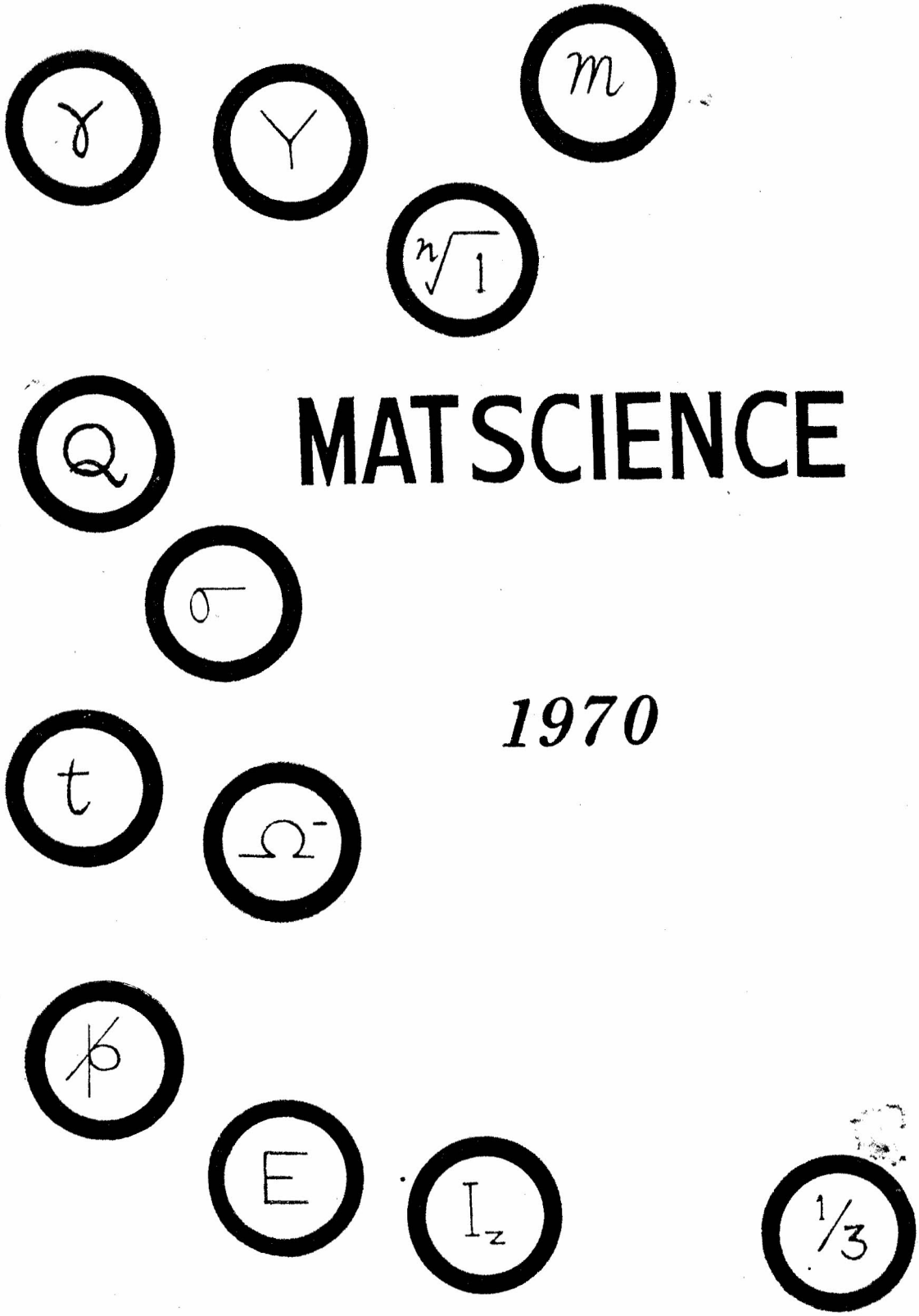

MATSCIENCE
1970

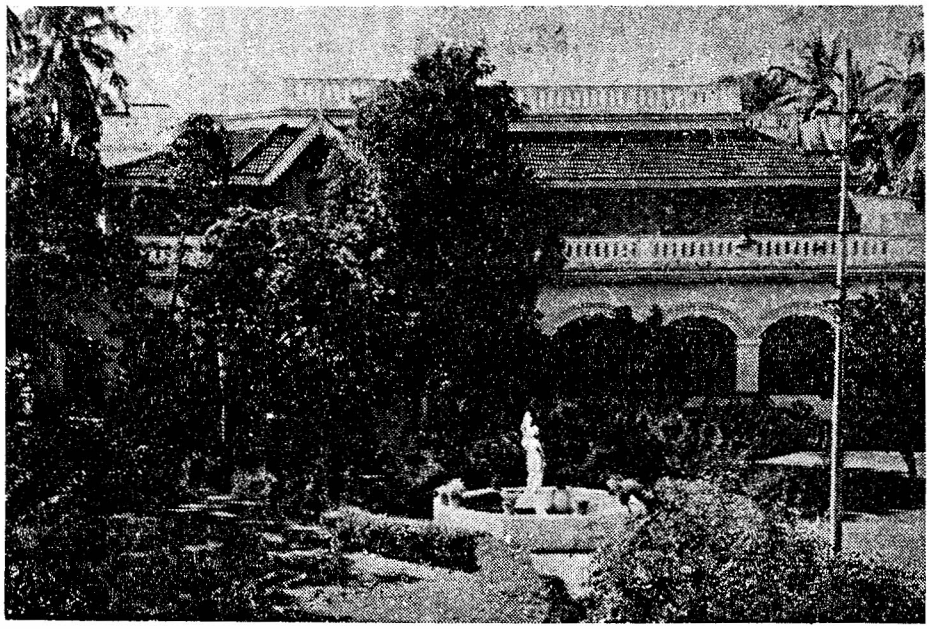
The Institute of Mathematical Sciences,

Madras

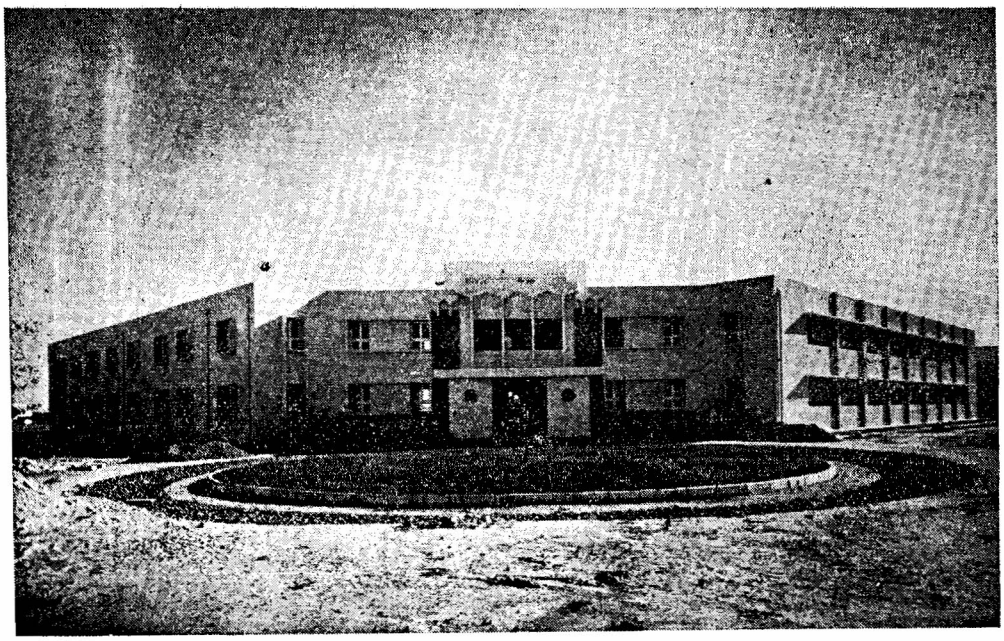
"The pursuit of science is at its best
when it is a part of a way of life"

Annual Report 1970

" The origins of which may be traced to the informal discussions held in my family home almost twelve years ago by the 'Theoretical Physics Seminar'....."



" We are now entering into an imposing edifice in this magnificent technological campus "



Patron :

Mr. C. Subramaniam

Chariman of the Board of Governors

Mr. V. R. Nedunchezhiyan

Minister for Education, Government of Tamil Nadu

Director :

Professor Alladi Ramakrishnan

Passion for Excellence 1970

Promises and performances

Nine years have passed since the creation of our Institute. It is a short time in the annals of an institution for advanced learning; but it is a long period in the active life span of any individual scientist. It is a natural question to ask: What promises have we made and how do our performances measure up to their fulfilment?

A haven of learning

In the enchantment of a new born Institute we raised great hopes in our sponsors and more generally in the international community of scientists. The founding father of our Institute Mr. C. Subramaniam set the standard at the Nobel Prize which only reveals his irrepressible faith in the future of our country and the creative talents of our scientists. Our Chairman Mr. Nedunchezhiyan has been no less demanding, though his interests seem to be more inclined towards the domain of mathematics. As there are no Nobel awards in mathematics, his expectations will be fulfilled only if future Ramanujans seek their Hardy in the Cantabrigian atomosphere of this haven of learning.

The guiding principle

We cannot claim to have reached this aim, but we assure you that we have kept alive the passion for excellence, the soul and spirit of this Institute. There is nothing in human life so logical as passion, for without it nothing original or creative can be accomplished. This is just the message of Viscount Haldane's address "The soul of the people" delivered sixty years ago, an address read to me so often by my great father that I have nursed it as the guiding principle of my life. This passion can easily be blunted if we are not wary enough to keep it whetted by frequent personal contact with famous minds. In this we have been particularly fortunate for over three hundred scientists of whom sixteen were Nobel Laureates had graced our group with their presence and participation in its academic activities.

Driving force

The driving force for any high endeavour is an idea—for nothing is so expansive as the train of thought suggested by an idea that is really great and if it has once been fully grasped nothing transforms the whole outlook in the fashion that its suggestive power does. To get real ideas we require great teachers and it is in quest of such luminous minds I travelled these twenty years to over a hundred centres of learning, Oxbridges, red bricks and ivy leagues in the world today. I was impatient to find out how the creators of quantum mechanics, Pauli, Schrodinger, Born, Dirac and Heisenberg, after four decades of unabated triumph, reacted to the discovery of the baffling maze of strange particles. I sought the enlightened atmosphere of the Institute of Advanced Study at Princeton, presided over by the architect of atomic energy whose achievements in four war years had transformed and directed the course of human civilisation. It was an inspiring experience just to watch Oppenheimer, with his slight and fragile figure and a great head looking as though the mind that tenanted it was dedicated to thought and nothing else.

Spearheads

I watched the spearheads of American science, Feynman and Gell-Mann when they were grappling with almost intractable problems of modern physics and their triumphant reactions at the ready acceptance of their discoveries by an awestruck scientific world.

A golden thread

During this quest we suddenly found ourselves on the track of a problem which even if partially solved will make us realise the depth and extent of the expanding domain of modern physics. To accomplish something tangible we had to limit ourselves to such a well-defined mathematical problem instead of being distracted by the myriad splendoured structure of relativistic quantum mechanics. We set as our objective just the understanding of the mathematical procedure of obtaining 4×4 Dirac matrices from the basic 2×2 Pauli set. In the excitement of building the edifice of quantum mechanics this problem was ignored even by its creators and we thought it was just the right time now to take it up since the spirit of the hour demanded a re-examination of the whole structure from the point of view of mathematical

rigour and logical precision. To our strange surprise we found that the procedure which Dirac used was of such general significance that it could be extended into a grammar of anti-commuting matrices, the ramifications of which give us a better insight into various branches of theoretical physics — relativity, complementarity, propagator formalism, unitary symmetry and the fundamental concepts of spin and mass of elementary particles. This has been so rewarding an experience that with pardonable excitement we claim to have justified the nine years of effort by tracing atleast one golden thread running through the whole fabric of modern physics.

Eternal quest

The pursuit of science is an eternal quest for the understanding of the nature of the universe around us. Such understanding does not reach a static state of completion but is always in the process of evolution.

There is no pre-conceived or pre-determined course to success; the larger our aim is, the harder is the toil required for its attainment but this toil brings with it greater happiness. As we advance on our voyage, there are strange seas to traverse, stranger islands to reach, the exploration of which promises us a new sense of possession. The mere endeavour apart from its result brings its reward.

We brace ourselves to meet the challenge of the future by projecting into it the experiences of the past and the passion of the present. Our course is set, the wind is strong, the bark is sturdy and the journey long. Come, my friends, smite the sounding furrows, let us sail beyond the sunset in search of newer worlds.

ALLADI RAMAKRISHNAN.

General Information

Aims and Objects

1. To create and provide an atmosphere and environment suitable for creative work and the pursuit of knowledge and advanced learning in the Mathematical Sciences for their own sake,

2. To promote and conduct research and original investigation on fundamental sciences in general, with particular emphasis on Mathematics, Applied Mathematics. Theoretical physics and Astrophysics,

3. To foster a rigorous mathematical discipline, to stimulate a zest for creative work and cultivate a spirit of intellectual collaboration among academic workers in pure and applied branches of science,

4. To arrange lectures, meetings, seminars and symposia in pursuance of its academic work and for the diffusion of scientific knowledge,

5. To invite scientists in India and abroad actively engaged in creative work to deliver lectures and participate in academic activity.

Academic Activities

The primary activity of the Institute is creative research in mathematical sciences. In pursuit of the objectives of the Institute, weekly seminars as well as series of lectures on various topics of interest, both by visiting scientists and the academic staff of the Institute are held.

To commemorate the inauguration of the Institute an Anniversary Symposium is held in January in which scientists from India and abroad are invited to deliver one hour addresses summarizing their original work or recent advances in various branches of mathematical sciences. The Institute also organises a Seminar in Analysis in which lectures range from introductory to advanced levels.

Academic Staff

The academic group consists of Professors, Permanent Members and Associate Members of the various faculties, visiting scientists, temporary members, research fellows and research trainees.

Ph.D. Programme

Facilities are available for post-graduate students to work for the Ph.D. degree under the guidance of the academic staff of the Institute in various faculties. Senior and Junior research fellowships are awarded by the Institute. Besides these, fellowships tenable at the Institute are awarded by the Department of Atomic Energy and the Council of Scientific and Industrial Research.

The Standing Committee of the Inter-University Board of India and Ceylon at its meeting held on February 28, 1967 adopted a resolution recognising the Institute of Mathematical Sciences as a suitable centre for research work. In view of the above resolution the Institute is now recognised by the various Indian universities as a centre for research for a doctorate degree in Theoretical Physics and Mathematics.

Mode of Admission

Memberships (temporary and permanent) of the Institute are available on invitation or by application to the Director.

Students intending to become research trainees and research fellows of the Institute are expected to apply on prescribed forms which are supplied on request.

Visiting Scientists Programme

Facilities are offered to visiting scientists to spend a considerable time in the Institute and work in collaboration with the academic staff of the Institute,

The visiting membership programme of the Institute is designed to enable young, active and promising scientists to pursue research and take part in various academic activities of the Institute. Such memberships are available on invitation or by request for such periods as may be fixed in consultation with the visiting members. Scientists intending to be invited under this scheme can contact the Director of the Institute giving particulars of their academic career and indicating the probable period of their stay.

Besides the above, scientists from various institutions may be invited to deliver lectures and seminars for which suitable honorarium will be offered.

Publications

1. RESEARCH PAPERS (Preprints and reprints are available on request)

2. MATSCIENCE REPORTS based on the lecture courses delivered at the Institute both by visiting scientists and academic staff. (Price Rs. 5/- within India or U.S. $ 1 outside India)

3. PROCEEDINGS OF THE SEMINAR IN ANALYSIS (based on lecture courses delivered at the Institute by Visiting Scientists or members of the Institute during the Annual Seminar in Analysis. (Price Rs. 5/- wthin India or U.S. $ 1.00 outside India)

4. Proceedings of the Summer School and the Anniversary Symposium published as a series entitled 'SYMPOSIA ON THEORETICAL PHYSICS AND MATHEMATICS' by the PLENUM PRESS, New York.

News of the Institute

President's Visit :

On 10th January 1970, the Institute had the pleasure and privilege of welcoming His Excellency Shri V. V. Giri, the President of India, who inaugurated the eight Anniversary Symposium. His Excellency Shri Ujjal Singh, Governor of Tamil Nadu presided over the inaugural function. Mr. V. R. Nedunchezhian, Minister for Education, Government of Tamil Nadu, welcomed the guests. Professor Hans A. Bethe, Nobel Laureate, Department of Physics, Cornell University, U.S.A. and Niels Bohr Visiting Professor at MATSCIENCE delivered the Anniversary lecture on "My life in Physics".

Anniversary Symposium :

Among the scientists who participated in the Eight Anniversary Symposium on "Land marks in modern physics, 1900-1970," which was conducted for four days, were Professors M. Gourdin, France; N. P. Klepikov, USSR; A. O. Morris, England; Dave Pandres, James Drummond, Thomas Kailath and V. S. Vaidyanathan of U.S.A.; A. L. Brown, England; B. S. Madhava Rao, Bangalore; C. J. Eliezer, Australia; M. H. Partovi, Iran and V. Devanathan, Madras; Balakrishnan, Annamalai University and I. Singer, Rumania.

Third Seminar in Analysis :

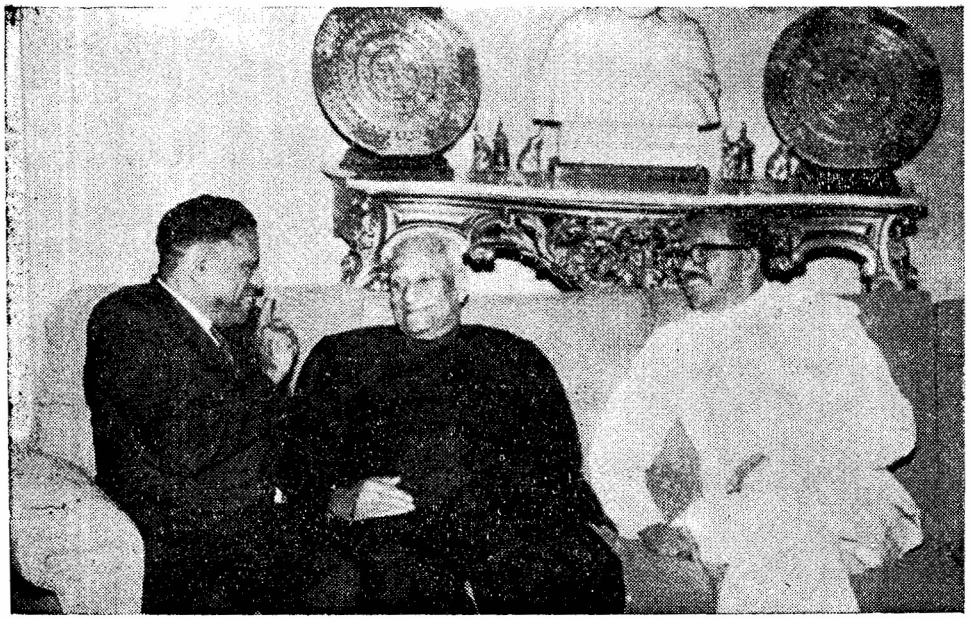
The Third Seminar in Analysis was conducted for a period of two weeks from 18th February, 1970, supported by a special grant from the Department of Atomic Energy, Government of India and was inaugurated by Mr. M. A. S. Rajan, I.A.S., Managing Director, Hindustan Photo Films, Ooty.

This seminar was intended for the mathematicians and students and research at Pre- and Post-doctoral levels. There were two main lecturers, each giving a series of lectures on advanced topics, Prof. A. L. Brown, University of New Castle, England who was a visiting member at MATSCIENCE and Professor K. R. Unni.

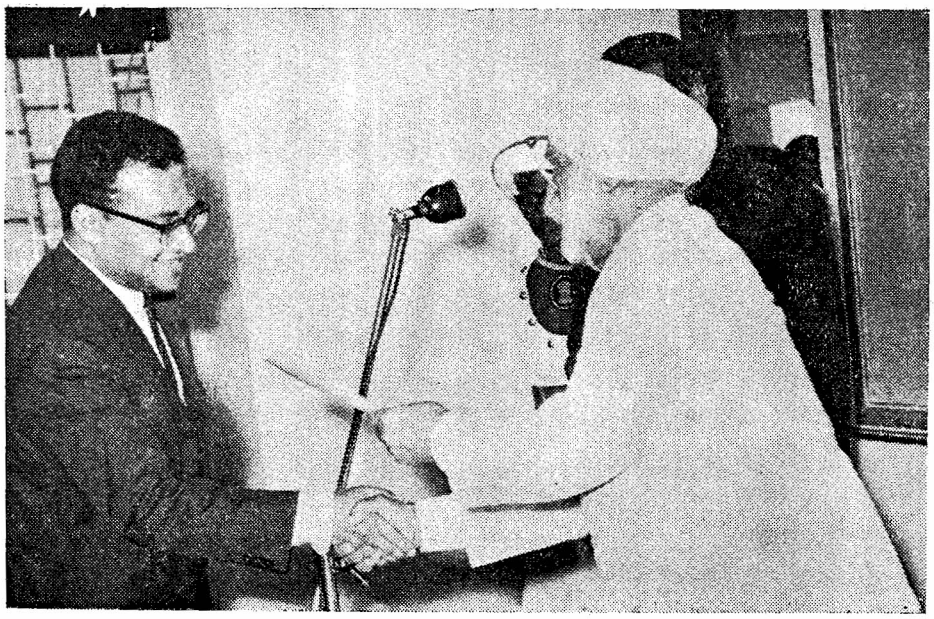
Topics of the lectures :

Professor A. L. Brown : Topics in abstract approximation theory

Professor K. R. Unni : Multiplier problem



His Excellency Shri V. V. Giri, President of India with the Chairman and Director.



His Excellency Shri Ujjal Singh, Governor of Tamil Nadu, presenting the second MASTECH award to Professor Thomas Kailath of Stanford University.

MASTECH Conferences :

A MATSCIENCE Seminar on Elementary Particles and Nuclear Theory was held at the National Aeronautical Laboratory, Bangalore from 22nd to 31st January 1970. This seminar was financially supported by the Department of Atomic Energy, Government of India.

Besides the staff members from MATSCIENCE the following were invited to give lectures in the seminar:

Prof. J. E. Drummond and D. Pandres of U.S.A.;
A. O. Morris (U.K.); E. J. Eliezer (Australia);
T. Venkatarayudu (Andhra Univ.); V. Devanathan (Univ. of Madras);
B. S. Madhava Rao (IIS, Bangalore).

The Institute conducted another seminar entitled ' Frontiers of Physics " at the H. P. F., Guest House, Ooty for a period of two weeks from September 14, 1970, supported by a special grant from Department of Atomic Energy, Government of India. The conference was inaugurated by Mr. M. A. S. Rajan, Managing Director, Hindustan Photo Films, Ooty.

Professor Alladi Ramakrishnan, Director, MATSCIENCE delivered the inaugural lecture on "Bhabha's contribution to Stochastic theory ". A novel feature of this conference is that every participant presented a seminar on his recent research.

One day symposium :

A one day symposium on "Cayley, Hamilton and Clifford in the light of Modern Physics" to project the work at MATSCIENCE demonstrating the use of Clifford Algebra and its generalisations in elementary particle physics was held on 2nd April 1970 and was inaugurated by Mr. P. Sivalingam, Director of Technical Education, Madras.

List of participants :

Prof. Alladi Ramakrishnan, Prof. R. Vasudevan,
Dr. N. R. Ranganathan, Dr. I. V. V. Raghavacharyulu,
Dr. T. S. Santhanam, Mr. P. S. Chandrasekaran and
Miss Nalini B. Menon

IMPACT Conferences :

(Interaction of Mathematics, Physics and Creative Technology)

MATSCIENCE in collaboration with the Fundamental Engineering Research Establishment and the Directorate of Collegiate Education conducted two one day

symposia called IMPACT Conferences. Their object was to demonstrate the interaction of mathematics, physics, and creative technology and the impact of science on social and economic development.

The first of the above series on "Co-ordinate transformations and their applications" which was held at the Engineering College, Guindy on 31st March 1970 was inaugurated by Hon'ble Thiru V. R. Nedunchezhiyan, Minister for Education, Government of Tamil Nadu.

Among the participants were Professor G. Tumarkin, USSR and Mr. A. Sivasailam, Chairman, Amalgamations Ltd., Madras; Prof. Alladi Ramakrishnan, Dr. A. R. Prasanna Mr. S. Nagarajan, (MATSCIENCE); Dr. G. V. Krishna Reddy, P. S. G. College of Technology, Coimbatore; Prof. V. S, Angappan, Engineering College, Guindy, Madras; Prof. R. Subbayan, P. S. G. Collage of Technology, Coimbatore; and Prof. S. Natarajan, Engineering College, Guindy, Madras.

The second conference on "Developments in aviation and their economic impact on India" was held at the Engineering College, Guindy on 20th September 1970 Among the participants were Mr. T. S. Krishna, Managing Director, Southern Roadways; Mr. T. V. Viswanathan, Director, Statistical Division, ECAFE, Bangkok; Mr. K. K. Unni, Air-India; and Dr. K. S. Nagaraja of U.S.A.

MASTECH Conferences:

The council of Scientific and Industrial Research, New Delhi sponsored a series of conferences called MASTECH conferences on "Mathematical methods in Science and Technology", this year.

The first of such conference was held at the National Aeronautical Laboratory, Bangalore for a week from 22nd September, 1969 the topic being "Matrix analysis and its applications to science and technology".

The second of the series entitled "Probability and statistics and their applications to science and technology" was held at MATSCIENCE for a week from 14th January, 1970.

The MASTECH award of Rs. 1000/- for the best paper presented at the First and Second Conferences were won by Prof. Mehdi S. Zarghamee, of Iran and Prof. Thomas Kailath of U.S.A. respectively.

Professor Alladi Ramakrishnan, Director, MATSCIENCE is the Convener for the conferences. The proceedings of the above conferences were published by INSDOC, Bangalore.

Academic Group

Theoretical Physics

Permanent Staff :

1. Professor Alladi Ramakrishnan — *Director*
2. Dr. R. Vasudevan* — *Permanent Member*

Associate Member:

1. Dr. N. R. Ranganathan

Temporary Members :

1. Dr. T. S. Santhanan
2. Dr. R. Pratap‡
3. Dr. M. H. Partovi‡
4. Dr. Ramesh Chand
5. Dr. I. V. V. Raghavacharyulu‡
6. Dr. U. Trivedi
7. Dr. Kotra V. Krishnamurthy
8. Dr. S. Mukherjee
9. Dr. N. K. Sehgal
10. Dr. V. S. Vaidyanathan‡
11. Dr. Prasad‡
12. Dr. J. Pasupathy‡
13. Dr. V. Balakrishnan
14. Dr. K. H. Mariwalla
15. Dr. V. Radhakrishnan

Senior Research Fellows :

1. Mr. K. Srinivasa Rao
2. Dr. A. R. Prasanna
3. Mr. S. Nagarajan‡
4. Mr. Michael Mareschal
5. Mr. A. Sundaram (CSIR)
6. Mr. R. Sridhar (CSIR)
7. Dr. (Mrs.) V. Balakrishnan
8. Mr. N. K. Dadhich‡

Junior Research Fellows :

1. Miss Nalini B. Menon
2. Mr. P. S. Chandrasekaran

Research Trainees:

1. Mr. A. R. Tekamulla
2. Mr. R. N. Verma

Pure Mathematics

Permanent Staff:

Dr. K. R. Unni — *Permanent Member*

Senior Research Fellow:

Miss P. K. Geetha

Junior Research Fellows:

Miss Shanthi Gopalan (*CSIR*)
Miss Vimala Walter (*CSIR Scheme*)
Mr. N. R. Nandakumar‡
Mr. M. R. Subrahmanya
Mr. G. N. Keshavamurthy

Present Address: * University of Southern California, Los Angeles, Calif., U.S.A.
‡ Indicates persons who have completed their tenure at the Institute.

Staff of the Institute

PROF. ALLADI RAMAKRISHNAN

Director of the Institute and Professor of Theoretical Physics

B.Sc. (Hons.) (Madras) 1943; Ph.D. (Manchester) 1951; Has published over hundred and twenty papers on stochastic processes and elementary particle physics in the following journals:

Astrophys. J.; Proc. Ind. Acad. Sci.; Proc. Phys. Soc.; J. Math. Phy. Sciences; Proc. Camb. Phil. Soc.; Prog. Theor. Phys.; Nucl. Phys.; J. Roy. Stat. Soc.; Phil. Mag.; Indag. Math.; Kon. Ned, Acad.; Ann. Inst. Henri Poincare; Z. Angew. Mate. Mech.; Bull. Math. Bio-Physies J. Math. Anal. Appl.; J. Ind. Math. Soc.; Z. Phys.; Current Sci.; Nuovo Cimento;

DR. R. VASUDEVAN

Permanent Member

M.A. (Madras) 1947; M.Sc. (Madras) 1954; Ph.D. (Madras) 1959; Has published more than sixty research papers in the following journals:

Astrophys. J.; Proc. Ind. Acad. Sci.; Nucl. Phys.; J. Math. Anal. Appl.; Proc. Phys. Soc.; Phy. Rev.; Phy. Rev. Lett.; Nuovo Cimento; Z. Phys.; Phys. Lett.; J. Math. Phys. Sciences; Ann. Inst. Henri Poincare; J. Num. Anal.; Kybernetik J.

DR. K. RAMAN UNNI

Permanent Member

B.A. (Hons.) (Madras) 1955. M.S. (Utah State Univ.) 1961; Ph.D. (Northwestern) 1963; Has published more than fifteen research papers in the following journals:

Canad. J. Math.; Bull. Ame. Math. Soc.; Scripta Math.; Tohoku Math. J.

DR. N. R. RANGANATHAN

Associate Member

M.Sc. (Madras) 1955; Ph.D. (Madras) 1961; Has published more than thirty research papers in the following journals:

Proc. Ind. Acad. Sci.; Nucl. Phys.; Nuovo Cimento; Proc. Phys. Soc.; J, Math. Anal. Appl.; J. Math. Phys. Sciences; Phys. Lett.

DR. T. S. SANTHANAM

Temporary Member

M.Sc. (Madras) 1962 ; Research Degree (Trieste) 1966 ; Ph.D. (Madras) 1970 ; Has published more than thirty research papers in the following journals :

Nucl. Phys. ; Phys. Rev. ; J. Math. Phys. ; Phys. Lett. ; Nuovo Cimento ; Helv. Phys. Acta. ; Prog. Theo. Phys. ; J. Math. Anal. Appl. ; J. Math. Phys. Sciences ; Z. Phys.

DR. U. TRIVEDI

Temporary Member

M.Sc. (Delhi) 1962 ; Ph.D. (Bombay) 1968 ; Has published six research papers in the following journal :

Phys. Rev.

DR. K. H. MARIWALLA

Temporary Member

M.Sc. (Bombay) 1958 ; Ph.D. (Georgia) 1963 ; Has published five research papers in the following journals :

Rev. Mod. Phys. : J. Math. Phys. ; Nuovo Cimento ; Ame. J. Phys.

DR. KOTRA V. KRISHNAMURTY

Temporary Member

M.Sc. (Andhra) 1951 ; Ph.D. (Washington) 1958 ; F.R.I.C. (London) 1967; Has published seventeen research papers in the following journals :

J. Indian Chem. Soc. ; Rec. Trav. Chim. Pays—Bas ; J. Am. Chem. Soc. ; J. Phys. Chem. ; Chem. Revs. ; J. Inorg. Nucl. Chem. ; Inorg. Chem ; Can. J. Chem. ; J. Chem. Educ. ; Ind. Jour. Chem ; Science.

DR. S. MUKHERJEE

Temporary Member

M.Sc. (Calcutta) 1962 ; Ph.D. (Calcutta) 1970 ; Has published four research papers in the following journals :

Ann. der Phys. ; Phys. Rev.

DR. N. K. SEHGAL

Temporary Member

M.S. (Hawaii) 1965 ; Ph.D. (Wisconsin) 1969 ; Has published three research papers in the following journals :

Bull. Ame. Phys. Soc. ; Phys. Rev. Lett. ; Phys. Rev.

DR. RAMESH CHAND

Temporary Member

Ph.D. (Univ. of Chicago) ; Has published more than thirty research papers in the following journals :

Phys. Rev.; Phys. Lett. ; Nuovo Cimento ; Ann. of Phys. ; Prog. Theor. Phys. ;

DR. V. RADHAKRISHNAN

Temporary Member

M.Sc. (Madras) 1959 ; Ph.D. (Bombay) 1967 ; Has published nine research papers in the following journals :

Nuovo Cimento ; Bull Acad. Royale de Belgique ; Phys. Lett. ; Physica Status Solidi ; Aust. J. Phys. ; Canadian J. Phys. ; J. Applied Phys.

DR. V. BALAKRISHNAN

Temporary Member

M.Sc. (Delhi) 1965 ; Ph.D. (Brandeis) 1970.

DR. A. R. PRASANMA

Senior Research Fellow

M.Sc. (Mysore) 1964 ; Ph.D. (Poona) 1970 ; Has published five research papers in the following journals :

Curr. Sci. ; Proc. National Inst. Sci.

DR. RADHA BALAKRISHNAN

Senior Research Fellow

M.S. (Rochester) 1967 ; Ph.D. (Brandeis) 1970.

MR. K. SRINIVASA RAO

Senior Research Fellow

M.Sc. (Madras) 1964; Ph.D. Thesis submitted to Madras Univ., 1970. Has published eight research papers in the following journals :

Nuovo Cimento; Nucl. Phys.; Phys. Lett.; J. Phys.

MR. A. SUNDARAM

Senior Research Fellow

M.Sc. (Madras) 1964. Has published seven research papers in the following journals :

Nuovo Cimento; J. Math. Anal. Appl,; Prog. Theo. Phys.; Phys. Rev.; Lett. Nuovo Cimento;

MR. R. SRIDHAR

Senior Research Fellow

M.Sc. (Madras) 1964. Has published three research papers in the following journals :

Phys. Lett.; Nuovo Cimento.

MISS. P. K. GEETHA

Senior Research Fellow

M.Sc. (Madras) 1966; Ph.D. thesis submitted to Madras Univ., 1970. Has published two research papers in the following journals :

J. Math. Anal. Appl.; Tohoku Math. J.

MR. M. MARESCHAL

Senior Research Fellow.

M.Sc. (Brussells) 1969.

Delegations

In response to invitations from various research institutions, Professor Alladi Ramakrishnan, Director of the Institute delivered seminars and gave lectures at various research centers abroad on his recent work during April-July, 1970. During this trip, he delivered lectures at the following centres of research in U.S.A. and Canada :

> Univ. of California, Irvine, U.S.A.; State College, Long Beach, California Univ. of Arizona, Temple.; North Texas University, Denton; Univ. of St. Louis, St. Louis; Univ. of Wisconsin, Madison; Purdue Univ.; Lafayette; Univ. of Illinois, Urbana; Wright-Patterson Air Force; Dayton, Ohio; U. S. Naval Research Laboratory, Washington D.C., Oak Ridge National Laboratory, Tennessee; Univ. of Texas at Dallas, Univ. of Texas at Austin: Rutgers Univ., New Jersey; Yeshiva Univ., New York; New York State Univ., Buffalo; Carleton Univ., Ottawa (Canada).

He spent some time at the Rand Corporation, California (U.S.A.) as consultant.

Dr. T. S. Santhanam, Temporary Member spent six months at the Physikalisches Institut, Univ. of Bonn, Fed. Rep. of Germany, as a visiting scientist. He was also invited to deliver lectures at the following centres of research in Europe: The Institute for Theoretical Physics, Torino, Italy ; The Institute for Theoretical Physics, Berne, Switzerland; The Institute for Theoretical Physics, Wien Austria. The Institute of Theoretical Physics, Liege, Belgium; Dublin Institute for Advanced Studies, Dublin, Ireland; Dept. of Pure Mathematics, Aberystwyth, Wales, England; Dept. of Applied Mathematics and Theoretical Physics, Univ. of Cambridge, England; Cavendish Laboratory, Cambridge, England; The Imperial College of Science and Technology, London, England; Institute of Physics, Nijmegen, Netherlands and Institute of Physics, Brussels, Belgium; Institute for Theoretical Physics, Naples, Italy. He spent a week at the ICTP., Trieste at the invitation of Professor Abdus Salam.

Dr. K. H. Mariwalla was invited to spend a year (1969-70) at Arya-Mehr University of Technology, Tehran, Iran as a visiting Associate Professor of Physics. The last three months of his stay abroad, he spend at various places in U.S.A., Europe and Russia to present his work at various International Conferences. He visited the following places: University of Colorado, Colorado (conformal and de Sitter Group Conference); University of Texas at Austin, Texas; conference on the role of history of Physics education held at M.I.T., Boston, Mass.; Theoretical Physics Conference at Istanbul, Turkey; XVth Annual High Energy Physics Conference at Kiev, U.S.S.R. He rejoined the Institute on December 3, 1970.

Mr. K. Srinivasa Rao, Senior Research Fellow, presented three papers at the symposium on "Nuclear Physics and Solid State Physics" held at Madurai by the Department of Atomic Energy from 27th to 30th December, 1970.

Distinguished Visiting Professorships

Niels Bohr Visiting Professorship :

The Niels Bohr Visiting Professorship was established as a tribute to the memory of the creator of modern physics and the founder of quantum theory whose life has been a glorious example of the universality of science and the eternal quest for the laws of nature. His benign interest in the advancement of Indian science and in particular the work of the group of theoretical physicists at Madras was the immediate stimulus for the creation of our Institute.

Visiting Professors :

Professor R. E. Marshak, U.S.A. 1963
Professor L. Rosenfeld, Netherlands 1964
Professor Hans A. Bethe, U.S.A. 1969

Ramanujan Visiting Professorship :

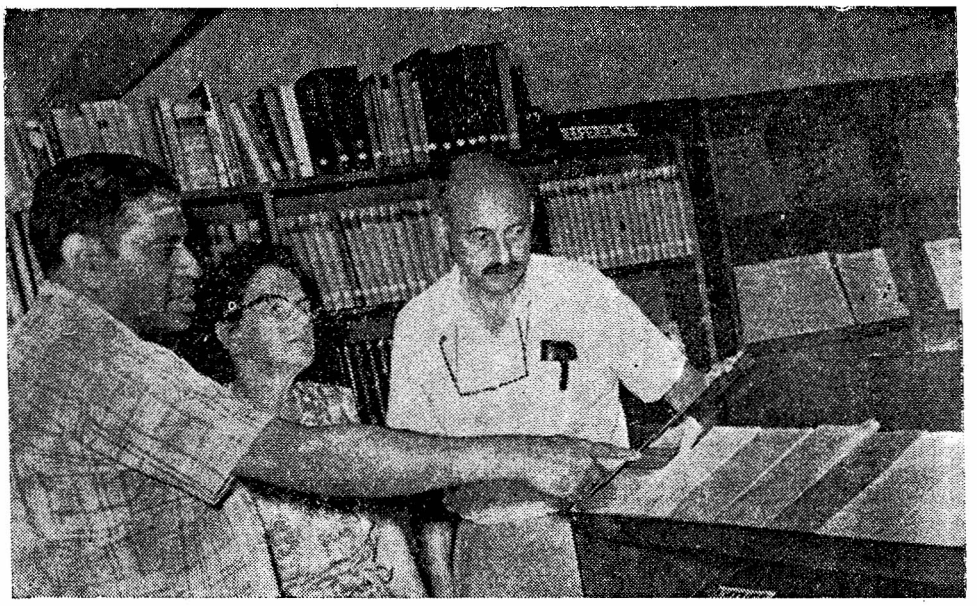
The second Visiting Professorship, "Ramanujan Visiting Professorship" is to honour the greatest mathematician India has produced.

Visiting Professor :

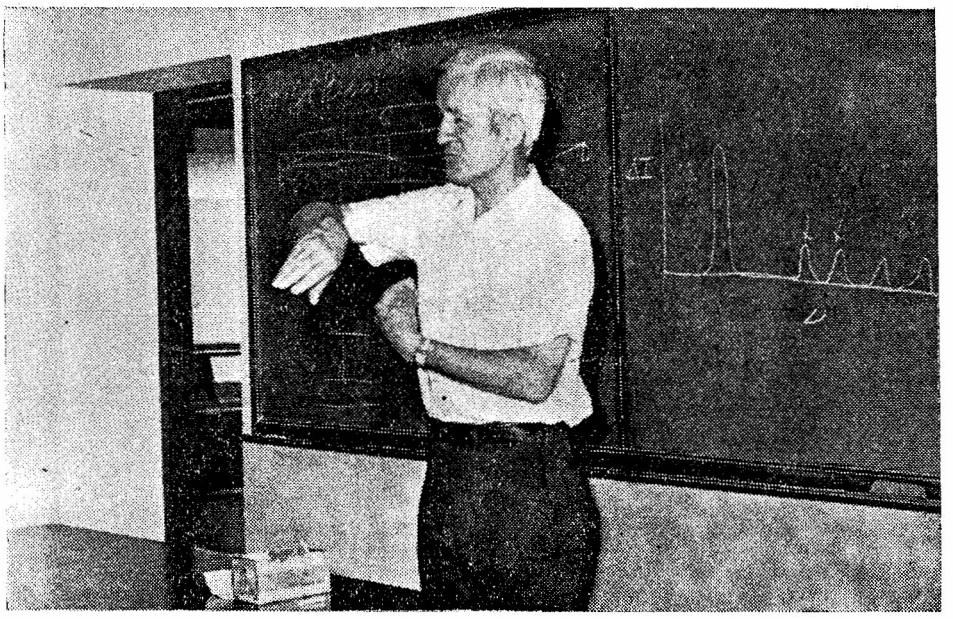
Professor Marshall H. Stone, U.S.A. 1963

Jawaharlal Nehru Visiting Professorship :

As a tribute to our benignant sponsor, the late Mr. Jawaharlal Nehru, a visiting professorship was created in his name in 1966.



Professor B. H. Neumann, Australian National University, Canberra with the Director.



Professor N. F. Ramsey, Harvard University, U.S.A. giving a lecture at the Institute.

Visiting Scientists

Theoretical Physics :

Prof. Hans A. Bethe (U.S.A.)
Prof. M. Gourdin (France)
Prof. A. Sharma (U.S.A.)
Prof. Alladi Prabhakar (Hyderabad)
Prof. N. P. Klepikov (U.S.S.R.)
Dr. Dave Pandres (U.S.A.)
Dr. James Drummond (U.S.A.)
Prof. K. S. Viswanathan (U.S.A.)
Dr. J. Pasupathy (TIFR, Bombay)
Dr. N. Kumar (Bangalore)
Prof. C. P. Patil (U.S.A)
Prof. Thomas Kailath (U.S.A.)
Prof. N. F. Ramsey (U.S.A.)
Prof. P. L. Jain (U.S.A.)
Prof. C. J. Eliezer (Australia)
Prof. S. K. Srinivasan (Madras)
Prof. S. M. R. Ansari (Aligarh)
Dr. V. Devanathan (Madras)
Prof. R. Sankaranarayanan (Bangalore)
Dr. B. P. Nigam (Arizona)

Pure Mathematics

Prof. A. O. Morris (*England*)
Prof. I. Singer (*Rumania*)
Prof. A. L. Brown (*England*)
Prof. A. Sharma (*Canada*)
Prof. G. G. Tumarkin (*U.S.S.R.*)
Prof. Lakshmikantham (*U.S.A.*)

Lecture Courses and Invited Lectures

Theoretical Physics

Lecture Courses

Name	*Title*
Professor Hans A. Bethe, Nobel Laureate, (Niels Bohr Visiting Professor) Cornell University, New York, (U.S.A.)	"Nuclear Matter"
Professor Alladi Ramakrishnan	"Dirac theory and Feynman graphs"
Dr. A. R. Prasanna	"Gravitation, general relativity and cosmology"
Dr. I. V. V. Raghavacharyulu	"Basic group theory in physics"
Dr. K. H. Mariwalla	"Space time approach to develop a unified treatment of classical and quantum mechanics"
Mr. K. Srinivasa Rao	1. "Group theory and Nuclear Structure' 2. "Angular momentum"

Invited Lectures

Prof. M. Gourdin (France)	"Electromagnetic mixing of Q and W mesons"
Prof. Thomas Kailath (U.S.A.)	1. "Innovation and representation" 2. "Solution of Fredholm integral equation" 3. "Application to detection of signals"
Prof. N. F. Ramsey (U.S.A.)	"Molecular Neutron Beams"
Prof. P. L. Jain (U.S.A.)	1. "Scattering of high energy muon on election." 2. "Inelastic interaction of high energy muon"
Prof. Alladi Prabhakar (Hyderabad)	"A report of the recent conference on non-linear system held at the University of Santa Clara, Calif. (U.S.A.)"

Name	*Title*
Dr. R. Sankaranarayanan (Bangalore)	1. "Factor analysis of finite wings in supersonic flow"
	2. "Effect of thickness on finite wings oscillating supersonic flow"
Dr. J. Pasupathi (TIFR, Bombay)	"Very high energy collisions"
Dr. N. Kumar (Bangalore)	1. "Feynman path integral and its applications"
	2. "Role of zero point energy in cosmology"
Prof. Melvin Shakun (U.S.A.)	"Operational Research"
Dr. S. B. S. Sharma (U.S.A.)	"Sampling system"
Dr. K. S. Nagaraja (U.S.A.)	"On a technique of solving certain singular integral equations"

Pure Mathematics

Lecture Course:

Miss P. K. Geetha	"Measure and Integration"
	"Fourier transforms"
	"Point set topology"

Invited Lectures:

Prof. Ivan Singer	"Some topics in approximation theory"
Prof. G. C. Tumarkin	1. "Problem of approximation by rational functions in complex domain"
	2. "Boundary properties of integral of Canchy type"
	3. "Conditions for convergence of boundary values of analytic function"
Prof. V. Lakshmikantham	"Lyapunov-like function"
Prof. A. Sharma	1. "On Hermite-Birkoff interpolation problem"
	2. "Simultaneous approximation by polynomials"
	3. "Approximation by splines"

Research Papers

Theoretical Physics

Alladi Ramakrishnan

Should we revise our notions about spin and parity in relativistic quantum theory ?
(Jour. Math. Phy. Sciences, V. 3, p. 213-219, 1969)

Symmetries associated with the roots of the unit matrix.
(Jour. Math. Phy. Sciences, V. p. 317-318, 1969)

On the composition of generalised helicity matrices.
(Jour. Math. Anal. Appl., V. 30, 1, 1970)

The weak interaction hamiltonian in L-matrix theory.
(Jour. Math. Anal. and Appl. in press)

On the shell structure of anti-commuting matrics
(Jour. Math. Anal. and App. in press)

Alladi Ramakrishnan R. Vasudevan
P. S. Chandrasekaran, and N. R. Ranganathan

On generalised idempotent matrices.
(Jour. Math. Anal. & Appl. in press)

Alladi Ramakrishnan, R. Vasudevan,

Kemmer algebra from generalized Clifford algebra.
(Jour. Math. Anal. Appl., V. 28, p. 108-111, 1969)

Alladi Ramakrishnan, R. Vasudevan (with S. K. Srinivasan)

Multiple product densities.
(Jour. Math. Phy. Sciences, V. 1, p. 275-279, 1969)

Alladi Ramakrishnan, R. Vasudevan and P. S. Chandrasekaran

Algebras derived from polynomial conditions.
(Jour. Math. Anal. Appl., in press)

Para-Fermi operators and special unitary algebras.
(Jour. Math Anal. Appl., in press)

Alladi Ramakrishnan, T. S. Santhanam and P. S. Chandrasekaran

On the representations of generalized Clifford algebra.

(Jour. Math. Phy. Sciences, V. 3, p. 307-313, 1969)

R. Vasudevan (with S. K. Srinivasan)

On the response output from non-linear switching elements with different types of finite dead terms.

(Kybernetik, V. 6, p. 121-124, 1969)

Stochastic kinetic equations and particle statistics.

(Ann. Inst. Henri Poincare, V-10, p. 419-429, 1969)

R. Vasudevan (with A. De Luca and L. M. Ricciardi)

Note on relating Pfaffians and Hafnians with determinants and permanents.

(Jour. Math. Phys., V. 11, p. 530-535, 1970)

T. S. Santhanam

Generating functions of classical groups and evaluations of partition functions.

(Jour. Math. Phys., V. 10, p. 1704-1710, 1969)

Remarks on the equations of motion in odd-dimentional spaces and CPT invariance.

(Jour. Math. Phys., V. 11, p. 1122, 1970)

Recursion relations for the multi-Veneziano amplitude and the residue functions.

(Zeit. fur. physik, Band p. 235, 5, 1970)

Rigorous bounds on the wave function renormalization constant of the pion and the status of the K. S. R. F. relation.

(Phys. Rev. D, V.1, p. 3403, 1970)

K. H. Mariwalla

On Tachyon-Lorentz transformations.

(Ame. Jour. Phys., V. 37, p. 1281, 1969)

K. H. Mariwalla

Co-ordinate transformations that form groups
Theoretical Physics Univ. of Colorado, V. XIII ;
(Proc. conference on de Sitter and conformal groups and their applications, Gordon and Breach, in press).

On the Dismensionality of space-time ;
(J. Math. Phys., in press).

K. Srinivasa Rao (with V. Devanathan)

Photoproduction of pions and the ground state wave functions of ^{16}O.
(Phys. Lett. 32B, p. 578, 1970)

K. Srinivasa Rao (with V. Devanathan and G. N. S. Prasad)

Photoproduction of charged pions from ^{12}C.
(Nuc. Phy. in press).

I. V. V. Raghavacharyulu and Nalini B. Menon

Polynomial Algebras.
(Jour. Math. Phys. 11, 3055, 1970)

A. R. Prasanna

On certain space-times having the fourth component of energy-momentum complex identically zero.
(Prog. Theor. Phys., in press)

T. S. Santhanam, P. S. Chandrasekaran and Nalini B. Menon

General involutional transformations and the representations of GL(N).
(Jour. Math. Phys., in press)

Ramesh Chand and A. Sundaram

High energy photoproduction of pseudoscalar mesons in a quark model.
(Phys. Rev. **D2**, October, 1970).

Ramesh Chand

High energy photoproduction of vector mesons in a quark model,
(Prog. Theor. Phys. **44**, 758, 1970).

Nonleptonic hyperon decays in a quark model.
(Prog. Theor, Phys., in press)

Vector meson production in meson-nucleon collisions in a quark model.
(Phys. Rev. **D2**, October, 1970).

Quark model for double charge-exchange meson-baryon scattering.
(Phys. Rev. D, in press)

A. Sundaram

γ - 3π coupling constant in the Veneziano Model;
(Prog. Theor. Phy., V. 48, p. 843, 1970).

Regge cut model and isobar production;
(Lettere al Nuovo Cimento, in press)

Pure Mathematics

K. R. Unni and P. K. Geetha

On multiplier transformations.
(Tohoku Math. Journal, in press).

M. R. Subrahmanya

A note on a problem of Rivlin.
(Jour. Approx. theory, in press)

Lecture Notes

Matscience Reports

Report Number	*Author*	*Title*
69	P. K. Geetha	Topics in Modern Mathematics
70	Alladi Ramakrishnan	Grammar of Dirac Matrices.
71	A. R. Prasanna	General Relativity and Cosmology (Basic course)

Seminar in Analysis

Report Number	*Author*	*Title*
4	A. L. Brown	Abstract Approximation Theory

1969—1970

Sale of Matscience Reports and Seminar in Analysis

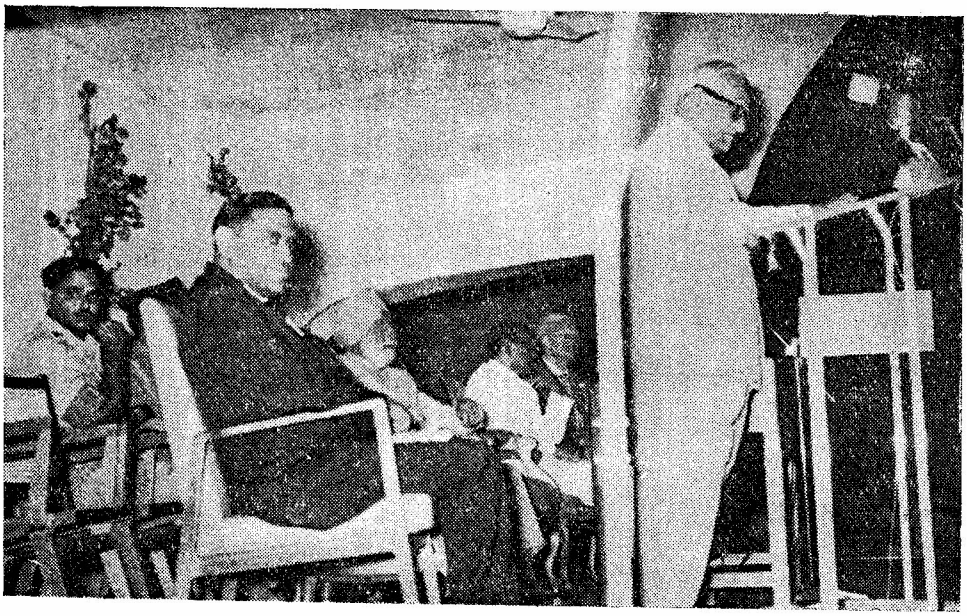
Within India : Rs. 994 . 94
Outside India : $ 1282/-

Royalties for publication of " Proceedings of Symposium on theoretical physics and mathematics " : Rs. 38637 . 11
: $ 5172 / 30

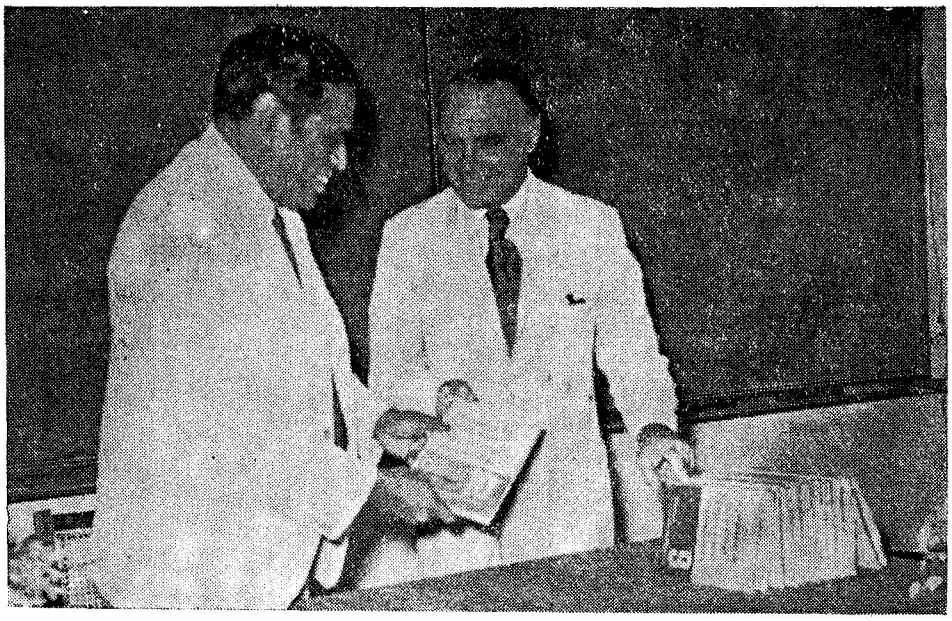
Total number of Reports sold during 1962—1970 : 3,098

48 Reports are being sent to various universities and other publishing organisation throughout the world.

Total number of standing orders for Matscience Reports : : 17



His Excellency Shri V. V. Giri, President of India, inaugurating the Eighth Anniversary Symposium in January 1970.



Director with Mr. George D. Henry, Director, U.S.I.S. on the occasion of the release of volume 10 of 'Symposia on theoretical physics and mathematics'

An International Endeavour

Professor L. Rosenfeld, the Editor of the 'Nuclear Physics' had expressed the view that 'material which represented the co-operative effort of scientists from various countries who participated in the visiting scientists programme of our institute, should be published in a permanent form' to reach a wider community of readers. We were given the opportunity to do this by Earl Coleman, President of Plenum Press, who made a spontaneous offer to publish these proceedings as a continuing series. It was also decided to include in each volume certain lectures delivered during the year, though not at the meeting itself, if they were relevant to the subject matter of the symposium.

The handsome effort of the Plenum Press to bring out the series beginning with the very first symposium has been matched by the willing co-operation of our visiting scientists, who have made this *an international endeavour*, the wholesome consequences of which will be felt beyond the domain of science.

Volume 1: (*First Anniversary Symposium 1963*)

The first symposium was arranged as a tribute to our distinguished visitor, Professor R. E. Marshak, who graciously accepted the Niels Bohr visiting professorship of our new Institute of Mathematical Sciences. "There is a peculiar appropriateness in naming Professor Marshak as the first occupant of this chair: the very conception of this Institute originated during my visit to America in the spring of 1956 when I had the opportunity to watch the proceedings of the Rochester conference. The theory of elementary particles is now offering the greatest challenge since the birth of quantum mechanics. The problems are so complex and baffling that even the novice sometimes feels able to discuss them with the savant without fear of being shown his place, for nobody knows whether we are dealing with a composite theory of elementary particles or an elementary theory of composite particles.

Volume 2: (*Second Anniversary Symposium, 1964*)

'As part of the surging current of scientific literature, this volume, we hope, will convey the 'integrating power of mathematics' and the 'universality of physical law.'

Volume 3: (*Summer School 1964*)
It was a very fortunate circumstance that this summer school was held immediately after the international Conference on High Energy Physics at Dubna, U.S.S.R.

Volume 4: (*Third Anniversary Symposium, 1965*)
In the introductory address Professor V. Weisskopf, presented a broad survey of the then current scene in elementary particle physics, the most dominant trend which is the concept of symmetry.....

It is our earnest hope that the supplementary sessions in mathematics will soon grow into a full fledged symposium to be conducted concurrently with that on theoretical physics.

Volume 5: (*Summer School 1965*)
'Theoretical physics today occupies a privileged position in fundamental sciences for the obvious reason that it is closely related to experimental physics on the one hand and draws its strength from mathematical methods on the other. Studies in theoretical physics at Matscience lay more emphasis on the mathematical aspects taking care, of course, not to get away from the world of observation and reality.'

Volume 6: (*Fourth Anniversary Symposium, 1966*)
'This volume presents a rich and varied fare ranging from experimental high energy physics to mathematical analysis '...' The range of subjects demonstrates the most striking feature of fundamental research today – the vanishing of frontiers that hitherto separated various domains of knowledge.'

Volume 7: (*Summer School 1966*)
Topics of special interest presented in this volume include the application of algebraic topology to the study and location of singularities of multiple scattering processes and the latest theory of super-conductivity.

Volume 8: (*Fifth Anniversary Symposium, 1967*)
Topics discussed include quasars, Dirac groups, the kinetic theory of gases, functional differential equations and Raikov systems. The structure of

L-matrices and the nature of the matrix operators is studied from a group theoretical point of view.

Volume 9: (*Sixth Anniversary Symposium, 1968*)

While the theory of wave equations for particles of spin greater than $\frac{1}{2}$ is one direction in which the Dirac equation is capable of extension, it was also felt appropriate to point out a new direction, in which the Dirac algebra could be extended from a Clifford algebraic point of view. The mathematics sections deals with contributions on the theory of analytic function, functional analysis, uniform distributions, locally compact Abelian groups and Nevanlinna theory.

The unique feature of the volume is the discussion of operational research, now widely used in industry to solve practical problems.

Volume 10: (*Seventh Anniversary Symposium, 1969*)

The volume opens with an article on the life and work of the famous Indian mathematician Srinivasa Ramanujan, whose memory is being cherished by the Institute, through a visiting professorship in his name.

In a series of articles, the recent work at the Institute on L-matrices, dealing with the role of Pauli matrices as a primary tool of mathematical physics has been presented. Their investigations have almost led us to believe that 'modern physics is Pauli matrices recollected in tranquillity'! This may sound like a hyperbole, but it does emphasize that there is much more to Pauli matrices than meets the eye.

ALLADI RAMAKRISHNAN.

Contributors

Abhyankar, S. (*U.S.A.*), Ananthanarayanan, K. (*India*), Arens, R. (*U.S.A.*), Baktavatsalou, M. (*France*), Balazs, L. A. P. (*U.S.A.*), Barucha-Reid, A. T. (*U.S.A.*) Blankenbecler, R. (*U.S.A.*), Brenig, W. (*Germany*), Bressani, T. (*Switzerland*), Chandrasekaran, P. S. (*India*), Charpak, G. (*Switzerland*), Coulter, P. W. (*U.S.A.*), Dallaporta, N. (*Italy*), Daniel, R. R. (*India*), Devanathan, V. (*India*), Deo, S. G. (*India*), Dewitt, H. (*U.S.A.*), Dietz, K. (*Switzerland*), Divakaran, P. P. (*India*), Dubin, D. A. (*England*), Eliezer, C. J. (*Malaysia*), Favier, J. (*Switzerland*), Fuchs, W. H. J. (*U.S.A.*), Fujii, A. (*Japan*), Fulco, J. R. (*U.S.A.*), Galiullin, A. S. (*U.S.S.R.*), Ganelius, T. H. (*U.S.A.*), Gavrilov, V. I. (*U.S.S.R.*), Goldhaber, G. (*U.S.A.*), Goldhaber, S. (*U.S.A.*), Good, R. H. (*U.S.A.*), Grossmann, A. (*U.S.A.*), Gruber, B. (*Italy*), Hagedorn, R. (*Switzerland*), Harish-Chandra, (*U.S.A.*), Hayman,, W. K. (*England*), Horvath. J. I. (*Hungary*), Jacob, M. (*France*), Joachain, C. J. (*Belgium*), Kallen, G. (*Sweden*), Kannappan, P. L. (*India*), Kelley, J. L. (*U.S.A.*), Kichenasamy, S. (*France*), Kotani, T. (*Japan*), Krzyz, J. G. (*Poland*), Kumar, A. (*India*), Landsberg, P. T. (*U.K.*), Lee, A. M. (*Canada*)' Lukierski, J. (*Poland*), Maglic, B. (*Switzerland*), Marshak, R. E. (*U.S.A.*), Massonnet, L. (*Switzerland*), Mathews, P. M. (*India*), Mercier, A. (*Switzerland*), Meyer, Ph. (*France*), Meyerhof, W. E. (*Switzerland*), Misra, S. P. (*India*), Mitra, A. N. (*India*) Mohlin, F. (*U.S.A.*), Morgan, D. J. (*U.K.*), Moyer, B. J. (*U.S.A.*), Nagy, S. B. (*Hungary*), Nair. S. C. K. (*India*), Narasimhan, R. (*India*), Narlikar, J. V. (*England*), Oakes, R. J. (*U.S.A.*), Oehme, R. (*U.S.A.*), Okubo, S. (*U.S.A.*), Padmanabhan, K. S. (*India*), Pham, F. (*France*), Picman, L. (*Yugoslavia*), Prakash, N. (*India*), Ramakrishnan, Alladi (*India*), Radha, T. K. (*India*), Raghavacharyulu, I. V. V. (*India*), Raifeartaigh, L. O. (*Ireland*), Rajasekaran, G. (*India*), Ramachandran, G. (*India*), Ramachandran, R. (*India*), Raman, K. (*India*), Ranganathan, N. R. (*India*), Rankin, R. A. (*Scotland*), Rho, M. (*France*), Riahi, F. (*Iran*), Rickayzen, G. (*England*), Rubel, L. A. (*U.S.A.*) Ruegg, H. (*Switzerland*), Rzewuski, J. (*Poland*), Sankaranarayanan, A. (*U.S.A.*), Santhanam, T. S (*India*), Scadron, M. (*England*), Segre, E. (*U.S.A.*), Shapiro, H. S. (*U.S.A.*), Shaw, G. L. (*U.S.A.*), Singh, S. K. (*India*), Singh, V. (*India*), Sjolander, A. (*Sweden*), Srinivasacharyulu, K. (*Canada*), Srinivasan. S. K. (*India*), Subrahmanyam, N V. (*India*), Sudarshan, E. C. G. (*U.S.A.*), Stone, M. H. (*U.S.A.*), Symanzik, K. (*U.S.A.*), Takahashi, Y. (*Ireland*), Takeda, G. (*Japan*), Teplitz, V. L. (*U.S.A.*), Udgaonkar, B. M. (*India*), Umerjee, R. K. (*India*), Unni, K. R. (*India*), Vasudevan, R. (*India*), Venkatesan, K. (*India*), Weisskopf, V. (*Switzerlad*), Williamson, J. H. (*England*), Zumino, B. (*U.S.A.*), Zupancic, C. (*Switzerland*).

Collaboration with Universities

With its permanent staff, its steady influx of visiting scientists and a well-equipped library, the institute is able to offer facilities for post-graduate students to work in pursuance of the Ph.D. degree of the various Universities in India. This Institute has been recognized as a centre where students from any university can carry out research towards the Ph.D. degree of their parent universities.

The list of persons who have worked under Professor Alladi Ramakrishnan before and after the inception of the Institute and obtained their Ph.D. degrees is given below :—

Before the inception of the Institute:

Dr. P. M. Mathews	1956	Dr. R. Vasudevan	1960
Dr. S. K. Srinivasan	1957	Dr. N. R. Ranganathan	1961

After the inception of the Institute:

Dr. K. Venkatesan	1963	Dr. S. Indumathi	1963
Dr. V. Devanathan	1963	Dr. G. Ramachandran	1964
Dr. T. K. Radha	1963	Dr. K. Raman	1965
Dr. Thunga Satyapal	1963	Dr. R. K. Umerjee	1965
Dr. A. P. Balachandran	1963	Dr. K. Ananthanarayanan	1965
Dr. G. Bhamathi	1963	Dr. T. S. Shankara	1970
		Dr. T. S. Santhanam	1970

Persons who are registered for Ph.D. of the various universities:

Mr. K. Srinivasa Rao	(Submitted thesis to Madras, Uni., 1970)
Miss P. K. Geetha	,,
Mr. R. Sridhar	Madras
Mr. A. Sundaram	,,
Mr. G. N. Keshavamurthy	,,
Mr. M. R. Subrahmanya	Bangalore
Miss Nalini B. Menon	Madras
Miss Vimala Walter	,,

Library

During this year 864 new books, including bound periodicals were added to the library, bringing the total number of volumes to 9750.

14 new journals were subscribed for during the year under report, bringing the total number of journals to 194. We started receiving one journal in exchange for our lecture notes "MATSCIENCE REPORTS" and "SEMINAR IN ANALYSIS"

New Journals :

Abonnement complementaire colloques.

Annual Review of Astronomy and Astrophysics. (Serial publication).

Atom, (U. K. Atomic Energy Authority).

Bulletin of the American Mathematical Society.

Bulletin of the Australian Mathematical Society.

Current Science.

Glasgow Mathematical Journal.

Herald of Library Science.

Lettere al Nuovo Cimento.

Library Science with a slant to Documentation.

Notices of the American Mathematical Society.

New Publications (AMS).

Proceedings of the Indian Science Academy—Sec. A.

Rivista del Nuovo Cimento.

Science Reporter (CSIR)

*Acta Universitatis Wratislaviensis—Series Matematyka.

•Exchange

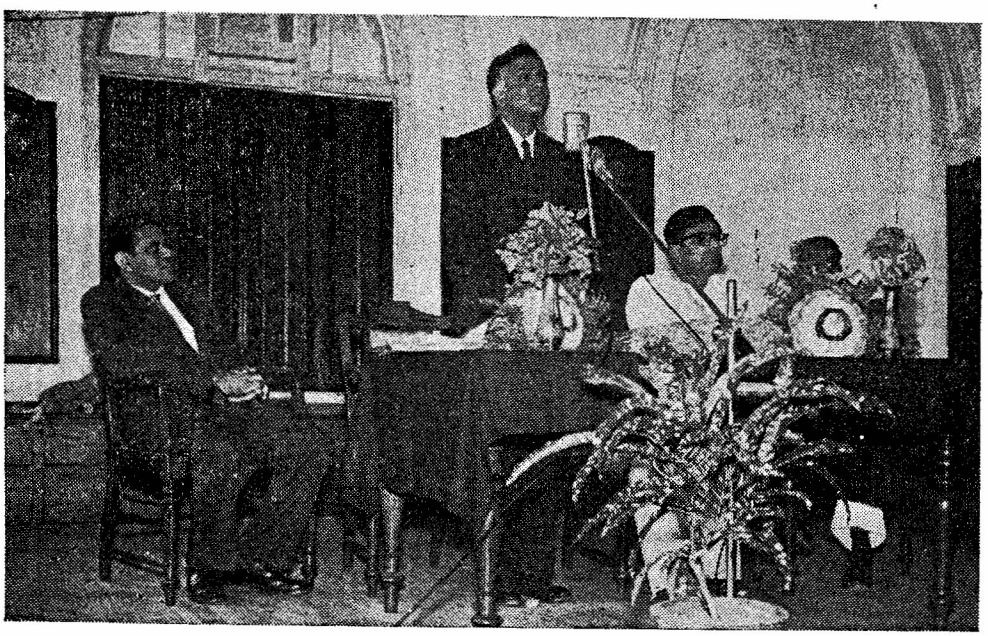
Total Number of Periodicals received in the Library:

Subscribed	194
Exchange	33
Free	16
	243

As in the previous years, we continue to receive a large number of preprints (papers to be published) from various research institutions throughout the world.

Lists Published:

1. List of periodicals (issued yearly).
2. List of MATSCIENCE REPORTS and REPORTS OF SEMINAR IN ANALYSIS (issued yearly).
3. List of reprints and research papers of the Institute (issued yearly)
4. Library Bulletin (giving the list of new additions in books, periodicals etc.) (issued quarterly).

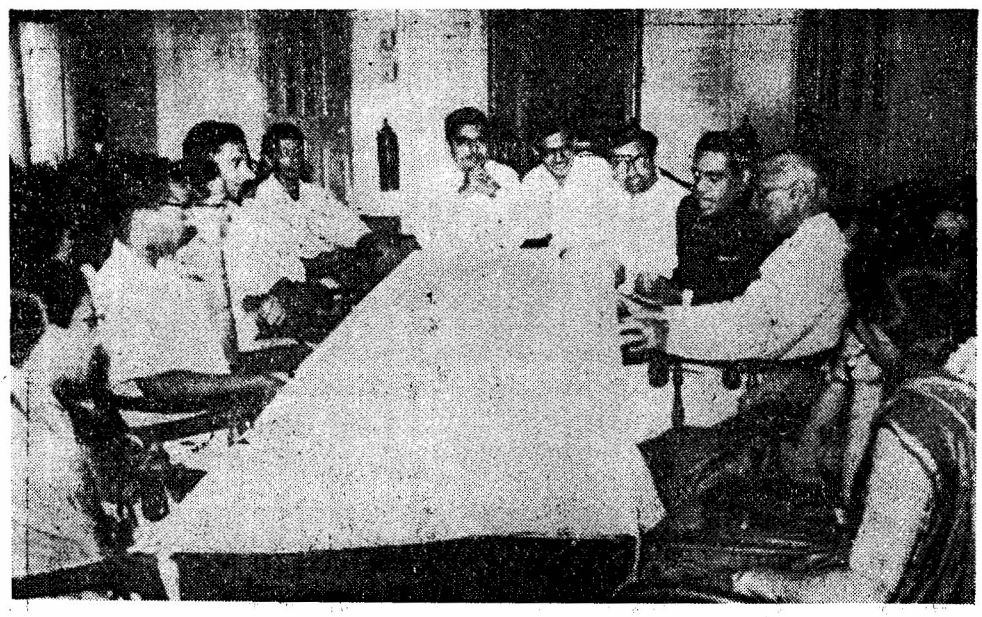


".....of course, the name of Ramanujan comes to the mind of everyone. He is, in my opinion, without question the greatest man of science India has produced in recent years".

—*Prof. S. Chandrasekar at the Inauguration of the Institute, 1962*

". ....I will say this is the beginning of the miracle. The justification for the Institute will be in the results achieved when the miracle will really happen..... I have no doubt that ere long this Institute will be one of the well recognised science institutions in the whole world. In the field of scientific research, we cannot anticipate—anything might happen or might not happen. The chances are there for great discoveries and work of international repute. Out of the young men and women, I hope a few will earn the Nobel Prize for Physics."

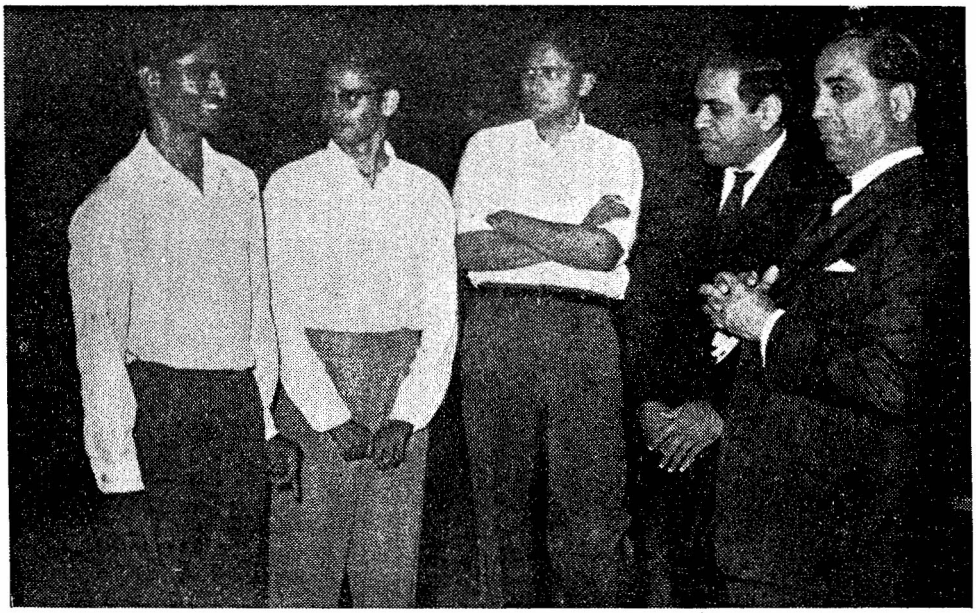
— Mr. C. Subramaniam at the Inauguration of the Institute, 1962



"..... Few lives in the history of Mankind have shone with such many splendoured Lues...An individualist in thought, he loved people to an extent that every child looked to him as a father and every Indian felt his benign influence.....

...His life was dedicated to improving the standard of life of the common man ; but he remained a restless intellectual, a votary for the advancement of science in our country. Amidst the tumult of politics and the anxieties of administration, he found time to exhort scientists to greater achievement and the aspirant youth to the pursuit of knowledge"

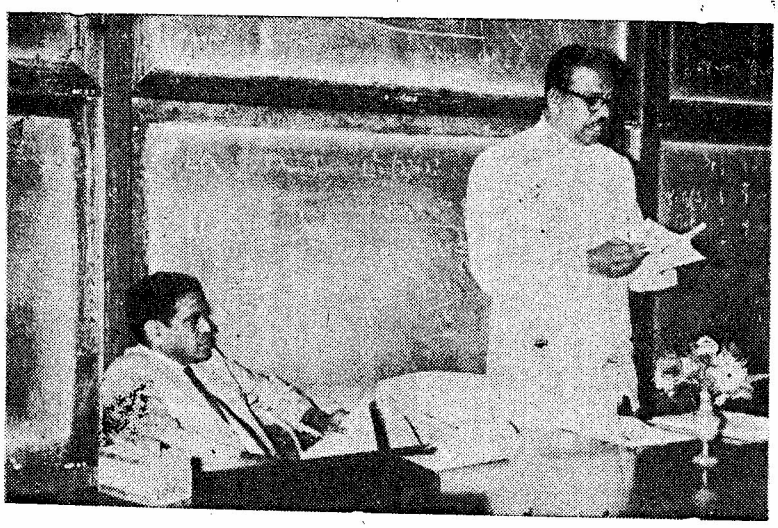
—Alladi Ramakrishnan.



".....He was born to be a theoretical physicist of worldwide reputation. He sought and grasped opportunities with undiminished vigour and uninterrupted success characteristic of a man destined to fame and fortune..... This ancient land, where methods of agriculture have not changed since the dawn of civilisation, under his leadership, joined the worldwide effort for harnessing atomic energy for peaceful purpose.

.....The legacy of Bhabha is the desire for excellence in the mathematical and physical sciences and more generally in the fascinating endeavour of understanding nature."

—Alladi Ramakrishnan.



".....while mathematicians withdraw more and more from the masses, and develop apparently abstract theories, the application brings about changes and developments that affect every aspect of our living..... I feel, mathematics teaching should be given due importance at all stages of education... No one would recognise a second rate contribution simply because it comes from a developing nation."

—Mr. V.R. Nedunchezhiyan at the Inauguration of the First Seminar in Analysis, 1967.