

**DEPARTMENT OF MATHEMATICS & STATISTICS
INDIAN INSTITUTE OF TECHNOLOGY KANPUR**

ANNUAL REPORT – April 2005 to March 2006

1. Books and Book-Chapters published:
 1. An Expedition to Geometry, Hindustan Book Agency, New Delhi, 2005, **Santhanam, G.**, Kumaresan, S.,
 2. Mathematical Biology - Recent Trends, Anamaya Publishers, New Delhi, 2005, **Chandra, Peeyush, Rathish Kumar, B.V.** (eds.)
 3. Feature selection using rough sets *in* Multi-Objective Machine Learning, Ed. Yaochu Jin, Series on Studies in Computational Intelligence 16 (Berlin;Springer-Verlag), 3-20, 2006, **Banerjee, M.**, Mitra, S. and Anand, A.
 4. Estimating zero coupon yield curve for government securities: the Indian experience during recent period, *in* DESACS Working Paper No. 2, Reserve Bank of India, 2005. Mitra, A., Gayen, S., **Mitra, S.**, Bhaunik, D., Biswas, S.,
 5. Abstract convexity *in* Handbook of generalized convexity and generalized monotonicity, (Series: Nonconvex Optimization and Applications 76), Springer, New York, 2005, pp 293-333, **Dutta, J.**, Rubinov, A.
 6. Statistical Signal Processing *in* Encyclopedia of Statistical Sciences, Wiley New York, 2006, N. Kannan and **D. Kundu**

2. Research Papers Published in Journals and Conference Proceedings:
 1. Multiple outlier detection in multivariate data using self-organizing maps, Computational Statistics, 20: 2005, 245-254, Nag, A. K., Mitra, A., **Mitra, S.**
 2. Frequency estimation of undamped exponential signals using genetic algorithm, Computational Statistics & Data Analysis, 10.1016/j.csda, 2005, **Mitra, A., Kundu, D., Agrawal, G.**
 3. Wavelet decomposition based genetic neural network models for forecasting daily spot foreign exchange rates, Statistical Methodology, Vol.3, Issue 2, 2006, 103-124, Mitra, A., **Mitra, S.**
 4. On linear codes over Z_2 Designs Codes and Cryptography, Vol.36, No.3, 2005, 227-244, **Lal, A.K.** Gupta, M.K., Bhandari, M.C.
 5. Change of variable formula for multiple integrals, Mathematics Newsletter (NBHM), Vol.15, No.1, 2005, 6-9, **Santhanam, G.**, Kumaresan, S.
 6. Estimation of linear models with missing data: The role of stochastic linear constraints, Communications in Statistics – Theory and Methods Vol. 34, 2, 2005, 375-387, **Shalabh**, Toutenburg, H.
 7. Estimation of regressions coefficients subject to exact linear restrictions when some observations are missing and balanced loss function is used, TEST, Vol.14, No.2, 2005, 385-396, **Shalabh**, Toutenburg, H.

8. Prediction in Restricted Regression Models, Journal of Combinatorics, Information System and Sciences, Vol. 29, Nos. 1-4, 2002 [Appeared in 2005] , pp. 229-238, **Shalabh** and R. Chandra
9. Estimation of Parameters in Multiple Regression With Missing Covariates using a Modified First Order Regression Procedure, Annals of Economics and Finance, 6, 2005, 289-301, **Shalabh**, Toutenburg, H., Srivastava, V.K., Heumann, C.
10. Penetrative phototactic bioconvection, Physics of Fluids 17, 074101-11, 2005, **Ghorai, S.**, Hill,N.A.
11. Rough contraction through partial meets, In Proc. 1st Int. Conf. On Pattern Recognition and Machine Intelligence (PreMI '05), LNCS Series (Springer-Verlag), 2005,726-731, **Banerjee, M.**, Singh, P.K.
12. Object extraction in grey-scale images using roughness measure of a fuzzy set, In Proc. 1st Int. Conf. On Pattern Recognition and Machine Intelligence (PreMI '05), LNCS Series (Springer-Verlag), 2005, 744-749, **Banerjee, M.**, Rao, J., Mitra, D.V.
13. A subset selection procedure for selecting the exponential population having the longest mean lifetime when the guarantee times are the same, Comm.Statist. Theory Method 34, No.7, 2005, 1555-1569, **Misra, N.**, Somesh, K., Meulen van der E.C., Tripathi, Y.M.
14. James-Stein type estimators for ordered normal means, J. Stat. Comput. Simul. 75, No.7, 2005, 501-511, **Misra, N.**, Somesh, K., Tripathi, Y.M.
15. Estimation of order restricted concentration parameters of von Mises distributions. Comm. Statist. Simulations and Comput, 34, No.1, 2005, 21-40, **Misra, N.**, Singh, H., Li, Shengqiao.
16. Simultaneous selection of extreme populations: optima two-stage decision rules. Advances in ranking and selection, multiple comparisons, and reliability, 143-161, Stat. Ind. Technol. Birkhauser Boston, Boston, MA, 2005. **Misra, N.**, **Dhariyal, I.D.**
17. Estimation of the entropy of a multivariate normal distribution, Journal of Multivariate Analysis, 92, 2005,324-342, **Misra, N.**, Singh, H.,Demchuk, E.
18. On estimating the scale parameter of the selected gamma population under the scale invariant squared error loss function, Journal of Computational and Applied Mathematics, 186, No.1, 2006, 268-282, **Misra, N.**, van der Meulen, E.C., Branden, Karlien, V.
19. Weighted extended B-spline method for the approximation of the stationary Stokes problem, J. Comput. Appl. Math 186, No.2, 2006, 335-348, **Rathish Kumar, B.V.**, Das. P. C., Srinivas, V.V.K.
20. Wavelet multiplayer Taylor Galerkin schemes for hyperbolic and parabolic problems, Appl. Math. Computation. 166, No.2, 2005,312-323, **Rathish, B.V.**, Mehra, M.
21. Time accurate solution of advection-diffusion problems by wavelet-Taylor-Galerkin Method, Comm. Numer. Methods Engrg. 21, No.6, 2005, 313-326, **Rathish Kumar, B.V.**, Mehra, M.,

22. Double diffusive natural convection in a doubly stratified wavy porous enclosure, Applied Mathematics and Computation, Vol.171, Issue 1, 2005, 180-202, **Rathish Kumar, B.V.**, Shalini.
23. Wavelet based pre-conditioners for sparse linear system, Applied Mathematics and Computation, Vol. 171, Issue 1, 2005, 203-204, **Rathish Kumar, B.V.**, Mehra, M.
24. A time –accurate pseudo-wavelet scheme for parabolic PDE’s, Nonlinear Analysis, Vol.63, 2005, 345-356, **Rathish Kumar, B.V.**, Mehra, M.
25. Non-stationary iterative solvers on a PC cluster, Advances in Engineering Software, Vol.36, Issue 6, 2005, 393-400, **Rathish Kumar, B.V.**, Shalini, Mehra, M.
26. Parallel pre-conditioners for heat transfer applications on ANU-cluster, Applied Mathematics and Computation, Vol.163, Issue 3, 2005, 1243-1263, **Rathish Kumar, B.V.**, Kumar, B.
27. Estimating the number of components of the fundamental frequency model J. Japan Statist. Soc.35, No.1, 2005, 41-59, **Kundu, D.**, Nandi, S.
28. Generalized Rayleigh distribution: different methods of estimations, Comput. Statist. Data Anal. 49, No.1, 2005, 187-200, **Kundu, D.**, Raqab, M. Z.
29. Discriminating between normal and Laplace distributions, Advances in ranking and selection, multiple comparisons, and reliability, Stat. Ind. Technology, 2005, 65-79, **Kundu, D.**
30. Discriminating between the log-normal and generalized exponential distributions, J. Statist. Plann. Inference 127, No.1-2, 2005, 213-227, **Kundu, D.**, Gupta, R.D., Manglick, Anubhav.
31. Estimation of $P(Y < X)$ for generalized exponential distribution, Metrika, Vol. 61, No.3, 2005, 291-308, **Kundu, D.**, Gupta, R.D.
32. Comparing different estimators of $P(X < Y)$ for a Burr Type X distribution, Communications in Statistics – Simulation and Computation, Vol.34, No.2, 2005, 465-483, **Kundu, D.**, Raqab, M.Z.
33. Tolerance intervals for exponentiated scale family of distributions, Journal of Applied Statistics, Vol. 32, No. 10, 2005, 1067-1074, **Kundu, D.**, Shirke, D.T., Kumbhar, R.R.
34. On discrete domain multidimensional sinusoidal models, Statistics, Vol. 40, No. 2, 2006, 129-147, **Kundu, D.**, Nandi, S.
35. A., A parameter uniform implicit difference scheme for solving time-dependent Burgers’ equations. Appl. Math. Comput. 170, No.2, 2005, 1365-1393, **Kadalbajoo, M. K.**, Sharma, K.K., Awasthi.
36. Numerical treatment for singularly Perturbed differential equations with negative shift Nonlinear Anal. Vol. 63, 2005, 1909-1924, **Kadalbajoo, M.K.**, Sharma, K.K.
37. Numerical treatment of boundary-value Problems for second order singularly perturbed delay differential equations, Comp. App. Math. Vol.24, No.2, 2005, 151-172, **Kadalbajoo, M.K.**, Sharma, K.K.

38. Fitted mesh B-spline collocation method for solving singularly perturbed reaction-diffusion problems, *J. Comput. Math.* Vol. 4, No.3, 2005, 349-365, **Kadalbajoo, M.K.**, Aggarwal, V.
39. Numerical treatment of a mathematical model arising from a model of neuronal variability. *J. Math. Anal. Appl.* 307, No.2, 2005, 606-627, **Kadalbajoo, M.K.**, Sharma, K.K.
40. Fitted mesh B-spline collocation method for solving self-adjoint singularly perturbed boundary value problems, *Appl.Math.Comput.* 161, No.3, 2005, 973-987, **Kadalbajoo, M. K.** , Aggarwal, V.K.
41. Numerical solution of singular boundary value problems via Chebyshev polynomial and B-spline, *Appl. Math. Comput.* 160, No.3, 2005, 851-863, **Kadalbajoo, M.K.**, Aggarwal, V.K.
42. Exact and approximate solutions of delay differential equations with non-local history conditions, *J. Appl. Math. Stoch. Anal.* No.2, 2005, 181-194, **Bahuguna, D.**, Agarwal, S.
43. Application of Rothe's method to delay differential equations, *Bull. Calcutta Math. Soc.* 97, No.6, 2005, 511-516, **Bahuguna, D.**, Shukla, R.K.
44. Partial functional differential equations and applications to population dynamics, *Nonlinear Dyn. Syst. Theory* 5, No.4, 2005, 345-356, **Bahuguna, D.**, Shukla, R.K.
45. Approximation of solutions to retarded differential equations with applications to population dynamics, *J. Appl. Math. Stoch. Anal.* No.1, 2005, 1-11, **Bahuguna, D.**, **Muslim, M.**
46. Approximation of solutions to history-valued neutral functional differential equations, *Computers and Mathematics with Applications*, Vol.51, Issue 3-4, 2006, 537-550, **Muslim, M**
47. Approximation of solutions to non-local history-valued retarded differential equations, *Applied Mathematics and Computation* 174, 2006, 165-179, **Muslim, M.**, **Bahuguna, D.**
48. A study of nonlocal history-valued retarded differential equations using analytic semigroups, *Nonlinear Dynamics and System Theory*, 6(1), 2006, 63-75, **Muslim, M.**, **Bahuguna, D.**
49. Evolution equations arising in the study of materials with memory, *Bull. Calcutta Math. Soc.* 97, No.2, 2005, 173-186, **Bahuguna, D.**, Shukla, R.K.
50. Optimality conditions for maximizing a locally Lipschitz function, *Optimization*, Vol. 54, 2005, 377-389, **Dutta, J.**
51. Necessary optimality conditions and saddle points for approximation optimisation in Banach spaces, *Top*, Vol. 13, No.1, 2005, 127-143, **Dutta, J.**
52. Generalized derivatives and non-smooth optimisation – a finite dimensional tour, *TOP*, Vol.13, 2005, 185-314, **Dutta. J.**
53. A convolution back projection algorithm for local tomograph, *ANZIAM J.* 46, No.3, 2005, 341-360, Das, P. C., Sastry, Challa, S.

54. Biological correlates of diffusivity in brain abscess, *Magnetic Resonance in Medicine*, 54, 2005, 878-885, **Rathore, R.K.S.**, Mishra, A.M., Saksena, S., Prasad, K.N., Purwar, D., Husain, N., Jha, D.K., Husain, M.
55. Dynamics of a family of transcendental meromorphic functions having rational Schwarzian derivative, *J. Math. Anal. Appl.* 2006, **Kapoor, G.P.**, Sajid, M.
56. Generalized cubic spline fractal interpolation, *SIAM J. Numerical Anal.* 44(2), 2006, 655-676, **Kapoor, G.P.**, Chand, A.K.B.
57. Dynamics of non-critically finite odd transcendental meromorphic function, *Indian J. Pure Appl. Math.* 36(4), 2005, **Kapoor, G.P.**, Sajid, M.
58. Dynamics of family of non-critically finite even transcendental meromorphic functions, *Regular and Chaotic Dynamics*, Vol.9(2), 2004, 143-162, **Kapoor, G.P.**, Sajid, M.
59. A combinatorial arc tolerance analysis for network flow problems, *Journal of Applied. Mathematics & Decision Sciences* 2, 2005, 83-94, **Sharma, P.**
60. Modelling and analysis of the spread of Malaria: Environmental and ecological effects, *J. of Biological Systems*, Vol. 13. No.1, 2005, Singh, S., **Chandra, Peeyush**, Shukla, J.B.,
61. Continuity of the optimal value function under some hyperspace topologies, *Journal of convex analysis* 12, 2005, 397-406, **Shunmugaraj, P.**, Chakrabarty, A.K.
62. Fourier Trigonometric Compression in Magnetic Resonance Imaging, *International Journal of Tomography & Statistics (IJTS)*, Volume 3 No. JJ05 June-July 2005, 44-80, **R.K.S. Rathore**, R.K. Gupta, R. Kalyan Raman, and Divya K.S. Rathore,

3. Research Papers Published in Conference Proceedings

1. Modelling the survival of a biological species affected by toxicants (pollutants) emitted from external source as well as formed by precursors in *Mathematical Biology- Recent Trends (Proc. ICMB-2004)*, pp. 278-284, 2006. **Sinha, P.**, Shukla, J.B., Sharma, S.,
2. Numerical methods for solving a mathematical model of neuronal variability, *Industrial Mathematics Proceedings of an international Conference* pp. 241-264, Narosa, 2006, **Kadalbajoo, M. K.**, Sharma, K.K.
3. Sample size determination for bioequivalence test, 2006, 117-126, , *Statistical Advances in Biosciences and Bio Informatics Proceedings of the Seventh Conference of the International Biometric Society (Indian Region)* Shukla, G.K., **Prasad, Anurag**
4. Resonance problems for Hardy-Sobolev operator with indefinite weights, *Proc. Dynamical Systems and applications*, Vol. 4, 2005, p.233-238, **Raghavendra, V.**, Sreenadh, K.,
5. The observed heterogeneity of DTI scalar metrics in high and low FA regions of brain abscess, *Proc. Intl. Soc. Mag. Reson. Med.* 13, 2005, **Rathore, R.K.S.**, **Purwar, A.**, Gupta, R.K., Mishra, A.M.

7. Biological correlates of diffusivity in brain abscess, Proc. Intl. Soc. Mag. Reson. Med. 13, 2005, **Rathore, R.K.S**, Mishra, A.M., Gupta, R.K., Husain, M., Saksena, S., Prasad, K.N., Jaggi, , R.S., Purwar A., Pandey, C.M., Husain,N.
8. Blood flow in a vessel with asymmetric aneurysm, in Mathematical Biology- Recent Trends (Proc. ICMB-2004), Anamaya Publishers, New Delhi 29-36 2006. **Rathish Kumar, BV.,**
9. Pulsatile power law fluid flow in a channel filled with a homogeneous porous medium (Proc. ICMB-2004), Anamaya Publishers, New Delhi 90-95,2006. **Rathish Kumar, BV.,** Shalini.
10. Modelling the depletion of dissolved oxygen in a water body due to organic pollutants and their effect on survival of species, in Mathematical Biology- Recent Trends (Proc. ICMB-2004), Anamaya Publishers, New Delhi 266-272,2006. **Chandra, P.,** Shukla, J.B., Misra, A.K.
11. Modelling the spread of malaria: Environmental effects (Proc. ICMB-2004), in Mathematical Biology- Recent Trends Anamaya Publishers, New Delhi, 285-290, 2006. **Chandra, P.,** Shukla, J.B., Singh, S.
12. WEBS method for the approximation of stokes problem, in industrial mathematics, 441-458, 2006 Narosa. **Rathish Kumar, B. V., Joshi, M.C., Pani, A.K., Safnis, S.V.**
13. 3D parallel computation on parallel processors of the natural convection process in porous enclosures, in ISTAM, Proceedings Dec. 14-17, 2005, IIT Khatragpur. **Rathish Kumar, BV., Shalini.,**
14. 3D – unsteady flow dynamics in a vessel with oversystem in industrial mathematics, 369-384,2006 Narosa. **Rathish, BVK., Joshi, M.C., Pani, A.K., Sabnis, S.V.,**

4. SEMINARS PRESENTED

1. Department of Mathematics, University of Limoges, France, May 27 2005, **Dutta J.**
2. Lagrange multipliers: Revisited *at* the Center for optimization and stochastics , Martin-Luther University, Halle, Germany., seminar title '**Dutta, J.**
3. Invited lectures at National seminar on partial differential equations and scientific computing held at Department of Mathematics, Sixth Gujarat University, Surat from 23-25, Jan. 2006, **Raghavendra, V.**(also chaired 2 seminars).
4. Numerical Methods for Singularly perturbed Delay Differential Equations - Professor S.K. Lakshamana Rao endowment lecture at NIT Warangal August'2005. **Kadalbajoo, M.K.**
5. Invited lectures in National Symposium on Scientific Computing with Application to Partial Differential Equations IIT Kanpur, Nov. 19-21, 2005 **Ghorai, S.**
6. An overview of FDM for PDEs in National Symposium on Scientific Computing with Applications to PDEs' at IIT Kanpur, Nov. 19-21'05 **Kadalbajoo, M.K.**
7. The Derived space of $L^p(G)$ on Feb. 25, 2006 at Department of Mathematics, University of Jammu. **Tewari, U.B.**
8. Frechet algebras of power series in the Department of Mathematics, University of Copenhagen, Denmark on 26th May 2005, **Patel, S.R.,**
9. Approximation by K-finite functions, ISI Kolkata, June, 2005, **Ray, S.K.**

10. Rough consequence relations at IMSc, Chennai, July, 2005, **Banerjee, M.**
11. (i) A new class of stabilized mesh free methods for viscous fluids: Part I. (ii) A new class of stabilized mesh free methods for viscous fluids: Part II, (iii) Wavelet Taylor Galerkin method for PDEs. Wavelet -Taylor Galerkin method & PDEs NUS, Singapore, 24 Oct. 2005, **Rathish Kumar, BV**
12. Regression Analysis in Agricultural sciences at Agricultural Institute, Allahabad, India in 2005, **Shalabh.**

5. CONFERENCES ATTENDED OUTSIDE IIT KANPUR

1. 9th Discussion meeting on harmonic analysis, HRI, Allahabad in Oct.'05 - invited talk on Integer translates L^p functions and chaired one session - **S. Madan.**
2. 9th Discussion meeting on Harmonic Analysis HRI, Allahabad from Oct. 05 - invited talk, titled Order Convolution and Vector-valued multipliers, also chaired a session. . **U.B. Tewari**
3. 9th Discussion meeting on harmonic analysis, HRI, Allahabad in Oct.'05 Contributory Paper by **R. Rawat.**
4. Recent advances in operator's theory and operator algebras III, I.I.Sc. Bangalore, December 12-22, 2005, invited lecture 'Approximation by K - finite functions in L^p spaces' by **S.K Ray.**
5. Recent advances in operator's theory and operator algebras III, I.I.Sc. Bangalore, December 12-22, 2005, lecture On Frechet algebras of power series by **S.R. Patel.**
6. 55th session of International Statistical Institute Sydney, Australia, April 2005, contributory paper 'On the regression method of estimation of population mean from incomplete data through imputation' by **Shalabh**
7. Golden Jubilee Congress of Indian Society of Theoretical and Applied Mechanics (An International Meet), 14-17 December, 2005, IIT Kharagpur, Invited talk Three dimensional bioconvection by **S. Ghorai.**
8. 20th summer conference on topology and its applications; July 10-14, 2005 Talk Order Convolution and vector-valued multipliers by **U.B. Tewari.**
9. International Conference on Reliability and Survival Analysis, at Indian Statistical Institute, New Delhi, December 20- 22, 2005- paper On Stochastic Comparisons of Poisson and Binomial Random Variables With Their Mixtures presented by **N. Misra.**
10. International Conference on Operations Research Applications in Infrastructure Development held at IISc, Bangalore from 27th to 29th Dec.'05, - paper presentation An efficient local search scheme for minimising weighted mean absolute deviation, by **P. Sharma, A. Gupta.**
11. International symposium on Algorithmic Operations Research at Simon Fraser University, Burnaby, Canada on the 27th Jan'06. **Sharma, P.** (participated)
12. Mini-symposium on Bilevel programming at T.U. Bergakademie, Freiberg, on 19th May 2005 Paper presented (with Stephan Dempe) titled: 'Bilevel programming with convex lower problems' by **Dutta, J.**

13. 8th International conference on generalized convexity and generalized monotonicity at University of Insubria, Varese, Italy, 3rd-8th of July 2005. Invited paper (jointly with Stephan Dempe), **Dutta, J.**
14. Recent advances in Operations Research and Graph Theory Calicut on December 16th and 17th, 2005 distinguished speaker **Sridharan, M. R.**
15. Commutative Algebra and Algebraic Geometry, Indian Institute of Mathematical Sciences, Chennai, August 1-6, 2005. Talk by **Maloo, A.K.**
16. 60th Annual meeting of the STLE, Las Vegas, NV, USA, May 15-19, 2005. Contributory paper (jointly with Saxena, S) Thermoelastohydrostatic lubrication of an externally Pressurized conical bearing with temperature and pressure dependent viscosity, by **Sinha, P.**
17. 3rd MIT Conference on Computational Fluid & Solid Mechanics, Cambridge, MA, USA, June 14-17, 2005, Contributory paper (jointly with Rao, P. S.) A streamline upwind Petrov - Galerkin finite element Simulation of thermo-hydrodynamic lubrication in tilted pad slider bearing considering fluid inertia and heat conduction to the pad: reference to load generation in a parallel slider **Sinha, P.**
18. SCI 2005 international Conference held at Orlando, U.S.A, July 10-12'2005 – invited paper by **Kadalbajoo, M.K.**
19. Scientific Computation, Numerical Analysis and Application IISc Bangalore, India during July 18-21'2005 invited paper by **Kadalbajoo, M.K.**
20. International conference on Functional and numerical analysis I.I.T. Bombay, 7-9, December 2005, invited talk Convergence of slices and subdifferentials by **Shunmugaraj, P.**
21. Conference in Reliability Analysis Indian Statistical Institute, New Delhi, Dec. 20-22, 2005, paper Analysis of partially complete time and type of failure data, **Kundu, D.**
22. Indo-Chinese Conference on Probability and Statistics Indian Statistical Institute, Kolkata, Jan 4-6, 2006, paper: Generalized exponential distribution, **Kundu, D** (jointly with Gupta, R.D.).
23. National Conference on Lifetime Data Cochin University of Science and Technology, Feb.20-22, 2006. Invited talk Step-Stress Model by **Kundu, D.**
24. International Conference on Topics in Functional and Numerical Analysis Indian Institute of Technology, Bombay, 07-09, December 2005, paper presented (jointly with Muslim M.), 'Approximations of Solutions to Nonlocal Functional Differential Equations' **Bahuguna, D.**
25. 17th Banach Algebra Conference at University of Bordeaux1, Bordeaux1, France, 2005 invited talk On Frechet algebras of power series; also chaired a session, **Patel, S.R.**
26. DST-CARDMATH working group & 4th update meeting on automata, concurrency, logic and verification, IIT Bombay, July, 2005, Invited Talk - Non-monotonic Reasoning, **Banerjee, M.**
27. 1st Indian Winter School on Logic and its Relationship with Other Disciplines, IIT Bombay, January, 2006 – Tutorial on Reasoning under uncertainty, **Banerjee, M.**
28. 1st International Conference on pattern recognition and machine intelligence (PreMI '05), ISI Kolkata, December, 2005, paper presented by **Banerjee, M.**,

29. Conf. on Topics on functional and numerical analysis, IIT, Bombay, from 7th to 9th Dec. 2005. **Patel, S.R.**
30. 9th Discussion meeting on harmonic analysis, HRI, Allahabad in Oct.'05, participated, **S.R. Patel.**
31. 4th Int. Conf. OWCHMT, May 17-20, 2005, Paris. Paper: Numerical predication of heat transfer and fluid flow in a complex ADSS geometry with straight guide-using SUPG-FEM, pp. no. ICCHMT 05163, **Rathish Kumar, BV.** Prakash, A.K., Biswas, G.
32. ASME, Summer Heat Conf. July 17-22, 2005 San Francisco, U.S.A. Paper HT 2005-72445, Thermal-Hydraulics of air ADSS with sharp 180° bend and St. flow guide using FEM, **Rathish Kumar, BV.,** Prakash, A.K., Biswas, G
33. ASME. Int. Mech. Engng. Congress and Exposition, Nov. 5-11, 2005, Paper #IMEC92005-80262, 2005 Florida, U.S.A. Numerical simulation of ADSS with surface heat flux and heat generation using FEM, **Rathish Kumar, BV.,** Prakash, A.K., Biswas, G
34. 18th National and 7th ISHMJ-ASME HMTc, Jan. 4-6, 2006 IIT Kharagpur, Paper # 4004, Numerical simulation of complex ADSS with FEM, **Rathish Kumar, BV.** Prakash, A.A., Biswas, G.

6. OTHER ACTIVITIES

(c) Visit to other institutes for research

1. **Lal, A.K.,** ISI Delhi from 2nd June 2005 to 29th June 2005.
2. **Shalabh** visited (i) Faculty of information technology, Bond University, Australia in April 2005. (ii) Department of Statistics, University of Woolangong, Woolangong, Australia in April 2005, (iii) Institute of Statistics, Ludwig Maximilian University, Munich, Germany in May 2005, (iv) Institute of Statistics, University of Angsburg, Angsburg, Germany in May 2005.
3. **Banerjee, M.,** visited The Institute of Mathematical Sciences, Chennai, June-July 2005.
4. **S. R. Patel** Visited the Department of Mathematics, University of Bordeaux1, Bordeaux1, France from 1st June to 18th July 2005 for collaborative work with Prof. J. Esterle and M. Akkar.
5. **S. R. Patel** visited the Department of Mathematics, Univesrity of Copenhagen, Copenhagen, Denmark from 24th May to 31st May 2005 to discuss the research with Profs. K. B. Laursen and N. Gronbaek.
6. **S. K. Ray** Visited ISI Kolkata, Stat/math Unit from 20th June, 2005 to 8th July, 2005.

(d) Awards and Honours

1. **Shalabh** received Humboldt Fellowship to work at Institute of Statistics, Ludwig, Maximilians Univ. Munich, Germany.
2. **Shalabh** – Member of organizing Committee of International workshop on TLS and Errors – variables Modelling, Belgium, 2006.
3. **Shalabh** - Associate Editor of Journal of Multivariate Analysis [Elsevier Journal].

4. **Banerjee, M.**, Member, Interim Advisory Board, International Rough Set Society.
5. **Dutta, J.**, Joined the editorial board of new journal titled : International journal of modern mathematics, by invitation in March 2006. The journal is published by Dixie. W. Publishing, Alabama, USA.
6. **Kundu, D.**, Editorial board member of the Journal of Modern Applied Statistical Methods, Statistics and Its Applications, Communications in Statistics – Theory and Methods, Communications in Statistics – Simulation and Computation.

(f) Continuing Education Activities

1. **Shunmugaraj, P.** and **J. Dutta** organized the Instructional Workshop on Convex Analysis, Optimization and Applications (sponsored by Department of Science and Technology) at IIT Kanpur from 5 Dec. 2005 to 21 Dec. 2005.
2. **B.V. Rathish Kumar** and **S. Ghorai** organized National Symposium on Scientific Computing with Application to Partial Differential Equations, IIT Kanpur, Nov. 19-21, 2005.
3. **Santhanam, G.**, gave lectures on ‘Introduction to Riemannian Geometry’ in advanced foundational school held in Bhaskaracharya Prathistana, Pune in December 2005 .
4. **Lal, A.K., R. Rawat, U. B. Teawri, M. K. Kadalbajoo, S. Ghorai, J. Dutta, P. Shunmugaraj, Peeyush Chandra** Gave number of lectures at the DST sponsored Advanced Training Programme in Mathematics for Undergraduate students of Eastern U.P. held at Christ Church College from 14th October 2005 to 23rd October 2005.
5. **Bahuguna, D.** delivered (i) two lectures in the orientation programme of Invertis Institute of Engineering Technology, Bareilly, August 10-11,2005. (ii) six lectures in the Training Programme on ODEs, IIT Guwahati, December 15-24, 2005.(iii) ten lectures on ODEs and PDEs in the Department of Mathematics, North Bengal University, December 26-30, 2005.
6. **Kadalbajoo, M.K.** Advanced training programme on theoretical and numerical aspects of ODE’s; Dec. 15-24, 2005, IIT Guwahati 06 lectures given on numerics of initial value ODEs’ in the workshop.
7. **Santhanam, G.**, was resident faculty in MTTTS programme 2005 held at S.P. College, Pune during May 14, 2005 – June 9, 2005 to teach a course of lectures on topology.
8. **Raghavendra, V.**, Delivered 6 lectures at the training programme on ‘Ordinary Differential Equations’ held at the Department of Mathematics, IIT Guwahati from Dec. 15 to Dec. 24, 2006.
9. **J. Dutta** delivered three lectures in ‘International Instructional Workshop on Convexity and Discrete Structure’: Trivandrum’ March 22nd to April2, 2006.
10. **S. K. Ray** resident faculty for MTTTS 2005 (level 0) held at Jadavpur University, 23.5.2005 to 18.6.2005 and gave a course on Real Analysis.