



Chennai Mathematical Institute

Annual Report 2007 - 2008

H1, SIPCOT IT Park
Padur Post, Siruseri,
Tamilnadu 603 103. India.

Chennai Mathematical Institute

H1, SIPCOT IT Park
Padur Post, Siruseri,
Tamilnadu 603 103. India.

Tel: +91-44-2747 0226 - 0229
+91-44-3298 3441 - 3442

Fax: +91-44-2747 0225

WWW: <http://www.cmi.ac.in>

Design and Printing by: Balan Achchagam, Chennai 600 058



Contents

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1. Preface	5
2. Board of Trustees	9
3. Governing Council	10
4. Research Advisory Committee	11
5. Research Activities	12
6. The National Undergraduate Programme	16
7. Activities of the Undergraduate Students	19
8. Special Convocation	21
9. Academic Members	22
10. Faculty Profiles	24
11. Awards	32
12. Publications	33
13. Conferences, Visits and External Lectures	37
14. Other Professional Activities	45
15. Undergraduate / Graduate Courses	47
16. Courses, Special Lectures	49
17. Visitors	51
18. Audited Statement of Accounts 2007-2008	55



Preface

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The Chennai Mathematical Institute (CMI) was founded in 1989 with a charter to build up an institution of excellence in the mathematical sciences. Over the years, CMI has succeeded amply in this goal. The Mathematics and Computer Science groups at CMI are among the best known in the research community in the country. The Institute has nurtured an impressive collection of students. Members of CMI maintain active research collaborations with leading research institutes throughout the world. A number of scholars from around the world visit CMI each year, enhancing the vibrant research atmosphere at the Institute.

Chennai Mathematical Institute began in 1989 as the School of Mathematics, a division of the SPIC Science Foundation. In August 1996, it became an independent institution called the SPIC Mathematical Institute (SMI), managed by a Trust of the same name, through a Governing Council. In order to place the Institute in a larger public domain, the name of the Institute was changed to Chennai Mathematical Institute (CMI) in January 1999.

Since its inception, CMI has had an active group of researchers in the fields of pure mathematics and theoretical computer science. More recently, the Institute expanded its areas of research into physics. The main areas of research in Mathematics pursued at the Institute are algebra, analysis, differential equations, geometry and topology. In Computer Science, the main areas of research are formal methods in the specification and verification of software systems, design and analysis of algorithms, computational complexity theory and computer security. In Physics, research is being carried out mainly in string theory, quantum field theory and mathematical physics.

Over the years, CMI has made very substantial contributions in these areas, as evidenced by the important research papers published by its members as well by the number and quality of doctoral students who are placed in various centres in India and abroad. The research activity at CMI is also enhanced and supported by seminars and lectures, both by the faculty and the students of CMI, as well as through

a healthy inflow of visitors from other research centres in India and abroad. Seminars are the life-line of any research group and CMI has had a rich tradition in this.

In September-October 2007, the Institute hosted a workshop on Arithmetic Geometry, with a focus on Galois representations and modular forms. In 2007-2008, the Institute had four distinguished visitors: Daniel Stroock, Jean-Marc Fontaine, David Mumford and S.R.S. Varadhan. All four visitors offered short lecture courses attended by faculty, postdoctoral researchers and doctoral students from a number of institutions. S.R.S Varadhan has also been nominated Distinguished Visitor of the Institute for the period 2008-2010. During his tenure, he will visit and interact with faculty and students at CMI on a regular basis.

CMI has always had an active PhD programme. CMI has also taken the initiative to bridge the gap between teaching and research by starting BSc and MSc programmes in Mathematics and allied subjects that are conducted entirely by faculty who are active in research. An important aim of the teaching programme at CMI is to motivate bright students to take up science at the university level. The teaching programme began in 1998 with the National Undergraduate Programme in Mathematics and Computer Science, leading to a BSc (Honours) degree. In 2001, separate MSc courses were introduced in Mathematics and Computer Science. In 2003, the BSc (Honours) programme was expanded to include a Physics stream. The present strength of the students in the BSc, MSc and PhD programmes is 67.

In the teaching programmes at CMI, talented students are selected at the national level and are taught by experts who have contributed to these fields. CMI has the continued support of scientists from other institutions, especially the Institute of Mathematical Sciences (IMSc), Chennai, the Tata Institute of Fundamental Research (TIFR), Mumbai, the Indian Institute of Technology (IIT) Madras, Chennai, Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam and the Homi Bhabha Centre for Science Education (HBCSE), Mumbai. Substantial support for this initiative is being provided by the National Board for Higher Mathematics (NBHM), an autonomous body constituted and funded by the Department of Atomic Energy (DAE).

The teaching programmes at CMI have turned out to be highly successful. Seven batches have already graduated in the BSc programme in Mathematics and Computer Science and moved on to some of the best institutions in the world. Two batches have graduated in the BSc programme in Physics and these students have also joined leading academic institutions in India and abroad. Five batches of MSc students have graduated and have been well placed in both academia and industry.

In December, 2006, CMI was granted the status of University by the Ministry of Human Resources and Development (MHRD), Government of India under Section 3 of the UGC Act, 1956. With this, the Institute has the authority to grant its own BSc, MSc and PhD degrees and also the flexibility to propose new programmes. An Academic Council has been constituted to oversee the degree programmes of the Institute, with separate Boards of Studies for the different subject areas. August 2007 saw the first batch of students graduating from CMI with degrees granted directly by the Institute.

In February 2008, a special convocation was held to award the degree of Doctor of Science (Honoris Causa) to three distinguished mathematicians who have also played an important role in the development of the Institute: David Mumford, M.S. Narasimhan and S.R.S. Varadhan.

Members of the Faculty have strong academic ties with reputed research institutions in India and abroad. The Institute participates in a programme of the Third World Academy of Sciences (TWAS), Trieste, Italy called the "Associate Membership Scheme at Centres of Excellence in the South".

The Institute has a memorandum of understanding with the Ecole Normal Supérieure in Paris, France, one of the leading institutions in the world for teaching and research in Mathematics. This agreement provides for regular exchange visits by academic members of CMI and ENS, Paris including, in particular, exchanges of visits by undergraduate students between the two institutions. Since 2000-2001, there have been regular visits from both sides each year under this programme.

CMI is also involved in a number of collaborative research projects, both with academic and industrial partners. The Institute is currently involved in a four year project on timed and distributed computing systems under the Indo-French Networking programme, jointly funded by the French Ministry of Science, CNRS and the Indian Department of Science and Technology. The project involves scientists from CMI, IMSc and IISc, Bangalore in India and the University of Paris 7, ENS de Cachan and the University of Bordeaux 1 in France.

CMI has a sponsored research project with Honeywell Technology Solutions Laboratory, Bangalore, in the field of avionics controls, initiated in 2004-2005. CMI also has a sponsored research project with Siemens' Corporate Technology research centre, Bangalore, in the area of formal testing of reactive systems.

The Institute actively supports conferences and workshops and other activities that contribute to the growth of Mathematics and Computer Science in the country.

CMI has a generous three-year grant from the Board for Research in Nuclear Sciences (BRNS) and the Department of Science and Technology (DST). This funding covers an ambitious visitors' programme as well as support to enhance computational infrastructure and library facilities at the Institute.

The faculty at CMI are also involved in training programmes both in academia and industry. Many CMI faculty play an active role in teacher-training workshops organized for college and university teachers. In addition, CMI faculty are actively involved in the Ignite programme of Tata Consultancy Services (TCS), a new initiative to impart training in computer science to fresh recruits with degrees in a diverse range of subjects. Mr. S. Ramadorai, Chief Executive Officer of TCS, has accepted an invitation to join the Board of Trustees of the CMI Trust.

In less than two decades, Chennai Mathematical Institute has established itself as an important centre for research and teaching in the mathematical sciences. The Institute has also evolved into an effective private-public partnership. In the next few years, the Institute will seek to consolidate the basic foundation that has been built and establish a presence in emerging areas related to the mathematical sciences.

C S SESHADRI

Director



Board of Trustees

.....

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-
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1. **Prof. R. Balasubramanian**
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3. **Prof. M.S. Narasimhan, F.R.S.**
TIFR Bangalore Centre, Bangalore
4. **Prof. M.S. Raghunathan, F.R.S.**
Professor of Eminence
Tata Institute of Fundamental Research, Mumbai
5. **Prof. S.R.S. Varadhan, F.R.S.**
Courant Institute of Mathematical Sciences
New York University, New York, U.S.A.
6. **Prof. M. Vidyasagar**
Executive Vice-President
Tata Consultancy Services, Hyderabad



Research Activities

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Mathematics

The main areas of research activity have been in algebraic geometry, representation theory, operator theory, commutative algebra, harmonic analysis, control theory and game theory.

In the area of representation theory, there was work on determining the multiplicity of a given irreducible $SL(2) * SL(2)$ module, in a given irreducible $SL(4)$ module, under the embedding of $SL(2) * SL(2)$ in $SL(4)$ given by $(A, B) \mapsto A \otimes B$. This has been a part of an on-going programme of study on quantum groups proposed by Ketan Mulmuley for this purpose. Work was done on related combinatorial solutions to this problem. Some partial results have been obtained towards solving the problem of determining invariants in characteristic p for $SL(n) \times SL(n)$ acting on $C^n \otimes C^n$.

There was geometric study of the stratification of the binary forms. Issues concerning the multiplicity of the line bundle restricted to the closed subvarieties of each dimension is being looked into. This was studied for the situation of homogeneous polynomials of degree in two variables. Work is in progress to extend this process to the general case. It was shown that the Geometric Invariant Theory quotient of the wonderful compactification of G/H for the action of H is independent of the choice of an ample line bundle. This result was proven more generally for any toroidal compactification of G/H . In particular, this result gives an application of studying the quotient of the adjoint group compactification modulo the conjugacy action.

Let G be a finite group. Let V be a finite dimensional faithful representation of G over an algebraically closed field. Then, the line bundle $L^{\otimes m}$ descends to the quotient $\mathbb{P}(V)/G$, where L is the ample generator of $\mathbb{P}(V)$, and m is the order of G . Let us denote this line bundle by M . Now, the natural question is that: Is the polarised variety $(\mathbb{P}(V)/G, M)$ projectively normal? An affirmative answer for this question was given when characteristic of the base field is coprime to the order of the group, and either G is solvable or G is generated by pseudo reflections.

Research was also carried out (a) To compute the multiplicity, or more generally the Hilbert function, at a point on a Schubert variety in the Orthogonal Grassmannian and, to provide an interpretation of the multiplicity as the cardinality of a certain set of non-intersecting lattice paths. (b) To compute the initial ideal (with respect to certain conveniently chosen term orders) of the ideal of the tangent cone at torus fixed points to Schubert varieties in the Orthogonal Grassmannian.

In the field of algebraic geometry, the main focus was on the Donaldson-Uhlenbeck compactification of the moduli space of principal bundles. Progress was made on the question of generic smoothness. Work was done on the asymptotic irreducibility of the moduli space of parabolic bundles that was constructed previously, generalizing the work of Kieran O'Grady. There has been work on certain questions on irreducibility of the moduli space of principal bundles on surfaces. Basic work on the study of Tannaka categories associated to semistable bundles on projective varieties was initiated.

In commutative algebra there was work on problems related to the bigraded modified Koszul complex. This yields several interesting results for the fiber cone. The bigraded complex was also used to study contracted ideals in a regular local ring.

In control theory and partial differential equations, the degenerate operator Riccati equation, which occurs in the study of the linear regulator problem of optimal control in Hilbert spaces with infinite time horizon, was studied. Results were obtained in the finite dimensional case and in the parabolic case.

In game theory, research interests include SDLCP, Stochastic Games of perfect Information.

In the area of operator theory, the primary interest was on the study of endomorphism semigroups (called E_0 -semigroups) on $B(H)$, the algebra of all bounded operators on a separable Hilbert space. There are some exotic type of E_0 -semigroups called as type III E_0 -semigroups. The first example of such a type III E_0 -semigroup was discovered by Robert Powers, in 1987. One has to wait for 13 years, till Boris Tsirelson produced an uncountable family of such E_0 -semigroups in 2000, to initiate a flurry of activity in this area. Fundamental progress was made after Tsirelson's discovery, in the research carried out in the past few years. Towards this a new construction called as 'generalized CCR flows' was introduced. Further work was carried out in the theory of these class of E_0 -semigroups and there has been some progress in finding gauge cocycle group of this family. Work has been carried out to generalize the above constructions to a more general frame work of Hilbert modules

etc. This is equivalent to studying E_0 -semigroups on more general factors, which are not type I as above. There has also been work on problems related to the first example of a type III E_0 -semigroup, discovered by Robert Powers (mentioned above). This yields an uncountable family of Powers' type III E_0 -semigroups. These E_0 -semigroups are shown to be mutually non cocycle conjugate, by analysing the invariants given by the associated local algebras. As a consequence of the proof, it follows that all these E_0 -semigroups are of type III.

In harmonic analysis, there was some work on Inductive Algebras, that is, commutative algebras of bounded operators on Hilbert space which are normalized by a unitary representation of a group. There was work on two analogues of Benedick's theorem for two step nilpotent Lie groups. An analogue of Hardy's theorem for operated valued distributions has been proven.

Computer Science

The research activity in Computer Science at CMI has been primarily in computational complexity theory, specification and verification of timed and distributed systems and analysis of security protocols.

In computational complexity theory, the deterministic isolation technique for reachability in planar graphs has been extended to obtain better complexity upper bounds for planar bipartite matching. Some work has also been initiated towards obtaining optimal upper bounds for planar graph isomorphism.

In the area of distributed systems, specifications of message-passing systems with timing constraints have been studied. The coverage problem asks if every path in a time constrained specification in the form of a High-level Message Sequence Chart (HMSC) is matched by a concrete run of an implementation given in the form of a message-passing automaton with local clocks. This question has been shown to be decidable for the class of locally-synchronized HMSCs, whose underlying behaviour is always regular.

Formal notions of local testing have been investigated for distributed communicating systems. Such a system is said to be locally testable if every combination of legal local observations of the system also constitutes a legal global behaviour. Local testability is known to be undecidable when local observations are made with respect to individual processes. It has been shown that the problem remains undecidable even if observations are made jointly with respect to all $n-1$ size subsets of a collection of n processes.

In the area of timed systems, an algorithm has been designed to solve the diagnosis problem for timed automata. In this problem, some actions of a timed automaton are unobservable and some control states are faulty. The problem is to determine, given a sequence of observed actions, whether any faulty locations are reachable from the current state and if so, to compute the minimum time in which such a fault may arise.

In the area of security protocol verification, the focus has been on electronic voting protocols. A formal model has been developed to capture relevant properties such as secrecy, receipt-freeness and individual verifiability, defined in terms of an equivalence relation over runs of a protocol. In this model, checking receipt-freeness has been shown to be decidable.

Physics

The research work in physics at CMI is concentrated in two major areas—mathematical physics and string theory.

In the former, the emphasis has been on developing a path integral approach to quantum entanglement. This has resulted in the construction of an infinite set of moments characterizing entanglement in a generic bipartite system. Another problem in which considerable progress has been made pertains to the motion of a classical particle on a knot. A nonlinear equation of motion has been derived that is still being studied.

In the latter field, work was focussed on somewhat disjoint questions in string theory. Gauge theory duals of cosmological backgrounds in string theory were studied, towards a view to obtaining an improved understanding of Big-Bang-like cosmological singularities in string theory, in the context of the AdS/CFT gauge/gravity duality. The response of the $N=4$ gauge theory to a time dependent gauge coupling source was studied in terms of a Schrodinger wave functional. This enables an understanding of the gauge theory dual description to a spacelike cosmological singularity. Brief discussions of embedding BKL cosmologies in this AdS/CFT framework were also performed. An understanding of the internal structure of dyons in $N=4$ super Yang-Mills theories by using their string realization in terms of D-brane constructions, near lines of marginal stability where these dyons decay was obtained. A simple derivation of the degeneracy of these dyons using their structure near decay and a wall-crossing formula was also obtained.



The National Undergraduate Programme

In 1998, CMI initiated a National Undergraduate Programme in the Mathematical Sciences in collaboration with Madhya Pradesh Bhoj Open University with a 3 year course in Mathematics and Computer Science, leading to a Honours degree. In 2001, this programme was extended to the postgraduate level with separate 2 year courses leading to degrees in Mathematics and Computer Science. The scope of the undergraduate programme was expanded in 2003 to incorporate a 3 year course leading to a Honours degree in Physics. From 2007, all degrees are awarded directly by Chennai Mathematical Institute, in its capacity as a University under Section 3 of the UGC Act, 1956.

The undergraduate and postgraduate teaching programmes at CMI are both run in cooperation with the Institute of Mathematical Sciences (IMSc), Chennai. These programmes tap the teaching talent available at the elite research institutes of the country, which are normally outside the university system. Students are thus exposed to lectures by active researchers who bring a very different perspective to the teaching.

B.Sc., (Hons.) Mathematics and Computer Science

In 2007, the tenth batch of students was admitted to the undergraduate programme. 33 students were offered admission and 13 have joined the programme. Of these, two are from the INMO stream and one is from the INOI stream. The second year BSc class has 6 students, while the third year BSc class has 9 students.

Out of the 8 students of the 2004 batch who took their degrees at the convocation in August, 2007, several have been placed in very prestigious institutions.

Name	Placement
Ananyo Dan	Ph.D., Berlin Mathematics School, Germany
Amit De	M.Sc., Chennai Mathematical Institute, Chennai, India
Vipul Naik	Ph.D., University of Chicago, USA

Name	Placement
Kazim Mehboob Bhojani	Islamic Studies, Imam Khomaini Education Research Institute, Iran
Ramprasad Saptharishi	Ph.D., Chennai Mathematical Institute, Chennai, India
R Shreevatsa	Ph.D., MIT, USA
Arul Shankar	Ph.D., Princeton University, USA
Robin Suri	MCA, IIT Roorkee, India

B.Sc., (Hons.) Physics

This programme was started in 2003 with the assistance of the Physics Faculty of the IMSc., Chennai, and the active participation of physicists across the country.

A Physics laboratory has been set up in CMI for Physics to students perform some basic experiments. In addition, students have an intensive laboratory programme at the Homi Bhabha Centre for Science Education (HBCSE), Mumbai, during the summer vacation after the first year. A similar arrangement has been worked out with the Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam for students at the end of the second year.

Out of the 5 students of the 2004 batch who took their degrees at the convocation in August, 2007, several have been placed in very prestigious institutions.

Name	Placement
A.B. Belliappa	Ph.D., Institute of Mathematical Sciences, Chennai, India
Arghya Mondal	Ph.D., Potsdam University, Germany
Shouvik Sur	M.Sc., Mc Master University, Hamilton, Canada
P Bhanukiran	Erasmus Mundus Master Program in Physics, France
Pramod Padmanabhan	M.Sc., Syracuse University, USA

In 2007, 6 students have joined the programme.

M.Sc., Mathematics

Saurabh Trivedi, who joined the programme in 2005 has completed the programme successfully. In 2007, one student has joined the programme.

M.Sc., Computer Science

The nine students who joined the programme in 2005 have completed the programme successfully.

Name	Placement
Debakanta Biswal	Associate Software Engineer, Symantec, Pune
Harish T M	Pinstorm, Mumbai
Pronita Ghosh	Picopeta, Bangalore
Rajarshi Ray	Ph.D., Chennai Mathematical Institute, Chennai
Ramachandra B Phawade	Ph.D., IMSc, Taramani, Chennai
Ritwik Banerjee	Global Analytics, Chennai
Sourasis Roy	ValuePitch International Pvt. Ltd.
Swati Rupa Das	Global Analytics, Chennai.
Vinod Parthasarathy	Texas Instruments, Chennai

In 2007, four students have joined the programme.

Convocation

The First Convocation of CMI as a University under Section 3 of the UGC Act, 1956 was held on 2nd August 2007. Degrees were awarded to 23 successful candidates at various levels. Of these, 13 were at the Undergraduate level and 10 were at the Postgraduate level. Prof. S.K. Joshi, Honorary Scientist Emeritus CSIR and Honorary Vikram Sarabhai Professor, National Physical Laboratory, New Delhi gave away the degree certificates. Prof. R.P. Bambah, former Vice Chancellor and Professor Emeritus, Punjab University delivered the convocation address and Shri S. Ramadorai, Chief Executive Officer, Tata Consultancy Services (TCS) was the Chief Guest.

The CMI Medal of Excellence (instituted by Prof. K.R. Nagarajan) was awarded to Arul Shankar in Mathematics and Pramod Padmanabhan in Physics for their outstanding performance at the undergraduate level.

Informatics Olympiad

CMI faculty coordinate the training and selection of students to represent India at the International Olympiad in Informatics through the Indian Association for Research in Computer Science (IARCS). CMI hosts the official IARCS website. From September 2004, a monthly online programming competition has been conducted by the CMI faculty via the IARCS website.



Activities of the Undergraduate Students

Achievements of CMI students

National Science Day-Quiz, February 2008

(Institute of Mathematical Sciences, Chennai)

Participants	Place
Renjan Rajan John and Harikrishnan Ramani	1st
Shiladitya Banerjee and Ravitej Uppu	2nd

Summer camps/courses/visits to other centres

- Preyas Popat
 - Attended Summer Camp VSRP 2007 at the Tata Institute of Fundamental Research from May-July 2007.
 - Internship at Microsoft Research (Bangalore) in December 2007.
- Shiladitya Banerjee attended the IMSc Visiting students Physics programme during May-July 2007 under Prof. Gautam Menon. He also worked in Low Temperature Lab, IGCAR, Kalpakkam, Material science division - in May, 2008
- Sourabh Nampalliwar attended an HBCSE-CMI lab programme at HBCSE, Mumbai. Participated in the summer camp for KVPY (Kishore Vagyanik Protsahan Yojana) fellows and attended lectures by some eminent scientists of India, along with visits to the labs at IISc and RRI at IISc, Bangalore.
- Subhasree Basu attended 2nd Winter School in Logic at IIT Kanpur during January 2007 and the 3rd Indian International Conference on Artificial Intelligence(IICAI) in December 2007
- Ved Datar attended Visiting Students Research Program (VSRP) at the Tata institute of Fundamental Research (TIFR) during June-July and studied Analytic Number Theory under the guidance of Prof. A. Sankaranarayanan.

- Anirbit Mukherjee
Delivered a seminar on “Action Functional approach to electrodynamics - A Review” at the Indira Gandhi Centre for Atomic Research, Kalpakkam in May 2007.
- Attended a summer camp at the Tata Institute Of Fundamental Research, Mumbai under the guidance of Prof. Shiraz Minwalla and studied various aspects of Classical Field Theory and Applications of Homotopy Theory and Hopf Fibration. Also studied various topics in Riemannian Geometry and Principle Bundles under the guidance of Prof. M.S. Raghunathan during July 2007.
- Delivered the following lectures at the Students Seminar in CMI:
 1. Writing the symmetries of special-relativity in terms of the Poincare Group.
 2. Deriving the topology and the First Homotopy Group of the Poincare Group.
 3. Deriving the Quantum Superselection Rule from the First Homotopy Group of the Poincare Group.
 4. Role of projective spaces in Quantum Theory.

Interaction with graduate students from Ecole Normale Superieure

Chennai Mathematical Institute has an agreement with the Ecole Normale Superieure in Paris, France, one of the leading institutions in the world for teaching and research in Mathematics. This agreement provides for regular exchange visits by academic members of CMI and ENS, Paris. This includes, in particular, exchanges of visits by undergraduate students between the two institutions.

Every year, the top three students passing out from the Mathematics programme spend 8 weeks at the ENS, where they work on research projects with the ENS faculty. In May-June, 2007, Arul Shankar, R. Shreevatsa and Vipul Naik visited the ENS.

The annual visitors from the ENS arrived in two groups: two for the period January-March and two for the period March-April. Pierre Dehornoy and Gabriel Giabicani visited CMI during January-March, 2008 while Francois Maillot and Hubert Lacoïn were here during March-April, 2008. They taught, examined and evaluated the course Calculus II (second semester of BSc I).



Special Convocation

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A Special Convocation was conducted in February 2008 to award the degree of Doctor of Science, Honoris Causa to three distinguished mathematicians Prof. David Mumford, Brown University, U.S.A., Prof. M.S. Narasimhan, Honorary Fellow, TIFR, Bangalore and Prof. S.R.S. Varadhan Courant Institute of Mathematical Sciences, U.S.A. in recognition of their achievements in research in the Mathematical Sciences.



Academic Members

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- Deputy Director S. Kesavan

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Madhavan Mukund
K. Narayan Kumar
V.V. Sreedhar
Shiva Shankar
K.V. Subrahmanyam

- Adjunct Professor S. Dale Cutkosky
V. Kumar Murty
V. Lakshmibai
R. Parimala
G. Rajasekaran
S. Ramanan
M. Ram Murty
Rani Siromoney
R. Sridharan

- Visiting Professor Tulsi Dass (until April 2007)

- Associate Professors C.S. Aravinda
Clare D'Cruz
K. Narayan
Samir Datta
S. Senthamarai Kannan
R. Srinivasan

	M. Sundari S.P. Suresh Upendra Kulkarni
■ Assistant Professor	Bharat Adsul (until May 2007) Suresh Nayak M.K. Vemuri
■ Scientific Officer	P. Vanchinathan
■ Post-doctoral Fellow	Arijit Dey (until November 2007) R. Parthasarathi T.C. Vijayaraghavan
■ Research Scholars	Jagat Chaitanya Gayathri Nair Ketan Tamhankar Nagarajan Krishnamurthy N. Naresh (until July 2007) C. Prakash Pranab Sardar (until July 2007) Puneet Bhateja Rajarshi Ray Ramprasad Saptharishi Sachin Anna Jaganade (until July 2007) Shyamashree Upadhyay Suman Bandyopadhyay
■ NBHM Research Scholars	Santosha Kumar Pattanayak Pabitra Barik
■ CSIR Research Scholars	A. Baskar S. Jijo
■ Administrative Staff	S. Sripathy V. Vijayalakshmi Rajeshwari Nair G. Samson



Faculty Profiles

C.S. Seshadri

C.S. Seshadri received his B.A. Hons. (Mathematics) degree from Madras University (1953) and his Ph.D. from Bombay University (1958).

He was at the School of Mathematics, Tata Institute of Fundamental Research, Bombay from 1953 to 1984 starting as a Research Scholar and rising to a Senior Professor. He was then a Senior Professor at the Institute of Mathematical Sciences, Madras (1984-89).

He has been a Visiting Professor at the University of Paris, France; Harvard University, Cambridge, U.S.A.; Institute for Advanced Study, Princeton, U.S.A.; University of California at Los Angeles, Los Angeles, U.S.A.; Brandeis University, U.S.A.; University of Bonn, Bonn, Germany; Kyoto University, Kyoto, Japan.

He has given invited talks at many international conferences including the International Congress of Mathematicians, Nice, France, 1970.

He has received the Shanti Swarup Bhatnagar Award and the Srinivasa Ramanujan Medal of Indian National Science Academy (INSA). He was awarded the D.Sc. Degree (Honoris Causa) of Banaras Hindu University, Varanasi. He has also been awarded the Shanti Swarup Bhatnagar Medal (1995) of INSA.

He is a Fellow of the Indian Academy of Sciences, Indian National Science Academy and a Fellow of the Royal Society.

His research interests are: Algebraic Geometry and Algebraic Groups.

S. Kesavan

S. Kesavan received his B.Sc. (Mathematics) from University of Madras (1971), M.Sc., (Mathematics) from Indian Institute of Technology, Madras (1973) and Docteur-

es-Sciences Mathématiques from Université Pierre et Marie Curie (Paris VI), awarded for the thesis entitled Sur l'approximation de problèmes linéaires et nonlinéaires de valeurs propres, supervised by Professors J.L.Lions and P.G.Ciarlet (1979).

He is a Fellow of the National Academy of Sciences, Allahabad (1997). He won the Tamil Nadu Scientist Award (TANSA), given by the Tamil Nadu State Council for Science and Technology, in Mathematical Sciences for 1998 and the C. L. Chandna Award for Outstanding Contributions to Mathematics Research and Teaching (1999). He is a Member of National Board for Higher Mathematics. He is a Fellow of the Indian Academy of Sciences, Bangalore (2008).

He is a Life Member of Indian Mathematical Society and Ramanujan Mathematical Society. He is a member of International Society for the Interaction of Mechanics and Mathematics (ISIMM), Indian Society of Industrial and Applicable Mathematics (ISIAM) and American Mathematical Society. He is a Fellow of Forum d'Analystes, Chennai.

Shiva Shankar

Shiva Shankar received his B.Tech. (Electrical Engineering) from the Indian Institute of Technology, Delhi (1978) and his Ph.D. from SUNY, Stony Brook (1983).

He has been an Assistant Professor, at the Department of Applied Mathematics, SUNY, Stony Brook (1983-84), a Visiting Fellow at the School of Mathematics, Tata Institute of Fundamental Research, Bangalore (1984-88), an Associate Professor at the Department of Electrical Engineering, Indian Institute of Technology, Bombay (1988-2000).

Visiting Positions include Institute of Mathematical Sciences, Chennai, and at Mathematics Institute, University of Groningen.

His research interests are: Partial Differential Equations, Mechanics and Control Theory.

Rani Siromoney

Rani Siromoney received her B.A. (Hons.) (Mathematics) degree from Madras University (1950), Master's degree from Columbia University (1960) and Ph.D. from Madras University (1970).

She has been associated with the Madras Christian College since 1951, starting as a Lecturer and is now Professor Emeritus in the Department of Computer Science.

She has been a Visiting Professor at the Boston University (1974) and Visiting Scientist at the IAS - Fujitsu Laboratories Numazu, Japan (1991).

She has given invited talks in Theoretical Computer Science at many national and international conferences and lectures at several universities and Research Institutes.

She has been awarded the Smith Mundt/Fulbright Scholarship for study in Columbia University (1958-59), "Outstanding Woman Professional" by the Federation of Industries and Chamber of Commerce (India) Ladies Organization, New Delhi (1984-85) and "Lifetime Achievement Award" by the Tamil Nadu State Council of Science and Technology (2002).

Her research interests are: Formal languages and Automata, Picture languages, Cryptography, Machine learning and DNA Computation.

R. Sridharan

R. Sridharan received his B.A. (Mathematics) degree from Vivekananda College, Chennai (1952), his M.A. (Mathematics) from Vivekananda College, Chennai (1955) and his Ph.D. (Mathematics) from Columbia University, New York (1960).

He has been a Professor at the University of Bombay, Mumbai (1964-67) and a Senior Professor at the Tata Institute of Fundamental Research, Mumbai (1967-2000).

He is a Fellow of the Indian Academy of Sciences and Indian National Science Academy.

He received the Shanti Swarup Bhatnagar Prize of the Indian National Science Academy (1980).

He has been an INSA Honorary Scientist since January 2001.

His research interest is: Algebra.

V. Balaji

V. Balaji received his B.A. Hons. (Mathematics) from University of Delhi (1982), his M.A. (Mathematics) degree from University of Delhi (1984), his Ph.D. from University of Madras (1991).

He has been an NBHM Post-doctoral Fellow at the Chennai Mathematical Institute (1989-92).

His research interest is: Algebraic Geometry.

Madhavan Mukund

Madhavan Mukund received his B.Tech. (Computer Science) degree from the Indian Institute of Technology, Bombay (1986) and his Ph.D. from Aarhus University, Aarhus, Denmark (1992).

He is a member of the Executive Council and the Secretary of the Indian Association for Research in Computing Science (IARCS). He is also a member of the Council of the European Association for Theoretical Computer Science (EATCS).

His research interests are: Partial order based models for concurrent systems and Logics for specifying and verifying concurrent systems.

K. Narayan Kumar

K. Narayan Kumar received his M.Sc. (Tech.) in Computer Science from Birla Institute of Technology and Science, Pilani (1990). He received his Ph.D., degree from the University of Bombay (1997). He has been a visiting scholar at the State University of New York at Stony Brook (1997-98).

His research interests include Logic, Automata theory and Concurrency.

V.V. Sreedhar

V.V. Sreedhar received his B.Sc. degree from Andhra University, Visakhapatnam, M.Sc., degree in Physics from the Indian Institute of Technology, Madras and received his Ph.D. degree in physics from Saha Institute of Nuclear Physics, Jadavpur University, Calcutta.

He has been an Assistant Professor in the Department of Physics at the Indian Institute of Technology, Kanpur, a Post-doc at the School of Theoretical Physics, Dublin Institute of Advanced Studies, Dublin, Ireland and a Post-doc at the Institute for Theoretical Physics, Uppsala University, Uppsala, Sweden.

His visiting positions include stints at the S.N. Bose National Centre for Basic Sciences, Kolkata, Raman Research Institute, Bangalore, Universities of Rochester,

New York and Cincinnati, Ohio, U.S.A. and the High Energy Research Organization (KEK), Tsukuba, Japan.

His research interests are: Quantum Entanglement, Classical and Quantum Field Theory and Fluid Dynamics.

K.V. Subrahmanyam

K.V. Subrahmanyam received his B.Tech. (Computer Science) degree from the Indian Institute of Technology, Bombay (1986) and M.S. from Vanderbilt University, U.S.A. in 1987. He received his Ph.D. degree from the University of Bombay in December, 1995.

His research interests are: Circuit Complexity, Algebraic methods in Complexity theory.

C.S. Aravinda

C.S. Aravinda received his B.Sc. degree from Bangalore University (1983), his M.Sc. (Mathematics) degree from Bangalore University (1985) and his Ph.D. from the University of Bombay (1995).

He has been a Visiting Mathematician at ICTP, Trieste, Italy (1991-92) and a Research Associate at the Indian Statistical Institute, Bangalore (1995-97).

He has been a visiting Associate Professor at the State University of New York at Binghamton (2000-2002).

His research interests are: Ergodic Theory, Riemannian Geometry and Topology.

Clare D' Cruz

Clare D' Cruz received her M.Sc. (Mathematics) from the Indian Institute of Technology, Bombay (1991) and her Ph.D. (Mathematics) from the Indian Institute of Technology, Bombay (1996).

She has been a Post-Doctoral Fellow at the Tata Institute of Fundamental Research, Mumbai (1996-98) and a Visiting Scholar at the Northeastern University, Boston, U.S.A. (1997-98).

Her research interest is: Commutative algebra.

K. Narayan

K. Narayan received his B.Tech. (Engineering Physics) from the Indian Institute of Technology Bombay, Mumbai (1997), M.S. (Physics) from the Cornell University, U.S.A. (1999) and Ph.D. (Physics) from the Cornell University, U.S.A. (2002).

He has been a Research Assistant at the Cornell University, U.S.A. (1998-2001), a Research Assistant at the Cornell University, U.S.A. (2001-02), a Postdoctoral Research Fellow at the Duke University, U.S.A. (2002-04) and a Postdoctoral Research (Visiting) Fellow at the Tata Institute of Fundamental Research, Mumbai (2004-07).

His research interests are: String theory and cosmology, Stringy geometry and D-brane gauge theories.

Samir Datta

Samir Datta received his B.Tech. degree from the Indian Institute of Technology, Kanpur (1995), M.S. degree from Rutgers University (1997) and Ph.D. degree from Rutgers University (2004).

He has been a Network Architect at Tellium Inc. (2000-03) and a Post Doctoral Fellow at WINLAB, Rutgers University (2004-05).

His research interests are: Complexity Theory, Wireless and High Speed Networking.

S. Senthamarai Kannan

S. Senthamarai Kannan received his B.Sc. degree from HKRH College, Uthama Palayam (1985-88), M.Sc. degree from the Madurai Kamaraj University (1988-90) and Ph.D. from the Chennai Mathematical Institute, (1992-98). He has been a Post-doctoral Fellow at the International Centre for Theoretical Physics (1999-2000).

His research interests are: Representation Theory and Algebraic Geometry.

R. Srinivasan

R. Srinivasan received his Ph.D. degree in Mathematics from the Indian Statistical Institute and the Institute of Mathematical Sciences (1998).

He has been a Visiting Fellow at the Harish-Chandra Research Institute, Allahabad (1998-2000), a Post Doctoral Fellow at the Indian Statistical Institute (2000-01), a Post Doctoral Fellow at Universite d'Orleans, France (2001-02), a Visiting Scientist at

the Indian Statistical Institute (2002-03), a Visiting Fellow at ICTP, Trieste, Italy (2003) and a JSPS Post Doctoral Fellow at University of Tokyo, Japan (2003-2005).

His research interests are: Operator Algebras and Operator Theory.

M. Sundari

M. Sundari received her M.Sc. (Mathematics) from the University of Hyderabad, Hyderabad (1988), M.Phil. (Mathematics) from the University of Hyderabad, Hyderabad (1990) and Ph.D. (Mathematics) from the Indian Statistical Institute, Bangalore (1996).

She has been a Visiting Mathematician at the International Center for Theoretical Physics, Trieste, Italy (1996), a Research Associate at the University of New South Wales, Sydney, Australia (1996-97), an Assistant Professor in the Effat College, Jeddah, Saudi Arabia (2000-01), a Faculty member at the ICFAI Institute of Science and Technology, Hyderabad (2003-04) and an Assistant Professor at the Indian Institute of Technology Roorkee, Roorkee (2004-06).

Her research interests are: Representation theory of Lie groups, Uncertainty Principles in Harmonic Analysis, Wiener-Tauberian theorems.

S.P. Suresh

S.P. Suresh received his M.C.A. degree from R.E.C. Trichy (1996), received his M.Sc. (by Research) from Anna University (1999) and received his Ph.D. degree from the Institute of Mathematical Sciences (2003).

His research interests are: Logic in Computer Science, Reasoning about Security protocols and Classical Indian Epistemology.

Upendra Kulkarni

Upendra Kulkarni received his B.Tech. (Computer Science) from the Indian Institute of Technology Bombay, Mumbai (1992) and Ph.D. (Mathematics) from Brandeis University, U.S.A. (1998).

He has been a Visiting Assistant Professor at the University of Massachusetts Amherst (1998-2000), an Assistant Professor at the Truman State University (2000-05), An Associate Professor at the Truman State University (2005), a Visiting Scientist at the Indian Statistical Institute, Bangalore (2005-06) and a Visiting Fellow at the Tata Institute of Fundamental Research, Bangalore (2006-07).

His research interests are: Representations of algebraic groups over the integers and in characteristic , Algebraic aspects of Lie representation theory including Lie algebras, quantum groups and related combinatorics and in solving elementary challenging problems.

Bharat Adsul

Bharat Adsul received his B.Tech. (Computer Sc. and Engg.) degree from the Indian Institute of Technology, Bombay (1997) and Ph.D. (Computer Sc. and Engg.) degree from the Indian Institute of Technology Bombay (2003).

His research interests are: Logic, Concurrency and Combinatorics.

Suresh Nayak

Suresh Nayak received his B.Tech. (Computer Science) degree from the Indian Institute of Technology, Bombay (1991), and Ph.D. (Mathematics) degree from the Purdue University, (1997,98).

He has been a Visiting Fellow at the Harish-Chandra Research Institute, Allahabad (1999-2001).

His research interests are: Algebraic Geometry and Commutative Algebra.

M.K. Vemuri

M.K. Vemuri received his M.S. (Mathematics) from Syracuse University, U.S.A. (1989) and Ph.D. from the University of Chicago, U.S.A. (1997).

He has been a Visiting Assistant Professor at Colgate University, U.S.A. (1997-99), an Instructor at Polytechnic University, U.S.A. (1999-2000) and a Teaching Research Associate at Syracuse University, U.S.A. (2000-2002).

His research interest is: Analysis



Awards

- **S. Kesavan** has been elected as a Fellow of the Indian Academy of Sciences.
- **Madhavan Mukund** has been elected to the Council of the European Association for Theoretical Computer Science (EATCS).



Publications

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Journal Articles

Mathematics

- J1 V. Balaji: Principal bundles on projective varieties and the Donaldson-Uhlenbeck compactification, *Journal Differential Geometry* 76, (2007), pp 351-398. (arXiv:math.AG/0505106)
- J2 V. Balaji, A. Dey and R. Parthasarathi: Geometry of parabolic bundles on surfaces-I, (The Donaldson-Uhlenbeck compactification), *Proceedings of the Indian Academy of Sciences*, 118, No 1, February 2008, pp 43-79. (archiv:math.AG/06001274)
- J3 V. Balaji and J. Kollar: Holonomy groups of stable vector bundles, *RIMS Journal, Kyoto University* 44 No 2, May 2008, pp 183-211. (archiv:math.AG/06001120)
- J4 V. Balaji, I. Biswas, O. Gabber and D. S. Nagaraj: Brauer Obstruction for universal bundles, *C. R. Math. Acad. Sci. Paris* 345, (2007), no. 5, 265-268.
- J5 V. Balaji: Lectures on Principal bundles, (to appear in *London Mathematical Society, Cambridge* in a Volume of papers dedicated to Peter Newstead).
- J6 S. Kesavan and T. Muthukumar: Low-cost control problems on perforated and non-perforated domains, *Proc. Indian Acad. Sci. (Math. Sci.)*, Vol. 118, No. 1, Feb. 2008, pp. 133-157.
- J7 T. Parthasarathy and R. Balaji: Q-Property of Multiplicative transformation in SDLCP, *electronic J of Linear Algebra* 16 (2007) p. 419-428.
- J8 S. S. Kannan, S. K. Pattanayak and Pranab Sardar: Projective normality of quotient varieties modulo finite groups, accepted for Publication in the *Proceedings of American Mathematical Society*. (arXiv: 0801.1168, math.AG).

- J9 S.S.Kannan and Pranab Sardar: Torus quotients of homogeneous spaces under general linear group and standard representation of certain symmetric groups, accepted for Publication in Proc. Indian. Acad. Sci. (arXiv: 0708.2138, math.AG).
- J10 Shiva Shankar, D.Napp and H.Trentelman: Regular implementation in the space of compactly supported functions, to appear in Systems and Control Letters.
- J11 R. Srinivasan and Masaki Izumi: Generalized CCR flows, Commun. Math. Phys., Volume 281, Number 2 / July, 2008, 529-571.
- J12 M. Sundari, Fulvio Ricci and Paolo Ciatti: Heisenberg-Pauli-Weyl inequalities and polynomial volume growth, Advances in Math. 215(2007), 616-625.
- J13 M. Sundari: Tangential Convergence of bounded harmonic functions on generalized Siegel domains, to appear in J. Aust.Math. Soc.
- J14 M.K. Vemuri: Realizations of the canonical representation, appeared in the Proceedings of the Indian Academy of Sciences - Mathematical Sciences.
- J15 M.K. Vemuri and Amritanshu Prasad: Eigenfunctions of the Laplace-Beltrami operator on Hyperboloids, accepted for publication in the Tamkang Journal of Mathematics.
- J16 M.K. Vemuri: A non-commutative Sobolev estimate and its application to spectral synthesis, accepted for publication in the Tamkang Journal of Mathematics.

Computer Science

- J17 Basu, S., Basu, S.: Different Types of Linear Fuzzy Cellular Automata and their Applications published in Fundamenta Informaticae 87 (2008).
- J18 E. Allender, D. Basrrington, T. Chakraborty, S. Datta and S. Roy: Planar and Grid Graph Reachability Problems, to appear in Theory of Computing Systems.

Physics

- J19 Adel Awad, Sumit Das, K. Narayan and Sandip Trivedi: Gauge theory duals of cosmological backgrounds and their energy-momentum tensors, arXiv:0711.2994 [hep-th], Phys. Rev. D.77, 046008 (2008).
- J20 K. Narayan: On the internal structure of dyons in $N=4$ super Yang-Mills theories, arXiv:0712.3625 [hep-th], Phys. Rev. D.77, 046004 (2008).

J21 Atish Dabholkar, K. Narayan and Suresh Nampuri: Degeneracy of decadent dyons, arXiv:0802.0761 [hep-th], J. High Energy Phys. 0803:026, 2008.

Conference Papers

Mathematics

C1 T. Parthasarathy, G. Ravindran and A.Chandrasekaran: Bankruptcy Problem: A Game theoretic analysis" in Management Science and Practice MSP 2007, edited by N.ravichandran; pp 118-123, Allied Publishers Pvt. Ltd. Ahmedabad.

Computer Science

C2 Basu,S., Basu,S.: Hybrid Fuzzy one dimensional Cellular Automaton with External Input, published in Proceedings of the 3rd Indian International Conference on Artificial Intelligence (IICAI-07), India, December 2007.

C3 S. Akshay, M. Mukund and K. Narayan Kumar: Checking Coverage for Infinite Collections of Timed Scenarios Proc. 18th International Conference on Concurrency Theory (CONCUR 2007), Springer Lecture Notes in Computer Science 4703 (2007), 181-196.

C4 S. Datta, R. Kulkarni and S. Roy: Deterministically Isolating a Perfect Matching in Bipartite Planar Graphs, STACS 2008: 229-240.

C5 P. Bhateja, P. Gastin, M. Mukund and K. Narayan Kumar: Local testing of message sequence charts is difficult Proc. 16th International Symposium on Fundamentals of Computation Theory (FCT 2007), Springer Lecture Notes in Computer Science 4639 (2007), 76-87.

C6 A. Baskar, R. Ramanujam and S.P. Suresh: Knowledge-based modelling of voting protocols, Proceedings of TARK XI, edited by Dov Samet, (2007) 62-71.

Physics

C7 Adel Awad, Sumit Das, Suresh Nampuri, K. Narayan and Sandip Trivedi: Gauge theories with time dependent couplings and their cosmological duals, arXiv:0807.1517 [hep-th].

Preprints and Reports

Mathematics

- P1 Corrado De Concini, S.S.Kannan and Andrea Maffei: The Quotient of Complete Symmetric Variety (arXiv: 0801.0509, math.AG).
- P2 Shyamashree Upadhyay: Hilbert Functions of points on Schubert varieties in Orthogonal Grassmannians (arXiv://math.0704.0542).
- P3 Shyamashree Upadhyay: Initial ideals of tangent cones to Schubert varieties in Orthogonal Grassmannians (arXiv://math.0710.2950).
- P4 M. Sundari, Michael Cowling and Bruno Demange: Vector valued distributions and Hardy's uncertainty principle for operators, (submitted to Revista Math. Ibero.)
- P5 M.K. Vemuri and Amritanshu Prasad: Classification of Heisenberg Lie groups.
- P6 M.K. Vemuri: Inductive algebras for finite Heisenberg groups, submitted to Communications in Algebra.
- P7 M.K. Vemuri: Hermite expansions and Hardy's theorem, submitted to Advances in Mathematics.

Computer Science

- P8 B. Adsul, Meenakshi Balasubramanian, M. Mukund, K. Narayan Kumar and Suman Roy: Fault prediction for timed automata.
- P9 R. Ramanujam and S.P. Suresh: Challenges for epistemic logic from security protocols to appear in special issue in honor of Prof. Rohit Parikh.

Books

Mathematics

- B1 S. Kesavan: Functional Analysis, to appear in the TRIM Series, Hindustan Book Agency, New Delhi.



Conferences, Visits and External Lectures

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C.S. Seshadri

- Attended the International Congress of Chinese Mathematicians held at Hangzhou, China during December 2007 and gave an invited talk.
- Attended the First CTS Conference on Bundles held at the Tata Institute of Fundamental Research, Mumbai in March 2008.

S. Kesavan

- Gave a Colloquium Talk at the Indian Institute of Technology, Mumbai, in May 2007.
- Attended the Workshop on Modern Theory of PDE at the Indian Institute of Technology, Mumbai during May 2007 and delivered a course of 6 lectures.
- Attended the Annual meeting of the Ramanujan Mathematical Society and delivered an invited talk in the mini symposium on "Teaching of Functional Analysis" in June 2007.
- Gave a talk at the Symposium on Teaching of Functional Analysis held at NIT, Suratkal in June 2007.
- Gave S.S. Pillai Endowment Lecture at the Manonmaniam Sundaranar University, Tirunelveli, in October 2007.
- Attended the Council Meeting of FASAS (Federation of Asian Scientific Academies and Societies), on behalf of INSA, at Bangkok, Thailand, during November 2007.
- Delivered the Inaugural Address and 2 invited lectures in the Refresher Course on Functional Analysis at the Ramanujan Institute for Advanced Study in Mathematics, University of Madras in November-December 2007.

Rani Siromoney

- Chief Guest at a seminar at Vellore Institute of Technology in November 2007.
- Delivered a talk on "DNA Computing" in the UGC sponsored National seminar at Periyakulam in March 2008.
- Gave a lecture in a Faculty Development Programme on Theory of Computation at SSN Engineering College in May 2007.

R. Sridharan

- At the invitation of AMTI, lectured at a meeting on "Tall oaks from little acorns grow" illustrating how the geometry of Greeks led to the work of Gauss and the theory of algebraic equations at P.S. High School premises in November 2007.
- Lectured at the IIT Madras on "Mathematics of Prosody and Music" in February 2008.

R. Parthasarathy

- Visited the Physics Department at the California State University at Fresno and lectured on "SU(2) YM theory at finite temperature", in April 2007.
- Visiting Professor to the Physics Department, Simon Fraser University, Burnaby, Canada, during June-July, 2007.

T. Parthasarathy

- Attended the Indian Mathematical Society, Centenary Conference held at Pune University during December 2007 and gave an invited talk titled "Semidefinite Linear Complementarity Problem; A short survey".
- Attended the Conference organised by IIM-Ahmedabad during March, 2008 and gave a talk titled "History of Operations Research"

Shiva Shankar

- Visited the Institute for Mathematics, University of Groningen, for a period of 2 months in June-July 2007 and gave a lecture on "Control theory in spaces that are not injective cogenerators".

- Also visited the Mathematics Institute at the University of Innsbruck in July 2007, and gave a similar lecture.
- Visited the Chinese University of Hong Kong in August 2007, and gave a talk on "The behavioural approach to control of distributed systems".
- Lectured in an Indo-French workshop on Dynamical Systems during October-November 2007 and gave a lecture on "Hamiltonian mechanics and symplectic geometry".
- Lectured on "Mechanics and symplectic geometry" in the Indo-French School on Dynamical Systems held at the Indian Institute of Science, Bangalore, in January 2008.
- Examiner for the Ph.D. thesis by D. Napp Aveli, entitled "An algebraic approach to multidimensional systems" Institute of Mathematics, University of Groningen, The Netherlands.

V. Balaji

- Visited University of California at Los Angeles and gave a talk on "Principal bundles on algebraic surfaces" in July 2007.
- Invited talk at the International Conference in Bad Honnef, Germany on "Vector bundles in algebraic geometry" held in July 2007.
- Gave a course of lectures in Vector bundles in the Harish-Chandra Research Institute, Allahabad in Feb 2008.
- Invited talks in the CTS workshop on Vector Bundles and Derived categories, held in TIFR in March 2008.

Madhavan Mukund

- Presented a survey talk on "Applications of learning theory in verification" at the 6th Update Meeting on Advanced Formal Methods, Indian Institute of Technology, Kanpur in April 2007.
- Participated in the Workshop on Machine-learning Applications in Programming Languages and Software Engineering (MAPS) at Microsoft Research India, Bangalore, April, 2007.

- Visited LSV, ENS de Cachan and LaBRI, University of Bordeaux 1 for one month in May 2007 on the Indo-French Networking Research Programme project "Timed and distributed models for control and verification (Timed-DISCOVERI)". Gave a talk entitled "Checking Coverage for Infinite Collections of Timed Scenarios" at LSV, ENS de Cachan in May 2007.
- Visited the Computer Science Department, Aarhus University, Denmark and gave a talk entitled "Local testing of message sequence charts is difficult" in August 2007.
- Presented a paper at the 16th International Symposium on Fundamentals of Computation Theory (FCT 2007), Budapest, Hungary August, 2007.
- Attended a Workshop on Compiler Techniques at the Indian Institute of Technology, Delhi in December 2007.
- Chaired a session at the International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS) 2007, at the Indian Institute of Technology, Delhi in December 2007.
- Delivered two lectures at the IARCS Instructional School on Advanced Topics in Theoretical Computer Science, Vellore Institute of Technology in January 2008.
- Visited the Tata Research Development and Design Centre (TRDDC), Pune in February 2008.

K. Narayan Kumar

- Attended the 6th Update Meeting on "Advanced Formal Methods" held at the Indian Institute of Technology, Kanpur and gave a talk on "The Theory of MSC Languages", in April 2007.
- Attended the Workshop on "Compiler Techniques" held at the Indian Institute of Technology, Delhi, in December 2007.
- Attended the Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2007) and Chaired a session held at the Indian Institute of Technology, Delhi, in December 2007.
- Visited Microsoft Research Faculty Summit, in July 2007, Microsoft, Redmond, U.S.A

- Visited LSV, ENS de Cachan and LaBRI, University of Bordeaux 1 for one month in May 2007 on the Indo-French Networking Research Programme project "Timed and distributed models for control and verification (Timed-DISCOVERI)". Gave a talk entitled "Local Testing of MSCs is difficult".
- Visited the Tata Research Development and Design Centre (TRDDC), Pune in February 2008.

V.V. Sreedhar

- Attended the international conference on "Non-perturbative gauge theories and gravity" as an invited speaker held at the S.N. Bose National Centre for Basic Sciences, Kolkata during January 2008

K.V. Subrahmanyam

- Gave a talk on "Algorithmic complexity" at the teachers training programme at Vellore Institute of Technology, Vellore in January 2008.
- Attended a workshop at MSRI Berkeley on Combinatorial representation theory in March 2008.
- Visited Prof Sara Billey at the Univ of Washington, Seattle, for a week in March 2008 and gave a talk on "Quasipolynomiality of plethysm constants and GCT as an approach to separating complexity classes" at the University of Washington, Seattle.
- Visited Prof Ketan Mulmuley at the University of Chicago in March 2008 and gave a talk at the Toyota Technological Institute, Chicago, "Geometric complexity Theory - an overview".

Clare D'Cruz

- Gave an invited talk on "Canonical module on toric varieties" at the CIMPA School on Commutative Algebra, IIT Bombay, January 2-11-2008.

K. Narayan

- Attended the "Cosmology and String theory Workshop" and gave a talk on "Cosmologies with Big-Bang singularities and their gauge theory duals", held at Kavli Institute of Theoretical Physics China (KITPC), Beijing, China during October-November 2007.

- Attended the "From Strings to LHC:II Advanced School Conference and gave a talk on "Cosmologies with Big-Bang singularities and their gauge theory duals" at Bangalore in December 2007.
- Attended the High Energy Physics and Cosmology (HEPCOS) Workshop and gave a talk on "Cosmologies with Big-Bang singularities and their gauge theory duals" at Jamia Millia Islamia University, Delhi in March 2008.

Samir Datta

- Gave a talk on "Deterministically Isolating a Perfect Matching in Bipartite Planar Graphs" at the Institute of Mathematical Sciences.
- Visited the Tata Research Development and Design Centre (TRDDC), Pune in February 2008.

S. Senthamarai Kannan

- Gave a talk at the Workshop on Group Theory at Indian Statistical Institute, Bangalore, during May 2008.

R. Srinivasan

- Attended a workshop on "Algebraic Quantum Field Theory", at Oberwolfach, Germany in April 2007.
- Attended a workshop on "Operator Theory", at the Indian Statistical Institute, Bangalore and gave a colloquium talk titled 'Type III factors as invariants of type III -semigrups' in June 2007. Visited Prof. B. V. Rajarama Bhat for two weeks in June 2007.
- Attended and gave a plenary talk titled "Type III criterion for Generalized CCR flows" in the workshop on "Noncommutative Dynamics and applications", at Fields Institute, Toronto in July 2007.
- Visited Prof. Kalyan B. Sinha at the Jawaharlal Nehru centre for Advanced Research, Bangalore for a week, followed by a visit to Indian Statistical Institute for another week during September-October 2007.
- Gave a colloquium talk titled "Type III factors as invariants of type III -semigrups" at The Institute of Mathematical Sciences in November 2007.

- Attended a workshop on "Noncommutative Geometry and ergodic theory" in The Institute of Mathematical Sciences, Chennai in February 2008.
- Attended and gave a talk titled "Non cocycle Powers type III E_0 -semigroups" in the discussion meeting on operator algebra, in Orange County, Coorg during February-March 2008.
- Gave a survey talk on " E_0 -semigroups" at the National seminar held at the University of Pondicherry, in March, 2008.

Sundari Maddala

- Attended 10th Discussion meeting on "Harmonic Analysis" at the Indian Institute of Science, Bangalore during December 2007-January 2008 and gave a lecture on "Vector-valued distributions and Hardy's theorem for operators".
- Gave an invited lecture on "Tangential convergence of bounded harmonic functions on generalized Siegel domains" at the 23rd Annual conference of the Ramanujan Mathematical Society held at the Indian Institute of Technology, Kanpur in May 2008.

S.P. Suresh

- Visited INRIA Lorraine, Nancy, Paris in June 2007.
- Visited LSV, ENS Cachan, Paris in June 2007.
- Attended TARK XI, Brussels, Belgium in June 2007.
- Attended the International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS) 2007, at the Indian Institute of Technology, Delhi in December 2007.
- Attended Second Indian Winter School in Logic at Indian Institute of Technology, Kanpur in January 2008.
- Gave an invited lecture on "Godel's incompleteness theorems" at the annual meeting of the Calcutta Logic Circle at Kolkata in December 2007.

M.K. Vemuri

- Gave a talk on "Some Schatten class estimates" at the Geometry Seminar, TIFR-Bangalore in September 2007.

- Attended the Instructional workshop on "Wavelet Analysis", BHU, Varanasi during October-November 2007 and gave a talk on "Basic Fourier analysis".
- Attended the 10th Discussion Meeting in Harmonic Analysis at the Indian Institute of Science, Bangalore during December 2007-January 2008 and gave a talk on "Some estimates for the Harmonic Oscillator".
- Gave a talk on "Hermite Expansions and Hardy's theorem" at West Virginia University, Morgantown, WV, USA.

A Baskar

- Attended Formal Methods Update 2007, in April 2007, at Indian Institute of Technology, Kanpur.
- Gave a lecture on "Finite Automata and Regular Expressions" in a Faculty Development Programme on Theory of Computation, SSN Engineering College in May 2007.
- Gave a talk, titled "Applications of Cryptography", in a Instructional course on Cryptography Net Security held at Nandha Engineering College, Salem in September 2007.

Puneet Bhateja

- Attended the International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS) 2007, at the Indian Institute of Technology, Delhi in December 2007.



Other Professional Activities

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S. Kesavan

- Member, National Board for Higher Mathematics.
- Member BoS (Mathematics) (PG), University of Madras.
- Member, BoS, Ramanujan School of Mathematics and Computer Science, Pondicherry University
- Member, BoS (Mathematics), Kanchi Mamunivar PG Centre, Pondicherry.

Shiva Shankar

- Associate Editor, Intl. Jour. on Multidimensional Systems and Signal Processing (Springer Verlag).
- Member of an IEEE Technical Committee in the area of Control Theory.

T. Parthasarathy

- Edited a volume on Mathematical Programming and Game Theory for decision Making" ISI platinum Jubilee volume 1 (2008) World Scientific Publishing Company Pvt. Ltd. (jointly with R.B. Bapat, A.K.Das and S.K.Neogy).

Madhavan Mukund

- Member, Editorial Board, Formal Methods Letters.
- Member, Editorial Board, Transactions on Petri Nets and Other Models of Concurrency (ToPNoC).
- Member, Program Committee, 32nd International Symposium on Mathematical Foundations of Computer Science (MFCS 2007), Cesky Krumlov, Czech Republic, 2007.
- Member, Program Committee, First India Software Engineering Conference (ISEC 2008), Hyderabad, India, 2008.

- Member of the Council, European Association for Theoretical Computer Science (EATCS).
- Secretary, Indian Association for Research in Computing Science (IARCS).
- National Coordinator, Indian Computing Olympiad.
- Team Leader of the Indian team, International Olympiad in Informatics, Zagreb, Croatia, August 2007.
- Column editor, "News from India", Bulletin of the European Association for Theoretical Computer Science (EATCS).

K. Narayan Kumar

- Member, Program Committee, 28th International Conference on the Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2007), New Delhi, December, 2007.
- Coach, Indian Computing Olympiad.
- Team Deputy Leader of the Indian team, International Olympiad in Informatics, Zagreb, Croatia, August 2007.

K.V. Subrahmanyam

- Consultancy work for Cybernet Software Systems on a problem related to scheduling of vehicles. The problem was successfully solved to the satisfaction of the client.

Samir Datta

- Served on Program Committee of FSTTCS 2007.



Undergraduate / Graduate Courses

Course	Instructor
■ Algebra IV	V Balaji
■ Calculus I	T Parthasarathy
■ English	Shreekumar Varma
■ Introduction to Programming I	K Narayan Kumar
■ Classical Mechanics I	R Parthasarathy
■ Overview of Physics	G Rajasekaran
■ Algebra III	S Senthamarai Kannan
■ Analysis I	S Kesavan
■ Caculus III	Clare D'Cruz
■ Design Analysis of Algorithms	K V Subrahmanyam
■ Algebra IV	R Sridharan
■ Theory of Computation	Madhavan Mukund
■ Ordinary Differential Equations	Sundari Maddala
■ Mathematical Physics	K S Balaji
■ Properties of Matter	R Shankar
■ Quantum Mechanics I	H S Mani
■ Condensed Matter Physics	Maha Seshasayee
■ Quantum Mechanics III	P P Divakaran
■ Statistcal Physics II	V V Sreedhar
■ Laboratory	M V Rao
■ Algebra	P Jothilingam
■ Algebraic Topology	Shiva Shankar
■ Measure Integration	Murali K Vemuri
■ Number Theory	R Sujatha

- Distributed Systems S P Suresh
- Computer Systems Verification Madhavan Mukund
- Computer Networks Samir Datta
- Algebra IIV Balaji
- Calculus II Gabriel Giabicani, Pierre Dehornoy
- Discrete Mathematics Samir Datta
- Introduction to Programming II K Narayan Kumar
- Economics S K Shanthi
- Music N Ramanathan
- Analysis II S Ramanan
- Computer Organization S P Suresh
- Topology Upendra Kulkarni
- Programming Language Concepts K Narayan Kumar
- Probability K V Subrahmanyam
- Classical Mechanics II K Narayan
- Electromagnetism IV V Sreedhar
- Quantum Mechanics II H S Mani
- Statistical Mechanics IV Srinivasan
- Atom Molecular Physics R Parthasarathy
- Electromagnetism II R Jagannathan
- Computational Methods Ronojoy Adhikari/R Jagannathan
- Nuclear Particle Physics G Rajasekaran
- Gravitation Cosmology R Nityananda
- LaboratoryM Veerabhadra Rao
- Quantum Field Theory N D Haridass
- Algebra S Senthamarai Kannan
- Complex Analysis M K Vemuri
- Functional Analysis S Kesavan
- Hamiltonian Mechanics Shiva Shankar
- Mathematical Statistics, A game T Parthasarathy
- Theoretic Point of View Logic Madhavan Mukund
- Program Analysis Madhavan Mukund
- Security S P Suresh



Courses, Special Lectures

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- A. Baskar gave a talk on "Knowledge-based modelling of voting protocols" (April 2007).
- Prakash Chandrasekaran gave a talk on "Programming Asynchronous Layers with CLARITY" (July 2007).
- K.V. Subrahmanyam gave talks on "A high level overview of GCT" and "Geometric Complexity Theory (continued)" (September 2007).
- R. Sujatha conducted Workshop on Serre's Conjecture at CMI (September-October 2007).
- N. Ramanathan gave a series of lectures on "Music Appreciation" during October 2007 - March 2008.
- R. Srinivasan gave a talk on "Type III factors as invariants of type III -semigroups" (October 2007).
- T C Vijayaraghavan gave a talk on "Algorithm for Polynomially Bounded Intersection of Linearly Representable Matroids" (November 2007).
- R. Parthasarathi gave a talk on "Parabolic bundles on algebraic surfaces - Public Viva-voce Notification" (November 2007).
- Jean-Marc Fontaine, Orsay University, Paris gave a series of lectures on "p-adic Galois representations" in November 2007.
- Adrian Iovita, Concordia University, Canada gave a series of lectures on "On the anticyclotomic Main conjecture for supersingular elliptic curves" in December 2007.
- David Mumford, Brown University, gave a course of lectures on "Theory of Shape" in January 2008.

- D. Stroock, MIT gave a Course of lectures on "Probability Theory, An Analytic View" during January-February 2008.
- David Mumford of Brown University conducted a seminar on "Topics in the History of Indian and Western Mathematics" in collaboration with P.P. Divakaran, R. Sridharan and M.D. Srinivas during January-February 2008.

Speaker	Title
D. Mumford	Negative numbers
M.S. Sriram	Indian planetary models
M.D. Srinivas	Calculus
S.G. Dani	Sulvasutra geometry
K. Ramasubramanian	Calculus
D. Mumford	Calculus
A. Datta	Kuttaka, Bhavana and Chakravala
R. Champakalakshmi	Contacts between India and the West post Alexander
F. Staal	From linguistics to mathematics
R. Sridharan	Sanskrit Prosody, its combinatorics, and thereafter
R. Narasimha	The epistemology underlying the Indian culture of proving

- S.R.S. Varadhan, Courant Institute of Mathematical Sciences, U.S.A. gave a course of lectures on "Diffusion Processes" in February 2008.
- Ramprasad Saptharishi, gave a talk on "Fast Algorithms for Integer Multiplication" (March 2008).



Visitors

- P.S. Thiagarajan, National University of Singapore, gave a talk on "A Parameter Estimation Technique for Bio-Pathway Models" (July 2007).
- Sourav Chakraborty, University of Chicago, gave a talk on "Property testing" (August 2007).
- K. Paramasamy, University of Virginia, U.S.A., gave a talk on "Toric degeneration of Bott-Samelson-Demazure-Hansen Varieties" (August 2007).
- Saket Saurabh gave a talk on "Combinatorial and Algorithmic Bounds on the minimum number of leaves in a Directed Tree of a Digraph" (August 2007).
- Baskar Balasubramanyam gave a talk on "Overconvergent modular symbols" (August 2007).
- Govind Krishnaswami, Utrecht University, The Netherlands, gave a talk on "Rigid Body in Classical Mechanics" (August 2007).
- Alladi Sitaram, Professor Emeritus, Indian Statistical Institute, Bangalore gave a talk on "On a question of Dani's about invariant measures on Symmetric Spaces and " (August 2007).
- Amit Deshpande, MIT, U.S.A., gave a talk on "A crash course on locally decodable codes" (August 2007) and "Spectral Graph Partitioning" (September 2007).
- Tanmoy Chakraborty, University of Pennsylvania, gave a talk on "Edge Connectivity: Iterative rounding of a Linear Program" (September 2007).
- Raghav Kulkarni, University of Chicago, U.S.A., gave a talk on "Deterministically Isolating a Perfect Matching in Bipartite Planar Graphs" (September 2007).
- R. Parthasarathy, TIFR, Mumbai, gave a talk on "Some facts about Verma Modules" (September 2007).

- Madhu, IIT, Chennai, gave a talk on "Perturbative Study of the Leigh-Strassler Deformations of Supersymmetric Yang-Mills Theory" (October 2007).
- Anirban Basu, IAS, Princeton, gave a talk on "Higher derivative corrections in type IIB superstring theory" (October 2007).
- Kalyan Sinha, JNCASR, Bangalore, gave a talk on "The interplay between Physics and Maths" (October 2007).
- M. Sakthi Balan, University of Western Ontario, Canada, gave a talk on "Computational Models Inspired by Peptide Computing" (October 2007).
- P. Ramadevi, I.I.T, Mumbai, gave a talk on "Knots, Links 3-dimensional manifolds: meeting ground for Physicists and Mathematicians" (November 2007).
- Blaise Genest, IRISA, Rennes, France, gave a talk on "On the fly Distributed Verification" (November 2007).
- N Narayanan gave a talk on "Acyclic Edge Colouring - A Survey" (November 2007).
- Peter Schneider, University of Muenster, Germany, gave a talk on "The search for a p-adic local Langlands correspondence" (November 2007).
- Paul Gastin, LSV, ENS de Cachan, France, gave a talk on "Safety and Liveness for Trace Languages" (December 2007).
- John H. Coates, Cambridge University, U.K., gave a talk on "The Iwasawa theory of the elliptic curve " (December 2007).
- M. Ram Murty, Queen's University, Canada, gave a talk on "An Effective Equidistribution Theorem" (December 2007).
- A.P. Balachandran, Syracuse University, U.S.A., gave a talk on "Quantum Fields on the Moyal Plane" (January 2008).
- K. P. Yogendran, CQueST, Seoul, Korea, gave a talk on "Finite density physics from AdS/QCD" (January 2008).
- Bum-Hoon Lee, CQuST and Sogang University, Seoul, Korea, gave a talk on "Formation of the False vacuum bubbles" (January 2008).

- Gerald B. Folland, University of Washington, gave a talk on "The algebra, analysis, and geometry of compact quotients of the Heisenberg group" (January 2008).
- L. Sriramkumar, Harish-Chandra Research Institute, Allahabad, gave talks on "Sub-leading contributions to the black hole entropy in the brick wall approach" and "A brief history of the universe" (January 2008).
- Baptiste Calmes, St. Edmund's Cllege, Cambridge, U.K., gave a talk on "Quadratic forms over Grassmannians" (January 2008).
- Pierre Colmez, CNRS, Ecole Polytechnique, Paris, gave a talk on "a -adic " (January 2008).
- K. Vishwanathan, Simon Fraser University, Canada, gave a talk on "QCD from AdS/CFT" (January 2008).
- Eleanora Dell'Aquila, Perimeter Institute, Canada, gave a talk on "Children's Drawings from Seiberg-Witten Curves" (January 2008).
- Supurna Sinha, Raman Research Institute, Bangalore, gave a talk on "Biopolymer Elasticity" (February 2008).
- Joseph Samuel, Raman Research Institute, Bangalore, gave a talk on "Surface Tension and the Cosmological constant" (February 2008).
- N.D. Hari Dass, DAE Raja Ramanna Fellow, Indian Institute of Science, Bangalore Hon. Director, Poornaprajna Institute, Bangalore, gave talks on "Recent progress in the construction of effective string theories" and "What is Quantum Mechanics?" (February 2008).
- Benedikt Bollig, LSV, ENS de Cachan, France, gave a talk on "On the Expressive Power of 2-Stack Visibly Pushdown Automata" (February 2008).
- Gregory M. Kapfhammer, Allegheny College, U.S.A., gave a talk on "Using Synthetic Coverage Information to Evaluate Test Suite Prioritizers" (February 2008).
- Subhashish Banerjee, Raman Research Institute, Bangalore, gave a talk on "Phase Distributions in Open Quantum Systems" (February 2008).
- Jozef Gruska, Masaryk University, Slovakia, gave a talk on "Challenges of Quantum Complexity Theory" (February 2008).

- K. Varadarajan, University of Calgary, Canada, gave a talk on "Anti Hopfian and Anti Co-Hopfian Modules" (February 2008).
- Jozef Gruska, Masaryk University, Slovakia, gave a talk on "From classical cryptography to quantum information processing and quantum physics and back" (March 2008).
- Ajit Kembhavi, IUCAA, Pune, gave a talk on "Black Holes in our Galaxy?" (March 2008).
- Pablo Ramacher, University of Gottingen, Germany, gave a talk on "Invariant integral operators on G-varieties" (March 2008).
- Pramathanath Sastry, University of East Carolina, U.S.A., gave a talk on "Grothendieck duality - the Deligne-Verdier approach" (March 2008).



N.K. Rajendiran & Co.,
Chartered Accountants

FORM NO. 10-B
(See Rule 17 – B)

AUDITOR'S REPORT

Audit report u/s 12A (b) of the Income Tax Act 1961, in case of charitable or religious Trust or institutions

We have examined the Balance sheet of **CHENNAI MATHEMATICAL INSTITUTE**, Plot No. H1, SIPCOT IT Park, Siruseri 603 103 as at 31st March 2008 and also the Income & Expenditure Account for the year ended on that date which are in agreement with the books of accounts maintained by the said Institution.

We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purpose of our audit. In our opinion, proper books of account, have been kept by the Head Office and the Branches of the above named institution visited by us so far as appears from our examination of the books, and proper returns adequate for the purposes of Audit have been received from Branches not visited by us.

In our opinion and to the best of our information and according to the information given to us the said accounts give a true and fair view.

- i) in case of Balance Sheet, of State of affairs of the above named Institution as at 31st March 2008, and
- ii) In case of Income & Expenditure Account, Excess of Income over Expenditure for the year end on that date.

Prescribed particulars are annexed hereto.

FOR N.K.RAJENDIRAN & CO.
Chartered Accountants.

Place: Chennai
Date: 04.07.2008

N.K. Rajendiran
(N.K.RAJENDIRAN)
PROPRIETOR

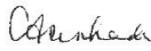
CHENNAI MATHEMATICAL INSTITUTE
PLOT NO. H1, SIPCOT IT PARK, SIRUSERI, 603 103.

BALANCE SHEET AS AT 31ST MARCH 2008

<u>SOURCES OF FUNDS</u>	SCH	31.03.2008 Rs.	31.03.2007 Rs.
Capital Fund	A	13499597	13499597
Endowment Fund	B	40750000	40750000
Project Fund	C	45329073	45231702
Revenue Surplus	D	11555365	7725733
TOTAL		<u>111134035</u>	<u>107207032</u>
 <u>APPLICATION OF FUNDS</u>			
Fixed Assets	E	69778640	70007914
Investments	F	17268105	19802584
<u>Current Assets, Advances & Deposits</u>			
Current Assets	G	538819	1068605
Advances and Deposits	H	548201	266299
Project Expenses - BRNS/DST		25299106	18475500
Total		<u>26386126</u>	<u>19810404</u>
Less: Current Liabilities	I	<u>2298837</u>	<u>2413871</u>
Net Current Assets		24087289	17396534
TOTAL		<u>111134035</u>	<u>107207032</u>
Notes forming part of Accounts	J		
Significant Accounting Policies	K		


Dr. A.C. Muthiah
 Founder Trustee


Shri K. Madhava Sarma
 Trustee/Secretary


Prof. C.S. Seshadri
 Trustee/Director



As per our report of even date annexed
 For M/s. N.K. Rajendiran & Co.,
 Chartered Accountants


N.K. Rajendiran
 Proprietor

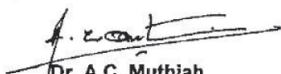


Place : Chennai
 Date : 4/7/2008


CHENNAI MATHEMATICAL INSTITUTE
PLOT NO. H1, SIPCOT IT PARK, SIRUSERI, 603 103.

INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2008

<u>INCOME</u>	SCH	31.03.2008 Rs.	31.03.2007 Rs.
Voluntary Contributions	L	34248531	20569200
Fee Receipts	M	526182	405210
Interest on Investments	N	1293685	1551857
Other Receipts	O	68083	49105
TOTAL		<u>36136481</u>	<u>22575372</u>
 <u>EXPENDITURE</u>			
Research & Establishment	P	17844301	15811402
Operational Expenses	Q	5899970	6513927
Administrative & General Expenses	R	1965480	1327482
Depreciation		6597098	5514141
TOTAL		<u>32306848</u>	<u>29166953</u>
Excess of Income Over Expenditure transferred to Balance Sheet		3829632	(6591580)


Dr. A.C. Muthiah
 Founder Trustee


Shri K. Madhava Sarma
 Trustee/Secretary


Prof. C.S. Seshadri
 Trustee/Director



As per our report of even date annexed
 For M/s. N.K. Rajendiran & Co.,
 Chartered Accountants


N.K. Rajendiran
 Proprietor

Place : Chennai
 Date : 4/7/2008



