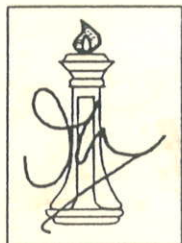


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JAWAHARLAL NEHRU CENTRE FOR  
ADVANCED SCIENTIFIC RESEARCH

**ANNUAL  
REPORT**

1989-90

Indian Institute of Science Campus  
Bangalore 560 012

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## FOREWORD

Although the Jawaharlal Nehru Centre for Advanced Scientific Research has been in existence just for a few months, it has successfully launched a fruitful academic programme. Discussion meetings on a few important scientific topics have already been held with considerable success, and several more are on the anvil. The publication programme of the Centre has also started with much promise. I am glad that the Centre has the support of a galaxy of renowned scientists of the country, who have become honorary members of the faculty.

We are now making serious efforts in building up the infrastructural facilities and the campus of the Centre and also in initiating research activities. There is much to look forward to in the years to come.

I would like to express my sincere thanks to the Indian Institute of Science for its wholehearted support of the Centre's activities and to the Department of Science and Technology, Government of India, for financial support. Thanks are due to the Government of Karnataka for the gift of the land for the Centre.

C.N.R. Rao  
President

PART A  
ANNUAL REPORT

## INTRODUCTION

This Centre, devoted to research in frontier and emerging areas of science and engineering, was established by the Government of India to commemorate the Centenary Year (1989) of Pandit Jawaharlal Nehru, who did much to foster the growth of science in India. The Department of Science and Technology has taken active interest in the establishment of the Centre and fully supports it.

It was considered desirable and conducive to the growth of the Centre to academically associate it with an established scientific research institution of standing, and this choice fell on the Indian Institute of Science. The latter welcomed the establishment of the Centre on its campus and agreed to extend all possible cooperation. Thus the Centre has come to be located on the campus of the Indian Institute of Science, where an office and some facilities of the Centre have been set up.

The Centre was registered as a Society under the Karnataka Societies Registration Act, 1960. It started functioning in June 1989 and initiated various academic activities with the help of the faculty of the Indian Institute of Science and also honorary faculty of the Centre. It functions as an independent, autonomous national centre devoted to research, without however awarding any degrees. It is governed by a Council of Management consisting of distinguished scientists and administrators.

Certain essential infrastructural facilities for the Centre will be created at the Indian Institute of Science campus. A campus of the Centre will be developed in lands which the Government of Karnataka has gifted to the Centre in the proximity of the Indian Institute of Science.

## AIMS AND OBJECTIVES

The main objectives of the Centre are:

- (a) To carry out and promote front-line research in selected areas of science;
- (b) To promote collaborative research with scientists at the Indian Institute of Science and other institutions in the country;
- (c) To provide a national and international forum for in-depth discussions on important scientific topics in areas of vital interest to scientists of the Centre and in the country at large;
- (d) To organize periodic winter and summer schools in certain areas, where young talented scholars would be associated;
- (e) To provide opportunities to carry out research projects for talented young students;
- (f) To provide facilities to visiting scholars and faculty from all over India, and abroad, to spend extended periods at the Centre;
- (g) To publish monographs and reports on frontier and futuristic areas of science as well as monographs of educational value.

The Centre will generally promote front-line research in emerging as well as interdisciplinary areas of science and engineering. This is sought to be achieved by making use of the facilities at the Indian Institute of Science and other advanced research institutions nearby and by developing such facilities of its own for theoretical studies and laboratory work as are essential.

COUNCIL OF MANAGEMENT

Dr. Raja Ramanna  
(Minister of State for Defence)  
Chairman of the Council  
Indian Institute of Science  
(*ex-officio*) (Chairman)

Prof. C.N.R. Rao,  
(Director, Indian Institute of Science)  
President of the Centre

Dr. Vasant R. Gowarikar  
Secretary  
Department of Science & Technology, New Delhi

Mr. B.K. Chaturvedi  
Joint Secretary & Financial Adviser  
Department of Science & Technology, New Delhi

Prof. N. Mukunda  
Chairman  
Division of Physical & Mathematical Sciences  
Indian Institute of Science

Prof. O. Siddiqi  
Professor of Molecular Biology  
Tata Institute of Fundamental Research  
Bombay

Prof. M.M. Sharma  
Director  
University Department of Chemical Technology,  
Bombay

Prof.H. Sharat Chandra  
Professor, Department of Microbiology &  
Cell Biology  
Indian Institute of Science

The Council held its first meeting on 7th December  
1989.

**ACADEMIC ADVISORY COMMITTEE**

Prof. C.N.R. Rao  
President of the Centre (Chairman)

Dr. S.K.Joshi  
National Physical Laboratory, New Delhi

Prof. P.Rama Rao  
Defence Metallurgical Research Laboratory  
Hyderabad

Prof. M.S. Narasimhan  
Tata Institute of Fundamental Research  
Bombay

Prof. A. Chakravorty  
Indian Association for the Cultivation  
of Science, Calcutta

Prof. N. Kumar  
Indian Institute of Science

Prof. R. Kumar  
Indian Institute of Science

Prof. G. Padmanaban  
Indian Institute of Science

Prof. V. Rajaraman  
Indian Institute of Science

Prof. T.V. Ramakrishnan  
Indian Institute of Science

The Committee held its first meeting on 20th February 1990.



## HONORARY PROFESSORS

### Biological Sciences

Prof. B.K. Bachhawat, F.A.Sc., F.N.A.  
University of Delhi, Delhi

Prof. G. Padmanaban, F.A.Sc., F.N.A.  
Indian Institute of Science

Prof. H. Sharat Chandra, F.A.Sc., F.N.A.  
Centre for Cellular & Molecular Biology  
Hyderabad

Prof. O. Siddiqi, F.A.Sc., F.N.A., F.R.S.  
Tata Institute of Fundamental Research  
Bombay

Prof. M.A. Viswamitra, F.A.Sc., F.N.A.  
Indian Institute of Science

Prof. M.S. Valiathan, F.A.Sc., F.N.A.  
Sree Chitra Tirunal Institute for  
Medical Sciences & Technology, Trivandrum

### Chemical Sciences

Prof. A. Chakravorty, F.A.Sc., F.N.A.  
Indian Association for the Cultivation  
of Science  
Calcutta

Prof. G. Mehta, F.A.Sc., F.N.A.  
University of Hyderabad, Hyderabad

Prof. C.N.R. Rao, F.A.Sc., F.N.A., F.R.S.  
Indian Institute of Science

### Engineering Sciences

Prof. R. Kumar, F.A.Sc., F.N.A.  
Indian Institute of Science

Dr. R.A. Mashelkar, F.A.Sc., F.N.A.  
National Chemical Laboratory, Pune

Prof. R. Narasimha, F.A.Sc., F.N.A.  
National Aeronautical Laboratory,  
Bangalore

Prof. V. Rajaraman, F.A.Sc., F.N.A.  
Indian Institute of Science

Prof. P. Rama Rao, F.A.Sc., F.N.A.  
Defence Metallurgical Research Laboratory  
Hyderabad

Prof. M.M. Sharma, F.A.Sc., F.N.A., F.R.S.  
University Department of Chemical Technology  
Bombay

#### Physical and Mathematical Sciences

Prof. S. Chandrasekhar, F.A.Sc., F.N.A., F.R.S.  
Raman Research Institute, Bangalore

Prof. S.K. Joshi, F.A.Sc., F.N.A.  
National Physical Laboratory, New Delhi

Prof. N. Kumar, F.A.Sc., F.N.A.  
Indian Institute of Science

Prof. Jayant Narlikar, F.A.Sc., F.N.A.  
Inter-University Centre for  
Astronomy and Astrophysics, Pune

Prof. N. Mukunda, F.A.Sc., F.N.A.  
Indian Institute of Science

Prof. M.S. Narasimhan, F.A.Sc., F.N.A.  
Tata Institute of Fundamental Research  
Bombay

Prof. T.V. Ramakrishnan, F.A.Sc., F.N.A.  
Indian Institute of Science

Prof. Virendra Singh, F.A.Sc., F.N.A.  
Tata Institute of Fundamental Research  
Bombay

## ADMINISTRATIVE AND SUPPORT SERVICES

An office has been established with minimum staff. Services of some members of the staff of the Indian Institute of Science are being used for various purposes. The construction programme of the Centre is being supervised by the Engineering staff of the Institute.

The Centre also has the benefit of the advice of some of the scientists who had already associated themselves with it as Honorary Professors.

## LAND AND BUILDINGS

The Government of Karnataka gifted to the Centre 15.55 acres of land near Jakkur, about 11 kms from the Indian Institute of Science. This land was taken possession of. The main campus of the Centre is being developed here. Mr. Charles Correa has been commissioned to draw up a master plan and design the buildings on this campus.

A small building in the Indian Institute of Science campus has been made available by the Institute and this is being renovated for locating the office of the Centre. This building will also provide for a Library and office accommodation for visiting scientists. An adjacent structure, where earlier an Exhibition had been set up by the Space Department and which has been made available to the Centre by the Indian Institute of Science, is being modified for use as a lounge-cum-dining room. A small lecture hall is under construction in the area.

## SEMINARS, WORKSHOPS AND DISCUSSION MEETINGS

In order to promote interaction and collaboration among scientists of the Centre in general and those in the country at large and to stimulate young talented scholars, the Centre organises periodical seminars, workshops and discussion meetings on important topics in science and engineering. A beginning was made during the year with the following programmes:

- (a) **Solvation Dynamics and Charge Transfer Reactions**, 12-13 March 1990. Conveners: Prof. V. Krishnan, IISc and Dr. Biman Bagchi, IISc.
- (b) **Complex and Polymeric Fluids**, 19-31 March 1990. Conveners: Prof. T.V. Ramakrishnan, IISc and Dr. R.A. Mashelkar, NCL, Pune.
- (c) **Computational Methods and Quantum Chromodynamics**, 26-31 March 1990. Conveners: Prof. J. Pasupathy, IISc, Prof. V. Rajaraman, IISc and Prof. R. Gavai, TIFR, Bombay.

The Centre also sponsored an International Conference on Primate Reproductive Biology held during 5-7 February 1990 (with Prof. N.R. Moudgal, IISc, Convener) through support of the publication of the proceedings.

## PUBLICATION PROGRAMME

The Centre has a three level publication programme:

- (a) Advanced monographs series aimed at promoting the publication of scientific books of an international standard and at research level;
- (b) Educational monographs concerned with short publications (about 100 pages each) aimed at Indian students in science at graduate and post-graduate levels;
- (c) Popular science books meant for the general reader. Where possible, these books will be produced in Hindi also. Arrangements have been made with Madyha Pradesh Council of Science & Technology to publish the first book in Hindi (on Computers).

## LIBRARY

In the process of building up its Library, during the year the Centre has subscribed to 8 current journals in Science and Engineering to meet the essential needs of the faculty and others.

## RECOGNITIONS

The Centre has sought recognition as a scientific/industrial research organisation by the Ministry of Scientific & Industrial Research (Department of Scientific & Industrial Research) and also applied for recognition under Section 35(1)(ii) of the Income Tax Act, 1961.

## FINANCES

The Department of Science & Technology, Government of India released a grant-in-aid of Rs.20 lakhs during the year 1989-90 and the Centre earned an interest of Rs.43,021.30 during the year by placing the current surplus in short-term deposits with the Bank. An amount of Rs.8,80,230.69 was spent during the period ended 31st March 1990, and the unspent balance of Rs.11,62,790.71 is being carried forward to the financial year 1990-91.

## AUDIT

The audit of the accounts of the Centre for the period ended 31st March 1990 was carried out by Messrs. B.R.V. Goud & Co. The audited statements of accounts are given in Part B.

**CENTRE ADMINISTRATION**

**President**

Prof. C.N.R. Rao, F.A.Sc., F.N.A., F.R.S.

**Co-ordinator**

Dr. R.B. Iyengar, D.Sc.

**Honorary Advisor (Projects)**

Mr. K.C. Reddy, B.E., M.S. (Purdue)

**Honorary Estate Officer**

Mr. N. Munivenkataswamy, B.E.

**Honorary Librarian**

Mr. N.M. Malwad, M.Lib.Sc., A.D.R.

**Secretary to President**

Mr. L. R. Rao, B.A.



PART B  
ANNUAL ACCOUNTS

B.R.V. GOUD & CO.,  
Chartered Accountants

'Shivaprasad Complex'  
I Floor, 1/1, Museum Road  
Bangalore 560 001  
Date: 28.06.1990

**FORM NO.10B**

**AUDIT REPORT UNDER SECTION 12A(b) OF THE  
INCOME TAX ACT, 1961**

We have examined the Balance Sheet of JAWA-HARLAL NEHRU CENTRE FOR ADVANCED SCIENTIFIC RESEARCH, Indian Institute of Science Campus, Bangalore 560 012, as at 31st March, 1990, and the Income & Expenditure Account for the period ended on that date which are in agreement with the books of account maintained by the said Centre.

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 accounts have been kept by the Centre so far as it appears from our examination of the books of accounts subject to the comments given hereunder:

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

- (i) In the case of the Balance Sheet of the State of Affairs of the Centre as at 31st March, 1990

AND

- (ii) In the case of the Income & Expenditure Account of the Excess of Income over Expenditure for the period ended that date.

for B.R.V. GOUD & CO.,

Sd. B.R.V. Goud  
Partner



**JAWAHARLAL NEHRU CENTRE FOR ADVANCED SCIENTIFIC RESEARCH**  
**Indian Institute of Science Campus, Bangalore 560 012**

**INCOME AND EXPENDITURE ACCOUNT FOR THE PERIOD FROM 26.09.1989 TO 31.03.1990**

Expenditure	Rs. P.	Rs. P.	Income	Rs. P.	Rs. P.
To Salaries & Allowances..	..	5,500.00	<u>By Grant in Aid:</u>		
" Printing & Stationery..	..	11,693.43			
" Honorarium .. ..	..	36,700.00	From Department of Science &		
" Registration Charges ..	..	1,300.00	Technology, Government		
" Postage .. ..	..	198.80	of India, New Delhi ..	..	20,00,000.00
" Miscellaneous Expenses	..	1,759.55			
" Bank Charges .. ..	..	30.00	<u>" Interest:</u>		
" Council Meeting Expenses	..	1,925.00	On Savings Bank ..	13,037.80	
" Conveyance Charges ..	..	43.75	On Term Deposits ..	29,983.50	
" Services & Infrastructural Facilities	..	1,02,337.56			43,021.30
" Seminars & Workshops ..	..	1,75,106.50			
" Audit Fee.. ..	..	1,500.00			
" Surplus .. ..	..	17,04,926.71			
Total Rs. ..	..	20,43,021.30	Total Rs. ..	..	20,43,021.30
To Building Construction	..	3,11,271.54	<u>By Surplus .. ..</u>	..	17,04,926.71
" Equipment.. ..	..	1,12,306.36			
" Furniture.. ..	..	4,247.60			
" Books & Journals ..	..	1,14,310.60			
" Excess of Income over Expenditure transfer- red to Capital Fund ..	..	11,62,790.61			
Total Rs. ..	..	17,04,926.71	Total Rs. ..	..	17,04,926.71

As per our report of even date  
for B.R.V. GOUD & CO.,  
CHARTERED ACCOUNTANTS

Place: Bangalore  
Date: 28.06.1990

Sd. C.N.R. Rao  
President

Sd. B.R.V. Goud  
Partner

