

**Harish-Chandra Research Institute**  
Chhatnag Road, Jhansi, Allahabad - 211019

**Annual Report**  
(2010-11)

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# About the Institute

## Early Years

The Harish-Chandra Research Institute is one of the premier research institutes in the country. It is an autonomous institute fully funded by the Department of Atomic Energy, Government of India. Till October 10, 2000 the Institute was known as Mehta Research Institute of Mathematics and Mathematical Physics (MRI) after which it was renamed as Harish-Chandra Research Institute (HRI) after the internationally acclaimed mathematician, late Prof Harish-Chandra.

The Institute started with efforts of Dr. B. N. Prasad, a mathematician at the University of Allahabad with initial support from the B. S. Mehta Trust, Kolkata. Dr. Prasad was succeeded in January 1966 by Dr. S. R. Sinha, also of Allahabad University. He was followed by Prof. P. L. Bhatnagar as the first formal Director. After an interim period in January 1983, Prof. S. S. Shrikhande joined as the next Director of the Institute. During his tenure the dialogue with the Department of Atomic Energy (DAE) entered into decisive stage and a review committee was constituted by the DAE to examine the Institute's future. In 1985 N. D. Tiwari, the then Chief Minister of Uttar Pradesh, agreed to provide sufficient land for the Institute and the DAE promised financial support for meeting both the recurring and non-recurring expenditure. In January 1990, about 66 acres of land was acquired in Jhansi, Allahabad and the Institute came up at this site.

Prof. Shrikhande was followed by Prof. H. S. Mani who took over as the Director in January 1992. With his joining and the shift to the new campus at Jhansi in 1996, the Institute's activities picked up pace. This phase of rapid growth still continues.

## New Phase

After a distinguished tenure of about nine years Prof. Mani retired in August 2001 and the charge was taken over by Prof. R. S. Kulkarni. After Prof. Kulkarni's tenure, Prof. Amitava Raychaudhuri took over as Director from July 19, 2005 to May 15 2011. The Institute will soon have a new director. The Institute continues to be devoted to fundamental research in diverse areas of mathematics and theoretical physics. Research is carried out by faculty members, visiting members, post-doctoral fellows and Ph. D. students.

Since 1992 the Institute has attracted worldwide attention, as is evident from the recognition received by many of its members. Among them are Ashoke

Sen, A. Raychaudhuri, B. Mukhopadhyaya, Pinaki Majumdar, Rajesh Gopakumar are all winners of the prestigious S. S. Bhatnagar award. Ashoke Sen was also awarded the Padmashri and was elected to the Fellowship of the Royal Society. Prof. Rajesh Gopakumar had earlier won the Swarnajayanti fellowship of Department of Science and Technology and the International Centre for Theoretical Physics (ICTP) prize for 2006. Recently, Prof. Ashoke Sen was chosen for the prestigious Infosys prize in 2009.

### **Research in Mathematics**

The mathematics group at HRI carries out research in several areas. In algebra, work is done on algebraic groups and related structures, the theory of groups and group rings, representation theory, and infinite-dimensional Lie algebras. Work in analysis is in the field of harmonic analysis of Lie groups.

Activity in geometry includes discontinuous groups and Riemann surfaces, algebraic topology, variational problems on manifolds, Chow groups of rational surfaces, and moduli of vector bundles. The number theory group works on algebraic, analytic and combinatorial number theory, automorphic forms and cryptography.

### **Research in Physics**

Research in Physics at HRI is carried out in the fields on astrophysics, condensed matter physics, quantum information and computing, high energy phenomenology and string theory. In astrophysics, work is done on the cosmic microwave background, large scale structure formation and galaxy evolution. Main areas of activity in condensed matter physics are strongly correlated electron systems, mesoscopic systems, quantum Hall effect and superconductivity. In string theory, perturbative and non-perturbative aspects of string theory and quantum field theory are being actively investigated. Research in neutrino physics, strong interactions, lattice gauge theory, supersymmetry and various aspects of physics beyond the standard model is done in high-energy phenomenology. The Institute is a member of the India-based Neutrino Observatory (INO) collaboration.

The Institute has a residential campus in Jhansi, Allahabad with a library, state of the art computational facility and fast Internet link to the outside world. There is an active graduate program and a large traffic of visiting scientists and students.

## Director's Report

This 2010-11 Annual Report of Harish-Chandra Research Institute (HRI) is intended to provide a glimpse of the Institute, especially of the academic accomplishments in the past year. The Institute, with a focus on mathematics and theoretical physics, is internationally renowned and is generously funded by the Department of Atomic Energy (DAE) of the Government of India.

HRI trains students who join after an M.Sc. (or a B.Sc.) for a Ph.D. (integrated Ph.D.) programme. They are selected via a rigorous procedure to attract only the best. For example, in physics, the high-rankers in the JEST examination are invited to appear in a written test and interview, for selection. Only a small fraction get through. All students register with the Homi Bhabha National Institute for their Ph.D. On completion of their degrees, they are picked up by leading institutions, usually abroad, with post-doctoral offers. Afterwards, they are absorbed in the top research and teaching institutions in the country.

Over the years, the Institute has made a concerted effort to enhance the student intake without making any compromise on high quality. The current student strength – around 60 – is being housed in two hostels, a married student apartment block, and from last year, in rented rooms in the city of Allahabad. A third hostel which should be able to accommodate another 60 students is under construction in the HRI campus. The Foundation Stone for this hostel will soon be laid by the Chairman, Atomic Energy Commission. HRI has also emerged as a thriving hub for collaboration meetings, pedagogic schools, and focussed conferences. The locational advantage of a well-equipped centre in a peaceful non-urban setting, excellent support facilities and most importantly the high quality scientists present locally makes the Institute a popular venue. Like every year, this year there were meetings in mathematics and physics covering a wide range – summer training courses for M.Sc. students to frontier research meetings and schools with wide national and international participation.

Besides the new students' hostel, work is now going on to extend the library building to increase, among other things, reading room and library storage space, provide more floor area to the Computer Centre, etc. These constructions are now on in full-swing. In addition, the ever-increasing number of short- and long-term visitors as also the regular scientific meetings necessitates an extension of the Guest House. This, and a new Conference Centre Complex, are on the cards.

Needless to say, one must bear in mind that the Institute is located not in a metropolis. Hence infrastructural support is of essence for it to succeed. The electrical power connection to the Institute is via an overhead line. On occasions, especially in the time of stormy weather, there have been breaches in the connection. For the essential services like the cluster computers, the internet links, etc., as a back-up two 500kVA DG sets have been installed in the past year. These will suffice at the time of power disruptions.

The lifeline of a research institute, that too in an isolated location, is its internet linkage to the world. Keeping this in mind the Institute internet connection bandwidth has been enhanced every year and now stands at more than 60 Mbps. Several service providers are utilised to build up redundancy.

HRI continues to keep Outreach as one of its missions. Several faculty members participate in INSPIRE and other programmes to act as Resource Persons for the students. The Institute also organises a Talent Search Test for physics and mathematics students in class X and XII of the city of Allahabad. This Test has been a continuing success and the prize-winners have gone on to do very well in later life and in competitions like the international olympiads.

During the last year one HRI-Triveni Lecture and three HRI-Girdharilal Mehta Lectures were arranged. Professor Vladimir Voevodsky of the Institute for Advanced Study, Princeton, USA delivered the 5th HRI-Triveni Lecture entitled 'Mathematics and Computers' on 16th February 2011. On 19th July 2010 the 9th HRI-Girdharilal Mehta Lecture on 'A Review of the Indo-US nuclear agreement and its ramifications' was delivered by Professor R. Rajaraman, JNU. Professor Boris Kayser, Fermilab, USA spoke on 'Antimatter, matter and how we came to be' in the 10th HRI-Girdharilal Mehta Lecture on February 21, 2011. The 11th HRI-Girdharilal Mehta Lecturer was Professor Kaoru Hagiwara, KEK, Japan, who spoke on March 08, 2011 on 'Physics to be explored at the LHC'.

As in the past years, there has been some changes in the staff at the Institute. Dr. Arun K. Pati, whose expertise is in Quantum Information, has joined the Institute. Earlier, he was at the Bhabha Atomic Research Centre, Mumbai. Dr. Srubabati Goswami, has left the Institute to join the Physical Research Laboratory, Ahmedabad. Dr. Jasjeet Singh Bagla and Dr. L. Sriramkumar have been granted lien to take up positions at IISER, Mohali and IIT Madras, Chennai, respectively. Mr. Sanjeev Nagar has joined as the Hindi

Typist. The Stores and Purchase Officer of HRI, Mr. P.S. Babu, has left the Institute.

HRI scientists have continued to win laurels for their academic work. Over the past year Professor Sudhakar Panda was elected to the Fellowship of the National Academy of Sciences, India. Dr. Andreas Nyffeler was selected for the 2010 Heinrich Greinacher award by the University of Berne, Switzerland.

As always, the non-academic staff of the Institute have worked hard to ensure that the prestige of HRI is enhanced. Many of them have gone out of their way to see to it that the faculty, visitors, and students can perform their work without any hindrance. There is a strong feeling of affiliation and identification with the organisation.

HRI is on a forward moving epoch. The general atmosphere is upbeat. We can expect many further successes in the period ahead.

A. RAYCHAUDHURI  
DIRECTOR

## Governing Council

1. Prof. M. S. Raghunathan  
Chairman  
School of Mathematics  
Tata Institute of Fundamental Research  
Homi Bhabha Road  
Mumbai – 400 005
2. Prof. R. Balasubramanian  
Director  
Institute of Mathematical Sciences  
CIT Campus, Taramani  
Chennai – 600 113
3. Dr. J. N. De  
BH-135, Sector II  
Salt Lake  
Kolkata – 700 091
4. Prof. Narendra Kumar  
Raman Research Institute  
C.V. Raman Avenue,  
Sadashivnagar  
Bangalore – 560 080
5. Prof. H. S. Mani  
2, Fourth Cross Street  
Durga Colony, Sembakkam  
Chennai - 600 073
6. Mr. S. L. Mehta  
4, Clive Row  
Kolkata – 700 001
7. Mr. Avnish Mehta  
4 Penn Road  
Kolkata – 700 027
8. Mr. Rama Kant Mishra  
IAS (Retd.)  
23/1E, P. C. Banerjee Road,  
Allen Ganj,  
Allahabad – 211 001
9. Prof. A. Raychaudhuri  
Director  
Harish-Chandra Research Institute  
Chhatnag Road, Jhunsi,  
Allahabad – 211 019



10. Mr. V. R. Sadasivam

Joint Secretary (F) DAE,  
Govt. of India,  
Ch. Shivaji Maharaj Marg  
Mumbai – 400 001

11. Ms. Revathy Iyer

Joint Secretary (R& D)  
DAE, Govt. of India,  
Anushakti Bhavan,  
Ch. Shivaji Maharaj Marg,  
Mumbai – 400 001

# Summary of Research Activities in Mathematics

## Research in Algebra and surrounding areas

Work is progressing in finding the irreducible integrable modules for an infinite dimensional Lie algebra, which is the fixed point set of several commuting finite order automorphisms of a finite dimensional simple Lie algebra over complex numbers attached with a subspace of the centre and derivations.

Examples of non-special finite  $p$ -groups of class 2 such that the automorphism group of these groups is abelian, have been constructed.

These examples provide counter examples to a conjecture in this area. Examples of finite  $p$ -groups of class 2 having no non-trivial abelian direct factor such that automorphisms of these groups are all central and the group of all automorphisms is non-abelian, have also been constructed. This solves an open problem in the literature. Class preserving automorphisms of unitriangular matrices over arbitrary fields have been studied and certain necessary and sufficient conditions on the group (more precisely on the underlying field) such that all class preserving automorphisms are inner, have been found.

## Research in Topology

Research has been going on in the area "Topological methods in Combinatorial Mathematics". Jointly with S.D.Adhikari, research seminars on the works of Lovasz, Barani and others using the Borsuk-Ulam Theorem of algebraic topology have been conducted. Work on some additional problems on nonmetrizable manifolds besides determining the mapping class groups of such spaces is going on. One problem with David Gauld, a possible generalization of the "bagpipe theorem" of Peter Nyikos in dimension three has been studied. In this problem, some initial results have been obtained.

## Research in Mathematical Physics

Work has been done in bifurcation theory in a dynamical system in a blackhole accretion disc. Collaboration work with a student and a postdoc on path spaces is going on. In addition, collaboration work with some colleagues on possible coadjoint orbit quantization of some integrable systems is going on.

## **Research in Harmonic Analysis**

The research in Harmonic Analysis is centered around Schrödinger equations and related problems. One of the problems studied concerns the well posedness of a class of non linear Schrödinger equation associated to the special hermite operator. This work relies on the Strichartz estimates for the Schrödinger propagator for the special hermite operator studied earlier. Jointly with A. K. Nandakumaran, and Salem Ben, Université Henri Poincaré, France, a related problem on the Strichartz type estimates for the Schrödinger propagator associated to the Dunkl Laplacian has also been studied. The third problem being studied is one of the ongoing works with E. K. Narayanan on qualitative uncertainty principle on two step nilpotent Lie Groups. This extends the results previously obtained on the Heisenberg group, to more general two step nilpotent Lie group.

## **Research in Algebraic Geometry and in Arithmetic**

With some students, work is progressing on some aspects of real algebraic geometry. Some characterizations of semistable real vector bundles over real abelian varieties were obtained. A correspondence between real orbifold bundles and real parabolic bundles over real algebraic curves was proved.

The compositum of all separable extensions of prime degree with solvable galoisian closure was determined. An elementary and conceptual proof of Serre's mass formula in prime degree was found.

## **Research in Number Theory**

People here pursue research in various areas of Number Theory.

### *Research in Analytic Number Theory*

Together with O. Ramare of the University of Lille, France it was shown that if the sequence of prime numbers is coloured with  $K$  colours then every sufficiently large integer admits a monochromatic representation as a sum of prime numbers in no more than  $CK \log \log K$  terms. This assertion is optimal in its dependence on  $K$  and answers a question of A. Sárközy.

Additive Combinatorics is the study of approximate mathematical structures such as approximate groups, rings, fields, polynomials, homomorphisms. This relatively new topic has been the subject of intensive research recently and has applications in various other branches of mathematics. One such application is in the work of Bourgain, Glibichuk and Konyagin, who used the results of the topic to obtain a nontrivial upper bound of the Fourier transform of an arbitrary small multiplicative subgroup of a cyclic group of

prime order under any nontrivial additive character. The later application in turn has several other applications including local Waring's problem and Cryptography. In a work in progress, this result in terms of an upper bound for trace of certain representation has been reinterpreted and has also formulated a general question. If this question has an affirmative answer, then this will generalise the above mentioned result of Bourgain, Glibichuk and Konyagin to nonabelian setting.

### *Research in Combinatorial Number Theory*

Work has been done on a weighted version of a result of Bollobás and Leader. For a finite abelian group of  $n$  elements, a lower bound has been obtained for signed  $n$ -element sums from a given sequence, in case there are no sums equal to zero. This also implies some known results.

Collected works of Dr. S. Sivasankaranarayana Pillai was compiled successfully and was published under RMS series. An asymptotic formula for the number of numbers which can be written as a sum of  $k^{\text{th}}$  power of prime and a  $k$ -free number was found. A bound for a least prime in arithmetic progression with difference  $m$  and starter 1 was obtained.

### *Research in Automorphic Forms*

Expressions for the special values of certain Dirichlet L-functions are given in terms of finite sums involving Jacobi symbols. In another work, the kernel of the restriction map of certain differential operator on the space of Jacobi forms of index 2 has been studied.

### *Research in Algebraic Number Theory*

Work in the area of special functions like various kinds of zeta functions, gamma functions etc. is in progress. In the area of elliptic curve cryptography, work is progressing in the area of proposing protocols for 'safe key exchange' and 'digital signatures' and some protocols have already been proposed. Work is in progress to improve these protocols further.

Throughout the year the members of the Mathematics group have visited many Institutes/Universities within India and abroad to attend conferences for giving invited talks and for collaborative research.

# Summary of Research Activities in Physics

Research activities are carried out in five major areas of Physics at HRI. These are: Astrophysics, Condensed Matter Physics, High Energy Physics, Quantum Information and Computing and String Theory.

## Astrophysics

The astrophysics group at HRI carried out research in relativistic and high energy astrophysics, compact objects, reionization and the intergalactic medium, and inflationary cosmology. In the area of relativistic and high energy astrophysics, studies were performed on accretion phenomena around black holes and related issues, for example, quasi periodic oscillations as observed in the galactic and the extra galactic sources. Application of the theory of dynamical systems in astrophysical flow was also studied. In the field of compact objects, the magnetic field evolution of neutron stars in ultra-compact binaries was investigated. In the field of reionization and intergalactic medium, statistical analysis based on principal component decomposition was performed to constrain the reionization history of the Universe. In the field of inflationary cosmology, detail analysis of various single field inflationary models that can produce features in the primordial power spectra were studied and these models are compared with the recent Cosmic Microwave Background angular power spectra.

## Condensed Matter Physics

The work in condensed matter group has been in three major areas: electronic structure correlated electronic systems, and mesoscopic and nanoscale physics. In electronic structure calculations, pure 4d and 3d-4d bimetallic clusters were studied in collaboration with experimentalists in the USA. In particular  $\text{Rh}_m\text{Co}_n$  ( $m = 1-5$ ,  $n = 1-2$ ) were studied. Validity of electron-counting rules in 3D transition metal (TM) doped *Ge* clusters were also studied. Theoretical studies of surface deposited clusters have been initiated. In the area of strongly correlated electron systems, work on disorder in double perovskites have been completed. Studies on the effect of strong Coulomb interactions on nanoscale inhomogeneities in TM oxides like manganites have been initiated. A strategy to use auxiliary field (Hubbard-Stratanovich) to the studies of strongly correlated systems is now being developed. In mesoscopic and nanoscale Physics, graphene and topological insulators have been studied. In particular, charge pumping in graphene-superconductor junctions and edge states of topological insulators have been studied. A three-terminal spin-polarized scanning tunneling

microscope setup for probing the helical nature of the Luttinger liquid of quantum Hall systems has been proposed. Among other aspects of mesoscopic systems, spin analogue of optical double refraction phenomena in lithographic structures has been studied. Based on these ideas, "Quantum Coherent Charge and Spin Transport" has been explored. By developing a scattering theory formalism, it has become possible to treat spin- and charge-current conservations on equal footing. Currently spin currents in helical Luttinger liquid wires in presence of magnetic field and transport through bent edges of topological insulators are being studied. Effect of spin-orbit coupling in mesoscopic systems to generate tunable spin currents is also being explored. faculty members working in this area have published seven papers and have written twelve preprints during this period.

## **High Energy Physics**

### *Quantum Information and Computing*

Quantum information is a science at the crossroads of physics, computer science, mathematics, and information theory, and has the potential of revolutionizing the future of communication and computational technologies. The quantum information and computation (QIC) group at HRI was initiated in August 2009 with two faculties. Another faculty member has joined the group in January 2011. In the academic year 2010-11, the activities of the group have been in research as well as in manpower development. During this period, we have organized an international school and conference on quantum information processing and applications (QIPA-2011), which included 27 invited speakers (13 from India, and 14 from abroad) and a further 56 participants, with many of the latter being young students. We have also mentored 4 visiting students and 6 project students (graduate students at HRI) during this period. A QIC faculty was invited as a mentor in the DST-funded INSPIRE INTERNSHIP SUMMER CAMP to nurture +2 students in basic science at Pt. Ravishankar Shukla University, Raipur. A popular article on quantum communication was written by two of us in Physics News. The research of the group has hovered around quantum communication, quantum thermodynamics, and the interface of quantum information with ultracold gases, condensed matter, and statistical physics. The group has produced 8 research papers, including Phys. Rev. Lett., Europhys. Lett., Phys. Rev. A, etc. One of the papers was highlighted in a news article in [www.phys.org](http://www.phys.org) (Quantum no-hiding theorem experimentally confirmed for first time: March 7, 2011). A member of the group received the Samanta Chandra Sekhar award from the Orissa Bigyan Academy.

## *String Theory*

The members of the string group carried out research in various areas of string theory, quantum field theory and its applications to other disciplines such as particle physics, cosmology and potentially even condensed-matter like systems.

Among the investigations on the formal side of string theory and quantum field theory were those on understanding better the microscopic origin of the entropy of black holes as well as on the gauge-string (or AdS/CFT) correspondence. In the former topic advances were made in computing and matching the logarithmic corrections to the Bekenstein-Hawking entropy in a class of black holes as well as a study of the so-called wall-crossing formula for  $N=2$  supersymmetric black holes. In the latter topic investigations included those of a new class of holographic duals involving minimal model 2d CFTs, the study of toy models of the duality as well as counterterms. Also generalised recursion relations of the BCFW kind were derived for gravity correlation functions in AdS. Another area that was studied was that of Newton-Cartan gravity. On the side of (potential) applications, AdS/CFT was applied to the study of asymptotically Lifshitz-like geometries which might describe strongly interacting field theories having Lifshitz scaling symmetry. Investigations were also carried out in the AdS/CFT framework of superfluid dynamics and new results were uncovered. Finally, brane models of inflation in string theory were investigated and comparison was made with observational data. A model of quintessence in string theory to describe dark energy was also proposed and its observational consequences explored.

## Library

The Institute's library is one of the best-equipped libraries in the region. Being a research institute, it provides the required support to the academic and research activities. It remained open on all working days between 8 a.m. to 2 a.m. including Saturdays. It also remained open during the Sundays and the Gazetted holidays from 10 a.m. to 6 p.m. It had added 821 (Eight hundred twenty one) new books, thus making the total number of books to 19868 (Nineteen thousand eight hundred sixty eight) which includes 780 books as gifted ones. It has also added 2544 bound volumes of the journals during the period from 1<sup>st</sup> April 2010 to 31<sup>st</sup> March 2011, it has increased bound volumes collection to 34718. The institute's library has a total collection of 54586 (Fifty four thousand five hundred eighty six) of books and bound volumes. The library had subscribed to 225 journals during this period, it includes 110 as online journals.

The physical stock verification has been recently completed with the help of PDT (Portable Data Terminal) for collection of Bar Codes. Since the whole collection is 'Bar Coded' and equipped with 'Tattle Tapes' for security it reflected no loss of titles in books or journals.

During the last year basic emphasis had been provided to create more space for users. The library had shifted some of the less used back volumes to the first floor storage area and created some more reading space for the users by rearranging the book and back volume display racks. The library provided better systems to our users for browsing the library OPAC and related search. The library procured one more photocopying machine to provide better photocopying services. The library enriched our Building of the Digital Depository of the HRI, which includes the submitted articles, thesis, lectures etc. The library web page has been updated which provides more detailed information about the library such as subscribed databases, archives, library rules, library staff, list of online journals, online link to the Video lectures and other useful links. The emphasis was also given to procure maximum number of journals online. The Institute library is providing on-line access of the periodicals to our users for 110 (One hundred ten) online titles.

The Library has provided the Web Enabled library catalogue to its users. The library can be termed as completely automated library system, which includes acquisition, cataloguing, circulation, search modules etc. This on-line catalogue had increased the opportunities of the use of our library resources by the neighboring organizations such as INSDOC, TIFR etc. through the Document Delivery Services (DDS). The Institute encourages



the use of its library by providing library consultation facilities to the research scholars from the neighboring institutes. The Institute had strengthened its library security system made with the implementation of Electro-magnetic Tattle Tapes to reduce the losses. It has been made completely functional.

## Computer Centre

1. Local Area Network with Optical Fiber Cable Giga backbone and with Gigabit node connectivity was set up in the Institute and Library building.
2. A new Network Storage Systems (NAS) with more centralised data storage with redundancy and automated backup facility has been installed.
3. Newer versions of different flavors of Linux operating systems were loaded on the desktops.
4. A new gateway machine for the secure remote login was set up for the users.
5. Webmail server for the Institute was upgraded for the Institute email users.
6. New internal mail server and domain name server were set up.
7. Computing related to conferences were held in the conference computer room.
8. New versions of several applications software were loaded on users' systems, computer centre and conference room systems.
9. All the computer centre NIS client machines were upgraded with Ubuntu (LTS).'
10. Four 80 KVA ONLINE central UPS with parallel redundancy (N+1) was installed and commissioned to provide redundant UPS power supply to all computers, peripherals and networking, equipments within the Institute building.
11. Expansion of wireless networking to cover up most of the places of Institute building and library building has been done.
12. A few Laptops for faculty members were purchased.

### **Current activities and plans:**

1. Tender has been published for the purchase of new Linux/Windows based high end desktops for faculty members, post doctoral fellows, research scholars and administrative members of the institute.
2. Tender has been published for the purchase of new iMac desktops for the faculty members of the Institute.
3. Tender has been published for the upgradation of institute's Mail Server, Name Server, Web Server, and Firewall Servers.

4. Purchase of few high end mono laser printers and a colour printer is being processed.
5. Upgradation of few laptops used by students and faculty members in under plan.

## Construction Activity

1. Tender for Construction of buildings 'Hostel', 'Extension of Institute Building, Library, Computer Centre', 'Engineering building' and 'Community Centre Annexe' at HRI has been finalized. The work has been awarded to M/s Kharaujha Builders Pvt. Ltd., Varanasi. Their work is in progress.
2. Two nos. additional 500 KVA Diesel Generator Sets complete with Diesel Engine, Suitable Alternator, Control panel, Starting and control batteries etc. have been supplied, Installed & Commissioned for giving a back-up power supply in case of power failure from UPPCL.
3. Following miscellaneous works were also carried out during the financial year :
  - a) Supply & installation of FRP cooling towers including Civil & Electrical works for the Institute & Library buildings.
  - b) Providing earthing for Lightning arrestors of various buildings in campus.
  - c) SITC of Electrical cable and Accessories for computing equipments.
  - d) Construction of in house facilities for NKN (National Knowledge Network) project.
  - e) SITC of intelligent fire alarm system for Library building.
  - f) Making an infrastructure for String theory project including Civil, Electrical & Air conditioning works etc.
  - g) Supply & installation of new Fire extinguisher in campus.
  - h) Providing & fixing shutter to cover shelves in the kitchen of all housing.

## **Note on Persons with Disabilities & SC/ST**

This Institute, devoted to theoretical research in the field of Physics and Mathematics, is financially supported by the Department of Atomic Energy, Government of India. Its activities are overseen by the Governing Council and its day-to-day activities are administered by the Director of the Institute. The Institute has a very limited number of sanctioned positions, which are evenly distributed between the Academic & Administrative posts. The Institute does not have any specific scheme catering to persons with disabilities and therefore there is no specific budget allocated in this regard. The recruitment of Academic members is done based on merit whereas recruitment in other sections of the Institute is done through an open advertisement. However, the Institute is sensitive to the subject of recruitment of persons with disabilities and would support such persons as and when the occasion arises.

Also the Institute is aware of its social obligation towards representation of Scheduled Castes and Scheduled Tribes in its services and follows the appropriate norms in recruitment.

## **Vigilance Report**

There is nothing to report from vigilance point of view for the period up to March 31st, 2011.

## **Auditor's Report**

1. We have audited the attached Balance Sheet of Harish-Chandra Research Institute, Allahabad as at 31<sup>st</sup> March 2011 and also the Income and Expenditure Account for the year ended on that date annexed thereto. These financial statements are the responsibility of the management of the Institute. Our responsibility is to express an opinion on these financial statements.
2. We conducted our audit in accordance with auditing standards generally accepted in India. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining on a test basis, evidence supporting the accounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.
3. Subject to our comments as per annexure-“A” read with significant accounting policies and notes on accounts appearing in Schedule-15 annexed hereto, we report that:
  - a. We have obtained all the information and explanation, which to the best of our knowledge and belief were necessary for the purpose of our audit.
  - b. In our opinion, proper books of accounts as required by law have been kept by the Institute, so far as it appears from our examination of the books.
  - c. The Balance Sheet and Income and Expenditure Account dealt with by this report are in agreement with the books of accounts.
  - d. In our opinion and to the best of our information and according to the explanations given to us, the said accounts give a true and fair view:
    - i) In case of Balance Sheet, of the state of affairs of the Institute as at 31<sup>st</sup> March 2011.
    - ii) In the case of Income and Expenditure Account, of the excess of expenditure over income of the Institute for the year ended on that date.

For Balram Chandra & Associates.  
Chartered accountants

Place: Allahabad  
Date: 19.07.2011

Partner

## **Annexure to the Auditors' Report**

(Referred to in paragraph 3 of our Report of even date)

1. Library & Publications includes receipt of current journals during the current year for Rs. 2,03,94,992/-. The Current journals received have not been capitalized in books of accounts.
2. Amount recoverable against completed projects shown as claims recoverable are outstanding since long. Institute should take necessary steps to recover or write off the following amounts
  - A. CARDMATH DST since 2004 Rs. 14848.00
  - B. DST (C S Dalawat) since 2005 Rs. 12986.00
  - C. NBHM Grant-K.Gangopadhyay since 2007 Rs. 47533.00
  - D. NBHM Grant- Joseph Samuel since 2007 Rs. 17030.00
  - E. DST- SFT Manoj Kumar since 2007 Rs. 33961.00
3. Institute has carried out a physical verification of fixed assets. The quantitative & value reconciliation are being done with fixed assets register, as such it is not possible for us to comment whether financial records are in agreement with physically verified fixed assets.
4. Balance of EMD, Security Deposits, Sundry Creditors, Loan & Advances and Claims Recoverable etc. are subject to confirmation, reconciliation and consequential adjustments thereof.



<b>HARISH-CHANDRA RESEARCH INSTITUTE</b>					
<b>ALLAHABAD 211 019</b>					
<b>BALANCE SHEET AS AT 31ST MARCH 2011</b>					
<b>As on March 2010</b>	<b>31st</b>			<b>As on 31st March 2011</b>	
		<b>CAPITAL FUND &amp; LIABILITIES</b>	<b>Sch.</b>	<b>Amount in Rs.</b>	<b>Amount - Rs.</b>
95394232.31		CORPUS / CAPITAL FUND	1		59929735.89
81343111.75		PLAN GRANT - Carried over	2		85648223.44
12282357.93		NON-PLAN GRANT Carried over	3		766816.09
127484508.10		CURRENT LIABILITIES AND PROVISIONS	4		161289355.10
<b>316504210.09</b>		<b>TOTAL ==&gt;</b>			<b>307634130.52</b>
		<b>ASSETS</b>			
		FIXED ASSETS	5		
513742188.54		GROSS BLOCK		537888736.54	
3771849.00		ADD : Capitalization of assets- Revenue Grant		1224176.00	
20374699.00		ADD : Capitalization of assets- Plan Grant		37456747.31	
		LESS: Adjustment of Prev.Years		-1308753.10	
-386872171.16		LESS: CUMULATIVE DEPRECIATION		-437846986.58	
151016565.38		Net Written Down Value			137413920.17
15877526.00		DEFERRED REVENUE EXPENSES ( POWER )	6		14289773.40
2145365.58		INVESTMENTS	7		2217581.00
147464753.13		CURRENT ASSETS, LOANS AND ADVANCES ETC.	8		153367483.95
<b>316504210.09</b>		<b>TOTAL ==&gt;</b>			<b>307288758.52</b>

For HARISH-CHANDRA RESEARCH INSTITUTE

As per our separate report of even date attached

**For Balram Chandra & Associates**

CHARTERED ACCOUNTANTS

Raaj Gulati  
ACCOUNTS OFFICER

P B Chakroborty  
ACTING REGISTRAR

Prof. Sumathi Rao  
ACTING DIRECTOR

Partner

Place : Allahabad  
Date : 19.07.2011

<b>HARISH-CHANDRA RESEARCH INSTITUTE</b>				
<b>ALLAHABAD 211 019</b>				
<b>INCOME AND EXPENDITURE ACCOUNT</b>				
<b>FOR THE YEAR ENDED ON 31ST MARCH 2011</b>				
<b>Amount in Rs. Year 2009-10</b>	<b>INCOME</b>	<b>Sch.</b>	<b>Amount in Rs.</b>	<b>Amount in Rs. Year 2010-11</b>
143200000.00	GRANTS / SUBSIDIES	9		144300000.00
99782.00	INCOME ON INVESTMENTS	10		121938.00
2600255.00	INTEREST EARNED	11		3474775.42
2635645.00	OTHER INCOME	12		3434598.61
<b>148535682.00</b>	<b>TOTAL ( A ) ==&gt;</b>			<b>151331312.03</b>
	<b>EXPENDITURE</b>			
73378896.00	ESTABLISHMENT EXPENSES	13	82788701.00	
72922642.50	OTHER ADMINISTRATIVE EXPENSES	14	80058152.87	162846853.87
73072618.81	DEPRECIATION - Current Year (Net total at the year end - corresponding to Schedule 5			52034854.13
0.00	Deferred Revenue Expenses-33KVA Power Line			1587752.60
21782053.00	PENSION,GRATUITY,EL ENCASHMENT- Current Year			20522813.00
<b>241156210.31</b>	<b>TOTAL( B ) ==&gt;</b>			<b>236992273.60</b>
<b>92620528.31</b>	BALANCE BEING EXCESS OF EXPENDITURE OVER INCOME (B-A) Transferred to General Fund			<b>85660961.57</b>
	SIGNIFICANT ACCOUNTING POLICIES & NOTES ON ACCOUNTS	15		

For HARISH-CHANDRA RESEARCH INSTITUTE

As per our separate report of even date attached

**For Balram Chandra & Associates**  
CHARTERED ACCOUNTANTS

Raaj Gulati  
ACCOUNTS OFFICER

P B  
Chakroborty  
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REGISTRAR  
Prof. Sumathi Rao  
ACTING DIRECTOR

Partner

Place : Allahabad  
Date : 19.07.2011



XIth Plan Grants	Received	Total Utilisation	Break-up of Utilisation					Balance Amount
			Revenue	Capitalised			Advance/Work in Progress	
				Capitalisation-upto last year	Capitalisation-Current Year	Capitalised Value (Gross)		
<b>High Performance Scientific Computing</b>	<b>72517000.00</b>	<b>56495551.00</b>	<b>4996074.00</b>	<b>47093412.00</b>	<b>4406065.00</b>	<b>51499477.00</b>		<b>16021449.00</b>
<i>Machinery &amp; Equipments</i>		42289868.00		38958514.00	3331354.00	42289868.00		
<i>Supplies &amp; Materials</i>		4272955.00	98154.00	3461769.00	713032.00	4174801.00		
<i>Major Works (Civil,Electrical &amp; AC)</i>		5059808.00	25000.00	4673129.00	361679.00	5034808.00		
<i>Domestic Travel</i>		155801.00	155801.00					
<i>Salaries</i>		631713.00	631713.00					
<i>Office Expenses</i>		273900.00	273900.00					
<i>Contingency</i>		3811506.00	3811506.00					
<b>Infrastructure(Housing)</b>	<b>35000000.00</b>	<b>2673468.00</b>					<b>2673468.00</b>	<b>32326532.00</b>
<i>Construction Hostal Building</i>		1934019.00					1934019.00	
<i>Contingencies-Misc.(Housing)</i>		739449.00					<b>739449.00</b>	
<b>Infrastructure(Non-Housing)</b>	<b>30300000.00</b>	<b>27649888.00</b>	<b>18007505.00</b>		<b>8658233.00</b>	<b>8658233.00</b>	<b>984150.00</b>	<b>2650112.00</b>
<i>Construction Admin Block</i>		248617.00	248617.00					
<i>Power Requirement &amp; Air-Conditioning(Non-Housing)</i>		19452820.00	13139770.00		6313050.00	6313050.00		
<i>Civil Works -Infrastructure (Non Housing)</i>		1686052.00	1004602.00		681450.00	681450.00		
<i>Contingencies-Misc.(Non-Housing)</i>		4763410.00	3099677.00		1663733.00	1663733.00		
<i>Salaries</i>		514839.00	514839.00					
<i>Advance to Architect</i>		984150.00					984150.00	
<b>Library Development Project</b>	<b>23160000.00</b>	<b>24127964.00</b>	<b>288007.00</b>	<b>18604454.00</b>	<b>5235503.00</b>	<b>23839957.00</b>		<b>-967964.00</b>
<i>Back Volumes</i>		23510729.00		18281526.00	5229203.00	23510729.00		
<i>Mach.&amp; Equipments</i>		583887.00	254659.00	322928.00	6300.00	329228.00		
<i>Salaries</i>		33348.00	33348.00					

contd.--page 2--

<b>Regional Center- Accelerator Based Particle Physic</b>	<b>19483000.00</b>	<b>18914168.50</b>	<b>8921447.50</b>	<b>8389785.00</b>	<b>1602936.00</b>	<b>9992721.00</b>		<b>568831.50</b>
Machinery & Equipments		6128493.00	1497.00	4937173.00	1189823.00	6126996.00		
Supplies & Materials		4615401.50	924236.50	3278052.00	413113.00	3691165.00		
Major Works (Civil,Electrical & AC)		174560.00		174560.00		174560.00		
Salaries		2551543.00	2551543.00					
Domestic Travel		1057806.00	1057806.00					
Foreign Travel		720563.00	720563.00					
Consultancy		537655.00	537655.00					
Contingencies - Collaboration Meetings		3128147.00	3128147.00					
<b>Scientific Computing &amp; Networking(XIth Plan)</b>	<b>68500000.00</b>	<b>45592879.81</b>	<b>17071938.50</b>	<b>8638460.00</b>	<b>14010117.31</b>	<b>22648577.31</b>	<b>5872364.00</b>	<b>22907120.19</b>
Machinery & Equipment		10088726.31	101794.00	6270181.00	3716751.31	9986932.31		
Major Works (Civil,Electrical & AC)		2421841.00	80700.00	1545759.00	795382.00	2341141.00		
NAS-Advance		5872364.00					5872364.00	
Band Width		15412225.50	15412225.50					
UPS & Batteries		9278000.00			9278000.00	9278000.00		
Books & Softwares		1043854.00	1350.00	822520.00	219984.00	1042504.00		
Salaries		526556.00	526556.00					
Office Expenses		352750.00	352750.00					
Quantum Information Processing & Application		596563.00	596563.00					
<b>Special Year in Mathematics</b>	<b>12040000.00</b>	<b>7738969.00</b>	<b>6480062.00</b>	<b>1258907.00</b>		<b>1258907.00</b>		<b>4301031.00</b>
Supplies & Materials		1204035.00	6028.00	1198007.00		1198007.00		
Domestic Travel		467483.00	467483.00					
Foreign Travel		1279132.00	1279132.00					
Salaries		270716.00	270716.00					
National Discussion Meetings		1389626.00	1389626.00					
International Discussion Meetings		1156939.00	1156939.00					
Funding for discussing results at International Fors		874478.00	874478.00					
Consultancy / honorariums		380200.00	380200.00					
Contingencies		508375.00	508375.00					
Misc.Expenses		207985.00	147085.00	60900.00		60900.00		

<b><i>Equipping &amp; Furnishing of Conference Centre</i></b>	<b>1906000.00</b>	<b>1156059.00</b>	<b>5100.00</b>	<b>363080.00</b>	<b>787879.00</b>	<b>1150959.00</b>		<b>749941.00</b>
<i>Machinery &amp; Equipment</i>		1002834.00	5100.00	363080.00	634654.00	997734.00		
<i>Supplies &amp; Materials</i>		153225.00			153225.00	153225.00		
<b><i>Scientific Human Resources Training</i></b>								
<b><u><i>Astrophysics Project</i></u></b>	<b>6330000.00</b>	<b>4294617.25</b>	<b>3390707.25</b>	<b>864267.00</b>	<b>39643.00</b>	<b>903910.00</b>		<b>2035382.75</b>
<i>Machinery &amp; Equipment</i>		843767.00		843767.00		843767.00		
<i>Supplies &amp; Materials</i>		126196.00	79796.00	20500.00	25900.00	46400.00		
<i>Salaries</i>		197849.00	197849.00					
<i>Foreign Travel</i>		346292.00	346292.00					
<i>Domestic Travel</i>		118564.00	118564.00					
<i>International Schools</i>		345357.00	345357.00					
<i>International Meetings</i>		1311689.75	1311689.75					
<i>Office Expenses</i>		15109.50	15109.50					
<i>Contingencies-Astrophysics</i>		40639.00	26896.00		13743.00	13743.00		
<i>Contingencies-Visitors Prog.</i>		608143.00	608143.00					
<i>Contingencies-National Meetings</i>		341011.00	341011.00					
<b><u><i>Condensed Matter Physics</i></u></b>	<b>7680000.00</b>	<b>3134979.50</b>	<b>2171175.50</b>	<b>763414.00</b>	<b>125390.00</b>	<b>888804.00</b>	<b>75000.00</b>	<b>4545020.50</b>
<i>Machinery &amp; Equipment</i>		763414.00		763414.00		763414.00		
<i>Supplies &amp; Materials</i>		156213.00	87313.00		68900.00	68900.00		
<i>Office Expenses</i>		134010.50	125021.50		8989.00	8989.00		
<i>Foreign Travel</i>		246573.00	246573.00					
<i>Instructional Schools</i>		528231.00	528231.00					
<i>International Discussion Meetings</i>		890055.00	890055.00					
<i>Contingencies-CMP</i>		70301.00	22800.00		47501.00	47501.00		
<i>National Level Collaboration Meetings</i>		271182.00	271182.00					
<i>CMP-Advance</i>		75000.00					75000.00	

<u>Neutrino Project</u>	<b>8665000.00</b>	<b>8200410.50</b>	<b>2733080.00</b>	<b>4460427.50</b>	<b>1006903.00</b>	<b>5467330.50</b>		<b>464589.50</b>
<i>Machinery &amp; Equipment</i>		5163307.00	3850.00	4170279.00	989178.00	5159457.00		
<i>Supplies &amp; Materials</i>		366848.50	58975.00	290148.50	17725.00	307873.50		
<i>Salaries</i>		422353.00	422353.00					
<i>Domestic Travel</i>		349851.00	349851.00					
<i>Foreign Travel</i>		1407666.00	1407666.00					
<i>Contingencies</i>		490385.00	490385.00					
<u>String Theory Project</u>	<b>6455000.00</b>	<b>6408822.00</b>	<b>3599976.00</b>	<b>1224768.00</b>	<b>1584078.00</b>	<b>2808846.00</b>		<b>46178.00</b>
<i>Machinery &amp; Equipment</i>		1953872.00		1219668.00	734204.00	1953872.00		
<i>Supplies &amp; Materials</i>		1520682.00	665708.00	5100.00	849874.00	854974.00		
<i>Domestic Travel</i>		497270.00	497270.00					
<i>Foreign Travel</i>		729333.00	729333.00					
<i>Salaries</i>		501750.00	501750.00					
<i>Consultancy</i>		1205915.00	1205915.00					
<b>Grand Total</b>	<b>29203600 0.00</b>	<b>206387776.56</b>	<b>67665072.75</b>	<b>91660974.50</b>	<b>37456747.31</b>	<b>129117721.81</b>	<b>9604982.00</b>	<b>85648223.44</b>

Amount - Rs.	SCHEDULE - 4 FORMING PART OF BALANCE SHEET AS AT 31ST MARCH 2011		Amount - Rs.
<b>As on 31st March 2010</b>	<b>CURRENT LIABILITIES AND PROVISIONS</b>		<b>As on 31st March 2011</b>
5606810.90	<b>A- Current Liabilities</b>		<b>9873494.90</b>
	1. EMD/ Security Deposits Payable		
	2. Sundry Creditors		<b>15278289.20</b>
7805905.00	a. Parties - Amount Payable	11397089.00	
644934.80	b. Staff - Amount Payable	1001689.80	
957969.00	c. Staff- Terminal Dues transfers	957969.00	
1868598.40	d. Other Recoveries Refundable	1921541.40	
	3. Statutory Liabilities		<b>1026330.00</b>
358400.00	a. Income Tax ( deducted from staff ) Payable	693655.00	
71681.00	b. Income Tax ( deducted from parties ) Payable	332675.00	
3474.00	c. Trade Tax / VAT (deducted from parties ) Payable	0.00	
	4. Amounts refundable against completed sponsored projects/schemes		<b>232632.50</b>
55400.50	Serc Schools	55400.50	
36280.00	NBHM - Projects	177232.00	
	5. Receipts against ongoing sponsored projects/schemes		<b>8389048.50</b>
48004.00	CSIR Grants	86504.00	
127104.00	DST Project- H K Jassal	0.00	
192184.00	DST Project- Aarti Girdhar	21282.00	
0.00	DST Project- Satya Deo	3650.00	
301740.00	J.C.Bose Fellowship (Ashoke Sen)	1255774.00	
0.00	J.C.Bose Fellowship (A.Raychaudhuri)	1119728.00	
269749.00	Swarnjayanti Fellowship (Rajesh Gopakumar)	440072.00	
1488675.00	EU Research Project( Prof. Pinaki Majumdar)	1049600.00	
	DAE-SRC Outstanding Research Investigator		
651016.00	Award	1186533.00	
0.00	Ramanujan Fellowships	953084.00	
0.00	India-EU Research Project	206759.00	
0.00	RADCOR 2011	1108145.00	
960965.50	UK-India Research Educational Fund	847547.50	
23395.00	CPSTIO Project	23395.00	
8332.00	Science Education Prog.-INSA	48332.00	
38643.00	TPSC Fund	38643.00	
<b>21519261.10</b>	<b>Total A</b>		<b>34799795.10</b>
	<b>B- PROVISIONS</b>		
84161134.00	1. Pension ,Gratuity, encashment of E.L. B/F	105943187.00	
21782053.00	Add : Additions during the year	20522813.00	126466000.00
22060.00	2. Audit Fee payable		23560.00
<b>105965247.00</b>	<b>Total B</b>		<b>126489560.00</b>
<b>127484508.10</b>	<b>Total A + B</b>		<b>161289355.10</b>



## Schedule 5 -forming part of Balance Sheet as at 31st March 2011

## Statement of Fixed Assets , Depreciation &amp; Depreciation Fund

Sl.No.	Description	Opening Gross Block of Assets as on 01.04.2010	Gross Block			Total Gross Block of Assets as on 31.03.11	Depreciation Reserve							Net Block of Assets
			Additions/Deductions during the year				Depreciation Rate	W.D.V. as on 31.03.10	Depreciation Charged on value (Total Gross Block-Total Cumulative Dep. Reserve upto last year)	Depreciation for the year 2010-11	Cumulative dep. Reserve as on 31.03.2010	Adjustments	Depreciation Reserve up to 31.03.2011	W.D.V.as on 31.03.11
			Funded from Non-Plan Grants as on 31.03.2011	Deductions	Funded from Plan Grant as on 31.03.2011									%
1	Land & Building	149796326.85	0.00		0.00	149796326.85	10%	58617530.57	58617530.57	5861752.96	91178796.28	0.00	97040549.24	52755777.61
2	Furniture & Fixtures	38688571.32	448795.00	0.00	4342081.00	43479447.32	10%	17554325.27	22345201.26	2234520.13	21134246.06	0.00	23368766.19	20110681.13
3	Other Assets	29494629.20	339184.00	0.00	6702625.00	36536438.20	15%	11780601.90	18822410.90	3013696.65	17714027.30	0.00	20727723.95	15808714.25
4	Guest House Assets	3516201.34	141951.00	0.00	266694.00	3924846.34	10%	1480244.54	1888889.56	266668.02	2035956.78	0.00	2302624.80	1622221.52
5	Library Assets	172052130.02	0.00	8753.10	5449187.00	177492563.92	25%	24195359.87	29635793.78	7408948.45	147856770.14	8753.10	155256965.49	22235598.44
6	Machinery & Equipments	140392106.40	139069.00	1300000.00	19979935.31	159211110.71	60%	36041954.55	54860958.86	32916575.32	104350151.85	1051285.61	136215441.56	22995669.15
7	Misc. Equipments	3948771.41	155177.00	0.00	716225.00	4820173.41	15%	1346548.68	2217950.66	332692.60	2602222.75	0.00	2934915.35	1885258.06
	<b>Grand Total====&gt;</b>	<b>537888736.54</b>	<b>1224176.00</b>	<b>1308753.10</b>	<b>37456747.31</b>	<b>575260906.75</b>		<b>151016565.38</b>	<b>188388735.59</b>	<b>52034854.13</b>	<b>386872171.16</b>	<b>1060038.71</b>	<b>437846986.58</b>	<b>137413920.17</b>

Amount - Rs.	SCHEDULE - 6 FORMING PART OF BALANCE SHEET AS AT 31ST MARCH 2011		Amount - Rs.
<i>As on 31st March 2010</i>	<b>Deferred Revenue Expenses (Power)</b>		<i>As on 31st March 2011</i>
15877526.00	Composite Work for Power Line	15877526.00	
0.00	Less : Deferred Revenue Expenses Written Off	-1587752.60	
<b>15877526.00</b>	<b>Total</b>		<b>14289773.40</b>

Amount - Rs.	SCHEDULE - 7 FORMING PART OF BALANCE SHEET AS AT 31ST MARCH 2011		Amount - Rs.
<i>As on 31st March 2010</i>	<b>Investments</b>		<i>As on 31st March 2011</i>
1637364.00	Fixed Deposit in State Bank Of India b/f	2145365.58	
	Add: Interest Earned during the year	9861.42	
		2155227.00	
508001.58	Add: Interest Accrued during the year	62354.00	
<b>2145365.58</b>	<b>Total</b>		<b>2217581.00</b>

Amount - Rs.	SCHEDULE - 8 FORMING PART OF BALANCE SHEET AS AT 31ST MARCH 2011		Amount - Rs.
<i>As on 31st March 2010</i>	<b>CURRENT ASSETS, LOANS AND ADVANCES ETC.</b>		<i>As on 31st March 2011</i>
	<b>A- Current Assets</b>		
81823.25	1. Cash Balance in hand		1739.25
	2. Bank Balances		
	a. Current Accounts		
51684.97	SBI (MB ) Current A/C		64904.97
	b. Savings Accounts		117645270.94
37098651.89	Bank Of Baroda - 101 A/C	44927094.52	
62685577.00	Bank Of Baroda - 102 A/C	47977691.69	
15451322.38	Bank Of Baroda - 108 A/C	20297157.88	
2893142.85	Bank Of Baroda - 109 A/C	3335181.85	
0.00	Bank Of Baroda - RADCOR	1108145.00	
	A/C		
	c. Short Term Deposits with BoB HRI Branch		
2013210.00	Ald.b/f	2655542.00	
	Add: Interest Earned during the year	17834.00	
		2673376.00	
642332.00	Add: Interest Accrued during the year	134731.00	2808107.00
1104.12	3. Postage in hand (Franking Machine )		6708.12
<b>120918848.46</b>	<b>Total A</b>		<b>120526730.28</b>

SCHEDULE -8 FORMING PART OF BALANCE SHEET AS AT 31ST MARCH 2011			
Amount - Rs.	CURRENT ASSETS, LOANS AND ADVANCES ETC.	contd.	Amount - Rs.
	<b>B - LOANS, ADVANCES AND OTHER ASSETS</b>		<b>As on 31st March 2011</b>
	<b>1. Loans to Staff</b>		<b>351566.00</b>
29400.00	Festival Advance	27000.00	
69000.00	Vehicle Advance	43800.00	
101798.00	Traveling Advance -Within India	151366.00	
93600.00	Traveling Advance -Outside India	129400.00	
	<b>2. Advances and other amounts recoverable in cash or in kind or for value to be received :</b>		
	a. On Capital Account		<b>19565792.00</b>
20715135.00	Advance to Suppliers for Journals	19565792.00	
	b. Deposits		<b>6761813.67</b>
2574200.00	With UPSEB	2574200.00	
262580.67	With Telephone Deptt.	267580.67	
39900.00	With Gas Agency	39900.00	
1441540.00	Securities in Hand -Fixed Deposits of Parties	3838133.00	
0.00	Advance Deposit City Hostel Rental	42000.00	
	<b>3. Income Accrued :</b>		<b>61450.00</b>
	a. On Loans and Advances		
55080.00	1. Vehicle	61450.00	
	<b>4. Claims Receivable</b>		
	a. Amount Recoverable against completed projects/schemes		<b>862234.00</b>
14848.00	CARDMATH(DST Meeting)	14848.00	
12986.00	DST ( C S Dalawat)	12986.00	
33961.00	Grant Receivable-DST-SFT (Manoj Kumar)	33961.00	
0.00	Finance Officer HNB Garhwal University	40000.00	
47533.00	Grant Receivable - NBHM (Krishnendu G.)	47533.00	
17030.00	Grant Receivable - NBHM (Joseph samuel)	17030.00	
417389.00	INO Conference	510009.00	
185867.00	NBHM Fellowships	185867.00	
	b. Others		<b>4995801.00</b>
68272.00	Claims Receivables- Parties	4893027.00	
110585.00	Claims Receivables- Staff	102774.00	
	<b>5. Payment against ongoing sponsored projects/schemes</b>		<b>242097.00</b>
50000.00	Registrar IIT Roorkee	50000.00	
16000.00	Registrar IIT Kanpur	12000.00	
25000.00	ISCQI-2008 Bhubneshawar	25000.00	
30458.00	ICM 2010	0.00	
103742.00	Jest Examination	125097.00	
30000.00	IIT Guwahati	30000.00	
<b>26545904.67</b>	<b>Total B</b>		<b>32840753.67</b>
<b>147464753.13</b>	<b>TOTAL A + B</b>		<b>153367483.95</b>

**HARISH-CHANDRA RESEARCH INSTITUTE**  
**ALLAHABAD 211 019**

SCHEDULES FORMING PART OF INCOME & EXPENDITURE FOR THE YEAR ENDED ON 31ST MARCH 2011

Amount in Rs. Year 2009-10	<b>SCHEDULE 9 - GRANTS / SUBSIDIES</b> (Grants & Subsidies Received)		Amount in Rs. Year 2010-11
143200000.00	1. Central Government - DAE	144300000.00	
0.00	2. State Government	0.00	144300000.00
<b>143200000.00</b>	<b>Total</b>		<b>144300000.00</b>

Amount in Rs. Year 2009-10	<b>SCHEDULE 10 - INCOME ON INVESTMENTS</b>		Amount in Rs. Year 2010-11
0.00	1. INTEREST received on deposits with UPPCL	121938.00	
99782.00	2. OTHERS (Specify) ( Misc. Receipts -Recovery of Excess Pension)	0.00	121938.00
<b>99782.00</b>	<b>Total</b>		<b>121938.00</b>

Amount in Rs. Year 2009-10	<b>SCHEDULE 11- INTEREST EARNED</b>		Amount in Rs. Year 2010-11
2592570.00	1. On Deposits with Scheduled Banks		3468405.42
7685.00	2. On Loans to Employees		6370.00
<b>2600255.00</b>	<b>Total</b>		<b>3474775.42</b>

Amount in Rs. Year 2009-10	<b>SCHEDULE 12 - OTHER INCOME</b>	Amount in Rs. Year 2010-11
1492984.00	1. License Fee & Electricity from Rented Buildings	1618649.00
551982.00	2. Guest House Receipts	589449.00
242610.00	3. Pantry Receipts	297618.00
89450.00	4. Sale of Tenders	28950.00
50720.00	5. Recovery of Telephone Charges	51921.00
57600.00	6. Recovery of Cable TV Charges	60000.00
75867.00	7. Recovery of Transport Charges	362537.00
3600.00	9. Sale of Scraps	15402.00
0.00	10. Profit on Sale of Assets	151285.61
70832.00	11. Misc.Income	258787.00
<b>2635645.00</b>	<b>Total</b>	<b>3434598.61</b>

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**ALLAHABAD 211 019**

**SCHEDULES FORMING PART OF INCOME & EXPENDITURE FOR THE YEAR ENDED ON 31ST MARCH 2011**

<b>Amount in Rs. Year 2009-10</b>	<b>SCHEDULE 13 - ESTABLISHMENT EXPENSES</b>		<b>Amount in Rs. Year 2010-11</b>
52588593.00	( A ) PAY AND ALLOWANCES		56329844.00
12681920.00	( B ) FELLOWSHIP & HONORARIUM		17331938.00
1958730.00	( C ) CONTRIBUTION TO PROVIDENT FUND ( CPF & NPS)		1490976.00
1509950.00	( D ) PENSION		1868964.00
319101.00	( E ) RETIREMENT BENEFITS		748207.00
155444.00	( F ) OVERTIME ALLOWANCE		164050.00
840546.00	( G ) LEAVE TRAVEL CONCESSION		1282125.00
2820176.00	( H ) MEDICAL AID		3127090.00
504436.00	( I ) STAFF WELFARE ACTIVITIES		445507.00
<b>73378896.00</b>	<b>Total</b>		<b>82788701.00</b>
<b>Amount in Rs. Year 2009-10</b>	<b>SCHEDULE 14 - OTHER ADMINISTRATIVE EXPENSES ETC.</b>		<b>Amount in Rs. Year 2010-11</b>
	a) Travel Expenses - Academic & Admin. Staff		
1500291.00	Within India	1620165.00	
1352447.00	Outside India	1137237.00	2757402.00
624648.00	b) Conference /Symposia		471978.00
293717.00	c) Furniture & Fixtures - From Non-Plan Grant		125127.00
2984370.00	d) Computers and Computer Service & Maintenance		3027398.00
1081333.00	e) Supplies & Materials		1249046.00
20759940.00	f) Library & Publications		21653361.00
4674903.00	g) Watch & Ward Services		7726983.00
7920944.00	h) House Keeping Services	-	11233349.00
	i) Maintenance Expenses		
2748379.00	Civil Maintenance	3944054.00	
1477339.00	Lawn Maintenance	1611260.00	
634710.00	Electrical Installations	1009381.00	
1120107.00	Misc.Equipment / Installations	926347.00	
1239230.00	Air Conditioners	1322052.00	
0.00	Fire Extinguishers	65636.00	
30800.00	Gas Bank	15400.00	
72110.00	Aqua Guards	22990.00	
36000.00	Elevator	25800.00	
55978.00	Photocopiers	112177.00	9055097.00

**HARISH-CHANDRA RESEARCH INSTITUTE**

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**SCHEDULES FORMING PART OF INCOME & EXPENDITURE FOR THE YEAR ENDED ON 31ST MARCH  
2011**

590793.00 124943.00 708865.00	j ) Departmental Canteen / Guest House & Hostels Pantry City Guest House Campus Guest House & Hostels	702058.00 137313.00 1166014.00	2005385.00
9017748.00 6953394.00	k ) Electricity & Power Electricity Generator Expenses	12754924.00 915885.00	13670809.00
76560.00 175878.00 3121886.00 467196.00	l ) Vehicle Running & Maintenance Staff Cars Hired Autos Hired Buses Hired Vehicles (Vans etc.)	56373.00 211975.00 3589248.00 548157.00	4405753.00
129288.00 1373416.00	m ) Postage Telephone & Communication Charges Postage Telephone, Telex ,Telegrams Etc.	96761.00 1108420.01	1205181.01
397912.00 84105.00 22060.00 682140.00	n ) Stationery & Printing o ) Consultancy & Legal Expenses p ) Auditors Remuneration q ) Advertisements r ) Others		364222.00 39623.00 22060.00 724950.00 320428.86
83619.50 58255.00 47100.00 2806.00 44221.00 153211.00	Bank Charges Binding Charges HRI Pre-School Liveries News Papers & Periodicals Office Expenses	29787.50 54652.00 65000.00 15904.00 43778.00 111307.36	
<b>72922642.50</b>	<b>Total</b>		<b>80058152.87</b>

**HARISH CHNADRA RESERACH INSTITUTE**  
**ALLAHABAD-211019**

**SCHEDULE-15 FORMING PART OF BALANCE SHEET AND INCOME AND EXPENDITURE ACCOUNT  
FOR THE YEAR ENDED ON 31<sup>st</sup> MARCH 2011**

**SIGNIFICANT ACCOUNTING POLICIES & NOTES ON ACCOUNTS.**

**Basis of Accounting**

1. The accounts are prepared under historical cost convention on an accrual basis.
2. Accounting policies not specifically referred to otherwise are consistent and inconsonance with generally accepted accounting principles except as stated in Sl. Nos. 9,10 & 12 below.
3. Figures of the previous year and current year have been regrouped wherever necessary to confirm classification.

**Fixed Assets**

4. Fixed Assets are stated at cost of acquisition inclusive of freight, duties, taxes and incidental expenses related to the acquisition. The Fixed Assets are subject to physical verification.
5. Realization made from Sale of Assets & Scrap is taken as Other Income in the year of receipt.

**DEPRECIATION**

6. Depreciation on Fixed Assets has been provided on written down value method as per rates specified in the Income Tax Act.1961.

• A Land	:	Nil
• B Building	:	10%
• C Plant Mach. & Equipments	:	15%
• D Vehicles	:	15%
• E Furniture & Fixtures	:	10%
• F Office Equipments	:	15%
• G Computer/Peripherals	:	60%
• H Electrical Installations	:	10%
• I Books & Journals	:	25%
• J Other Fixed Assets	:	15%
• K Solar Lights & Systems	:	80%

- 6.1 Depreciation has been charged for the full year on additions made during the year. No Depreciation is charged on assets, which is sold during the year.

**Investment**

7. Investments are valued at cost plus interest accrued thereon.

## Plan Funds

8. Assets purchased from XIth plan funds during the year for Rs.3, 74,56,747.31P. have been capitalized under the appropriate heads of accounts of Fixed Assets.

## Funds for Projects/Schemes

9. All grants in respect of projects/Schemes are accounted on realization basis.

The unspent amount of grants received in respect of the projects/Schemes is shown under Current Liabilities in the Balance Sheet under the head "Receipts against ongoing sponsored projects/schemes" and excess of payments made over the grants received in respect Project /Schemes are shown under Current Assets in the Balance Sheet under the head "Payments against ongoing sponsored Projects/Schemes".

## Expenses

10. Consumable, stores and stationery are charged to the Income and Expenditure Account in the year of its purchase.
11. Email, VSAT facility, Internet / Broadband charges, Annual Maintenance charges of fixed assets, Up-date Allowances, PRIS are charged to the Income & Expenditure account in the year of its payment. Rent receipts are taken into Income & Expenditure account on cash basis.
12. Deferred Revenue Expenditure incurred on composite work of Power Line is to be written off 1/10<sup>th</sup> per year over a period of ten years.

## Income /Receipts

13. Interest income on UPPCL deposit and bank accounts are recognized on receipt basis.

## Retirement Benefits

14. Provision for accrued liability towards Gratuity, Leave Encashment and Pension has been made on actuarial valuation basis.
15. Interest Liability on NPS balances has not been provided for.

## Taxation

16. Since there is no taxable income as per the provisions of Income Tax act 1961, provision for Income Tax has not been made.

As per our separate report of even date attached.

**Balram Chandra & Associates**  
Chartered Accountants

for Harish Chandra Research Institute

Partner  
Sd/-  
(Raaj Gulati)  
(Accounts Officer)

Sd/-  
(P B Chakroborty)  
Acting Registrar

Sd/-  
(Prof.Sumathi Rao)  
Acting Director

Place: Allahabad  
Date: 19.07.2011



**Replies to Auditors Notes on A/cs – FY 2010-11**

<b>S.No.</b>	<b>Notes on Accounts</b>	<b>Compliance</b>
1.	Library & Publications includes receipt of current journals during the current year for Rs.2,03,94,992/-. The Current journals received have not been capitalized in books of accounts.	The Institute was advised by the Joint Secretary(Fin.) that Journals of the Library should not be capitalized and the Institute should inform the Auditors in this regard accordingly.
2.	Amount recoverable against completed projects shown as claims recoverable and Advance for Journals are outstanding since long. Institute should take necessary steps to recover or write off the following amounts: A. CARDMATH DST since 2004 Rs.14848.00 B. DST (C S Dalawat) since 2005 Rs.12986.00 C. NBHM Grant-K. Gangopadhyay since 2007 Rs.47533.00 D. NBHM Grant-Joseph Samuel since 2007 Rs.17,030.00 E. DST-SFT Manoj Kumar since 2007 Rs.33961.00	The Institute is trying hard to realise these amounts and in case they remain unrealizable, necessary steps for writing off will be initiated.
3.	Institute has carried out a physical verification of fixed assets. The quantitative & value reconciliation is being done with fixed assets register, as such it is not possible for us to comment whether financial records are in agreement with physically verified fixed assets.	The reconciliation process is going on and is likely to be completed very shortly. So far no major discrepancy has been observed.
4.	Balance of EMD, Security Deposits, Sundry Creditors, Loan & Advances and Claims Recoverable etc. are subject to confirmation, reconciliation and consequential adjustments thereof.	This is a routine process which is being carried out at periodical intervals. No discrepancy / disagreement has been found so far.

Sd./-  
(Raaj Gulati)  
Accounts Officer

Sd./-  
(P.B. Chakraborty)  
Acting Registrar

Sd./-  
(Sumathi Rao)  
Acting Director