Algorithms at the Indian Institute of Technology, Kanpur in a one day seminar on Soft Computing.

Kundu, M. K., delivered invited lectures on (i) Digital Information Security and Data Hiding, in a special seminar organized at the Indian School of Mines (ISM), Dhanbad, on March 12, 2003, (ii) Information hiding, Steganography and Digital Watermarking in the Conference on Horizons of Telecommunication (HOT 2003) organized by the Institute of Radio Physics and Electronics, Calcutta University, during February 3 - 5, 2003 and (iii) Digital Image Processing: An Introduction with Example during November 19 - 22, 2003 at the CIMPA-UNESCO-INDIA International School on Soft Computing Approach to Pattern recognition and Image Processing held at Kolkata, during December 2 - 13, 2002. He was nominated as an external member of the Academic Council and also as an *external member* of the Board of Course Studies (BOCS) for the department of Computer Science & Engineering at the Indian School of Mines (ISM), Dhanbad, for 2002-2005. He served as member of the scientific committee for the CIMPA-UNESCO-INDIA School held at the Indian Statistical Institute during December 2 - 13, 2002. He was nominated as a member of the Steering Committee by the Ministry of Information Technology (MIT), Govt. of India, to monitor and review periodically the progress of the project on "Application of image processing technique for improved clinical feature extraction in echocardiography related to cardiac diseases" being carried out by ER&DC, Kolkata.

Mitra, S., served as the Tutorial Chair for Sixth International Conference on Technology, Bhubaneswar, India, during December 22 - 25, 2002. She delivered a tutorial lecture on "Data Mining" at IIT, Kolkata in February 2003.

Murthy, C. A., delivered lectures on Genetic Algorithms in IIT, Kolkata in February 2003. He also delivered a lecture on Content Based Image Retrieval in the Computer Science department of University of Hyderabad in the last week of November 2002.

Pal, S. K., served as the Scientific Director of an International School (CIMPA-UNESCO-INDIA School) on Soft Computing Approach to Pattern Recognition and Image Processing at ISI, Kolkata during December 2 - 13, 2002. He worked in many national committees such as Chairman of the Project Review & Steering Group (PRSG), ERDC, Kolkata and member of the DST-PAC, Electrical Engineering, Computer

SEVENTY FIRST ANNUAL REPORT : 2002-2003

Science, New Delhi; DST-FIST Committee, New Delhi; DST-Swamijayanti Fellowship Committee, New Delhi; IGNOU, New Delhi and in the Delhi University Board. He delivered a series of lectures in Advanced Course on AI in CAIR, DRDO, Bangalore on 19.11.2002 and in the Sikkim Manipal Institute of Technology, Sikkim during September 26 - 28, 2002. He acted as a member of Program Committee of the International Conference on Analysis and Discrete Structures, December 22 - 24, 2002, IIT, Kharagpur and delivered invited talk in HOT-2003, Calcutta University.

Physics and Earth Sciences Division

Physics and Applied Mathematics Unit

Kar, G. visited, the (i) Institute of Mathematical Sciences, Chennai during January 6 - 30, 2003 for academic interaction and the Department of Physics, I. I. T. University during July 7 - 14, 2002 for academic collaboration.

Mandal, B.N., visited the (i) Benaras Hindu University during June 10 - 13, 2002 for presenting a paper at the 17th Annual Conference of Ramanujan Mathematical Society organised at Department of Applied Mathematics, BHU, (ii) Indian Institute of Science, Bangalore during July 28 - August 10, 2002 for academic interaction, (iii) Bangalore University during December 07 - 14, 2002 to deliver lectures.

Parashar, Preeti, visited the Institute of Physics, Bhubaneswar during December 9 - 20, 2002 for collaborative research work.

Roychoudhury, R., visited the (i) Mahendra Engineering College, Namakkal, Tamilnadu during November 21 - 25, 2002 to give invited talk at the National Conference on Mathematics in Engineering, Science & Technology, and (ii) Institute of Advanced Study in Science & Technology, Guwahati during January 30 - February 8, 2003 for collaborative research work.

Biological Sciences Division

Anthropology and Human Genetics Unit

Gupta, Ranjan, visited (i) Department of Anthropology, Dibrugarh University, Assam during March 16-18, 2003, and (ii) Department of Anthropology, Vidyasagar University, Midnapur on March 27, 2003 and delivered invited lectures.

Majumder, Partha P., delivered invited lectures entitled (i) "Reverse population genetics and evolution" in Stephen J. Gould Memorial Meeting at the Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, on June 18, 2002; (ii) "Peopling & Structure of India: A genomic view" in International Dialogue to Celebrate the 50th Anniversary of the Discovery of the Double Helix in New Delhi on February 14, 2003.

Mukhopadhyay, Barun, participated in the (i) 35th Annual Conference of the Indian Anthropological Society held at Vidyasagar University, Midnapur and presented a paper titled "Health Infrastructure: A Key indicator of Rural Development in Sikkim", during September 19 - 21, 2002, (ii) 10th Annual Conference of the Association of Medical Biochemists of India (10th AMBICON 2003) held at Nilratan Sircar Medical College and Hospital, Kolkata and presented an invited paper titled "Anthropology of Health in Himalayan Populations: An Assessment", during January 10 - 12, 2003, (iii) Training Workshop on HIV/AIDS for Medical Practitioners of Indian Systems of Medicine and Health (ISM&H) in Sikkim organized by the Voluntary Health Association of Sikkim, Gangtok as a Resource Person and a Discussant during February 12 - 13, 2003, (iv) Seminar on "Disadvantaged People in Eastern and North Eastern India: Emerging Issues" held at North Bengal University Darjeeling and presented a paper titled "Disadvantage and demography: The Lepchas of Kalimpong during March 15 - 16, 2003. He also delivered an invited lecture titled "Anthropology: A Synthetic Science" in the Department of Anthropology, North Bengal University, Darjeeling on March 12, 2003.