Department of Physics, Sambalpur University
Evaluative Report for the period 2010-11 to 2014-15

1. Name of the Department: School of Physics (Autonomous), Sambalpur University, Sambalpur, Odisha
2. Year of establishment: 1969
3. Is the Department part of a school/Faculty of the university?: Faculty of the University.
4. Name of programmes offered (UG, PG, M.Phil., Ph.D., Integrated Masters, Integrated Ph.D., D.Sc, D.Litt, etc.):
   M.Sc. Physics: 32
   M.Phil.: 10
   Ph.D.: ---
5. Interdisciplinary programmes and departments involved: NIL
6. Courses in collaboration with other universities, industries, foreign institutions, etc.: NIL
7. Details of programmes discontinued, if any with reasons:
   a) M.Sc. Electronics: Shifted to their own building situated in SUIIT, Sambalpur University Sambalpur, Odisha
   b) M.Sc. Nuclear Physics: Lack of Faculty
8. Examination system: Annual/ Semester/Trimester/choice based credit system: Semester Based Credit System
9. Participation of department in courses offered by other departments: N.A.
10. Number of teaching post sanctioned, filled and actual (Professors/ Associate professors/ Asst. Professors/others).

<table>
<thead>
<tr>
<th>Position</th>
<th>Sanctioned</th>
<th>Filled</th>
<th>Actual (including CAS &amp; MPS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor</td>
<td>02</td>
<td>01</td>
<td>03 (02CAS)</td>
</tr>
<tr>
<td>Reader</td>
<td>03</td>
<td>01</td>
<td>00 (01 Promoted to Professor through CAS)</td>
</tr>
<tr>
<td>Lecturer</td>
<td>05</td>
<td>04</td>
<td>03 (01 promoted to Professor through CAS)</td>
</tr>
<tr>
<td>Others</td>
<td>00</td>
<td>00</td>
<td>00</td>
</tr>
</tbody>
</table>
11. Faculty profile with name, qualification, designation, area of specification, experience and research under guidance.

<table>
<thead>
<tr>
<th>Name</th>
<th>Qualification</th>
<th>Designation</th>
<th>Specialization</th>
<th>No. of Years of Exp.</th>
<th>No. of Ph.D./M.Phil. student guided in 4 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. D. P. Ojha</td>
<td>M.Sc., Ph.D., FRSC</td>
<td>Professor &amp; Head</td>
<td>Condensed Matter Physics</td>
<td>22</td>
<td>Ph.D.: 03 M.Phil.: 06</td>
</tr>
<tr>
<td>Dr. G. N. Dash</td>
<td>M.Sc., M.Phil., Ph.D.,</td>
<td>Professor</td>
<td>Electronics</td>
<td>36</td>
<td>Ph.D.: 03 M.Phil.:07</td>
</tr>
<tr>
<td>Dr. T. R. Routray</td>
<td>M.Sc., M.Phil., Ph.D.</td>
<td>Professor</td>
<td>Nuclear Physics</td>
<td>28</td>
<td>Ph.D.: 05 M.Phil.:06</td>
</tr>
<tr>
<td>Dr. S. N. Nayak</td>
<td>M.Sc., Ph.D.</td>
<td>Sr. Lecturer</td>
<td>High Energy Physics</td>
<td>13</td>
<td>M.Phil.:03</td>
</tr>
<tr>
<td>Dr. Z. Naik</td>
<td>M.Sc., M.Phil., Ph.D.</td>
<td>Lecturer</td>
<td>Nuclear Physics</td>
<td>06</td>
<td>M.Phil.:06</td>
</tr>
<tr>
<td>Dr. B. Behera</td>
<td>M.Sc., M.Phil., Ph.D.</td>
<td>Lecturer</td>
<td>Nuclear Physics</td>
<td>05</td>
<td>Ph.D.:01 M.Phil.:07</td>
</tr>
</tbody>
</table>

12. List of Senior Visiting Fellows, adjunct faculty, emeritus professors:
   a) Visiting Fellow: 1. Prof P. R. Sharma, VECC Kolkata
                       2. Prof. J.C. Mohanty, Retired Principal
                       3. Dr. D. N. Basu, Scientist, VECC, Kolkata

13. Percentage of class taken by temporary Faculty- Program wise information: NIL

14. Programme-wise student teacher Ratio:
   (a) M.Sc. Physics: 6:1(Approx.)
   (b) M.Phil. Physics: 2:1(Approx.)

15. Number of academic Support staff (technical) and administrative staff: sanctioned, filled and actual:

<table>
<thead>
<tr>
<th>Name of the Post</th>
<th>Sanctioned</th>
<th>Filled</th>
<th>Actual (including CAS &amp; MPS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrator/ Lab. Asst. (Technical)</td>
<td>05</td>
<td>05</td>
<td>05(02+03)</td>
</tr>
<tr>
<td>Asst. Store keeper</td>
<td>01</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>Office Asst. (Non Technical)</td>
<td>01</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td>Class IV (Non Technical)</td>
<td>08</td>
<td>04</td>
<td>04</td>
</tr>
</tbody>
</table>

16. Research thrust area as recognized by major funding agencies:
   a) Theoretical and Experimental Research in Physics: DRS-1 under SAP of UGC.
   b) DST, FIST programme of Govt. of India
17. Number of faculty with ongoing projects from (a) National (b) International funding agencies, and (c) Total grants received. Give the name of funding agencies, project title and grants received project wise.

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Funding Agency</th>
<th>Project title</th>
<th>Duration Years</th>
<th>Approved budget/Total grant received.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. D. P. Ojha (PI)</td>
<td>UGC</td>
<td>Computational Studies on Molecular Interactions in Liquid Crystals</td>
<td>3 Years</td>
<td>Rs. 7,00,000/</td>
</tr>
<tr>
<td>SERB-DST,</td>
<td></td>
<td>Study of Electronic Structure, Phase Behaviour and Ultraviolet Stability of Liquid Crystals through Computer Aided Molecular Design</td>
<td>3 Years</td>
<td>Rs. 16,47,400/</td>
</tr>
<tr>
<td>CSIR</td>
<td></td>
<td>Computational Modeling of Phase Structures and Band Gap Engineering of Liquid Crystals for Electro-Optic Applications</td>
<td>3 Years</td>
<td>Rs. 14,20,833/</td>
</tr>
<tr>
<td>DAE-BRNS</td>
<td></td>
<td>Molecular Design and Study of Phase Organization in Model Liquid Crystals through Statistical Simulation</td>
<td>3 Years</td>
<td>Rs. 10,79,800/</td>
</tr>
<tr>
<td>Dr. B. Behera</td>
<td>SERB-DST</td>
<td>Development of Rare-Earth Based New Multiferroic Composites of BiFe₃PbTiO₃³</td>
<td>3 Years</td>
<td>Rs.23,48,000/-</td>
</tr>
<tr>
<td>Dr. B. Behera as CO-PI</td>
<td>UGC</td>
<td>Dielectric Polymer Ceramic Nanocomposites for Capacitor Application</td>
<td>3 Years</td>
<td>Rs. 10,12,000/-</td>
</tr>
</tbody>
</table>

18. Inter-institutional collaborative projects and associated grant received
(a) National collaboration: NIL
(b) International collaboration: NIL

19. Departmental projects funded by DST-FIST; UGC-SAP, Total grant received:

**DST- FIST:** Rs. 18500000.00

**UGC –SAP:** Rs 5300000.00

**UGC-BSR:** Rs.  2000000.00

Total: Rs. 2,58,00,000.00
20. Research Facility/centre with
   - **State recognition**: N.A.
   - **National recognition**: Research Lab Funded by DST & UGC, N.Delhi
   - **International recognition**: N.A.

21. Special research laboratories sponsored by/ created by industry or corporate bodies: Nil

22. Publications:
   - Number of papers published in peer reviewed journals (national/ international)
     
     |---------------------|------|------|------|------|------|------|
     | International       | 09   | 16   | 45   | 17   | 31   | 11   |
     | National            | 02   | 03   | 02   | 02   | 00   | 00   |
     | Proceedings         | 06   | 04   | 02   | 03   | 03   | 00   |
     | Books/Book chapters | 00   | 00   | 00   | 00   | 01   | 00   |

23. Details of patents and income generated: NA

24. Area of consultancy and income generated: NA

25. Faculty selected nationally / internationally to visit other laboratories / institutions / industries in India / abroad:
   a) Prof. G. N. Dash Visited Nanyang Institute of Technology, Hong-Kong

26. Faculty serving in
   a) National committees
   b) International committees
   c) Editorial Board
      **Prof. D. P. Ojha**:
      1. Editor: *Chemical Science Communications*
      2. Editorial-Board convenor, *Bulletin of Pure & Applied Sciences, Sec.:D-Physics*
      3. Editorial-Board Member: *Materials Science*
   d) any other (please specify).
27. Faculty recharging strategies (UGC, ASC, Refresher/ Orientation programs, workshops, training programs and similar programs)
Two Refresher Courses Organized with ASC, Sambalpur University

28. Student projects
- Percentage of students who have done in-house projects including inter-departmental projects: Nil.
- Percentage of students doing projects in collaboration with other universities/industry/institute: Nil.

29. Awards / recognitions received at national and international level by
- Faculty:

<table>
<thead>
<tr>
<th>Name of the Faculty</th>
<th>Awards and recognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. G. N. Dash</td>
<td>1. Distinguished lecturer of Electron Devices society by IEEE, USA</td>
</tr>
<tr>
<td></td>
<td>2. Fellow, Institute of Engineering and Technology (IET), UK.</td>
</tr>
<tr>
<td>Prof. T. R. Routray</td>
<td>1. Visited on invitation to Facultate de Fisica, university of Barcelona, Spain for Scientific Collaboration</td>
</tr>
<tr>
<td></td>
<td>2. Invited to 3rd International Symposium on Nuclear symmetry and Energy, FRIB, East Lancing, Michigan, USA.</td>
</tr>
<tr>
<td>Prof. D. P. Ojha</td>
<td>1. Admitted as FRSC, Cambridge, Uk.</td>
</tr>
<tr>
<td></td>
<td>2. Nominated, ACS member.</td>
</tr>
</tbody>
</table>

- Doctoral/ Post-Doctoral Fellows Students: Dr. P.L. Praveen, RA, DST Project

30. Seminars/ Conferences /Workshops Organized and the Source of funding (National/ International) with details of outstanding participants, if any.

<table>
<thead>
<tr>
<th>International/ National Seminar</th>
<th>Source of Funding</th>
<th>Period</th>
<th>Director</th>
<th>Outstanding Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Workshop on Awareness Program :Medical and Societal Application of Nuclear Physics</td>
<td>Sambalpur University and DRS-1 under SAP, UGC.</td>
<td>26th March 2011</td>
<td>Prof. P. Nayak</td>
<td>45% Approx.</td>
</tr>
<tr>
<td>Physics and Technology of Novel Materials(PTNM-II-2012)</td>
<td>Sambalpur University and DRS-1 under SAP, UGC.</td>
<td>10-11 March 2011</td>
<td>Prof. P. Nayak</td>
<td>50% Approx.</td>
</tr>
</tbody>
</table>
### International/ National Source of Funding

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Source of Funding</th>
<th>Period</th>
<th>Director</th>
<th>Outstanding Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Conference on Nuclear Physics.(NCNP-2013)</td>
<td>Sambalpur University and DRS-1 under SAP, UGC.</td>
<td>1-3 March 2013</td>
<td>Dr. K. C. Panda</td>
<td>42% Approx.</td>
</tr>
</tbody>
</table>

### 31. Code of ethics for research followed by departments: NP, HEP, Electronics & CMP

### 32. Students profile programme –wise

<table>
<thead>
<tr>
<th>Name of the Programme (refer to question no. 4)</th>
<th>Applications Received</th>
<th>Selected</th>
<th>Pass percentage</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.Sc. Physics 2010</td>
<td>530</td>
<td>18</td>
<td>18</td>
<td>88.88</td>
<td>66.66</td>
</tr>
<tr>
<td>M.Sc. Physics 2011</td>
<td>520</td>
<td>19</td>
<td>17</td>
<td>78.94</td>
<td>76.47</td>
</tr>
<tr>
<td>M.Sc. Physics 2012</td>
<td>550</td>
<td>15</td>
<td>17</td>
<td>93.33</td>
<td>100</td>
</tr>
<tr>
<td>M.Sc. Physics 2013</td>
<td>515</td>
<td>24</td>
<td>14</td>
<td>91.66</td>
<td>85.71</td>
</tr>
<tr>
<td>M.Sc. Physics 2014</td>
<td>605</td>
<td>16</td>
<td>15</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>M.Phil. Physics 2010</td>
<td>32</td>
<td>04</td>
<td>05</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>M.Phil. Physics 2011</td>
<td>44</td>
<td>05</td>
<td>05</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>M.Phil. Physics 2012</td>
<td>34</td>
<td>03</td>
<td>06</td>
<td>66.66</td>
<td>100</td>
</tr>
<tr>
<td>M.Phil. Physics 2013</td>
<td>44</td>
<td>01</td>
<td>08</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>M.Phil. Physics 2014</td>
<td>32</td>
<td>02</td>
<td>06</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Ph.D. Physics 2012</td>
<td>-</td>
<td>09</td>
<td>03</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ph.D. Physics 2013</td>
<td>-</td>
<td>08</td>
<td>03</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ph.D. Physics 2014</td>
<td>-</td>
<td>03</td>
<td>05</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### 33. Diversity of students:

<table>
<thead>
<tr>
<th>Name of the Programme</th>
<th>% of Students From Same University</th>
<th>% of Students From other Univ. Within the State</th>
<th>% of Students From Universities Outside the State</th>
<th>% of Stud. Other Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.Sc. (2011)</td>
<td>80.55</td>
<td>19.44</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>M.Sc. (2012)</td>
<td>75</td>
<td>25</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>M.Sc. (2013)</td>
<td>63.15</td>
<td>36.84</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>M.Sc. (2014)</td>
<td>52.6</td>
<td>47.4</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>M.Phil. (2010)</td>
<td>88.88</td>
<td>11.11</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>M.Phil. (2011)</td>
<td>60</td>
<td>40</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>M.Phil. (2012)</td>
<td>66.66</td>
<td>33.33</td>
<td>00</td>
<td>00</td>
</tr>
</tbody>
</table>
34. How many students have cleared Civil Services and Defence Services Examinations, NET, SET, GATE and other competitive examinations? Give details category-wise

CSIR-NET: 01, SET: 02 & GATE: 04

35. Students Progression:

<table>
<thead>
<tr>
<th>Students Progression</th>
<th>Percentage against enrolled</th>
</tr>
</thead>
<tbody>
<tr>
<td>UG to PG</td>
<td>NA</td>
</tr>
<tr>
<td>PG to M.Phil.</td>
<td>25%</td>
</tr>
<tr>
<td>PG to Ph.D.</td>
<td>12.5%</td>
</tr>
<tr>
<td>Ph.D. to post- Doctoral</td>
<td>NA</td>
</tr>
<tr>
<td>Employed</td>
<td>NA</td>
</tr>
<tr>
<td>• Campus selection</td>
<td>NA</td>
</tr>
<tr>
<td>• Other than campus recruitment</td>
<td>NA</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>NA</td>
</tr>
</tbody>
</table>

36. Diversity of Staff:

<table>
<thead>
<tr>
<th>Percentage of faculty who are graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Of the same university</td>
</tr>
<tr>
<td>From other universities within the state</td>
</tr>
<tr>
<td>From other universities from other states</td>
</tr>
<tr>
<td>From universities outside the country</td>
</tr>
</tbody>
</table>

37. Number of faculty who awarded M.Phil., Ph.D., D.Sc. and D.Litt. during the assessment period: N.A.

38. Present details of departmental Infrastructural facilities with regard to

a) Library: The department has a seminar library with a collection of 1718 No. of Books.

b) Internet facilities for staff and students: All the students & staffs are provided internet facility in 24*7

c) Total No. of class rooms: 04.

d) Class rooms with ICT facility: 01

e) Students laboratories: The department has facility for 08 Nos. of student laboratories namely;

   1) Electricity & Magnetism, 2) Optics
   3) Electronics, 4) Condensed Matter Physics
   5) Nuclear Physics, 6) High Energy Physics
   7) Modern Physics & 8) Computer
f) Research Laboratories: The Department has facility for 02 Nos. of Research Laboratories Namely; 1) Materials and devices and Nuclear Sciences Research Lab Sponsored by DRS I under SAP of UGC.

2) Materials Physics Research Lab. Sponsored by FIST of DST, Govt. of India.

39. List of doctoral, postdoctoral students and Research Associates
a) From the Host Institution /University: Nos. 26
   • Nilaya Kumar Mohanty (Ph. D.)
   • Santosh Kumar Satpathy (Ph.D.)
   • Gitanjali purohit (Ph.D.)
   • Sasmita rani Bag (Ph.D.)
   • Sriyanka Behera (Ph.D.)
   • Ajay Kumar Behera (Ph.D.)
   • Srikant Tripathy (Ph.D.)
   • Swagatika Pattanaik (Ph.D.)
   • Deepanjali Behera (Ph.D.)
   • Subhasis Sarangi (Ph.D.)
   • Akshyaya Kumar Sahoo (Ph.D.)
   • Chaturbujha Pradhan (Ph.D.)
   • Binod Sahoo (Ph.D.)
   • Bibhuti Parida (Ph.D.)
   • Sri Janmejaya Pradhan (Ph.D.)
   • Mrs. Pranati Panda (Ph.D.)
   • Mr. Satyanarayan Padhi (Ph.D.)
   • Mr. Krishna C. Mohapatra (Ph.D.)
   • Mr. Santosh Kumar Swain (Ph.D.)
   • Mrs. Anjali Dash (Ph.D.)
   • Mrs. Huda Fatima (Ph.D.)
   • Mr. Md. Abdul Khaleel (Ph.D.)
   • Mrs. Sunita Dash (Ph.D.)
   • Mr. Manas Ranjan Jena (Ph.D.)
   • Mr. Jagamohan Padhi (Ph.D.)
   • Mr. Manoranjan Sahu (Ph.D.)

b) From other institution /universities: Dr. P Laxmi Parveen (Research Associate)

40. Number of postgraduate students getting financial assistance from the university: 04 (The different scholarship)

41. Was any need assessment exercise undertaken before the development of new programme(s)? If so highlight the methodology. N.A.

42. Does the department obtain feedback form
   a. Faculty on curriculum as well as teaching learning evaluation? If yes how does the department utilize the feedback?
   b. Students on staff, curriculum and teaching – learning – evaluation and how does the department utilize the feedback? Personal Discussion
   c. Alumni and employers on programmes offered and how does the department utilize the feedback? Inviting to make interactions with Staff & Students
43. List the distinguished alumni of department (maximum 10)
   - Dr. Debanand Sa, Professor, BHU
   - Dr. Bibbas Behera, Professor, Panjab University
   - Dr. K.L. Panigrahi, Associate Professor, IIT KGP
   - Dr. Swarupa Nanda Pradhan, Scientist, BARC, Mumbai
   - Dr. Pramod Meher, Professor, NUD, Singapore
   - Dr. Aryabrata Sahu, Assistant Professor, IITG
   - Mr. Umakanta Nanda, Chief Secretary, Undivided Bihar
   - Dr. Sarira Sahu, Professor, UNAM, Mexico
   - Dr. Sanghamitra Mohanty, Vice-Chancellor, North Orissa University,
   - Dr. Deepak Mishra, Scientist, BARC

44. Give the details of students enrichment programmes (special lectures / workshops/ seminar) involving external experts.
    Organized Special lectures & Seminars on different topics involving the external experts such as Prof. S.K., Pandey, V.C., Pt. Ravishankar Shukla University, Raipur; Prof. P.R. Sharma, VECC, Kolkata; Prof. J.C. Mohanty, Retd. Principal, Cuttak; Dr. D.N. Basu, Scientist, VECC, Kolkata etc.

45. List the teaching methods adopted by faculty for different programmes.

46. How does the department ensure that programme objectives are constantly met and learning outcomes are monitored?
    Group discussion & Personal interactions at time to time

47. Highlight the participation of students and faculty in extension activities:
    The students and faculty members of the department are participating in different extension programmes organized by the university from time to time.

48. Give details of “beyond syllabus scholarly activities” of department:
    Taking care of departmental library & maintenance equipments in the different laboratories of our department.

49. State whether the programme / department is accredited /graded by other agencies? If yes give details: N.A.

50. Briefly highlight the contributions of the department in generating new knowledge, basic or applied.
    The department has made the significant contribution towards the new knowledge of students by making them familiar with the latest ongoing research activities in our department and handling of sophisticated equipments available in our department for their carrier development.
51. Details five major strengths, Weaknesses, and challenges (SWOC) of the department:
   - Theoretical & Experimental research work in Nuclear Physics, High Energy Physics, Electronics & Condensed Matter Physics
   - Group discussion and seminar presentation.
   - Latest books for students & faculty.
   - Organizing the guest lecturers to make an effective interactions with subject experts.
   - Visit to the advanced laboratories to make familiar with the latest scientific research and development.

52. Future plans of the department:
   A. The establishment of experimental research laboratory (i.e., synthesis and characterization) in the liquid crystal field by arranging the grants from Government of India funding agencies.
   B. Starting Self-financing Diploma Course namely; Diploma in X-Ray Spectroscopy.
   C. Introducing Nanotechnology as Special paper at M.Sc. level.
   D. Submission of proposal for next Phase of DRS to the UGC, New Delhi to strengthening the department.
   E. Collaboration with more National and International laboratories.
Annexure


Banarji Behera, E. B. Araujo and Adolfo Franco Junior; *Structural and dielectric properties of relaxor Sr$_{0.5}$Ba$_{0.5}$Bi$_2$Nb$_2$O$_9$ ceramic,* Advances in Applied Ceramics (Publisher: Maney Publishing; ISSN: 1743-6753), 109 (2010) 1.


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Snapshots of The Departmental Activities

Alumni Meet 2012

National Seminar 2010

National Seminar 2012

National Seminar 2014