IIT BOMBAY
DEPARTMENT OF MATHEMATICS
ANNUAL REPORT (YEAR 2004-2005)

The Department has continued with its tradition of excellence in teaching with synergistic augmentation of research in Fundamental and Applied areas. The department is celebrating the year 2005 as "Year of Popularizing Mathematics". The major Academic and R & D activities of the current academic year include the following:

Industrial Mathematics Group:

Industrial Mathematics Group (IMG) of the department aims to develop a long term partnership with industry via Study Group Meetings,
Workshops, Inhouse Programme and Industry - IIT Meets.
Apart from an ongoing European Union Funded ASIA IT project on WEBOPT (Web Enabled Optimization Tools and Industrial Deployment) with partners from CARISMA, Brunel University, UK, University of Vienna
(Austria), Jadavpur University, Kolkata and IITB, IMG is also a partner of an ONGC sponsored project titled `Physical and Numerical Models for Unconventional Flood Patterns' of amount 2.16 crores.

During the Year 2004-05 the group had a few rounds of discussion with RBI, Govt. of India and HDFC on a possible interaction in the areas of quantitative finance, with Managing Director from Countrywide Security Corporation and with CEO and its group from Zafin Labs on possible collaboration in terms of joint projects. IMG had a brain storming session with the President-Worldwide Research and Technology and its group from Michelin Tyre Company (France) for possible sponsorship on research and also for hiring mathematicians from .
During the academic year 2004-2005, IMG in collaboration with for Industrial and Applied Mathematics (OCIAM) , organised an Indo-UK Study Group Meeting on Industrial Problems during under India-UK Science Network Programme. It also hosted an International Conference on Recent Trends in Nonlinear Analysis and Its Applications during .
As a part of IMG activity, a year long programme on Computational Partial Differential Equations (CPDE-05) with an objective of bringing together experts working in this area and of developing awareness in the Mathematics Departments in the country is presently going on.

Year Long Programme on Computational Partial Differential Equations (CPDE-05):

Industrial Mathematics Group (IMG) in the Department of Mathematics, IIT Bombay is presently hosting a year-long programme on ``Computational Partial Differential Equations" starting from January, 2005. The focus of this programme is to bring together experts working on this area, to develop awareness amongst the mathematical community in our country, to train campus community in effective use of public domain computational tools and to encourage young researchers and students from our country to participate in the year long activities. Main emphasis is on the recent advances in the development of new methodologies and solution strategies employed in Computational PDEs in solving physically relevant and mathematically hard problems. The list of speakers included Prof. S. Kesavan, IMT, Chennai; Prof. C. Carstensen, , ; Prof. Vidar Thomee, Chalmers University of Technology, Sweden; Prof. Francois Coulouvert from et Marie Curie Univ. France.

Year long Programme on Homological Methods in Commutative Algebra:

During the academic year 2004-05, the members of the research group in commutative algebra organized several activities. Distinguished lecture series were organized. The following mathematicians visited the department and delivered series of lectures: Prof. S. M. Bhatwadekar, TIFR, Mumbai, Dr. V. Trivedi, TIFR, Mumbai, Prof. R. A. Rao, TIFR, Mumbai, Prof. B. Singh, IIT Bombay, Prof. T. Puthenpurakal, IIT Bombay, Prof. A. R. Shastri, IIT Bombay, Mr. A. Bhattacharya, TIFR, Mumbai, Dr. A. V. Jayanthan, HRI, Allahabad, Dr. Clare D'Cruz, CMI, Chennai, Prof. J. Herzog, University of Essen-Duisberg, Germany.

Year long Programme on Mathematics Education and Awareness:

During the period January 2005- March 2005 the following activities were organized: Lecture by Prof. M.S. Raghunathan titled Mathematics, the Queen of Sciences, Mathematica in Math Education by R. Knopp, Wolfram Labs**.**

Academic Programmes:

Besides the teaching of B. Tech. Courses, the department offers M.Sc. and Ph.D. programmes along with its research activity. It has two distinct M.Sc. programmes. M.Sc. in Mathematics (intended for those who wish to pursue research and/or teaching as their career) and M.Sc. in Applied Statistics and Informatics (ASI). This job oriented programme that began in 1997, has been a success and a trend setter for some other IITs.

In addition, the Department has a research programme leading to Ph.D. degree. This programme has a broad based course work and specialization in Pure Mathematics, Applied Mathematics, Scientific Computing and Statistics.

R & D Activities

The key objectives of the research and development activities of the department are: **Basic Research,** focusing in contemporary areas of fundamental, developmental and strategical importance and**Interdisciplinary Research,** aiming at development of multidisciplinary research teams involving mathematicians and scientists/engineers in frontier areas of Mathematics and Statistics. Academic & Research Interaction of the Department has further expanded with leading R & D institutions like TIFR, IISc, ISI, ISRO, DRDO, ONGC, Indian Meteorological Centers, etc., and Foreign Universities likeBrunel (U.K), Humboldt University, Berlin, Technical University, Dresden, INSA, Toulouse (France) and nodal organizations such as CSIR, DAE, DBT, DST, etc., for scientific exchange of ideas of national importance. In order to fulfill the broad objectives of research activities, steps are taken to ensure that the theoretical base in emerging areas are strengthened, interdisciplinary problems requiring mathematical solutions are identified, interaction between Indian and overseas scientists are facilitated, local talents are well nurtured through lecture series and instructional workshops and by evolving a pool of trained manpower in thrust areas.

The Department has 25 core and 2 adjunct faculty members.

The research interests of the faculty members cover a wide range of fields:

- Algebraic Geometry
- Algebraic Topology
- Applied Probability,
- Approximation Algorithms
- Bio-Statistics Combinatorial Optimization
- Combinatorics
- Commutative Algebra
- Computational Biology. & Bio-informatics
- Functional Analysis
- Geo-Statistics
- Harmonic Analysis
- Image Processing & Pattern Recognition

- Industrial Mathematics & Financial Mathematics
- Inference of Stochastic processes & Statistical Inference
- Mechanics of Solids and Fluids
- Number Theory
- Numerical Analysis & Scientific Computing
- Optimization & Control
- Partial Differential Equation
- Quasilinear Hyperbolic Systems of PDEs and Non-Linear waves.
- Reliability theory and Industrial Statistics
- Riemannian Geometry
- Statistical Signal Processing
- Stochastic Differential Game Theory

Faculty members undertake projects sponsored by organizations such as National Board for Higher Mathematics (NBHM), Indian National Science Academy (INSA), Board of Research in Nuclear Science (BRNS), Council of Scientific & Industrial Research (CSIR), Department of Science & Technology (DST), Department of Bio-Technology (DBT), and Indian Council of Medical Research (ICMR). Some of the important ongoing and recently completed projects are listed below:

Sponsored Projects

Joshi R.R.

Project Title: Software Development for Ab-initio Prediction of 3D structure of Proteins using Knowledge-Based Nonparametric Regression.

Sponsoring Agency: Dept. of Biotechnology, Govt. of India.

Amount generated: Rs.11.76 lakhs

Beginning Year: 2003

End Year: 2006

Natraj, N.

Project Title: A parallel mixed finite element implementation of IV order elliptic source/ eigenvalue problems in distributed memory environments.

Sponsoring Agency: IRCC

Amount generated: Rs. 3 lakhs

Beginning Year: 2003

End Year: 2005

Pani A.K. and Patkar Sachin

Project Title: WebOPT

Sponsoring Agency: European Union ASIA-ITC
Amount generated: Rs. 40 lakhs
Beginning Year: 2003
End Year: 2005

Pani A. K., Mitra S.K and Vinjamur M.

Project Title: Physical and Numerical Models for Un-conventional Flood Patterns
Sponsoring Agency: Institute of Reservoir Studies, Ahmedabad (ONGC)
Amount generated: Rs.2.16 crores
Beginning Year: 2004
End Year: 2007

Subramanyam A and Suresh Kumar K.

Project Title: Stochastic Modelling, Analysis and Optimization of resource allocation.
Sponsoring Agency: ISPC
Amount generated: Rs. 5.7 lakhs
Beginning Year: 2003
End Year: 2005

Rana Inder K.

Project Title: Preparation of E-Modules.
Sponsoring Agency: MHRD
Amount generated: Rs. 1.6 lakhs
Beginning Year: 2003
End Year: 2005

Project Title: 10^{th} Workshop in Mathematics
Sponsoring Agency: DST
Amount generated: Rs.1.5 lakhs
Beginning Year: 2004
End Year: 2005

Project Title: NPTEL. (jointly with CDEEP)
Sponsoring Agency: MHRD
Amount generated: Rs.
Beginning Year: 2003
End Year: 2006

Sabnis S.V.

Project Title: Study of Optimal Reliability Test Plans
Sponsoring Agency: DST
Amount generated: Rs. 6.43 lakhs
Beginning Year: 2002
End Year: 2005

Sharma V.D.

Project Title: Analytical and numerical methods for hyperbolic conservation laws with applications.
Sponsoring Agency: CSIR
Amount generated: ~ Rs.7 Lakhs
Beginning Year:2003
End Year: 2005

Consultancies

Pani A.K.

Project Title: Enhanced Oil Recovery
Sponsoring Agency: ONGC
Amount generated: Rs. 4,50,000/-
Beginning Year: 2004
End Year: 2007

Patkar Sachin

Project Title: Issues in VLSI Partitioning
Sponsoring Agency: SoftJin
Amount generated: Rs. 5,50,000/-
Beginning Year: 2004
End Year: 2005

Project Title: Algorithmic Investigation of Simulator Accelerator
Sponsoring Agency: Powai labs
Amount generated: Rs. 1,50,000/-
Beginning Year: 2004
End Year: 2005

Sabnis S.V.

Project Title: Statistical modelling of Airline Data.
Sponsoring Agency: Kale Consultancy, Mumbai
Amount generated: Rs. 49,986/-

Beginning Year: 2003
End Year: 2005
Project Title: Development of Design of Experiments related subroutine.
Sponsoring Agency: Asian PPG Industries Limited
Amount generated: Rs. 15,000/-
Beginning Year: 2004
End Year: 2005
Project Title: Discrete Choice Modelling
Sponsoring Agency: TNS India Pvt. Limited
Amount generated: Rs.95,000/-
Beginning Year: 2004
End Year: Ongoing

Extension Activities
POPULAR LECTURE SERIES
The faculty is actively involved in various programmes of popularizing of mathematics and training in Mathematics such as NBHM sponsored
nurture programme, Ganit Utsav organized by Bombay Mathematical Colloquium and popular lectures at Nehru Science Centre, to name a few.

Another important activity in this direction is the Popular Lecture Series in Mathematics a joint activity of Mathematics Association of IIT, and Bombay Mathematical Colloquium.

This was started in 1997 by the Mathematics Association of IIT, . Forty lectures have been held under this series so far on diverse topics in mathematics.
The lectures are aimed at a wide spectrum of audience. Besides mathematicians, we also invite scientists and engineers who apply mathematics in research and development in their areas. The speakers are instructed to start from the basics and build their lectures so that beginners as well as experts can benefit. The series has become extremely popular among students and faculty at IIT and college teachers in Mumbai.
Workshops and Conferences Organized by the Department:
Organizer: Prof. Inder K. Rana

10th Workshop in Mathematics sponsored by DST. The Workshop aims to motivate Young Students for higher studies in Mathematics. About 40 students participated in the Workshop.

Organizer: Prof. A.K. Pani

Indo-Uk Study Group Meeting on Industrial Problems:
IMG and , UK hosted a 5-day Study Group Meeting at IITB, , under the auspices of India-UK Science Network programme. This meeting was
sponsored by DST and Royal Society (UK).

International Conference on Recent Trends in Nonlinear Analysis and Its Applications, (CNAA- 2004): The Industrial Mathematics Group hosted an international Conference on Recent Trends in Nonlinear Analysis and Its Applications during . The main emphasis of this conference was on the applications of nonlinear analysis to ordinary & partial differential equations, control & optimizations, approximation theory
& variational inequalities, fixed point theory & multivalued analysis and scientific computing

CEP Workshops

Prof. Sabnis S.V.

Conducted a two-day in-house CEP workshop on "Statistical Process Control- Basic Awareness Programme" for Crompton Greaves during December 21-22, 2004.

Acted as one of the resource persons for a workshop on Design of Experiments conducted for a group of scientists from Onida in April 2004.

Acted as one of the resource persons for a SAS Workshop held at Department of Statistics, University of Pune during October 1-2, 2004.

Workshops and Conferences Organized outside the Department.

Organizer: Prof. J.K. Verma

Conducted a 3 week long workshop and an international conference, School on Commutative Algebra and Interactions with Algebraic Geometry and Combinatorics in International Centre for Theoretical Physics, Italy during 24th May to 11th June 2004. It was co-organized with C. Huneke, , , A. Simis, Pernambuco, , B. Sturmfels, , , N.V. Trung, , , G. Valla,, , Ramadas T. Ramkrishnan, ICTP, Italy.

VISITORS TO OUR DEPARTMENT

Prof. Upendra Kulkarni, ,

Modular and Integral representations of GLn

Dr. Vrushali A Bokil, ,

A Computational and statistical framework for multidimensional
domain acoustooptic interrogation.
Dr. Ravi Raghunathan, TIFR
Converse theorems, Zero and poles of L-functions
Dr. Urmie Ray, Universite de Reims,
Bocherds-Kac-Moody Lie algebras and denominator formulas
Dr. Swagata Nandi, University of Heidelberg, Germany.
Sinusoidal Frequency Model and chirp signal model
Dr. Radha Mohan, ,
Inetgrally Closed Modules, reductions and cores.
Professor Kishore Sinha, Birla Agricultural University, Ranchi
Balanced and Partially Balanced Designs
Prof. Arun Bagchi, Twente,
Stochastic system Theory.
Dr. V.V.K.Srinivas Kumar, IIT Knapur
Web-Spline method for the Navier Stokes Problem.
Bruno Poizat, Universite Claude Bernard- Lyon
Computations over an Arbitary Structure.
Prof. P.N.Kaloni, ,
Stability Problems in Magnetic Fluids
Prof. Anand Srivastav, Universitaet zu ,
Geometric Discrepancies in High Dimensional Integration.
Prof. Jitesh Gajjar, ,
Numerical Solutions of the Navier- Stokes equations for the flow in a Cylindrical Cascade.
Dr. Rama Misra, IIT
Polynomial Knots and their Degree Sequence.
Dr. M.N.N. Namboodiri, of Science and Technology,
Spectral Gaps of Self-Adjoint Operators.
Prof. N. Rao Chaganty, ,
Bivariate Models for identifying Differentially Expressed Genes in Micro array Experiments
,2005
Prof. Gerard Ioose, Institut Non Linéaire Niec,
Existence of standing gravity waves in deep water.

,2005

Prof. S. Kesavan, Institute of Mathematical Sciences, Chennai

Saint Venant Revisited

Prof. S. Kabadi, ,

Multipath Flows: Analysis, Realizability and Network Synthesis problems

Prof. Shreeram S. Abhyankar, ,

Resolution of Singularities and Modular Galois Theory.

Prof. R.L. Karandikar, ISI, .

An Invitation to Cryptography

Professor Vidar Thomee, Chalmers ,

Parabolic finite Element Equations in Nonconvex Polygonal Domains

Mr. Amitava Bhattacharya, TIFR Mumbai

Introduction to Polytopes

Prof. J. Herzog, of

Grobner bases in Commutative Algebra and Combinatorics

Dr. A.V. Jayanthan, HRI, Allahabad

Grobner bases and Initial Ideals

Prof. P.N. Rathie, of

Renyis entropy and Tail Probabilities.

Dr. Clare DCruz, CMI, Chennai

Regularity of Ideals I

Prof. Francois Coulouvrat, Universit Pierre et Marie ,

Diffraction of nonlinear waves : numerical simulation and applications

List of Faculty and Specializations

Athavale Ameer (Professor- VF)

Functional Analysis

Ghorpade Sudhir R. (Professor)

Algebraic Geometry, Combinatorics

Joshi K. D. (Professor)

Topology, Discrete Mathematics

Joshi R. R. (Professor)

Computational Biology and Biostatistics, Bioinformatics

Kulkarni Rekha P. (Professor)

Numerical Functional Analysis, Spline Theory

Limaye Balmohan V. (Professor)

Functional Analysis, Numerical Analysis, Spectral Approximation

Mitra Amit (Assistant Professor)

Statistical Signal Processing

Nataraj Neela (Assistant Professor)

Finite Element methods

Pai Devidas V. (Adjunct Professor)

Functional Analysis, Approximation Theory, Set-valued Analysis

Pani Amiya K. (Professor)

Numerical Analysis, Partial Differential Equations, Industrial Mathematics

Patkar Sachin B. (Associate Professor)

Combinatorial Optimization, Algorithms

Prakash J. (Professor)

Tribology

Puthenpurakal T.J (Senior Lecturer)

Commutative Algebra

Rana Inder K. (Professor)

Harmonic Analysis, Mathematics Education

Ranjan Akhil (Professor)

Differential Geometry

Raghunathan Ravi (Assistant Professor)

Automorphic forms, Number Theory

Sabnis S. V. (Associate Professor)

Reliability Theory, Industrial Statistics

Saikia Anupam (Assistant Professor)

Number Theory

Sharma V.D. (Professor)

Quasilinear Hyperbolic Systems of PDEs/ Nonlinear Waves

Shastri A. R. (Professor)

Algebraic Geometry, Algebraic Topology

Sivaramakrishnan Sivasubramanian (Senior Lecturer)

Polyhedral Combinatorics, Approximation Algorithms

Srinivasan Anitha (Senior Lecturer)

Number Theory

Srinivasan G. K. (Assistant Professor)
Partial Differential Equations
Srinivasan M. K. (Professor)
Combinatorics
Subramanyam A. (Associate Professor)
Statistical Inference, Geostatistics
Sureshkumar K. (Assistant Professor)
Stochastic Differential Game Theory, Mathematical Finance.
Vellaisamy P. (Professor)
Applied Probability, Statistical Inference, Industrial Statistics
Verma J. K. (Professor)
Commutative Algebra

Publications in Books

Pai D.V.

Haussdorff Strong Uniqueness in Simultaneos Approximation. Part I, in " Approximation Theory XI Gatlinburg 2004", C. K. Chui, M. Neamtu and L. L. Schumaker(eds.),101 118, Nashboro Press, Brentwood, TN, USA, 2005.
(with Indira K.)

On Well-Posedness of Some Problems in Approximation Theory, in "Advances in Constructive Approximation", M. Neamtu and E. B. Saff(eds.), Nashboro Press , ,USA, 2004, 371-392
(wirh Indira K.)

Srinivasan M.K.

A Polytope in Hypergraph Theory, in Combinatorial Optimization, Narosa publishing House, 2004, 139-150

Publication in Journals

(International)

Athavale Ameer

On a class of alternatingly hyperexpansive subnormal weighted shifts, Irish Math. Soc. Bulletin 53 (2004), pp. 35-52.
(with A. Ranjekar, V.M. Sholapurkar)

Joshi R.R.

Yagyopathic Herbal treatment of Pulmonary Tuberculosis symptoms A clinical Trial.
Alt. Compl. Therap. 2004, Vol. 10(2), pp. 101-105.
(with M. Raghuvanshi, P. Pandya)

A Biostatistical Approach to Ayurveda Qunatifying the Tridosha, Jnl. Alt. Comp. med. 2004, Vol. 10(5), pp. 879-889.

Kulkarni R.P.

Approximate Solution of Multivariable Integral Equations of the Second Kind, Journal of Integral Equations and Applications, 16(2004), 343-374.

Spectral Refinement using a New Projection Method, ANZIAM J, 46(2004), 343-374.
(with N. Gnaneshwar)

Limaye B.V.

Computation of Spectral Subspaces for Weakly Singular Operators, Numerical Functional Analysis and Optimization, Vol.25, pp 1-14 (2004).
(with M. Ahues)

Mitra Amit

"Time series lag selection using genetic algorithms", Advances and Applications in Statistics, Vol. 4(2), 233-251, 2004**.**
(with Ashok K. Nag**)**

"Forecasting business cycle movements using wavelet filtering and neural networks", , Finance , Vol 18(2), 1605-1626, 2004.
(with Sharmishtha Mitra)

"Detecting multidimensional outliers from large datasets using self-organizing maps", , Computational Statistics, 2, 2005.
(with Ashok K. Nag, Sharmishtha Mitra)

Nataraj Neela

A parallel mixed finite element implementation of fourth order plate bending problems in distributed memory environments. Applied Mathematics and Computation, 163, 253-274 (2005).
(with Kshitij Kulsreshtha, Michael Jung)

Performance of a parallel mixed finite element implemenatation for fourth order clamped anisotropic plate bending problems in distributed memory environments, Applied Mathematics and Computation, 155, 753-777 (2004).
(with Kshitij Kulsreshtha, Michael Jung)

Pai D.V.

On well-Posedness of some problems in approximation, Journal of Indian Math. Soc. 70 (2003), 1-16.

Pani A.K.

An H^1-Galerkin mixed method for second order hyperbolic equations, International J. Numer. Anal & Modeling, 1 (2004) pp.111-130.
(with Rajen K. Sinha, Ajaya K. Otta).

Higher order fully discrete scheme combined with H^1-Galerkin mixed finite element method for semilinear reaction-diffusion equations, J. Applied Mathematics and Computing, 15, (2004), pp. 1-28
(with S. Arul Veda Manickam, Kannan M. Moudgalya)

Sliding motion and stability of a class of discontinuous dynamical systems, Nonlinear Dynamics, 37 (2004), pp. 151-168.

(with Jyoti Agrawal, Kannan M. Moudgalya)
A second order splitting lumped mass finite element method for the Rosenau equation, Differential Equations and Dynamical Systems, 12 (2004), pp. 331-351.
(with Sang K. Chung)
Orthogonal cubic spline collocation method for the extended Fisher-Kolmogorov equation, Journal of Computational and Applied Mathematics, 174 (2005), pp. 101-117
(with P.Dhanumjaya)
A qualocation method for unidimensional single phase Stefan problem, IMA J. Numer. Anal. 25 (2005), pp.139-159
(with L. Jones Doss)

Rana Inder K.

On the continuity of the associated interval function, Journal of Real Analysis Exchange, (29) 2003/04, No.2

Sharma V.D.

Energy dissipated across shocks in weak solutions of conservation laws, Studies in Applied Mathematics (,), volume 112, pp. 281-291, 2004.
(with G.K. Srininvasan)
Imploding cylindrical and spherical shock waves in a non-ideal medium, Journal of Hyperbolic Differential Equations, (World Scientific; /), volume 1, pp. 521-530, 2004.
(with Madhumita G)

Sivaramakrishnan S.

On approximating the isoperimetric number of strongly regular Graphs to appear in the Electronic journal of Linear Algebra.

Srinivasan Anitha

Solutions of some Generalized Ramanujan- Nagell Equations, to appear in Indagationes Mathematicae
(with N. Saradha)

Srinivasan G.K.

Implosion time for converging Cylindrical and Spherical shells, Z. Angew. Math. Phy. , Vol 55, (2004), pp. 974-982.
(with V.D. Sharma)

Srinivasan M.K.

On the quotients of posets, with an application to the q- analog of the Hypercube, European Journal of Combinatorics 25 (2004) 675-683.

Subramanyam A

On the equivalence of the Cokriging and Kriging systems, Journal of the Mathematical Geology, 36 (4), 2004, pp. 504-523.
(with Pandalai H.S)

Tests of Independence in a bivariate exponential distribution, Metrika 61, 2005, pp. 47-62.
(with Usha A. Kumar)

Suresh Kumar K.

A nonzero-sum Stochastic differential game in the orthant, Journal of Mathematical Analysis and Applications, Vol. 305, Issue 1, 2005, pp.158-174
(with M.K Ghosh)

Vellaisamy P.V.

Poisson Approximation for (K1, K2)- events via the Steni-Chen method, Journal of Applied Probability, 41, 1081-1092.

Verma J.K.

Cohen-Macaulay fiber cones of almost minimal multiplicity, Nagoya J. Math. 177(2005), 155-179.
(with A. V. Jayanthan)

Papers in Proceedings

(International)

Mitra Amit

"Frequency estimation of signal processing models using genetic algorithms",
Proceedings of the International Conference on Recent Advances in Statsiitcs, IIT Kanpur, January 2005.
(with Debasis Kundu)

"Relationship between money, output and price: revisited using wavelet filtering", Proceedings of the International Conference on Recent Advances in Statsiitcs, IIT Kanpur, January 2005**.**
(with Sharmishtha Mitra)

Neela Natraj

A Mixed Finite Element Method for Fourth Order Eigenvalue Problems PAMM, Volume 4, Issue 1, Date: December 2004, Pages: 358-359.

Pani A.K.

Industrial Mathematics, Proceedings of the International Conference on Industrial Mathematics, 2002 (toappear).
(with Mohan C. Joshi, Sanjeev Sabnis)

Sivaramkrishnan

On complete Partitions of Graphs, Symposium on Discrete Algorithms, 2005.
(with Jaikumar Radhakrishnan, Magnus Halldorsson, Guy Kortsarz)

Presentation / Participation in Conferences/ Symposia.

(National)

Athavale Ameer

Title: Functional Analysis and its Applications
Organizer: Sardar Patel University, Gujarat
Duration: March 14-16, 2005.
Details: Presented an invited talk on Sectorial Forms and Unbounded Subnormals.

Ghorpade S.R.

Title: S. K Malik Memorial Chandigarh Mathematics Colloquium
Organizer: Punjab University
Duration: February 11-12, 2005
Details: Delivered Lecture on Geometric and Combinatorial Aspects of Coding Theory.
Title: Symposium on Algebraic Groups in honour of V.Lakshmibai.
Organizer: Chennai Mathematical Institute, Chennai
Duration: January 8, 2005
Details: Participated

Joshi K.D.

Duration: February 3-4, 2005.
Details: Delivered 2 lectures on Quaternionic Approach to SU_2
at Karnatak Vishwavidyalaya, Dharwad
Title: Recent Trends in Analysis
Organizer: Karnatak Vishwavidyalaya, Dharwad
Duration: March 18, 2005.
Details: Presented an invited talk on Fibonacci Numbers in Analysis.

Joshi R.R.

Title: National Symposium on Recent Trends in Molecular and Medical Biophysics
Organizer: IBS, Pune
Duration: 22-25 Feb, 2005
Details: Talked on Statistical Computational Approach to Function-Elucidation Predicted Structure of an EF-hand Ca2+ Binding Protein.

Limaye B.V.

Title: Conference on Functional Analysis and its Applications.
Organizer: Sardar Patel University
Duration: March 14-16, 2005
Details: Delivered lecture on Continuity and Countable Subadditivity of a Seminorm.

Pani A.K.

Title: Scientific Computing: Linear Solvers
Organizer: AISMS College of Engineering,
Duration: December 16, 2004.
Details: Delivered 2 hours talk on `Scientific Computing: Linear Solvers.
Title: Surprises in Mathematics and Their Applications
Organizer: UGC
Duration: January 17,2005.
Details: Industrial Mathematics: A Key to Key Technologies

Sharma V.D.

Title**:** Workshop on Optical Communications
Organizer: Department of Electronics and Telecommunication Engineering, VES Institute of Technology, Mumbai
Details: Delivered the Inaugral address.

Shastri A.R.

Title: Annual Foundation School I, Dept. of Mathematics, IIT Bombay.

Organizer: NBHM

Duration: May 2004

Details: Delivered 6 Lectures in Differential Topology.

Title: Annual Foundation School II, HRI, Allahabad.

Organizer: NBHM

Duration: December, 2004

Details: Delivered 9 Lectures on Algebraic Topology..

Srinivasan M.K.

Title: Workshop on Algebraic Graph theory.

Organizer: IIT Guwahati

Duration: December, 2004

Suresh Kumar K.

Title: 19th Annual Conference of Ramanujan Mathematical Society

Organizer: Dept. of Mathematics, Dr. B.R.Ambedkar University, Agra

Duration: July 21-24, 2004

Details: Delivered Lectures on Portfolio Optimization problems.

Verma J.K.

Title: R. P. Stanley's solution of the ADG conjecture, National symposium in memory of Hans-Raj Gupta, Punjab University, Chandigarh,

Organizer: Punjab University

Duration: 19-20 November, 2004

Title: Annual Foundation School II, HRI Allahabad.

Organizer: NBHM

Duration: 3-15 December, 2004.

Details: Delivered Six lectures on Noetherian rings and modules

Title: Hilbert functions and magic squares

Organizer: IIT Delhi

Duration: 22 November, 2004

Title: Annual Foundation School-I Indian Institute of Technology Bombay,

Organizer: NBHM

Duration: 17-22 May, 2004

Details: Delivered lectures on Topics in Galois theory,

(International)

Joshi K.D.

Title: Conference on Discrete Mathematics and its Applications

Organizer: Devi Amritha Vidyapeetham, Coimbatore

Duration: 9-11 December, 2004.

Details: Chaired a panel discussion on Discrete Mathematics.

Pai D.V.

Title: 11th International Conference in Approximation Theory .
Organizer: NSF, Army Research office and Vanderbilt University
Duration: May 18-22, 2004
Details: Delivered Research talk entitled Hausdorff strong uniqueness in simultaneous approximation of 20 minutes duration.

Pani A.K.

Title: Conference on Complex Systems, Control and Optimizations .
Organizer: Northeastern University, Shenyang (China)
Duration: August 8-12, 2004
Details: Plenary Talk on Oldroyd Model in Viscoelestic Fluid Flow Problems:
Some Theoretical and computational Issues
Title: Indo-French Workshop on Partial Differential Equations and Applications
Organizer: IISc Bangalore
Duration: February 07-12, 2005
Details: Delivered 45 minutes invited talk entitled ` A New Mixed Finite Element Method for Evolution Equations: An Old Wine in a New Bottle'

Patkar Sachin B.

Title: APMOD 2004 (at London)
Organizer: Brunel University, U.K.
Duration: June 2004
Details: Presented paper on Multidimensional Scheduling.

Rana Inder K.

Title: 10th International Congress on Mathematics Education
Organizer: International Mathematics Union
Duration: July 2004.
Details: Made a presentation on the development of E-course.

Sabnis S.V.

Title: International Conference on the Future of Statistical Theory, Practice and Education
Organizer: Indian School of Business, Hyderabad.
Duration: December 29, 2004- January 1, 2005
Details: Gave an invited talk on Estimation and Construction of Bounds using r th Best Prototype

Shastri A.R.

Title: International AMS-India meeting, I.I.Sc. Bangalore
Organizer:
Duration: May 2004.
Details: Presented a paper on Topology of Matrix Varieties.
Title: International workshop on Low Dimensional Topology, I.S.I, Bangalore.
Organizer: I.S.I Bangalore.
Duration: September 2004

Details: Delivered 4 lectures on Topology of open Algebraic Surfaces.

Joseph Tony

Title: Commutative Algebra and Interactions with Algebraic Geometry and Combinatorics
Organizer: ICTP, Italy.
Duration: June 7-11, 2004

Vellaisamy P.

Title: International Conference on Reliability Statistics and Related areas.
Organizer: IIM, Kozhikode
Duration: January 7-9, 2005

Invited lectures

Ghorpade S.R.

"On the number of solutions of equations over finite fields", Colloquium talk, University of Tennessee, Knoxville, USA, April 2004.

"Linear Codes, Schubert Varieties and Enumerative Combinatorics", Colloquium talk, State University of New York at Albany, USA, May 2004.

"Rational points of varieties over finite fields", Algebra Seminar, University of Missouri-Columbia, USA, May 2004.

"Linear codes, Schubert varieties and enumerative combinatorics", Geometry - Algebra - Singularities - Combinatorics (GSAC) Seminar, Northeastern University, Boston, USA, May 2004.

"Varieties, codes and combinatorics", , Pocatello, , May 2004.

"Coding Theory", A series of three lectures, Workshop on Coding Theory, Mathematical Sciences Institute, Postgraduate Centre of Karnataka University, Belgaum, November 2004.

"Algebraic Geometry for Scientists and Engineers", of Enginnering and Technology, Belgaum, November 2004.

"Codes, enumeration and varieties over finite fields", Indian Statistical Institute, Delhi, December 2004.

Kulkarni R.P.

Approximate Solution of Operator Equations, Max Planck Institute for Mathematics in Sciences, , , 27th October 2004.

A Superconvergence Result for Solutions of Compact Operator Equations, , , , .

A Superconvergence Result for Solutions of Second Kind Integral Equations, Technische Universitat, , , .

Approximate Solution of Integral Equations, , Saint Etienne, , .

Limaye B.V.

Invited lecture at the University of California, Irvine (USA) on Continuity of Countably Subadditive Seminorms on April 6th, 2004.

Mathematics Colloquium at California state University, Los-Angeles on Numerical Approximation of Eigen values on April 26th , 2004.

Pai D.V.

Colloquium lecture entitled Strong unicity in Simultaneous Approximations at Facultaat Mathematische, Catholische Universitaet, Eichstaet, Germany May 26, 2004.

Pani A.K.

A series of eight Lectures (each one and half hours) on Mathematical Theory of Finite Element Methods in the Department of Mathematics , Dr. Babasaheb Ambedkar Marathwada University, Aurangabadduring February 21-25,2005.

Gave a talk to B.Sc. students on `Why should Industry Hire Mathematicians' in the Maulana Azad College,Aurangabad on February 22, 2005.

Gave a talk on `Industrial Mathematics: A Case Study' under lecture series on Development in Graduate Level Masthematics, held in Jawaharlal Nehru Enginering College, Aurangabad, on February 25,2005,organised by Marathwada Mathematical Society.

Sabnis S.V.

Acted as one of the Resource Persons for a workshop on "Design of Experiments" conducted for a group of scientists from Onida research Center in April,2004.

Acted as one of the resource persons for a SAS workshop held at Dept. of Statistics, of Pune during ,2004.

Delivered 8 lectures on "Sample Size Methodology" in the DST sponsored Workshop during .

Gave one invited talk at on "Applications of Statistics in Industry" on .

Sharma V.D.

Delivered an invited lecture at the Fourth World Congress of Nonlinear Analysts 2004, organized by the Florida Institute of Technology held at Orlando, Florida (July 3, 2004).

Delivered an invited lecture at the International Conference on Mathematical Fluid Dynamics held at the Department of Mathematics and Statistics, University of Hyderabad, Hyderabad (December 3, 2004).

PATENTS

Patkar Sachin B.

Patent filed based on R & D work at Powai Labs, Mumbai. Simulator Accelerator IMAGE.

Honorary work

Athavale Ameer

Reviewer for Mathematical Reviews

Ghorpade S.R.

Member, Council of Editors, Resonance, A Journal of Science Education published by the of Sciences, .

Co-opted Member, Board of Studies in Mathematics: of [2000-2005], of Pune [2001-2006] and Shivaji , Kolhapur [2002--2005]

Editor (with J. K. Verma and H. Srinivasan), Contemporary Mathematics volume on Commutative Algebra and Algebraic Geometry, American Mathematical Society.

Reviewer for Zentralblatt MATH

Joshi R.R.

Referee for papers submitted to "Nucleic Acid Research" and "BioSilico"

Reviewer for projects submitted to DBT and DST.

Member of the selection committee in University of Pune.

Limaye B.V.

Member of the Selection committees for faculty recruitment at various IITs.

Pai D.V.

Appointed as a Member, Programme Advisory Committee(PAC)- Mathematical Sciences, SERC, DST, Govt. of

Appointed as a Member, Scientific Committee-Indian side of Indo-French Institute of Mathematics(IFIM) by DST, Govt. of India.

Examined a Ph.D. thesis from IIT Madras.

Pani A.K.

Referee job for IMA J. Numer. Anal, Numer. Meth. PDEs, Journal of Computational and Applied Mathematics, Indian J. Pure and Applied Mathematics, SIAM J Numer Anal etc.

Examined Ph. D. Theses: one from Berhampur University, one from IIT Kanpur, One from IIT Madras.

Patkar Sachin B.

Member of Expert Committee for deigning Curriculum at IGNOU

Refree for Maths of OR, IPL.

Nataraj Neela

Reviewer for Calcolo, Journal of The Indian Institute of Science

Sabnis S.V.

Acted as one of the Resource Persons for a workshop on "Design of Experiments" conducted for a group of scientists from Onida research Center in April,2004.

Acted as one of the resource persons for a SAS workshop held at Dept. of Statistics, of Pune during ,2004.

Examined one Ph.D. thesis from Nagpur University.

Evaluated one research proposal for DST.

Sharma V.D.

Reviewer for Mathematical Reviews (USA) and Zentralblatt MATH (Germany).

Examined Ph.D. Thesis submitted to ISI Calcutta and IIT Kharagpur.

Served as a member of the Selection Committee for faculty recruitment at University of Hyderabad and NIT Jalandhar (Punjab)

Shastri A.R.

Reviewer for Mathematical Reviews

Srinivasan M.K.

Referee for research papers

Verma J.K.

Reviewer for Mathematical Reviews

Editor (with S.R. Ghorpade and H. Srinivasan), Contemporary Mathematics volume on Commutative Algebra and Algebraic Geometry, American Mathematical Society.

Secretary for the NBHM supported Advanced Training in Mathematics Schools

Member of the Nurture Programme committee of the NBHM.

Member of Board of studies of University of Baroda

Member, Council of Editors, Resonance, A Journal of Science Education published by the Indian Academy of Sciences, Bangalore.

Member, Coordinating committee for China-India-Vietnam network for Commutative Algebra of ICTP, Italy.

Significant Awards and Distinctions

Pani A.K.

Plenary Speaker in the International Conference on Complex Systems and Optimization, held in Northeastern University, Shenyang (China) during August, 2004.

Member of the Editorial Board: Differential Equations and Dynamical Systems : An International Journal; International J. Numer. Anal & Modeling.

Inagaurated the UGC sponsored conferences on `Surprises in Mathematics and Their Applications, held in Vivekananda College, Chembur during January 17, 2005**.**

Sharma V.D.

Nominated as a Member of the Editorial Board of the Indian Journal of Pure and Applied Mathematics.

Nominated as a Member of the Sectional Committee of INSA (New Delhi) to assess nomination for election as INSA Fellow for a term of 3 years beginning January 2005.

Nominated as a Member of Technical Advisory Committee for the Physics and Earth Sciences Divisions, ISI Calcutta.