

**REPORT ON THE ACTIVITIES OF
SCIENCE & TECHNOLOGY DEPARTMENT FOR THE YEAR 2011-12**

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1. INTRODUCTION

The Science & Technology Department is the nodal Department for the promotion of the Science & Technology in the State. The manifold scientific and technological activities are carried out by different agencies like Odisha Renewable Energy Development Agency (OREDA), Odisha Space Application Centre (ORSAC), Odisha Bigyan Academy (OBA), Pathani Samanta Planetarium (PSP), Institute of Mathematics & Applications (IMA) and Institute of Materials Science (IMS) working under the aegis of this Department with the following objectives:-

- 1.1. To keep abreast of the latest developments in the field of Science & Technology and to take steps for dissemination of these among institutions like industries, research laboratories, Universities and among scientists and technologists.
- 1.2. To co-ordinate the R&D Programmes of different departments, industrial and research institutions and to ensure scientific and technical co-operation among these institutions and agencies.
- 1.3. To formulate and fund, research and application programmes in the field of science and technology,
- 1.4. To encourage, develop and extend the use of renewable sources of energy including energy plantations.
- 1.5. To popularize Remote Sensing Technology and make effective use of it.
- 1.6. To popularize science and technology among students and the people so as to inculcate in them a scientific temper and attitude.
- 1.7. Promote and popularize appropriate rural technologies.
- 1.8. Development of Library cum Documentation Centre for Science & Technology.
- 1.9. Science & Technology communication through awareness promotion, support to Institutions for Seminars/Workshops etc., development of Science Centres and administration of Pathani Samanta Planetarium.
- 1.10. To conduct Science & Technology Entrepreneurship Development Programmes.

- 1.11. To undertake fundamental research in mathematics and its application.
- 1.12. To conduct basic and applied research in the frontier areas of Material Science & Engineering.

2. STATE COUNCIL ON SCIENCE & TECHNOLOGY

The State Council on Science & Technology functions as the highest policy making body for development of Science & Technology and oversees the implementation of the programmes undertaken in the field of Science and Technology in the State. The activities pertaining to various programmes / schemes undertaken during the year 2011-12 are stated below.

2.1. Scholarship at Post Graduate Level on Basic Sciences

To promote and encourage the meritorious students to pursue their Post Graduate studies in Basic Science subjects such as Physics, Chemistry, Mathematics, Botany, Zoology and Geology, Government of Odisha in Science and Technology Department is implementing a Scholarship programme @ Rs 2000/- per month for 100 students during the year-2011-12 under the aegis of the State Council on Science and Technology. The Institute of Mathematics and Applications, Bhubaneswar is the Nodal agency to implement this scheme as per rules.

2.2. UNESCO- Kalinga Prize

The UNESCO Kalinga Prize for popularization of Science is an International Award and created in the year 1951 .The prize is being administered by UNESCO, Paris since 1952.

The State Council on Science & Technology, Odisha coordinates for UNESCO- Kalinga Prize. The donation for this prize is shared by the Govt. of India, Govt. of Odisha and Kalinga Foundation Trust since the year 2005. Government of Odisha in Science & Technology Department has been pleased to release Rs.20.00 lakh to Kalinga Foundation Trust, Bhubaneswar during 2011-12 to meet the enhanced share of Odisha Government from the award year 2013 in addition to Rs 25.00 lakh released earlier.

The 60th anniversary of UNESCO Kalinga Prize was celebrated during 4-5th January, 2012 at KIIT campus, Bhubaneswar in conjunction with the 99th Indian

Science Congress. High level dignitaries from UNESCO and Govt. of India including past UNESCO Kalinga Prize awardees, Jury members, delegates from International Science Museums attended the function.

2.3. Establishment of Sub-Regional Science Centers.

The State Council on Science & Technology is taking active steps for establishment of Sub-Regional Science Centers at different Regions in Odisha to develop scientific temper, to promote creative activities, to highlight important and relevant issues in science and technology and to popularize these for the benefit of the community especially for students and young mass. Action has been taken for setting up Sub Regional Science Centre, Nrusinghnath in Bargarh District, Jeypore in Koraput District and Keonjhar in the district Keonjhar.

The land which was identified in Paikmal Tahasil for setting up of Sub Regional Science Centre, Nrusinghnath is not suitable as per the field visit report of the experts of NCSM, Kolkata during August,2011. Accordingly the Collector Bargarh has been requested to search for alternate site around Bargarh Dist. HQ for the purpose.

2.4. Establishment of District Science Centers (New Scheme)

The State Council on S&T is taking steps for establishment of District Science Centre as State initiatives. The proposed District Science Centre will be a small one in comparison to the Sub Regional Science Centre cited above. The site selection criteria prescribed by NCSM will be followed scrupulously. The prescribed guideline for setting up of Sub Regional Science Centre will be followed as a basis to prepare the plan for construction of a District Science Centre.

2.5. Celebration of National Science day

The State Council on Science & Technology is taking steps for celebration of National Science Day -2012 in collaboration of different High Schools of the state through Odisha Bigyan Academy. The Project proposal of Odisha Bigyan Academy for the purpose has been submitted to the DST, Government of India for sanction. The theme of this year is “**Clean Energy Options and Nuclear Safety**”.

2.6. Participation in the 99th Indian Science Congress, KIIT University, Bhubaneswar.

State Council on Science & Technology took initiatives for participation in the 99th Indian Science Congress held at KIIT University campus, Bhubaneswar from 3-7, January, 2012 and successfully coordinated with the Organizers and the participating Institutions.

The Team Odisha participated in the 99th Indian Science Congress. The participation was well organized under the guidance of Commissioner-cum-Secretary to Govt. S&T Department. The Director Biotechnology-cum-Additional Secretary to Government, Science & Technology Department was the State Coordinator and OREDA, Bhubaneswar was the Nodal Agency to organize the participation in the Mega event. The theme of 99th ISC was “**Science and Technology for Inclusive Innovation- Role of Women**”. The participating agencies like OREDA, ORSAC, PSP, Biotechnology Cell, IM&A, and OBA displayed exhibits in accordance with the theme of the 99th Indian Science Congress. The state bagged the “Best State” prize in the “Pride of India” Science Exhibition.

2.7. Research Grant under “Development of Biotechnology”

State Council on Science & Technology is sanctioning Research Grant under the scheme “Development of Biotechnology” and releasing to the Principal Investigators of different research projects.

2.8. Patent Information Centre

The State Council on Science & Technology has taken steps for establishment of Patent Information Centre (PIC) in Odisha. The project will run for a period of 5 years with the financial assistance from the Department of Science & Technology (DST), Government of India. An amount of Rs.28,43,000/- (Rupees twenty eight lakh forty three thousand) only has been sanctioned and Rs.7,37,000/- has been released by the DST during the current financial year 2011-12.

The project will be run by a Project Scientist to be recruited on contractual basis by the S&T Department, Odisha with consolidated salary @ Rs.20,000/- pm. The project would be monitored by a monitoring committee comprising of experts from DST, Govt. of India. The MOU will be signed between Science & Technology Department, Odisha and DST, Govt. of India before implementation of the project.

2.9. Participation in the State S&T Councils meeting at New Delhi.

State Council on S&T, Odisha participated in the 15th All India State S&T Councils / Departments interaction meeting on “Strengthening Central-State Technology Partnerships for the formulation of S&T propelled XII Five Year Plan for State S&T” on 11th and 12th July, 2011 at INSA, New Delhi. Eminent Scientists from different Departments Govt. of India including Dr. T. Ramasami, Secretary, Department of Science & Technology, attended the meeting and finalized the 12th Five year plan of all S&T Councils. The Commissioner-cum-Secretary to Govt., Science & Technology Dept., Odisha and Senior Scientist of S&T Department attended the meeting.

2.10. Constitution of Task Force on Technology Labs and improving Educational Curriculum for the courses on Advance Technology.

In the knowledge-based economy, higher education plays a vital role in shaping the manpower required for R&D, Industry and Educational Institutions. The Government of Odisha in Science & Technology Department is planning to constitute a Task Force to identify the equipment at different levels of Research and Development to strengthen and promote infrastructure and other facilities in various Educational / Research and Industrial Institutions and to assess the budget thereof in the areas of Advance Technology viz. Micro Electronics, New Materials and Nanotechnology, Advance Mechanical and Civil Engineering Design, Software Development and Technologies along with their Course Curriculum and regulatory mechanism. Based on Task Force report, the necessary budgetary provision is to be made for improving the condition of Labs in different Educational Institutions.

2.11. Documentation Centre-cum-Library

This Department has a Documentation Centre-cum-Library which establishes a close link with the Research Activities in the State and provides up-to-date information to Research Scientists in various fields of specialization. The library has a good number of Books and Journals. State Council on S&T is also regularly subscribing Magazine, Journals and Books for the said Library of Science & Technology Department. The conference room of the DCL has been renovated during 2011-12.

3. DEVELOPMENT OF BIOTECHNOLOGY

Biotechnology is a frontier area of technology with immense benefits to society in diverse areas such as Food Security, Nutritional Supplementation, Health

Care Productions and Industrial applications. Considering the diversified resources of the State, this cutting edge technology has a potential to make a significant contribution to the economy of the State.

- Research grant has been sanctioned for 11 Research & Development Projects in Biotechnology.
- Government of Odisha is developing a State of the Art Biotech Pharma IT Park over an area of about 64.613 acres at Mouza-Andharua under Bhubaneswar Tahasil in a Public –Private Partnership (PPP) mode.
- Within this Park, over about 10 acres of land , a Biotechnology Incubation Centre (BTIC) will be developed by the State Government for use by researchers, entrepreneurs and students.
- A Task Force Committee on Biotechnology has been constituted to strengthen and promote infrastructure and Lab. facilities in various Universities/ Educational Institutes of the State.
- Active steps have been initiated for development of two more Biotech Parks in the State i.e. one at Deras, Khurda and other Marine Biotechnology park in Ganjam district.
- The Science & Technology Department through its agencies and Biotechnology wing have participated in the 99th Indian Science Congress held from 3-7th January, 2012 at KIIT, Bhubaneswar.
- Financial assistance has been provided to Sambalpur University, JyotiVihar, Burla for organizing an International Conference on Plant Science in Post Genomic Era (ICPSPGE-2011) at School of Life Sciences, Sambalpur University, Burla.

4. ODISHA RENEWABLE ENERGY DEVELOPMENT AGENCY

Odisha Renewable Energy Development Agency (OREDA), under the Depart of Science & Technology, Govt of Odisha is a society constituted under societies Registration Act-1860. The main objectives of this Agency in the development of New and Renewable Source of Energy are:

- to encourage the development and accelerated utilization of renewable energy sources wherever they are technically and economically viable.
- to improve the access to and availability of renewable , decentralized sources of energy particularly for the rural population.

- to contribute towards balanced rural and urban development as well as development of backward, hilly and tribal areas by enabling the use of locally available decentralized renewable energy sources and to create gainful employment opportunity with due importance for ensuring access to woman and other disadvantaged group to employment opportunities.
- to reduce environmental degradation resulting from deforestation.

4.1. Remote Village Electrification Programme (RVEP)

The objective of the programme is electrification of those un-electrified remote census villages and remote un-electrified hamlets of electrified census villages where grid connectivity is either not feasible or not cost effective through conventional sources of energy with the financial assistance of Government of India and State Government. So far 650 remote villages have been covered under this Programme.

4.2. Renewable Energy power Project.

4.2.1 Solar Power Projects

OREDA has been proactively promoting solar power projects under the Jawaharlal Nehru National Solar Mission with a view to fulfill the solar power purchase obligation of the State as well as for trading Renewable Energy Certificates (REC) within and across the State.

For the current year the solar power obligation of the State is about 24 MU. So far 9 Developers have signed PPAs for a total generation of about 20.8 MU. More solar power developers are being encouraged to set up power plant in the state so as to meet our own obligations and at the same time trade renewable energy certificates.

So far 4 MW @ 1MW each solar power plant and one 5 MW solar power plant have been commissioned in different areas of the state under the RPSSGP and NTPC Vidyut Vyapar Nigam Ltd respectively.

4.2.2 Biomass Power Projects:-

The Biomass Power potential of the State has been estimated to be about 300 MW.

So far the State Technical Committee has cleared a total of 11 projects for a cumulative capacity of 138 MW. Of these, 9 developers have already signed PPAs with GRIDCO for a total capacity of 118 MW. The first 20 MW project in Dhenkanal has been commissioned in all respect and the said project is commercially operated since 1.12.2011.

These projects would pump about 651 MU to the grid which entirely covers the non solar renewable obligation of the State for the current year as well as coming few years.

4.2.3 Wind Power Projects:

The estimated wind power potential in Odisha is about 800 MW. Wind resource assessments are being taken up in 15 sites by C-wet, Chennai, an organization under the Ministry of new and renewable Energy, GOI and Suzlon and Regen, wind power majors in private sector. A tender for putting of met mast in 10 locations of the state has been floated and hosted in OREDA web site on 7.2.2012 for wide circulation as well as submission of offer from the eligible entrepreneurs of the country.

4.3 National Biogas and Manure Management Programme (NBMMP)

The National Biogas and Manure Management Programme (NBMMP) are a high priority Central Sector Scheme, and a part of the 20-Point Programme. It can be used for cooking and lighting purpose. During the year 2010-11 the state had achieved 6050 family type biogas plants

During 2011-12 a total of 2452 domestic biogas plants have been constructed in the state till end of December' 2011 against a target of 8000 plants. It has been proposed to achieve balance 5548 biogas plant during the last quarter of the current year.

4.4 SPV Programme.

4.4.1. Street Lighting System: Against the sanction of 80 sets of SPV Street Lighting System (SLS) by the MNRE Govt of India 55 sets of SPV SLS of such system have been commissioned in the district of Keonjhar and Sundargarh

4.4.2 SPV Power Plant: One 650 Wpk SPV Power plant has been commissioned at Badatamera Seva Sharma of Nowrangpur district.

A sum of Rs, 8.00 lakhs has been received from S&T Deptt. under TSP. 2 kwp SPV power plant to be installed at Palia Seva sharma of Nowrangpur district has been commissioned. The work order has been placed with the firm for installation of 6 KWP SPV power plan and 1800 Wp SPV pumping system at Govt. (SSD) higher secondary school under Chadhandi block of Nawarangpur district. Apart from this the work for 13 SPV power plant is under progress in 13 sevasharam of Nawrangpur district..

4.5 Solar Thermal programme .

During the current year solar water heating system of 2000 Litres per day (LPD) system will be installed at Govt (SSD) High School Dhadipani of Nawarangpur district for supply of hot water to kitchen and other use point of the school. Tender has been floated for selection of supplier for installation and commissioning of the system.

4.6 Energy Plantation & Bio-Diesel Production

The scheme of Jatropha plantation through MGNREGS has been suspended vide Panchayati Raj Department, Govt of Odisha letter no 19674 dtd 30.9.2011.

4.7 Village Energy Security Programme (VESP).

Number of VESP Projects sanctioned by MNRE, Govt. of India – 14

Installation and commissioning of biomass gasifiers power-generating systems in 11 VESP projects have been completed and the rest 3 (three) projects are under progress. M/s Winrock International India, New Delhi has been appointed as the Regional consultant for Project design, development and capacity building under VESP.

4.8 Research and Development Programme.

Provision for Rs.5.00 lakhs was made during the year 2007-08. A joint research project by OREDA and OUAT on operation of the stationary engine on straight vegetable oil have been taken up. Diesel engine with test rig & viscometer etc. have been purchased and commissioned at OUAT campus.

Provision for Rs.5.00 lakhs was made during 2008-09 towards development of solar tunnel dryer for drying Kendu leaves, ginger, vegetable, NTFP etc. Now the different types of materials to be dried have been short listed. Literature survey on different types of tunnel dryers in use has been done and the materials have been collected. At present a suitable institution (Engineering College) is being located for taking up the research project. Steps are being taken to complete the project during this financial year.

4.9 Tribal sub-plan.

Village electrification of village–Jakham, Block-Bhawanipatna, dist-Kalahandi using biofuel under TSP for the year 2007-08 is under progress and likely to be completed during the current financial year.

Electrification of village Talakabadi in the district of Mayurbhanj using SVO based power generating system for the year 2008-09 is under progress.

4.10. Renewable Energy Club

In order to create awareness about New & Renewable Sources of Energy, its various systems and devices amongst the students, Renewable Energy Clubs in 10 Engineering Colleges have been set up in the State. These clubs are regularly organizing seminars, symposiums, workshops, exhibition etc. to promote renewable energy.

4.11 Celebration of Rajiv Gandhi Akshaya Urja Diwas (RGAUD)

State Level Rajiv Gandhi Akshaya Urja Diwas (RGAUD) was observed in the state in the manner detailed below.

School level competitions viz; Oriya essay, debate, quiz, in two categories (senior and junior) on Renewable Energy and climate change was organised by Circle Inspector of schools and District Inspector of Schools in Bhubaneswar.

Debate competition (English) on Renewable Energy and climate change among the college students of degree level was organised by B.J.B. College, Bhubaneswar.

Debate competition (English) among the Degree students of Engineering Colleges on Renewable Energy was organised by Biju Patnaik University of Technology (BPUT).

Debate competition on Renewable Energy in two categories among the Diploma / Polytechnic and I.T.I students was organised by Directorate of Technical Education & Training, Odisha.

A mini marathon was arranged on this occasion at 7:20 AM on 20.08.2011 by Directorate of Sports & Youth Services, Odisha. Approximately 2000 participants from different schools and sports hostels took part in the marathon. The length of the marathon was about 4 kilometres, which Started from Kalinga Stadium and passed through 120 Battalion square left turn Sashtri Nagar Road Divider right turn- Institution of Engineer building site-left turn-Nicco Park Square-left turn- Near Kalinga Stadium Petrol Pump-Right turn-Entered Kalinga Stadium in Gate No.3. Hon'ble Minister, Higher Education and Sports & Youth Services, Odisha flagged off the marathon race.

An exhibition on Renewable Energy was organized by OREDA in the exhibition hall of Jaydev Bhawan, Bhubaneswar on 20.08.2011. The suppliers of Renewable Energy Products as well as the organisations associated with Renewable Energy Programmes displayed their products in the exhibition. Hon'ble Minister, Revenue & Disaster Management and I & PR, Odisha inaugurated the exhibition at 11.40 AM.

The state level function cum prize distribution ceremony was held at 6.30 PM on 20.08.2011 in Jaydev Bhawan, Bhubaneswar. Sri Atanu Sabyasachi Nayak, Hon'ble Minister, Energy was the Chief Guest. Among other eminent personalities also present were Sri Surya Narayan Patra, Hon'ble Minister, Revenue & Disaster Management and I & PR, Odisha, Sri Prasad Harichandan, Hon'ble Member of Odisha Legislative Assembly and Ex-Minister, Odisha, Sri Surendra Nath Tripathy, I.A.S, Principal Secretary to Government, I & PR Department, Odisha, Sri Debendra Nath Gupta, I.A.S, Commissioner-cum-Secretary to Government, Science & Technology Department, Odisha, Sri Bivas Kumar Panda, PSO & Head, Eastern Region, Regional office, MNRE, Govt. of India and Sri Baishnab Prasad Mohanty, Director, I & PR Department, Govt. of Odisha. All the winners of competitions were awarded with prizes, certificates etc. At the end, eight selected schools performed one-Act Play of 15 minutes duration of based on Renewable Energy. Best three schools were awarded with prizes for their outstanding performance in one-Act play.

As a part of celebration, six workshops on Renewable Energy, Energy Efficiency & Energy Conservation for school children were organised at Biju Pattanaik Energy Park, Bhubaneswar from 14.09.2011 to 23.09.2011. These workshops were for the school students and teachers who would understand the importance of the energy and know-how to use energy in a wiser way by refining their knowledge about conserving energy in different ways. The idea was to train the master trainer who would in turn disseminate the information to other students and community in general as brand ambassador of energy conservation.

As a part of celebration, a state level workshop on "Renewable and Co-generation Purchase Obligation Regulation 2010" was organized by OREDA on 28.10 2011 at Bhubaneswar. All obligated entities in the state and experts on the

subject were discussed the different ways and mean to fulfill the predetermined obligations.

4.12 Awareness Generation, Publicity & Exhibition during 2011-12

OREDA has also been enthusiastically participating in several different Melas / festivals in different important festive occasions of Odisha by organizing NRSE Exhibitions for popularization of NRSE devices as well as well as programmes. The following Exhibitions were organized on different occasions during the year 2011-12.

Exhibition at Baragarh on the occasion of Dhanuyatra.

Exhibition at Bhubaneswar on the occasion of State level Annual Adivasi Mela.

Exhibition at Bhubaneswar on the occasion of National Kharvela Mahostav.

Exhibition at Sarandagada of Subarnapur under Banki Block of Cuttack district on the occasion of Ansupa Pallishree Mela-2011 from 27.05.2011 to 31.05.2011.

Under Print Media, advertisements (both classified & displayed) in colour and black & white in different news papers (both National & Regional), magazines, souvenirs, journals have been issued for wide publicity.

4.13. Workshops / Trainings:

A One day National Seminar on “Biomass Energy System: Challenges and Opportunities” was organized by OREDA on 29.07.2011 in Biju Pattanaik Energy Park, Khandagiri, Bhubaneswar.

A One-day workshop on “Renewable and Co-generation Purchase Obligation Regulation 2010” was organized by OREDA on 28.10 2011 at Bhubaneswar as a part of celebration of State level Rajiv Gandhi Akshaya Urja Diwas-2011. All obligated entities in the state and experts on the subject were discussed the different ways and mean to fulfill the predetermined obligations.

4.14. 99th Indian National Science Congress – 2012

The 99th Indian Science Congress was held from 3rd to 7th January 2012 in the sprawling campus of KIIT University, Bhubaneswar. In this event on National Importance Team Odisha participated for the fourth time under the leadership of OREDA. In the valedictory function, the prize as ‘Best States’ for the Odisha stall was adjudged in terms of the theme of the Expo for its Design, Content and Presentation. ‘Team Odisha,’ comprises of the Biotech Cell in the Science & Technology Department, Odisha Renewable Energy Development Agency, Institute of Mathematics and Applications, Institute of Material Sciences, Odisha Remote Sensing Application Centre and Pathani Samanta Planetarium and Odisha Bigyan Academy.

5. ODISHA SPACE APPLICATION CENTRE

The following are the brief activities of the Odisha Space Application Centre Bhubaneswar.

5.1. FASAL

District wise acreage estimation and production forecasts have been made for Kharif paddy during the Kharif season. The paddy acreage has been estimated through the analysis of multirate RADARSAT SAR data and yield forecast is based on agro-meteorological models. The results have been made available to the user departments of State and Central Government.

5.2. GRAMSAT Project

65 Interactive Training Programmes have been conducted by the user departments from January to December 2011. 150 episodes of developmental news programmes of 'Sunara Odisha' and 153 episodes of 'Swapnara Odisha' have been transmitted through OTV & ETV respectively.

5.3. Block level Resource Atlas GIS Database Generation

The web version of block level GIS Atlas of Odisha under "Odisha Sampada" has been released by the Hon'ble Chief Minister, Odisha.

5.4. Resurvey of CADASTRAL Maps in Odisha

Ortho image generation for Ganjam, Keonjhar & Khurda districts is in progress.

5.5. EDUSAT Programme

Classroom teaching transmission on Mathematics , Science & English has been conducted for 9th & 10th class students for 130 days.

5.6. Urban Land Information System

Urban mapping for Bolangir, Bhawanipatna, Badbil, Rayagada and Bhadrak towns has been completed.

5.7. Dynamics of Landuse / land cover change in Mahanadi Basin

Maps have been prepared on soil, drainage, road, rainfall and temperature for Mahanandi & adjacent river basins.

5.8. Geomorphology and Linement Mapping

Geomorphology and lineament mapping for Nuapada, Bargarh, Bolangir, Sonepur, Boudh, Kandhamal, Kalahandi, Rayagada and Gajapati districts in progress.

5.9. DGPS Survey of Mining Lease Areas

Steel and Mines Department, Govt. of Odisha has recognized ORSAC as nodal agency for DGPS survey of mining lease areas. The survey for 128 mining lease areas has been completed.

5.10. Rajiv Gandhi National Drinking Water Mission –Bihar & Odisha State

Interpretation for various themes is in progress for groundwater prospects mapping of Bihar State. Groundwater quality data analysis is continuing for Odisha State.

5.11. Space Based Information Support for Decentralised Planning (SIS-DP)

Interpretation on land use/land cover, road, rail and drainage has been completed for Laxmipur block of Koraput district. Georectification of satellite data has also been completed.

5.12. Forest Survey Proposed for Diversion Projects

DGPS/ETS Survey has been undertaken for 10 organizations/ departments for forestland diversion.

6. PATHANI SAMANTA PLANETARIUM

Pathani Samant Planetarium is a premier institute of the State for popularization of science in general, astronomy, astrophysics and Space Science in particular under the administrative control of Science & Technology Department, Govt. of Odisha.

6.1 Visitors & Revenue Collection during the year 2011-12.

	PSP Show	Light & Sound show
Total Show	257	22
No. of Adult Visited	16071	825
No. of Child Visited	8717	1553
Total No. of Person Visited	24788	2378
Total Amount collected (in Rs.)	288946	40905

6.2 Other activities of the Planetarium

6.2.1 With participation of staff of Pathani Samanta Planetarium, the monthly meeting of SCAAA was held on Sunday following the Second Saturday in the premises of PSP. Eminent scientists delivered lectures on various astronomical events in the meeting.

6.2.2 Night sky watch programme was held after the new moon day of every month for three to four days. People observed celestial objects like Venus, Mars, Saturn, Jupiter and Moon through telescope.

6.2.3. Zonal Camp of Young Astronomers Talent Search (YATS-2011) was organized at following places. About 500 students from different schools are invited to display their model on "May Dram Space Craft".

21.08.2011 B.R. High School, Belpahar
 28.08.2011 Joda West Recreation Clud, guide
 04.09.2011 D.N. High School, Jeypore
 11.09.2011 Govt. Secondary Training Girls' High School, Berhampur
 18.09.2011 Govt. Boys' High School, Jeypore
 25.09.2011 Pathani Samanta Planetarium, BBSR.
 01.10.2011 Saraswati Sishu Vidyamandir, Dhabalgiri, J.K. Road

6.2.4 State level camp of Young Astronomer Talent Search (YATS-2011) was held at PSP on 12th & 13th December 2011. 112 students of different places display their models on "May Dram Space Craft". Out of them best 20 models are awarded by the Hon'ble Minister of Science & Technology on the 176th Birth Anniversery of Mahamahopadhyaya Chandrasekhar Harichandan Mohapatra Samanta. Many dignitaries, Scientists and students attend the function.

7. INSTITUTE OF MATHEMATICS & APPLICATIONS

The following are the objectives of the Institute of Mathematics & Application.

7.1. Research Activity

Research scholars with fellowship from CSIR, NBHM, DST along with State Govt.

Fellowships are persuing research in Mathematics in Institute of Mathematics & Applications.

New areas of research under taken by the Institute of Mathematics and Applications are:

- i) Cryptography
- ii) Stochastic Filtering and its Applications to Signal Process
- iii) Application of Stochastic Process to Mathematical Finance
- iv) Operator Theory
- v) Graph Theory and its applications
- vi) Combinatorial Optimization
- vii) Non Commutative Geometry, Number Theory
- viii) Numerical Analysis
- ix) Cellular Automata Theory

Six (06) Research Scholars and three (03) Post Doctoral fellows are working on research and about 10 out station college teachers are also persuing their research work with supervision from Institute of Mathematics and Applications, Bhubaneswar in Mathematics.

Professor A.K Mishra, Berhampur University is to get D. Sc degree with the supervision of the Director, Professor S. Pattanayak.

It is planned to pursue these along with few new areas in future.

7.2. Exchange programme

A memorandum of Understanding has been reached with Abhilash Mishra, Metron College, Oxford on Science Education Initiative for training and nurture of rural meritorious school students of Odisha.

A memorandum of understanding has been reached with Western Ontario University, Canada since 2006-07 for student exchange programme.

7.3. Seminar/Conference/Symposium

National workshop/conference were organized

- (i) It is planned to hold more workshops on some other branches of Mathematics, Astronomy & related topics in near future.
- (ii) Seminars are held in the Institute regularly where internal members & invited Professors deliver their talk.

7.4. Teaching Programmes:

The Institute offers a Master Level Course in Computational Finance. This is the first of its kind in India. This has already started attracting financial institute. Our students have already got lucrative job offers even before their result are published. We shall continue to offer the course which has enormous job potential. 04 of our pass out students in this course are doing their Ph.D in (i) Belgium, (ii) German (iii) IIM, Indore, (iv) IIT, Kharagpur.

The Institute offers a B.Sc (Hons) in Mathematics & Computing. The aim of the course is to orient a student to take up a research course in mathematics. There are only four such courses in India. These children shall be able to go directly for their Ph.D after the B.Sc (Hons) in Mathematics & Computing.

A few of our students are excellent in their progress. One student of final year B.Sc of the Institute competing with other students from all over India both B.Sc and M.Sc, qualified for Ph.D programme of TIFR Mumbai and for the Integrated Ph.D program of the TIFR Centre Bangalore. He has been selected finally to join the Ph.D programme of Institute of Mathematical Sciences. Other students of the same batch has taken admission in other reputed Institutions.

Two of the 3rd year B.Sc students have been selected under Kishore Vaigyanik Proshahan Yojana (KVPY) of CSIR. This entitles each of them to a scholarship of Rs. 5000/-per month till they finish their Masters programme.

Now, B.Sc programme of the Institute has become popular at all India level.

7.5. Summer Internship

Students of different Institute like NIT, Rourkela/Central University, Pondycheri / NISER, Bhubaneswar have come to Institute of Mathematics and Applications for their summer project/ internship.

7.6. Search & Nurture Programme

The Institute has been running the **Rural Mathematics Talent Search Programme** since 2003. So far more than 1400 students have passed through this programme. Some of them have done extremely well in the high school certificate exams and pursuing their higher education in reputed institutions.

Regular students & guide teachers training camps are held in IMA for the selected Rural Mathematics Training Search students of class VII, VIII & IX.

State level Training and prize distribution Ceremony for Mathematics Olympians-2009 was organized by the Institute of Mathematics & Applications since 2000 regularly in May-June every year. The Hon'ble Chief Minister of Odisha Sri Naveen Patnaik distributes Gold and Silver medals and prizes to Mathematics Olympians who are in the merit list of Regional & Junior Mathematics Olympiad conducted by Odisha Mathematical Society. Sri Ramesh Chandra Majhi the Hon'ble Minister Science & Technology Dept, Govt. of Odisha had graced the occasion as Guest of Honour since last 2 years. In future these activities will be continued covering more students.

7.7. Interactive Mathematics training Programme for Under Graduate and Post Graduate Students

The institute organizes Interactive Mathematics Training Camp for undergraduate students in an area of rural setting but selected from all over Odisha.

7.8. Sunday Morning Problem Solving Classes for School Children:

Every Sunday the Institute conducts Problem Solving classes for school children. In these classes the children were taught the techniques and methods of problem solving of non traditional and non routine types of mathematics problems which are not generally taught in their schools. Students of both urban and rural areas are attending these classes. A bus has been arranged for this purpose. In future these will be continued more effectively.

7.9. Programme for SC/ST students

Two training Programmes in Mathematics & IT subjects for P.G Teachers of EMRS & Junior Lecturers of Higher Secondary Schools under ST & SC Development. Department, Govt. of Odisha started from 21/11/2011 to 23/11/2011 in the Institute of Mathematics & Applications, Bhubaneswar.

7.10. Capacity Building Programme in Tribal area

A project has been undertaken by this Institute for improvement of overall performance of low performing ST/SC Schools of Koraput, Malkanagiri, Nawarangpur district of Odisha. The Government is fully aware of the fruits of the programme. There have been requests from other districts to extend this programme to their ST/SC schools. This will have a far reaching effect on the mathematical competence of ST/SC children. To consolidate this effort we propose

to get some of these children and teachers to our Institute periodically to train and nurture them.

In future these will be continued covering more tribal areas of the State.

7.11. Library

A good set of standard books and journals may be procured in the Institute of Mathematics & Applications, Bhubaneswar library to make it a reputed library of advanced study in Mathematics & Applications. It has been accepted by experts to be one of best library in Mathematics in Eastern India.

7.12. Special Training Programme for Tribal Students of KBK Districts:

A special training programme for +2 ST/SC students of KBK Districts have been undertaken by the Institute since academic session 2008-09 under which the students are given special coaching for Examinations of IIT/NISER/NIT & other reputed Institutions. Under this programme 22 ST/SC students of KBK Districts admitted in 2008-09 and 10 students are admitted in 2009-10. The boarding & lodging coaching & other expenses for these studies are made in Institute of Mathematics & Applications, Bhubaneswar. In future these are to be continued more effectively.

7.13. Nodal Agency of State Level P.G Scholarship in Basic Sciences

Institute of Mathematics & Applications, Bhubaneswar acts as the nodal agency of the State to co-ordinate the Scholarship Programme for students perusing **P.G. in Basic Sciences** under the aegis of State Council on Science & Technology. Institute of Mathematics & Applications, Bhubaneswar undertakes the selection of students

7.14. State Level Training for Teachers of Tribal Schools

In collaboration with SC & ST development Department, Govt. of Odisha, Teacher's training programme and Tribal student counseling programme had been taken by Institute of Mathematics & Applications, Bhubaneswar for the 19 EMRS and SSD High Schools of SC & ST development Department, Govt. of Odisha.

7.15. Institute of Mathematics & Applications, Bhubaneswar conducts & co-ordinates all the all India tests on Mathematics for Odisha for P.G & Ph.D level exams being organized by National Board of Higher Mathematics.

8. INSTITUTE OF MATERIAL SCIENCES

The following are the brief activities of the Institute of Materials Science for the year 2011-12.

8.1 (i) Well equipped electro- ceramic laboratory has been developed by IMS to prepare new materials and to study its electronic properties.

(ii) Testing and characterization laboratory has also been developed which is hubbed with latest state of art few equipment to study electro- transport properties of new materials.

(iii) Research activities:

- a. Two Research paper has been published in international Journal.
- b. Two Research paper has been published in International Proceeding.
- c. Two research scholars have submitted their Ph.D thesis to Utkal University.

(iv) High sensitive electrometer (Keithley–Germany make) has been purchased which will be used to test the leakage property highly resistive samples.

- 8.2. Steps has already been taken to create a dedicated research laboratory for young researchers of the states to work in the frontier field of materials science for which a piece of land (2 Acres) has been allotted to S & T Department by GA Department for construction of IMS research building and its campus.
- 8.3. IMS has been continuing its in-house collaboration researches with other laboratory outside India. (Naval Research laboratory, USA, University of Witwatersrand & University of South Africa, South Africa, Norfolk state university, USA.)
- 8.4. A manuscript is sent to physica– B: condensed matter for international publication.
- 8.5. Installation of DC and RF sputtering thin film unit has been installed in IMS laboratory for the preparation of transparent conducting oxide thin film and other new material.
- 8.6. Institute of Materials Science organized two days long National Workshop on “New and Nanomaterials” (WNNM-2012) at hotel the New Marrion, Bhubaneswar on 20th & 21st January, 2012.
- 8.7. IMS has completed the scientific exposure visit programme of 253 SC & ST school students situated in TSP zones of Odisha to stimulate their young minds about the need of science.
- 8.8. One research scholar of IMS has qualified National level CSIR-UGC Net conducted by CSIR, Govt. of India.

9. ODISHA BIGYAN ACADEMY

During the Year 2011-12 Odisha Bigyan Academy has organised different popular science programme as follows :

- 9.1. “Bigyan Diganta”, the monthly Science Magazine, specially designed for school students and for their parents and other rural people is being continuously published by the Odisha Bigyan Academy since 1993. During 2011-12 (up to January, 2012) **ten issues** of “Bigyan Diganta” have been released. **Two more issues** for the month of February and March shall be

published during this year. The magazine is distributed to the Government recognized High Schools of the State free of cost.

- 9.2. Odisha Bigyan Academy is also publishing an abridged version of "Bigyan Diganta" for visually handicapped students of the state. The magazine is brought out as a quarterly publication and distributed to the blind students and their institutions. During 2011-12 (up to January, 2012) **three issues** of the abridged version of popular science magazine "Bigyan Diganta" have been printed in braille oriya script and released. **One more issue** (quarterly publication) for the month of January-March, 2012 shall be published during this year.
- 9.3. The Academy is publishing a monthly Science Magazine "Science Horizon" in English language from the month **May-2011** for English Medium Schools and +2 Science College students of the State. During 2011-12 (up to January, 2012) **nine issues** of "Science Horizon" have been released. **Two more issues** for the month of February and March shall be published during this year.
- 9.4. Odisha Bigyan Academy, Odisha Renewable Energy Development Agency and Science and Technology Department, Government of Odisha jointly organised a **Seminar on "Biomass Energy System : Challenges and Opportunities"** at Biju Patnaik Energy Park, Bhubaneswar on 29.07.2011. Hon'ble Minister, Textile & Handlooms, Science & Technology, Govt. of Odisha graced the occasion as Chief Guest.
- 9.5. The **meeting of the Expert Panel** in different disciplines was held at Bhubaneswar on 29.10.2011 to 31.10.2011 for selection of Biju Patnaik Award for Scientific Excellence, Samanta Chandra Sekhar Award and Odisha Young Scientist Award 2011. The members of the Expert Panel handed over the final recommendation of above Awards to the Secretary, Odisha Bigyan Academy.
- 9.6. The Meeting of the Award Advisory Committee was held on 19.11.2011 for **selection of Senior Scientists** to be felicitated for the Year 2011. The members of the said committee handed over their final recommendation to the Secretary, Odisha Bigyan Academy.
- 9.7. The meeting of the Expert Panel in different disciplines was held at Bhubaneswar on 21.11.2011 for **selection of "Pranakrushna Parija Popular Science Award"** for the year 2011. The members of the Expert Panel handed over their final recommendations to the Secretary, Odisha Bigyan Academy.
- 9.8. The 79th **Executive Council Meeting** was held on 23.11.2011. In the meeting the members of the council have approved as follows.
 - a) Approved the Audited Accounts of Odisha Bigyan Academy for the Year 2010-11.
 - b) Approved the Revised Budget of 2011-12 and Budget for 2012-13.
 - c) Approved the name of the 24 Scientists as ad-hoc Life Member of Odisha Bigyan Academy.
 - c) Approved the name of the Writers and Scientists for different Awards for the Year 2011 recommended by the Expert Panel.
- 9.9. Odisha Bigyan Academy, Institute of Materials Science and Science and Technology Department, Government of Odisha jointly organised a **Workshop on "New and Nanomaterials"** at Bhubaneswar on 20.01.2012

and 21.01.2012. Chief Secretary, Government of Odisha graced the occasion as Chief Guest on the inaugural function.

- 9.10. Odisha Bigyan Academy, Odisha Space Applications Centre (ORSAC) and Science and Technology Department, Government of Odisha jointly organised a **Workshop on "GIS & Remote Sensing for Rural & Urban Development"** at Bhubaneswar on February 03-04, 2012. Development Commissioner-cum-Additional Chief Secretary, Government of Odisha graced the occasion as Chief Guest on the inaugural function.
- 9.11. Odisha Bigyan Academy has taken steps for celebration of **National Science Day-2012**.
- 9.12. The Academy is taking active steps for **construction of Odisha Bigyan Academy** building at Saheed Nagar through IDCO, Bhubaneswar. The work is under progress.