

Academic activities described in this section are those of individual faculty members with respect to research and development, consulting, recognition, publications and honorary work for other academic organizations.

Sponsored Projects

Funding for the following projects has been received from the sponsoring agencies during 2009-10:

- ♦ Development of a Rapid Visual Screening Method for Seismic Assessment of RC Frame Buildings in India. Sponsored by the Seismology Division, Ministry of Earth Sciences, Government of India, New Delhi. Prof. Sudhir K. Jain is the Principal Investigator and the collaborators are Prof. Durgesh C. Rai from IIT Kanpur, Prof. Keya Mitra from BESU Shibpur, and Prof. Mehul Shah from CEPT Ahmedabad.
- ♦ R & D of Equipment for Peeling of Husk from Cashew Kernels. Sponsored by Olam Exports India Ltd, Quilom, Kerala. Prof. N. Ramakrishnan is the Principal Investigator.
- ♦ Hybrid calix[n]pyrin(s) with pyridine moiety: New block of macrocycles as potential candidates for anion sensing and metal coordination. Sponsored by the Department of Science and Technology, New Delhi. Dr Iti Gupta is the Principal Investigator.

Awards and Recognition

The following Institute faculty have received special awards and recognition by external bodies during 2009-10:

Prof. Sudhir K. Jain has been elected a Fellow of the Gujarat Science Academy.



Dr Deepthi Shanker was awarded the Prof. M. N. Srinivas Memorial Prize in Sociology for her outstanding Ph.D. thesis. She received the award from His Excellency the Governor of Karnataka, Dr Hans Raj Bhardwaj at ISEC, Bangalore on January 20, 2010 during the Founder's Day Celebrations.

Dr Nitin Padhiyar has been awarded the Indo-US Research Fellowship by the Indo-US Science & Technology Forum (IUSSTF). Under this fellowship he will be carrying out research work at the Carnegie Mellon University, USA for one year starting July 2010.

Honorary Work by Faculty for Other Organizations

Prof. Sudhir K. Jain, Civil Engineering

- ✦ Executive Vice President, International Association for Earthquake Engineering
- ✦ Member of the Board, World Seismic Safety Initiative
- ✦ Chairman, International Activities Committee, Earthquake Engineering Research Institute, USA
- ✦ Member, Board of Management, NIIT University, Neemrana
- ✦ Member, INAE Silver Jubilee Celebrations Committee, Indian National Academy of Engineering
- ✦ Examiner, Ph.D. thesis, Bengal Engineering and Science University, Shibpur, Howrah
- ✦ Member of the Selection Committee, IIT Delhi
- ✦ Member, Advisory Editorial Board, Earthquake Engineering and Structural Dynamics, John Wiley and Sons
- ✦ Member, Editorial Board, Earthquake Engineering and Engineering Vibrations, Springer-Verlag

Prof. D. V. Pai, Mathematics

- ✦ Examiner, Ph.D. thesis in Mathematics, Guru Nanak Dev University, Amritsar
- ✦ Associate Editor, Asian European Journal of Mathematics, World Scientific Publishers, London and Singapore



- ◆ Reviewer, Mathematics Reviews (American Mathematical Society)

Prof. Dhiren R. Patel, Computer Science and Engineering

- ◆ Member, Technical Committee CCB/AIEEE 2010 Counseling Software Operations, MHRD, Government of India
- ◆ Member, Core Committee, Information Security Education & Awareness, DIT, Government of India
- ◆ Member, PRSG - BFIS - Biometrics Project, C-DAC Mumbai
- ◆ Member, Indo-UK Information Security Research Group

Prof. Manmohan Pandey, Mechanical Engineering

- ◆ Member, Local Organizing Committee for International Workshop on New Horizons in Nuclear Reactor Thermal Hydraulics and Safety, Mumbai, January 7-8, 2010

Participation of Faculty in National and International Conferences

Prof. Dhiren R. Patel attended the International Conference on Information Security and Digital Forensics 2009 during September 7-8, 2009 at the City University London. Prof. Patel delivered an Invited Talk titled Moving Forward: Cryptology Primitives for Secure Systems.

Prof. D. V. Pai was invited to visit DST Centre for Mathematical Sciences at Arunapuram, Pala, Kerala during September 11-12, 2009. He chaired the Planning Committee for the SERC School series entitled Matrix variable calculus and statistical distribution theory and applications in data analysis, model building and astrophysics problems.

Prof. Sharmita Lahiri was invited to the National University of Singapore during August 5-8, 2009, to conduct workshops on Writing Exercises, and Converting Syllabi into Effective Writing Modules.



Prof. Sudhir K. Jain was invited by the Earthquake Engineering Research Institute (EERI), the professional association of earthquake engineers in USA, to attend two meetings in San Francisco. The first meeting Housner Gift Invitational Workshop was held from September 20-22, 2009 and the second meeting EERI/WHE-PAGER Project Review Meeting was held on September 23, 2009.

Prof. U. A. Yajnik presented a talk titled Topological objects and metastable vacua on September 2, 2009 at the International Conference on Challenges in Cosmology at the Tufts University Center, Talloires, France. He attended the International Conference on Particle Physics and Cosmology - Cosmo09 at CERN (European Centre for Nuclear Research), Geneva, Switzerland, during September 7-11, 2009. During September 14-16, 2009 he visited Feza Gursey Institute for Fundamental Sciences, Istanbul, Turkey and gave a seminar. Prof. Yajnik was invited to deliver a public lecture Advances into the Quantum World, August 14, 2009, Mahatma Gandhi University, Kottayam, Kerala. During August 13-14, 2009 he also gave a seminar at Cochin University of Science and Technology, and a popular lecture at St Thomas College, Pala, Kerala.

Prof. Koshy Tharakan attended a seminar titled Philosophy in Colonial India at Indian Institute of Advanced Study, Shimla during October 9-13, 2009 and Philosophy and Modern World: Epistemic Structures at IIT Bombay on November 18, 2009. Prof. Tharakan also attended the International Seminar on Cultural Encounters: India and Europe, Universidade Catolica Portuguesa, Lisbon, December 16, 2009. He delivered an invited talk on Prospects of Interpretative Social Sciences after Postmodernism at ISCTE - Lisbon University Institute, Lisbon on December 17, 2009.

Dr Ameeya Bhagwat visited the University of Barcelona, Spain for collaborative research from October 20 to November 12, 2009.



Prof. Dhiren Patel delivered a talk at Carnegie Mellon University Qatar Campus on October 20, 2009. He conducted a half-day workshop on Biometrics & Authentication at Mumbai in association with C-DAC Mumbai and BSPA Lab, Purdue University on November 18, 2009. From November 23-24, 2009 Prof. Patel attended Nasscom/DSCI (Data Security Council of India) Information Security Summit at Delhi. On November 25, 2009 he delivered a keynote talk on Information Security: Past and Present at Nirma University, Ahmedabad. Prof. Patel delivered a distinguished lecture on Information Security at SP CET, Visnagar on December 1, 2009.

Prof. M. S. Agarwal participated in the 24th Indian Engineering Congress during December 10-13, 2009 at NITK Surathkal. He participated in the 7th International Seminar on Capacitors (CAPACIT-2010) organized by the Indian Electrical and Electronics Manufacturers' Association (IEEMA) at The Leela, Mumbai from January 20-22, 2010. He also chaired a session on Life Cycle Management in the seminar.

Dr Jaison Manjaly attended the international conference, From Experience to Thought: Debates in Consciousness, Cognition and Agency held at Jawaharlal Nehru University, New Delhi from January 7-9, 2010. He presented a paper titled Panpsychism: Experience as Fundamental Reality.

Dr Vinod Narayanan attended an Indo-UK mini-workshop on Instabilities in Shear Flows held at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore from January 11-15, 2010.

Prof. N. Ramakrishnan gave an invited presentation on Low Cost Automation on the occasion of India's 1st Stainless Steel Fair INDINOX 2010 held on January 17, 2010 at Convention Hall, Ahmedabad. Prof. Ramakrishnan also coordinated a course entitled Low Cost High-Tech Automation (LCHA) at Ashok Leyland, Chennai from January 21-23, 2010.



Prof. Suchitra Mathur attended a workshop on Transforming Science: Feminist Perspective from February 16-18, 2010 at Mumbai. The workshop was organized under the auspices of the Indian Association for Women's Studies.

Dr Nitin Padhiyar was invited as a Chairperson to adjudicate Paper Presentation at Nirma University, Ahmedabad on March 26, 2010.

Faculty Publications

The Institute strongly encourages its faculty to present their research work for peer review through publication in reputed journals and conference proceedings, and by presenting the same in conferences. These activities not only give the faculty important feedback on their work, but also enhance the visibility of the Institute in the national and international academic arena. The Institute also encourages dissemination of knowledge through publication of books, book chapters and monographs, etc. The following is a list of publications by faculty during 2009-10:

Book Chapters

A. Sarkar and L. M. Bhole, "Bank Depositors' Role as a Disciplinary Force in Indian Banking: a Dynamic Panel Approach", in Pradhan, R. P. (ed), "Forecasting Financial Markets in India", 2009, ISBN 978-81-8424-426-7.

D. V. Pai, "Multivariable Calculus and Optimal Recovery of Functions" in Publication No. 40 SERC SCHOOL NOTES 2010, on "Multivariable and Matrix Variable Calculus and Applications: Stochastic Models", pp 1-44, CMS (Centre for Mathematical Sciences), Pala Campus, Arunapuram P.O., Pala, Kerala, February, 2010.

D. Shanker and C. K. Baba, "Empowering People through technology: Role of ICT in rural development" in U. N. Roy and J. S. Saini, ed., "People's Empowerment and Sustainable Rural Development: A



Technological Approach”, Rawat Publications, Jaipur, 2009, pp 329-338, ISBN 81-316-012-9.

A. Pandey, D. Radhakrishnan, M. Rajvanshi, K. Gayen and K. V. Venkatesh, “Optimization of bioprocesses using metabolic engineering”, Indo-US Series on Biofuels, 2009.

Papers Published in Refereed Journals

A. S. Nair, A. Sarkar, A. Ramanathan, and A. Subramanyam, “Anomalies in CAPM: A Panel Data Analysis under Indian Conditions”, International Research Journal of Finance and Economics, Issue 33, November 2009, pp 192-206, ISSN 1450-2887.

Y. K. Gambhir, A. Bhagwat and M. Gupta, “The superheavy elements: overview”, Indian Journal of Physics, Vol. 83, pp 661 - 669, May 2009 ISSN 0019-5480 (print) 0974-9845 (online).

A. K. Suresh and C. Ghoroi, “Solid-solid reactions in series - A modelling and experimental study”, AIChE Journal, Vol. 55, Iss. September 9, 2009, Pages 2399-2413, ISSN 00011541, DOI 10.1002/aic.11829.

D. V. Pai, “On Lower Semi-continuity of the Restricted Center Multifunction”, Revue D'Analyse Numerique et de Theorie de L'Approximation, (ANTA), Academy of Sciences, Roumania, Tome 38, No.1, 2009, 83-99, ISSN 1222-9024.

D. Shanker, “Towards Understanding the Concept Aspirations”, Endeavor, Vol. II, No. 2, July – December 2008 pp 121-131, ISBN TNENG/2007/19258.

D. R. Patel and S. A. Khuba, “Realization of Semantic Atom Blog”, Journal of Computing, Vol. 1, Iss. 1, pp 34-38, December 2009, ISSN 2151-9617.



D. Jinwala, D. R. Patel and K. Dasgupta, "FlexiSec: A Configurable Link Layer Security Architecture for Wireless Sensor Networks", *Journal of Information Assurance and Security*, Vol. 4, pp 582-603, 2009, ISSN 1554-1010.

D. R. Patel and D. Shah, "Architecture Framework Proposal for Dynamic and Ubiquitous Security in Global SOA", *International Journal of Computer Science & Applications (IJCSA)'s special issue on Advanced Grid and Parallel Computing*, Vol. 6, No.1, pp 40-52, 2009, ISSN 0972-9038.

D. Jinwala, D. Patel and K. S. Dasgupta, "Investigating and Analyzing the Light-weight ciphers for Wireless Sensor Networks", *INFOCOMP Journal of Computer Science*, Vol. 8, Iss. 2, pp 39-50, 2009, ISSN 1807-4545.

K. Parekh, R. V. Upadhyay and V. K. Aswal, "Monodispersed Magnetic Fluids: Synthesis and Characterization", *Solid State Phenomena*, 155 (2009) 155. ISSN 1662-9779.

R. P. Desai, V. S. Davariya, K. H. Parekh and R. V. Upadhyay, "Structural and magnetic properties of size controlled $Mn_{0.5}Zn_{0.5}Fe_2O_4$ nanoparticles and magnetic fluids", *Pramana-Journal of Physics* 73 (4) (2009) 765. ISSN 0304-4289.

K. Parekh and R. V. Upadhyay, "Static and dynamic magnetic properties of monodispersed $Mn_{0.5}Zn_{0.5}Fe_2O_4$ nanomagnetic particles", *J. Appl. Phys.*, 107 (2010) 053907. ISSN 0021-8979 print, 1089-7550 online.

R. V. Upadhyay and K. Parekh, "Monodispersed Magnetic Fluids", *J. Sci.-Gujarat* 1 (2010) 33.

S. P. Lakshmanan and M. Pandey, "Analysis of Startup Oscillations in Natural Circulation Boiling Systems", *Nuclear Engineering and*

Design, 239 (11), November 2009, Pages 2391–2398. ISSN 0029-5493.

S. V. Dalvi and R. N. Dave, “Analysis of Nucleation Kinetics for Precipitation of Poorly Water Soluble Drugs in Presence of Ultrasound and Hydroxypropyl Methyl Cellulose”, International Journal of Pharmaceutics, 387 (1-2), 2010, 172-179.

S. V. Dalvi and R. N. Dave, “Controlling Particle Size of Poorly Water Soluble Drug using Ultrasound and Stabilizers in Antisolvent Precipitation”, Ind. Eng. Chem. Res. 48 (16), 2009, page 7581-7593.

S. V. Dalvi and M. Mukhopadhyay, “A Novel Process for Precipitation of Ultra-fine Particles using Sub-critical CO₂”, Powder Technology, 195, 2009, page 190-195.

S. V. Dalvi and M. Mukhopadhyay, “Use of Subcritical CO₂ for Precipitation of Ultra-fine Particles by Pressure Reduction of Gas-Expanded Organic Liquids”, Ind. Eng. Chem. Res. 48, 2009, page 5696-5707.

S. Kanvah, J. Joseph, G. B. Schuster, R. N. Barnett, C. L. Cleveland and U. Landman, “Oxidation of DNA: Damage to Nucleobases”, Acc. Chem. Res., February 2010, 43, pp 280–287 ISSN 0001-4842; Web Edition ISSN 1520-4898.

S. Kanvah and G. B. Schuster, “One-electron oxidation of DNA: thymine versus guanine reactivity”, Org. Biomol. Chem., February 2010, 8, 1340 – 1343 ISSN 1477-0520.

B. Jana, S. Pal and B. Bagchi, “Enhanced Tetrahedral Ordering of Water Molecules in Minor Grooves of DNA: Relative Role of DNA Rigidity, Nanoconfinement, and Surface Specific Interactions”, J. Phys. Chem. B, 2010, 114 (10), pp 3633–3638.



H. B. Kaushik, D. C. Rai, and S. K. Jain, "Effectiveness of Some Strengthening Options for Masonry-Infilled RC Frames with Open First-Storey", Journal of Structural Engineering, ASCE, Vol. 135, No.8, August 2009.

S. Patra, A. Sarkar, U. Sarkar and U. Yajnik, "Spontaneous Parity Violation in a Supersymmetric Left-Right Symmetric Model", Phys. Lett. B679:386-389, 2009.

U. Yajnik and S. Mishra, "Spontaneously broken parity and consistent cosmology with transitory domain walls", Phys. Rev. D 81:045010 (2010).

Papers Published in Conference Proceedings

A. Bhagwat, J. P. Maharana and Y. K. Gambhir, "Wigner-Kirkwood approach for mass calculation: Effect of higher order correction terms", in the proceedings of DAE - BRNS International Symposium on Nuclear Physics, 2009.

M. Gupta, A. Bhagwat and Y. K. Gambhir, "a-decay of ^{265}Sg and ^{261}Rf revisited", in the Proceedings of DAE-BRNS International Symposium on Nuclear Physics, 2009.

O. Pal, S. Saiwan, P. Jain, Z. Saquib and D. R. Patel, "Cryptographic Key Management for SCADA System: An Architectural Framework", IEEE Proceedings of ACT 2009 International Conference on Advances in Computing, Control, and Telecommunication Technologies, Pages-169-174, Thiruvanthapuram, India, December 2009.

U. P. Rao and D. R. Patel, "A Survey of Database Intrusion Detection Approaches for Database Security", Proceedings of the International Conference on Computing, Communication and Information Technology Applications (CCITA 2010), Coimbatore, ISBN 978-81-909789-0-3, pp 222-227, January 2010.

C. Modi, U. P. Rao and D. R. Patel, "A Survey on Preserving Privacy for Sensitive Association Rules in Databases", in the Proceedings of International Conference on Recent Trends in Business Administration and Information Processing (BAIP 2010 – LNCS-CCIS) Trivandrum, India, March 2010.

Komalesh H. S. and J. A. Manjaly, "Time as History, as Myth", in the proceedings of Time in Indian Culture. Ed. Patnaik P, Chatterjee S. C. and Suar D. New Delhi: D. K. Print World, 2009. ISBN 812460535-1.

S. Jauhari, K. Parekh, K. B. Pai and R. V. Upadhyay, "Corrosion Inhibition of Mild Steel in an acidic media using nanomagnetic fluid as a novel approach to corrosion resistance", in the Proceedings of NACE 2010 during March 14-18, 2010 at San Antonio, Texas, USA.

K. Tharakan and A. Siqueira, "Science of Nature: Garcia de Orta as a Philosopher of Science," in the Proceedings of International and Transdisciplinary Conference on "Garcia de Orta and Alexander von Humboldt: Across the East and the West", Lisbon: Universidade Catolica Editora, 2009. ISBN 978-972-54-0252-8.

S. P. Lakshmanan and M. Pandey, "Numerical Experiments on Power Ramping in a Natural Circulation Boiling Water Reactor". Paper No. N13P1194. In: Proc. 13th Int. Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-13), Kanazawa City, Japan, September 27-October 2, 2009.

S. Thakre, S. P. Lakshmanan, V. Kulkarni and M. Pandey, "Study of Thermal Hydraulic Behavior of Supercritical Water Flowing Through Fuel Rod Bundles". Paper No. N13P1303. In: Proc. 13th Int. Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-13), Kanazawa City, Japan, September 27-October 2, 2009.



R. S. Patil, M. Pandey and P. Mahanta, "Study on wall to bed heat transfer characteristics in the upper splash region of cold circulating fluidized bed risers". In: Proc. 20th Nat. 9th Int. ISHMT-ASME Heat Mass Transf. Conf., Mumbai, India, January 4-6, 2010.

S. P. Lakshmanan and M. Pandey, "Numerical study of startup instabilities in a parallel-channel natural circulation boiling system". In: Proc. 20th Nat. 9th Int. ISHMT-ASME Heat Mass Transf. Conf., Mumbai, India, January 4-6, 2010.

S. K. Sarma, A. Bhuyan, M. Pandey and S. K. Gupta, "Numerical computation of one-dimensional unsteady two-phase flow", In: Proc. 20th Nat. 9th Int. ISHMT-ASME Heat Mass Transf. Conf., Mumbai, India, January 4-6, 2010.

P. P. Ghalsasi, P. S. Ghalsasi and J. L. Yarger, "Single Crystal X-ray Structure and Vibrational Properties of α -Quartz BeF_2 ", 12th International Conference on Inorganic Ring Systems, Goa, August 2009.

P. P. Ghalsasi, S. Saha, D. V. S. Muthu, U. V. Waghmare, A. K. Sood and C. N. R. Rao, "Raman study of metallic ReO_3 under pressure", in the proceedings of 54th DAE Solid State Physics Symposium, M.S. University of Baroda, Gujarat, December 14-18, 2009.

S. V. Dalvi and R. N. Dave, "Precipitation of Poorly Water Soluble Drugs using Ultrasound and Stabilizers: Controlling Process Parameters", Annual Meeting of AIChE at Nashville, TN, November 8-13, 2009.

C. Beck, S. V. Dalvi and R. N. Dave, "Controlled Liquid Antisolvent Precipitation of Poorly Water Soluble Drugs using a Scalable Rapid Mixing Device", Annual Meeting of AIChE at Nashville, TN, November 8-13, 2009.



D. To, S. V. Dalvi, S. Sundaresan and R. N. Dave, "Deagglomeration and Mixing of Nanopowders Using RESS Based Methods", Annual Meeting of AIChE at Nashville, TN, November 8-13, 2009.

Papers Presented at Conferences

A. Sarkar, "A Study of Market Discipline in Indian Banking: Role of Subordinated Debt Market" at the AIEFS Biennial Meeting, New Delhi, India jointly organised by Association of Indian Economic and Financial Studies, Vanderbilt University and Research and Information Systems for Developing Countries (2009).

A. Bhagwat, "Microscopic-Macroscopic Global Nuclear Mass Formula", Presented at DAE BRNS Meeting on "Horizons In Nuclear Physics", BARC, July 2009.

J. A. Manjaly, "Metaphysics and Metaphors in Cognitive Science", presented in International Conference on Language, Mind and Social Construction, at IIT Bombay, 2009.

J. A. Manjaly, "Panpsychism: Experience as fundamental reality", International Conference on From Experience to Thought: Debates in Consciousness, Cognition and Agency, Jawaharlal Nehru University, New Delhi, January 7-9, 2010.

M. Rajvanshi, K. Gayen and K. V. Venkatesh, "Characterization of Heterogeneity in Phenotypic States of *Corynebacterium glutamicum*", International Conference for Systems Biology (ICSB), August 31-September 3, 2009, Stanford, California, USA.

K. Tharakan, "Repositioning Interpretative Social Science after Postmodernism: Understanding, Interpretation and Self", at the National Seminar on Philosophy and Modern World: Epistemic Structures, Department of Humanities and Social Sciences, IIT Bombay, November 18, 2009.



K. Tharakan, "Making Sense of Other Cultures: Phenomenological Critique of Cultural Relativism", at the International Seminar on Cultural Encounters: India and Europe, CECC, Universidade Católica Portuguesa, Lisbon, December 16, 2009.

K. Tharakan, "Questioning Body: Towards a Sense of Technology", at the National Conference on Theorizing Body: Problems and Perspectives, Department of Philosophy, University of Calicut, January 27-29, 2010.