

## 6. ACADEMIC ACTIVITIES

### 6.1 PELLETRON BEAM UTILIZATION BY USERS

#### 6.1.1 Pelletron Beam Time Utilization and Experiments performed (April, 2012 to March, 2013)

Users	No. of Shift allotted	Project in				
		Nuclear Physics	Materials Science	Radiation Biology	Atomic Physics	AMS
<b>A. Universities/Colleges</b>						
Aligarh Muslim University (AMU), Aligarh	15	1				
Allahabad University, Allahabad	4		1			
Amity University, Uttar Pradesh	2		1			
Andhra University, Visakhapatnam	3					1
Anna University, Chennai	5		2			
Banaras Hindu University (BHU), Varanasi	2		1			
Bangalore University, Bangalore	3		1			
Delhi University, Delhi	19	1	2			1
Dr. Babasaheb Ambedkar Marathwada University, Aurangabad	4		2			
G.B. Pant University of Agriculture & Technology, Pantnagar	6		2			
Guru Gobind Singh Indraprastha University (GGSIPU), Delhi	13		5			
Guru Nanak Dev University (GNDU), Amritsar	10		4			
Hyderabad University, Hyderabad	8		1			
India Gandhi National Open University (IGNOU), Delhi	3		1			
Jamia Milia Islamia (JMI), New Delhi	2		1			
Kalyani University, West Bengal	6			1		
Kurukshetra University, Kurukshetra	3		1			
Mysore University, Mysore	3		1			
Pondicherry University, Pondicherry	4					1
Punjab University, Chandigarh	77	4				
Saurashtra University (SU), Rajkot	2		1			
Tezpur University, Tezpur (Assam)	5		2			
West Bengal University of Technology (WBUT), Kolkata	1			1		
<b>B. Institutions</b>						
All India Institute of Medical Sciences (AIIMS), New Delhi	4		1			
Bhabha Atomic Research Centre (BARC), Mumbai	19	1		1		
Indian Institute of Technology (IIT), Delhi	5		2			
Indian School of Mines, Dhanbad	6		1			
ISRO Satellite Centre, Bangalore	9	1				

Users	No. of Shift allotted	Project in				
		Nuclear Physics	Materials Science	Radiation Biology	Atomic Physics	AMS
Inter-University Accelerator Centre (IUAC), New Delhi	113	4	8		1	
Kishinchand Chellaram College, Mumbai	3					1
Kongunadu Arts and Science College, Coimbatore	2		1			
Malaviya National Institute of Technology, Jaipur	3		1			
Maulana Azad National Institute of Technology, Bhopal	3		1			
National Institute for Material Sciences (NIMS), Japan	3		1			
National Institute of Technology (NIT), Kurukshetra	3		1			
National Institute of Technology (NIT), Rourkela	2		1			
Research Centre Imarat (RCI), DRDO-Hyderabad	3	1				
Sant Longowal Institute of Engineering & Technology, Punjab	3		1			
School of Physical Sciences (SPS), JNU, New Delhi	6		2			
Tata Institute of Fundamental Research (TIFR), Mumbai	15	1				
UGC-DAE-CSR, Kolkata	15	1				
Variable Energy Cyclotron Centre (VECC), Kolkata	15	1				
C. Facility Tests	6		2			
<b>TOTAL</b>	<b>438</b>	<b>16</b>	<b>52</b>	<b>3</b>	<b>1</b>	<b>4</b>

Beam time was also used for LINAC Group, IUAC.

### 6.1.2 List of Users Family

The following list includes Universities/Colleges/Institutions that have used the IUAC Pelletron facility (once or more) since 1991.

#### (A) UNIVERSITIES - (87)

- |   |                |
|---|----------------|
| 01. Acharya Nagarjuna University          | Andhra Pradesh |
| 02. Agra University (B.R. Ambedkar Univ.) | Agra           |
| 03. Aligarh Muslim University             | Aligarh        |
| 04. Allahabad University                  | Allahabad      |
| 05. Amity University                      | Uttar Pradesh  |
| 06. Andhra University                     | Waltair        |
| 07. Anna University                       | Chennai        |
| 08. Assam University                      | Silchar        |
| 09. Babasahed Bhimrao Ambedkar University | Lucknow        |
| 10. Banaras Hindu University              | Varanasi       |
| 11. Bangalore University                  | Bangalore      |
| 12. Berhampur University                  | Berhampur      |
| 13. Bhagalpur University                  | Bhagalpur      |

14.	Bharathiar University	Coimbatore
15.	Bharthidasan University	Tirucherapalli
16.	Bhavnagar University	Bhavnagar
17.	Bombay University	Mumbai
18.	Burdwan University	Burdwan
19.	Calcutta University	Kolkata
20.	Calicut University	Calicut
21.	Chaudhury Charan Singh University	Meerut
22.	Cochin University	Cochin
23.	Cochin University of Science & Technology	Cochin
24.	Delhi University	Delhi
25.	Devi Ahilya University	Indore
26.	Dr. B.A.M. University	Aurangabad
27.	G.B. Pant University	Pantnagar
28.	Gauhati University	Guwahati
29.	Gujarat University	Ahmedabad
30.	Gulbarga University	Gulbarga
31.	Guru Ghasidas University	Bilaspur
32.	Guru Nanak Dev University	Amritsar
33.	Himachal Pradesh University	Simla
34.	H.N.B. Garhwal University	Srinagar Garhwal
35.	Hyderabad University	Hyderabad
36.	Indra Prastha University (GGSIPIU)	New Delhi
37.	Indira Gandhi National Open University (IGNOU)	New Delhi
38.	Jamia Milia Islamia University	New Delhi
39.	Jammu University	Jammu
40.	Jawaharlal Nehru University	New Delhi
41.	Kalyani University	Kalyani
42.	Karnataka University	Dharwad
43.	Kashmir University	Srinagar
44.	Kiel University	Germany
45.	Kurukshetra University	Kurukshetra
46.	Kuvempu University	Shankaraghatta, Shimoga
47.	Lucknow University	Lucknow
48.	Ludwig Maximilian University	Munich, Germany
49.	M.D. University	Rohtak
50.	M.L. Sukhadia University	Udaipur
51.	M.S. University	Baroda
52.	Madras University	Chennai
53.	Mahatama Gandhi University	Kottayam
54.	Manav Rachna International University	Faridabad

55.	Mangalore University	Mangalore
56.	Manipur University	Imphal
57.	Mannonmaniam Sundarnar University	Tirunelveli
58.	M.M. University	Ambala
59.	Mysore University	Mysore
60.	Nagpur University	Nagpur
61.	North Carolina State University	USA
62.	North Eastern Hill University	Shillong
63.	North Maharashtra University	Jalgaon
64.	North Orissa University	Baripada
65.	Osmania University	Hyderabad
66.	Patna University	Patna
67.	Periyar University	Kerala
68.	Pondichery University	Pondichery
69.	Poona University	Pune
70.	Punjab Agricultural University	Ludhiana
71.	Punjab University	Chandigarh
72.	Punjabi University	Patiala
73.	Rani Durgawati University	Jabalpur
74.	S.K. University	Anantpur
75.	Sharda University	Greater Noida
76.	Stuttgart University	Germany
77.	Saurashtra University	Rajkot
78.	Technical University	Darmstadt, Germany
79.	Tezpur University	Tezpur
80.	Tumkur University	Tumkur
81.	Shivaji University	Kolhapur
82.	University and Petroleum & Energy Studies	Dehradun
83.	University of Maryland	Maryland, USA
84.	University of Notre Dame	Notre Dame, USA
85.	University of Padova	Italy
86.	University of Rajasthan	Jaipur
87.	Utkal University	Bhubaneswar
88.	Vikram University	Ujjain
89.	Visva-Bharati University	Shanti Niketan
90.	West Bengal University of Technology	Kolkata

**(B) COLLEGES - (54)**

01.	Anand Mohan College	Kolkata
02.	Armed Forces Medical College	Pune
03.	Bareilly College	Bareilly

04.	Belonia College	Belonia, Tripura
05.	Beant College of Eng. And Technology	Gurdaspur
06.	Bharatiya Jain Sanghatana College	Pune
07.	Bhiwandi College	Mumbai
08.	B.N.N. College	Bhivandi, Madhya Pradesh
09.	C.H.M. College	Ulhasnagar, Maharashtra
10.	College of Engineering and Technology	Aligarh
11.	D.A.V. College	Mumbai
12.	D.A.V. College	Jalandhar
13.	D.A.V. College	Kanpur
14.	D.B.S. College	Dehradun
15.	Doodhsakhar Mahavidyalaya	Bidri, Maharashtra
16.	Ewing Christian College	Allahabad
17.	Govt. Art College	Rajamundri, Andhra Pradesh
18.	Govt. College	Ajmer
19.	Govt. College	Mehendragarh
20.	Govt. College	Kota
21.	Govt. M.S.J. College	Bharatpur
22.	Goyalpara College	Goyalpara, Assam
23.	Gurudas College	Kolkata
24.	Jai Hind College	Mumbai
25.	Kandi Raj College	Murshidabad, (WB)
26.	Kishinchand Chellaram College	Mumbai
27.	Kongunadu Arts & Science College	Coimbatore
28.	Koshi College	Khagaria, Bihar
29.	Mahila Degree College	Lucknow
30.	Marwari College	Ranchi
31.	M.M.H.College	Ghaziabad
32.	M.R. College	Vizianagram (AP)
33.	Malviya Regional Engg. College	Jaipur
34.	Nayagarh College	Nayagarh
35.	Nizam College	Hyderabad
36.	NSAM College	Mangalore
37.	Orissa Univ. of Agriculture & Tech.	Bhubneshwar
38.	Poorna Prajna College	Udipi, Karnataka
39.	Punjab Engineering College	Chandigarh
40.	R.B.S. College	Agra
41.	RD & DJ College	Munger, Bihar
42.	Regional Engineering College	Kurukshetra
43.	R.P.G. College	Ratnagiri
44.	School of Physical Sciences	JNU, New Delhi

45.	School of Physical Sciences	Nanded, Maharashtra
46.	School of Tech. & Applied Sciences	Kottayam, Kerala
47.	SDM College	Ujire, Mysore
48.	Sharanabasaveshwar College of Science	Gulbarga
49.	S.N.College	Kollam
50.	Sri Bhuvanendra College	Karkala
51.	St. Edmunds College	Shillong
52.	S.V. College	Aligarh
53.	Swami Shardhanand College	New Delhi
54.	University College	Kurukshetra
55.	University College of Science & Tech.	Kolkata
56.	Vaish College	Rohtak

**(C) OTHER INSTITUTIONS – (64)**

01.	AICTE	New Delhi
02.	AIIMS	New Delhi
03.	Amity School of Engineering	New Delhi
04.	Bhabha Atomic Research Centre	Mumbai
05.	C.E.E.R.I.	Pilani
06.	CAT	Indore
07.	CCMB	Hyderabad
08.	Centre for Superco	tivity research, USA
09.	CSNSM, Orsay Cedex	France
10.	D.M.R.L.	Hyderabad
11.	Dayalbagh Educational Institute	Agra
12.	Defence Laboratory	Jodhpur
13.	Defence Research & Development Orgn.	Dehradun
14.	Genetic Institute of Manufacturing Technology	Singapore
15.	GSI	Germany
16.	Harcourt Butler Technological Institute	Kanpur
17.	ICGEB	New Delhi
18.	IISER	Kolkata
19.	I.G.C.A.R.	Kalpakkam
20.	Indian Institute of Science	Bangalore
21.	Indian Institute of Technology	Chennai
22.	Indian Institute of Technology	Kanpur
23.	Indian Institute of Technology	Kharagpur
24.	Indian Institute of Technology	Mumbai
25.	Indian Institute of Technology	New Delhi
26.	Indian Institute of Technology	Roorkee
27.	Indian School of Mines	Dhanbad

28.	Indian Space Research Organisation	Bangalore
29.	INFN-LEGNARO	Italy
30.	INMAS	New Delhi
31.	Institute of Basic Sciences	Agra
32.	Institute of Materials Science	Bhubaneswar
33.	Institute of Physics	Bhubaneswar
34.	Institute of Science	Mumbai
35.	IUC-DAEF, Calcutta Centre	Kolkata
36.	IUC-DAEF, Indore Centre	Indore
37.	Joint Inst. of Nuclear Research	Dubna, Russia
38.	KIIT	Bhubaneswar
39.	Massachusetts Inst. of Technology	USA
40.	Malaviya National Institute of Technology	Jaipur
41.	Maulana Azad National Inst. of Technology (MANIT)	Bhopal
42.	Nanocrystals Technology	USA
43.	National Institute of Material Sciences	Japan
44.	National Academy of Science	Allahabad
45.	National Institute of Oceanography	Goa
46.	National Institute of Technology, Hamirpur	Himachal Pradesh
47.	National Institute of Technology	Kurukshetra
48.	National Institute of Technology	Raurkela
49.	National Institute of Technology	Silchar
50.	National Institute of Technology	Srinagar
51.	National Institute of Technology	Tiruchirapalli
52.	National Physical Laboratory	New Delhi
53.	NCCCM/BARC	Hyderabad
54.	NCAOR	Goa
55.	NCSR	France
56.	NISER	Bhubaneswar
57.	Oak Ridge National Laboratory	USA
58.	Physical Research Laboratory	Ahmedabad
59.	Research Centre Imarat (RCI), DRDO	Hyderabad
60.	Saha Institute of Nuclear Physics	Kolkata
61.	Sant Longowal Institute of Engineering & Technology	Sangrur
62.	SSPL	New Delhi
63.	Tata Institute of Fundamental Research	Mumbai
64.	Thapar Inst. Of Eng. & Technology	Patiala
65.	UGC-DAE-CSR	Kolkata
66.	Variable Energy Cyclotron Centre	Kolkata
67.	Wadia Institute of Himalayan Geology	Dehradun

## 6.2 STUDENTS' PROGRAMME

### 6.2.1 B. Sc. Summer Programme

A.Mandal

To encourage meritorious students for studying basic science, we have started a summer project programme for B.Sc Physics students. An advertisement is put on the web site [www.iuac.res.in](http://www.iuac.res.in) seeking application from students. The programme is for one month and generally conducted during the month of June. All the students are allotted an experimental project under the supervision of one of our scientists. At the end of the programme, they present their activities in front of academic staff and a certificate is issued to each student. They are provided free lodging and boarding in our guest house and travel allowances. Last year about 20 students from all over India were selected for this programme.

### 6.2.2 M. Sc. Orientation Programme

R Mehta

Inter-University Accelerator Centre (IUAC) conducts M. Sc. Orientation Programme to encourage interested students to supplement their knowledge and to motivate them to continue their career in science. This programme has been envisaged to provide hands-on training in fields associated with accelerator / ion beam based research to selected M. Sc. students by way of short projects. However, this programme is not conducted to satisfy the M. Sc. credit requirements of any University / Department. Due to large number of applications received every year, we may not be able to select all for the project work. In order to provide opportunity for students from various universities, students from the same universities may be given less priority for consideration in successive years.

The duration of M. Sc. Orientation programme is three weeks. It is open throughout the year. Student can apply for this programme based on their convenient time. This flexibility allows the students to choose the project period without hampering their main study course. We try to plan the project period as desired by the student but in case we are unable to do so we suggest suitable dates of the project.

This year 12 students participated in this programme. They were assigned projects in various discipline areas like accelerators, superconductivity, material science & detectors.

Details of this programme can be accessed at: <http://www.iuac.res.in/events/msco.htm>

### 6.2.3 PhD Teaching Programme

A.Mandal

The two semester Ph.D programme for research students of IUAC , other universities in India and for new scientist trainees of IUAC continued to run well during this year. Overwhelming response from different universities shows the positive benefit of the programme to the community of students starting fresh research at different universities throughout the country. The programme consists of two semesters- one during January-May in which courses on Experimental Physics and Accelerator Physics are offered and the second one during August-December in which courses on Computers in instrumentation and data acquisition and Advanced course on Material sciences and Nuclear Physics were offered. Each course consists of five modules. Each module consists of 8 lectures of one and half hour duration and the credit awarded is 1.0. One course on Engineering Drawing is also offered as a part of the Experimental Physics to give basic understanding of drawing. About 20 students from different universities, colleges participated in



each module. Several students from School of Physical sciences, JNU attended the course on Experimental Physics.

One month before each semester a poster containing details of the course is printed and circulated to physics department of various universities and colleges inviting application for attending to the courses. The programme is also put into our website. Accommodation and TA/DA are provided to the selected participants.

#### 6.2.4 Teaching Laboratory Activities

B. P. Ajithkumar and V. V. V. Satyanarayana

Development of a new version of the Computer Interface for Science Experiments was completed and made commercially available. This device, called expEYES Junior, is compact unit supporting around fifty experiments. The expEYES interface has got good response from the academic community and more than 500 units have been sold by different vendors during last year. A photograph of the latest device is shown in the figure.

Around forty teachers attended the “Six Days Training Programs” conducted during May-2012 and Oct-2012. They were trained on computer interfaced science experiments, Python programming for data analysis and visualization and installation of open source educational software. Those who are interested in information about training programs may join the mailing list by registering at the website [www.iuac.res.in](http://www.iuac.res.in)

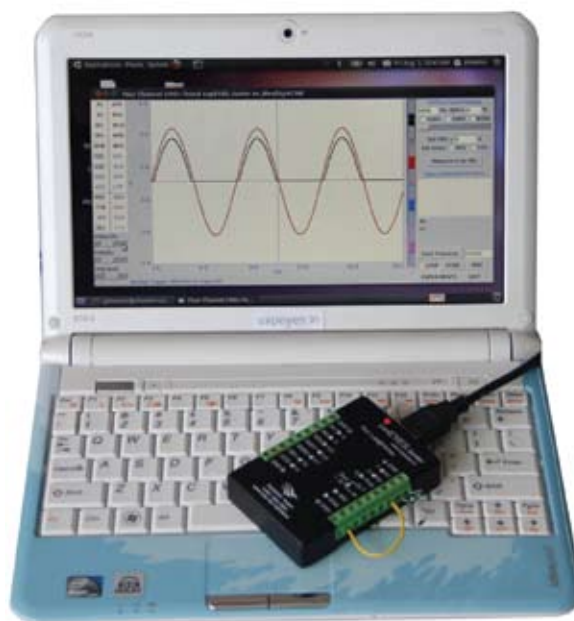


Fig. 1. Study of a p-n junction using expEYES

### 6.3 LIBRARY

**Priyambada Nayak**

Salient features

Working hours:

Round the clock, all days of the week

Total Books:

~2835 (broadly covering the subjects Nuclear Physics, Materials Science, Nanotechnology, Electronics, Computer Science, Radiobiology, Radiation Physics, Vacuum Instrumentation, Cryogenics, Atomic Physics, Mathematical Physics, Quantum Mechanics, Astrophysics etc.

New Books added in 2012-13:

50

Current Journals:

52

Journal Archives:	9
Bound Journals:	~8500
Laboratory Reports:	~900 (from nearly 50 labs)
Reprints/Photocopies:	~700
Newsletters, House magazines etc.	50
Databooks, Manuals etc.:	~550
Ph.D. Thesis:	140
Clientele:	Apart from IUAC staff and students, the library is consulted by students, teaching and research staff from over 100 academic and research institutions in different parts of the country.

The technical reports and technicals memos of various projects carried out at IUAC are also compiled and kept in the library for reference purpose. Web-based OPAC and library cataloging software package has been installed for the computerization of library documents. Apart from the print journals, online journals & archives are also being subscribed by the library. The library is a member of UGC-INFONET, INDEST-AICTE Consortium and more than 4500 journals are being accessed on-line through these facilities. The library is open round the clock. Hence, automatic monitoring system has been installed.

#### 6.4 ACADEMIC ACTIVITIES HELD IN 2012-13

April 10-14	School cum <b>Workshop on Parallel Computing for Scientific Applications</b> (Contact Person: S. Mookherjee)
May 30-5	<b>Workshop on Innovative Experiments</b> (Contract Person: Ajith Kumar B.P./V.V. Satyanarayan, IUAC)
June 14	<b>Acquaintance Programme at Mata Vaishno Devi Univ., Jammu</b> (Contact Person: Fouran Singh)
June 15	<b>Summer Programme for B.Sc Physics students</b> (Contact Person: A. Mandal)
July 6-7	<b>Users' Workshop</b>
July 8	<b>52<sup>nd</sup> AUC Meeting</b>
August 9-10	Workshop on <b>Accelerator based Atomic Physics</b> (Contact Person: T.K. Nandi)
August 22-24	<b>IUAC Academic Workshop</b>
September 12	<b>Discussion Meeting on LEIBF</b> (Contact Person: Pravin Kumar)
September 21	<b>Acquaintance Programme at Saurashtra University</b> (Contact Person: K. Asokan)
October 3-8	<b>International School on Ion Beam in Material Sciences</b> (Contact Person: D.K. Avasthi)
October 9-12	International Conference on <b>Swift Heavy Ion Material Engineering and Characterisation (SHIMEC-2012)</b> (Contact Person: D.K. Avasthi)
October 15-20	Workshop on <b>Innovative Experiments</b> (Contact Person: Ajith Kumar B.P./V.V. Satyanarayan, IUAC)

November 16	Acquaintance Programme at <b>Ranchi Central University</b> (Contact Person: A. Mandal)
November 22-23	Workshop on <b>High Performance Computing</b> (Contact Person: S. Mookherjee)
November 26	Workshop on Physics with <b>Neutron Array</b> (Contact Person: P. Sugathan)
December 11-13	School on <b>Thin Film</b> (Contact Person: D. Kabiraj)
December 17-18	<b>Users' Workshop</b>
December 19	<b>Foundation Day &amp; 53<sup>rd</sup> AUC Meeting</b>
January 21	<b>Ph.D Programme:</b> Spring Semester Starts (Contact Person : A. Mandal, IUAC)
February 28	<b>National Science Day</b> (Contact Person : Saif A. Khan)
March 1-2	School cum Workshop on <b>Parallel Computing for Scientific Applications</b> (Contact Person : S. Mookherjee)
March 19-20	<b>IUAC Academic Workshop</b> (Contact Person : P. Sugathan)
March 22	<b>Acquaintance Programme at Mizoram</b> (Contact Person : D.K. Avasthi)

## 6.5 FORTHCOMING EVENTS: 2013

April 4-5	Conference on <b>Particle Accelerators : Technology &amp; Applications in Science</b> (Contact Person : D. Kanjilal)
April 29-May 4	<b>Workshop on Innovative Experiments</b> (Contact Person : Ajith Kumar B.P./V.V.Satyanarayan, IUAC)
May 7-8	<b>Workshop on Ancillary Equipments for Nuclear Physics</b> (Contact Person (N. Madhavan, S. Muralithar)
May 15-16	<b>Workshop on High Performance Computing</b> (Contact Person : S. Mookherjee)
June 3	<b>Summer Program</b> for B.Sc Physics students (Contact Person : A. Mandal)
July 6-7	<b>Users' Workshop</b>
July 8	<b>54<sup>th</sup> AUC Meeting</b>
July 19	<b>Acquaintance Programme at Bilaspur</b> (Contact Person : S. Muralithar)
August 8	<b>Ph.D Programme,</b> Fall semester starts (Contact Person : A. Mandal)
August 12-14	<b>IUAC Academic Workshop</b> (Contact Person : P. Sugathan)
August 22-23	Workshop on <b>AMS</b> (Contact Person : S. Chopra)
September 12	Workshop on <b>Accelerator based Atomic Physics</b> (Contact Person : T.K. Nandi)
September 20	<b>Acquaintance Programme</b> at Meerut University (Contact Person : Pravin Kumar)
September 26-27	Workshop on <b>Secondary RIB using HYRA</b> (Contact Person : N. Madhavan, P. Sugathan)
October 15-20	Workshop on <b>Innovative Experiments</b> (Contact Person : Ajith Kumar B.P./V.V. Satyanarayan, IUAC)
October 23-25	Conference on <b>Nanostructuring by ion beam</b> (Contact Person : D.K. Avasthi, IUAC, Y.K. Vijay, Jaipur University)
November 7-8	<b>Workshop on research with LEIBF</b> (Contact Person : Pravin Kumar)

November 18	<b>Acquaintance Programme at Madurai</b> (Contact Person : A. Mandal, IUAC, N. Soundararajan, Madurai Univ.)
November 25-29	<b>Workshop on Radiation Biology</b> (Contact Person : Asiti Sarma)
December 17-18	<b>Users' Workshop</b>
December 19	<b>Foundation Day &amp; 55<sup>th</sup> AUC Meeting</b>

## 6.6 LIST OF PH.D AWARDEES

### Doctoral Theses

- **S. Muralithar:** Development of Experimental facilities for in-beam Gamma-ray Spectroscopy and Nuclear Structure in  $^{216,217}\text{Ra}$  at High Spins. Jawaharlal Nehru University, New Delhi.
- **Subir Nath:** Fusion Fission Dynamics in A~200 region. Andhra University, Visakhapatnam.
- **Gayatri Mohanto:** Evaporation residue spin distribution studies for heavy ion fusion fission reaction in the region A~200. Jawaharlal Nehru University, New Delhi.
- **Rajesh Pratap Singh:** Shapes and spin effects in  $^{99}\text{Rh}$ ,  $^{131}\text{Ce}$ ,  $^{133}\text{Pr}$  and  $^{156}\text{Gd}$  nuclei. Jawaharlal Nehru University, New Delhi.

## 6.7 LIST OF PUBLICATIONS IN THE YEAR 2012-13

### A. NUCLEAR PHYSICS

1. **Neutron multiplicity measurements for  $^{19}\text{F}+^{194,196,198}\text{Pt}$  systems to investigate the effect of shell closure on nuclear dissipation,** Varinderjit Singh, B.R. Behera, Maninder Kaur, A. Kumar, P. Sugathan, K.S. Golda, A. Jhingan, M.B. Chatterjee, R.K. Bhowmik, Davinder Siwal, S. Goyal, Jhilm Sadhukhan, Santanu Pal, A. Saxena, S. Santra and S. Kailas, *Phys. Rev. C 87 (2013) 064601*.
2. **g factors of  $9/2^-$  and  $23/2^+$  isomeric states in  $^{129}\text{Ba}$ ,** Jasmeet Kaur, A.K. Bhati, N. Bansal, V. Kumar, Vijay R. Sharma, H. Kumar, R. Kumar and R.K. Bhowmik, *Phys. Rev. C 87 (2013) 064312*.
3. **Effect of N/Z in pre-scission neutron multiplicity for  $^{16,18}\text{O}+^{194,198}\text{Pt}$  systems,** Rohit Sandal, B. R. Behera, Varinderjit Singh, Maninder Kaur, A. Kumar, G. Singh, K. P. Singh, P. Sugathan, A. Jhingan, K. S. Golda, M. B. Chatterjee, R. K. Bhowmik, Sunil Kalkal, D. Siwal, S. Goyal, S. Mandal, E. Prasad, K. Mahata, A. Saxena, Jhilm Sadhukhan and Santanu Pal, *Phys. Rev. C 87 (2013) 014604*.
4. **Rotational bands in  $^{113}\text{Sb}$ ,** P. Banerjee, S. Ganguly, M.K. Pradhan, H.P. Sharma, S. Muralithar, R.P. Singh and R.K. Bhowmik, *Phys. Rev. C 87 (2013) 034321*.
5. **Core-coupled states and split proton-neutron quasiparticle multiplets in  $^{122-126}\text{Ag}$ ,** S. Lalkovski, A.M. Bruce, A. Jungclaus, M. Gorska, M. Pfutzner, L. Caceres, F. Naqvi, S. Pietri, Zs. Podolyak, G.S. Simpson, K. Andgren, P. Bednarczyk, T. Beck, J. Benlliure, G. Benzoni, E. Casarejos, B. Cederwall, F.C.L. Crespi, J.J. Cuenca-Garcia, I.J. Cullen, A.M.D. Bacelar, P. Detistov, P. Doornenbal, G.F. Farrelly, A.B. Garnsworthy, H. Geissel, W. Gelletly, J. Gerl, J. Grebosz, B. Hadinia, M. Hellstrom, C. Hinke, R. Hoischen, G. Ilie, G. Jaworski, J. Jolie, A. Khaplanov, S. Kisyov, M. Kmiecik, I. Kojouharov, R. Kumar, N. Kurz, A. Maj, S. Mandal, V. Modamio, F. Montes, S. Myalski, M. Palacz, W. Prokopowicz, P. Reiter, P.H. Regan, D. Rudolph, H. Schaffner, D. Sohler, S.J. Steer, S. Tashenov, J. Walker, P.M. Walker, H. Weick, E. Werner-Malento, O. Wieland, H.J. Wollersheim and M. Zhekova, *Phys. Rev. C 87 (2013) 034308*.

6. **Coulomb excitation of  $^{104}\text{Sn}$  and the strength of the  $^{100}\text{Sn}$  shell closure**, G. Guastalla, D.D. DiJulio, M. Gorska, J. Cederkall, P. Boutachkov, P. Golubev, S. Pietri, H. Grawe, F. Nowacki, K. Sieja, A. Algora, F. Ameil, T. Arici, A. Atac, M.A. Bentley, A. Blazhev, D. Bloor, S. Brambilla, N. Braun, F. Camera, Zs. Dombradi, C. Domingo Pardo, A. Estrade, F. Farinon, J. Gerl, N. Goel, J. Grebosz, T. Habermann, R. Hoischen, K. Jansson, J. Jolie, A. Jungclaus, I. Kojouharov, R. Knoebel, R. Kumar, J. Kurcewicz, N. Kurz, N. Lalovic, E. Merchan, K. Moschner, F. Naqvi, B.S. Nara Singh, J. Nyberg, C. Nociforo, A. Obertelli, M. Pfitzner, N. Pietralla, Z. Podolyak, A. Prochazka, D. Ralet, P. Reiter, D. Rudolph, H. Schaffner, F. Schirru, L. Scruton, D. Sohler, T. Swaleh, J. Taprogge, Zs. Vajta, R. Wadsworth, N. Warr, H. Weick, A. Wendt, O. Wieland, J.S. Winfield and H.J. Wollersheim, *Phys. Rev. Lett.* 110 (2013) 172501.
7. **Study of nuclear shapes in extreme conditions**, S. Muralithar and Gamma spectroscopy group in IUAC. *AIP Conf. Proc.* 1524 (2013) 37.
8. **Evidence of quasi-fission in asymmetric reactions forming the  $^{250}\text{Cf}$  compound system**, C. Yadav, R.G. Thomas, R.K. Choudhury, P. Sugathan, A. Jhingan, S. Appannababu, K.S. Golda, D. Singh, Ish Mukul, J. Gehlot, E. Prasad and H.J. Wollersheim, *Phys. Rev. C* 86 (2012) 034606.
9. **Search for an effect of shell closure on nuclear dissipation via a neutron-multiplicity measurement**, Varinderjit Singh, B.R. Behera, Maninder Kaur, P. Sugathan, K.S. Golda, A. Jhingan, Jhilm Sadhukhan, Davinder Siwal, S. Goyal, S. Santra, A. Kumar, R.K. Bhowmik, M.B. Chatterjee, A. Saxena, Santanu Pal and S. Kailas, *Phys. Rev. C* 86 (2012) 014609.
10. **Small quadrupole deformation for the dipole bands in  $^{112}\text{In}$** , T. Trivedi, R. Palit, J. Sethi, S. Saha, S. Kumar, Z. Naik, V.V. Parkar, B.S. Naidu, A.Y. Deo, A. Raghav, P.K. Joshi, H.C. Jain, S. Sihotra, D. Mehta, A.K. Jain, D. Choudhury, D. Negi, S. Roy, S. Chattopadhyay, A.K. Singh, P. Singh, D.C. Biswas, R.K. Bhowmik, S. Muralithar, R.P. Singh, R. Kumar and K. Rani, *Phys. Rev. C* 85 (2012) 014327.
11. **Effect of  $\alpha$ -Q value on incomplete fusion**, A. Yadav, V.R. Sharma, P.P. Singh, R. Kumar, D.P. Singh, Unnati, M.K. Sharma, B.P. Singh and R. Prasad, *Phys. Rev. C* 86 (2012) 014603.
12. **Entrance channel effect on ER spin distribution**, Gayatri Mohanto, N. Madhavan, S. Nath, Jhilm Sadhukhan, J. Gehlot, I. Mazumdar, M.B. Naik, E. Prasad, Ish Mukul, T. Varughese, A. Jhingan, R.K. Bhowmik, A.K. Sinha, D.A. Gothe, P.B. Chavan, Santanu Pal, V.S. Ramamurthy and A. Roy, *Nucl. Phys. A* 890-891 (2012) 62.
13. **Fission fragment angular distribution measurements for  $^{16}\text{O}+^{194}\text{Pt}$  reaction at energies near the Coulomb barrier**, E. Prasad, K.M. Varier, R.G. Thomas, A.M. Vinodkumar, K. Mahata, S. Appannababu, P. Sugathan, K.S. Golda, B.R.S. Babu, A. Saxena, B.V. John and S. Kailas, *Nucl. Phys. A* 882 (2012) 62.
14. **Nuclear structure of  $^{216}\text{Ra}$  at high spin**, S. Muralithar, G. Rodrigues, R.P. Singh, R.K. Bhowmik, P. Mukherjee, B. Sethi and I. Mukherjee, *Pramana – J. Phys.* 79 (2012) 403.
15. **In-beam gamma spectroscopy of  $^{73}\text{As}$  nucleus**, M.K. Raju, P. Sugathan, T. Seshi Reddy, B.V.T. Rao, S. Muralithar, R.P. Singh, R.K. Bhowmik and P.V. Madhusudhana Rao, *J. Radioanal. Nucl. Chem.* 294 (2012) 53.
16.  **$\gamma$  spectroscopy of calcium nuclei around doubly magic  $^{48}\text{Ca}$  using heavy-ion transfer reactions**, D. Montanari, S. Leoni, D. Mengoni, J.J. Valiente-Dobon, G. Benzoni, N. Blasi, G. Bocchi, P.F. Bortignon, S. Bottoni, A. Bracco, F. Camera, P. Casati, G. Colo, A. Corsi, F.C.L. Crespi, B. Million, R. Nicolini, O. Wieland, D. Bazzacco, E. Farnea, G. Germogli, A. Gottardo, S.M. Lenzi, S. Lunardi, R. Menegazzo, G. Montagnoli, F. Recchia, F. Scarlassara, C. Ur, L. Corradi, G. de Angelis, E. Fioretto, D.R. Napoli, R. Orlandi, E. Sahin, A.M. Stefanini, R.P. Singh, A. Gadea, S. Szilner, M. Kmiecik, A. Maj, W. Meczynski, A. Dewald, Th. Pissulla and G. Pollarolo, *Phys. Rev. C* 85 (2012) 044301.

17. **Multiple  $\beta^-$  decaying states in  $^{194}\text{Re}$ : Shape evolution in neutron-rich osmium isotopes**, N. Al-Dahan, P.H. Regan, Zs. Podolyak, P.M. Walker, N. Alkhomashi, G.D. Dracoulis, G. Farrelly, J. Benlliure, S.B. Pietri, R.F. Casten, P.D. Stevenson, W. Gelletly, S.J. Steer, A.B. Garnsworthy, E. Casarejos, J. Gerl, H.J. Wollersheim, J. Grebosz, M. Gorska, I. Kojouharov, H. Schaffner, A. Algora, G. Benzoni, A. Blazhev, P. Boutachkov, A.M. Bruce, I.J. Cullen, A.M.D. Bacelar, A.Y. Deo, M.E. Estevez, Y. Fujita, R. Hoischen, R. Kumar, S. Lalkovski, Z. Liu, P.J. Mason, C. Mihai, F. Molina, D. Mucher, B. Rubio, A. Tamii, S. Tashenov, J.J. Valiente-Dobon and P.J. Woods, *Phys. Rev. C* 85 (2012) 034301.
18. **Spectroscopy of odd-mass cobalt isotopes toward the N=40 subshell closure and shell-model description of spherical and deformed states**, F. Recchia, S.M. Lenzi, S. Lunardi, E. Farnea, A. Gadea, N. Marginean, D.R. Napoli, F. Nowacki, A. Poves, J.J. Valiente-Dobon, M. Axiotis, S. Aydin, D. Bazzacco, G. Benzoni, P.G. Bizzeti, A.M. Bizzeti-Sona, A. Bracco, D. Bucurescu, E. Caurier, L. Corradi, G. de Angelis, F. Della Vedova, E. Fioretto, A. Gottardo, M. Ionescu-Bujor, A. Iordachescu, S. Leoni, R. Marginean, P. Mason, R. Menegazzo, D. Mengoni, B. Million, G. Montagnoli, R. Orlandi, G. Pollarolo, E. Sahin, F. Scarlassara, R.P. Singh, A.M. Stefanini, S. Szilner, C.A. Ur and O. Wieland, *Phys. Rev. C* 85 (2012) 064305.
19. **Structure of the N=50 As, Ge, Ga nuclei**, E. Sahin, G. de Angelis, G. Duchene, T. Faul, A. Gadea, A.F. Lisetskiy, D. Ackermann, A. Algora, S. Aydin, F. Azaiez, D. Bazzacco, G. Benzoni, M. Bostan, T. Byrski, I. Celikovic, R. Chapman, L. Corradi, S. Courtin, D. Curien, U. Datta Pramanik, F. Didierjean, O. Dorvaux, M.N. Erduran, S. Erturk, E. Farnea, E. Fioretto, G. de France, S. Franchoo, B. Gall, A. Gottardo, B. Guiot, F. Haas, F. Ibrahim, E. Ince, A. Khouaja, A. Kusoglu, G. La Rana, M. Labiche, D. Lebhertz, S. Lenzi, S. Leoni, S. Lunardi, P. Mason, D. Mengoni, C. Michelagnoli, V. Modamio, G. Montagnoli, D. Montanari, R. Moro, B. Mougnot, D.R. Napoli, D. O'Donnell, J.R.B. Oliveira, J. Ollier, R. Orlandi, G. Pollarolo, F. Recchia, J. Robin, M.-D. Salsac, F. Scarlassara, R.P. Singh, R. Silvestri, J.F. Smith, I. Stefan, A.M. Stefanini, K. Subotic, S. Szilner, D. Tonev, D.A. Torres, M. Trotta, P. Ujic, C. Ur, J.J. Valiente-Dobon, D. Verney, M. Yalcinkaya, P.T. Wady, K.T. Wiedemann and K. Zuber, *Nucl. Phys. A* 893 (2012) 1.
20. **Toward the N = 40 sub-shell closure in Co isotopes and the new island of inversion**, F. Recchia, S.M. Lenzi, S. Lunardi, E. Farnea, A. Gadea, N. Marginean, J.J. Valiente-Dobon, M. Axiotis, S. Aydin, D. Bazzacco, G. Benzoni, P.G. Bizzeti, A.M. Bizzeti-Sona, A. Bracco, D. Bucurescu, F. Camera, L. Corradi, G. de Angelis, F. Della Vedova, E. Fioretto, M. Ionescu-Bujor, A. Iordachescu, S. Leoni, R. Marginean, P. Mason, R. Menegazzo, D. Mengoni, B. Million, G. Montagnoli, D.R. Napoli, F. Nowacki, R. Orlandi, G. Pollarolo, A. Poves, E. Sahin, K. Sieja, F. Scarlassara, R.P. Singh, A.M. Stefanini, S. Szilner, C.A. Ur and O. Wieland, *Phys. Scr. T* 150 (2012) 014034.

## B. MATERIALS SCIENCE

1. **Investigation of nickel lattice sites in diamond: Density functional theory and x-ray absorption near-edge structure experiments**. Etienne Gheeraert, Amit Kumar, Etienne Bustarret, Laurent Ranno, Laurence Magaud, Yves Joly, Sakura Pascarelli, Matthew Ruffoni, Devesh Kumar Avasthi and Hisao Kanda, *Phys. Rev. B* 86(2012)54116
2. **Plasmonic, Low-Frequency Raman, and Nonlinear Optical-Limiting Studies in Copper-Silica Nanocomposites**. Satyabrata Mohapatra, Y. K. Mishra, A. M. Warriar, Reji Philip, S. Sahoo, A. K. Arora, D. K. Avasthi, *Plasmonics* 7(2012)25
3. **Blue-Shifted SPR of Au Nanoparticles with Ordering of Carbon by Dense Ionization and Thermal Treatment**. R Singhal, D Kabiraj, PK Kulriya, J C Pivin, R Chandra, DK Avasthi, *Plasmonics*, (2012); DOI 10.1007/s11468-012-9389-6
4. **N-ion-implanted TiO<sub>2</sub> photoanodes in quantum dot-sensitized solar cells**. YS Kang, S Pitchaimuthu, K Asokan, E Ito, *Nanoscale*, 4, 2416-2422. (2012)

5. **Giant enhancement in ferromagnetic properties of Pd nanoparticle induced by intentionally created defects.** P K Kulriya, BR Mehta, DC Agarwal, P Kumar, SM Shivaprasad, JC Pivin, DK Avasthi, *Journal of Applied Physics* 112(2012) 014318
6. **Magnetic and electric properties of In doped cobalt ferrite nanoparticles.** Razia Nongjai, Shakeel Khan, K. Asokan, Hilal Ahmad, Imran Khan, *Journal of Applied Physics* 112 (2012), 084321.
7. **Crystal growth behaviour in Au-ZnO nanocomposite under different annealing environments and photoswitchability.** Mishra Y. K. , Chakravadhanula V. S. K., Hrkac V., Jebriil S., Agarwal D. C., Mohapatra S., Avasthi D. K., Kienle L., Adelung R., *J Appl Phys.* 112(2012)64308
8. **Temperature dependence of 1/f noise in Ni/n-GaN Schottky barrier diode.** A Kumar, K Asokan, V Kumar, R Singh, *Journal of Applied Physics* 112 (2), 024507 (2012)
9. **Disorder induced semiconductor to metal transition and grain boundary modifications in nanocrystalline zinc oxide thin film.** Fouran Singh, Babloo Chaudhary, Vinod Kumar, R. G. Singh, Sanjeev Kumar and A. Kapoor, *J. Appl. Phys.* 112, (2012) 073101.
10. **A study on the formation of Ag nanoparticles on the surface and catcher by ion beam irradiation of Ag thin films.** Udai B Singh, Dinesh C Agarwal, Saif A Khan, Satyabrata Mohapatra, Ambuj Tripathi and Devesh K Avasthi, *J Phys. D.* 45(2012)445304
11. **Synthesis of an embedded metal nanoparticle planar assembly by low-energy ion irradiation of a thin discontinuous metal film sandwiched in silica.** Saif A Khan, S K Srivastava and D K Avasthi, *J Phys. D: Appl. Phys.* 45 (2012)375304
12. **A study on 120 MeV Ag<sup>9+</sup> irradiation induced modifications in structural, electrical and optical behavior of ZnSnO<sub>3</sub> thin films.** R Kumaravel, K Ramamurthi, I Sulania, K Asokan, D Kanjilal, DK Avasthi, *Nuclear Instruments and Methods in Physics Research B* 285, 61-64 (2012)
13. **PbTe formation by swift heavy ion beam induced interface mixing of Te/PbO bilayer.** Srashti Gupta, D.C. Agarwal, Jai Prakash, S.A. Khan, S.K. Tripathi, A. Tripathi, S. Neeleshwar, S.K. Srivastava, B.K. Panigrahi, R. Chandra, D.K. Avasthi, *Nucl. Instr. & Meth. B* 289(2012)22
14. **Swift heavy ion induced formation of Al/polymer composite layer for low thermal emissivity in the IR range.** Harshada A. Babrekar, J.P. Jog, V.L. Mathe, D.K. Avasthi, S. Ojha, S.V. Bhoraskar, *Nucl. Instr. & Meth. B* 287(2012)135
15. **Swift heavy ion induced surface and microstructural evolution in metallic glass thin films.** Hysen Thomas, Senoy Thomas, Raju V. Ramanujan, D.K. Avasthi, I.A. Al- Omari, Salim Al-Harhi, M.R. Anantharaman, *Nucl Instr. & Meth. B* 287(2012)85
16. **Effect of 120 MeV Au<sup>9+</sup> ion irradiation on structural, optical and dielectric properties of YCa<sub>4</sub>O(BO<sub>3</sub>)<sub>3</sub> nonlinear optical crystal.** M Kalidasan, R Arun Kumar, K Asokan, R Dhanasekaran, *Nuclear Instruments and Methods in Physics Research B* 280, 134-139 (2012)
17. **Effect of swift heavy ion irradiation on sputter deposited SiO<sub>2</sub>/Co/Pt/SiO<sub>2</sub> multilayers.** R. Walia, J.C. Pivin, R. Jain, R. Jayaganthan, E. Pippel, Fouran Singh, R. Chandra, *Nucl. Instrum. and Methods B* 280, (2012) 123.
18. **100 MeV Si<sup>8+</sup> ion induced luminescence and thermoluminescence of nanocrystalline Mg<sub>2</sub>SiO<sub>4</sub>:Eu<sup>3+</sup>.** S.C. Prashantha, B.N. Lakshminarasappa, Fouran Singh, *Journal of Luminescence* 132, (2012) 3093.
19. **Luminescence and defect studies of YAlO<sub>3</sub>:Dy<sup>3+</sup>, Sm<sup>3+</sup> single crystals exposed to 100 MeV Si<sup>7+</sup> ion beam.** H.B. Premkumar, D.V. Sunitha, Fouran Singh, H. Nagabhushana, S.C. Sharma, B.M. Nagabhushana, G. Zhao, J. Chen, R.P.S. Chakradhar, *J. of Luminescence* 132, (2012) 2679.

20. **Thermo, Iono and photoluminescence properties of 100 MeV Si<sup>7+</sup> ions bombarded CaSiO<sub>3</sub>:Eu<sup>3+</sup> nanophosphors**, D.V. Sunitha, H. Nagabhushana, Fouran Singh, B.M. Nagabhushana, S.C. Sharma, R.P.S. Chakradhar, *J. of Luminescence* 132, (2012) 2065.
21. **Modification of optical and electrical properties of zinc oxide-coated porous silicon nanostructures induced by swift heavy ion**. Y. Kumar, M. Herrera-Zaldivar, S.F. Olive-Méndez, Fouran Singh, X. Mathew, V. Agarwal, *Nanoscale Research Letters* 7, (2012) 366.
22. **Opto-structural studies of well dispersed silicon nanocrystals grown by atom beam sputtering**. N Saxena, P Kumar, D Kabiraj, D Kanjilal, *Nanoscale Research Letters* 7 (2012) 547
23. **Nanotwinning and structural phase transition in CdS quantum dots**. P Kumar, N Saxena, R Chandra, V Gupta, A Agarwal, D Kanjilal, *Nanoscale Research Letters* 7 (2012) 584
24. **Enhancement of wettability and antibiotic loading/release of hydroxyapatite thin film modified by 100MeV Ag<sup>7</sup> ion irradiation**. K Elayaraja, P Rajesh, MI Ahymah Joshy, V Sarath Chandra, RV Suganthi, J Kennedy, P K Kulriya, I Sulania, K Asokan, D Kanjilal, DK Avasthi, HK Varma, S Narayana Kalkura, *Materials Chemistry and Physics* 143(2012) 464
25. **In-situ Investigation of Current Transport across Pt/n-Si (100) Schottky Junction during 100 MeV Ni<sup>+7</sup> Ion Irradiation**. Shammi Verma, Kumsi C. Praveen, Tanuj Kumar and Dinakar Kanjilal, *IEEE Transactions on Device and Materials Reliability* (2012); doi: 10.1109/TDMR.2012.2217396
26. **Evidence for phase change memory behavior in In<sub>2</sub>(Se<sub>x</sub>Te<sub>1-x</sub>)<sub>3</sub> thin films**. P Matheswaran, R Sathyamoorthy, K Asokan, *Electronic Materials Letters* 8 (4), 417-421 (2012)
27. **Phase transformation in Ni–Mn–Sn ferromagnetic shape memory alloy thin films induced by dense ionization**. R Vishnoi, R Singhal, K Asokan, D Kanjilal, D Kaur : *Applied Physics A: Materials Science & Processing*, 1-10 (2012)
28. **130 MeV Au ion irradiation induced dewetting on In<sub>2</sub>Te<sub>3</sub> thin film**. P. Matheswaran, KM Abhirami, B Gokul, R Sathyamoorthy, J Prakash, K Asokan, D. Kanjilal, *Applied surface science* 258, 8558-8563(2012).
29. **Influence of mesoporous substrate morphology on the structural, optical and electrical properties of RF sputtered ZnO layer deposited over porous silicon nanostructure**. Y. Kumar, J.E. Garcia, Fouran Singh, S.F. Olive-Méndez, V.V. Sivakumar, D. Kanjilal, V. Agarwal, *Applied Surface Science* 258, (2012) 2283.
30. **Investigation of phase segregation in Zn<sub>1-x</sub>Mg<sub>x</sub>O systems**. P Kumar, JP Singh, Y Kumar, A Gaur, HK Malik, K Asokan, *Current Applied Physics* 12, 1166-1172.(2012).
31. **Highly transparent and conducting boron doped zinc oxide films for window of Dye Sensitized Solar Cell applications**. V. Kumar, R.G. Singh, Fouran Singh, L.P. Purohit, *J. Alloys and Compounds* 544, (2012) 120.
32. **Cathodoluminescence and photoluminescence of swift ion irradiation modified zinc oxide-porous silicon nanocomposite**. Y. Kumar, M. Herrera, Fouran Singh, S.F. Olive-Méndez, D. Kanjilal, S. Kumar, V. Agarwal, *Mater. Science and Eng. B: Solid-State Materials for Advanced Technology* 177, (2012) 1476.
33. **Ion beam induced amorphization and bond breaking in Zn<sub>2</sub>SiO<sub>4</sub>:Eu<sup>3+</sup> nanocrystalline phosphor** D.V. Sunitha, H. Nagabhushana, Fouran Singh, S.C. Sharma, N. Dhananjaya, B.M. Nagabhushana, R.P.S. Chakradhar, *Spectrochimica Acta - Part A: Mol. and Biomol. Spectroscopy* 90, (2012) 18.
34. **Swift heavy ion induced structural, iono and photoluminescence properties of β-CaSiO<sub>3</sub>:Dy<sup>3+</sup> nanophosphors**, D.V. Sunitha, H. Nagabhushana, Fouran Singh, N. Dhananjaya, S.C. Sharma, B.M. Nagabhushana, C. Shivakumara, R.P.S. Chakradhar, *Spectrochimica Acta - Part A: Mol. and Biomol. Spectroscopy* 93, (2012) 300.



35. **Ionoluminescence studies of natural kyanite mineral from different parts of Indian origin.** H. Nagabhushana, Fouran Singh, S.C. Sharma, B.M. Nagabhushana, R.P.S. Chakradhar, *Spectrochimica Acta - Part A: Mol. and Biomol. Spectroscopy* 86, (2012) 15.
36. **Lattice distortion in ion beam synthesized silicon nanocrystals in SiO<sub>x</sub> thin films.** N Saxena, P Kumar, A Agarwal, D Kanjilal, *Physica Status Solidi (a)* 209 (2012), 283
37. **Nanotwinning in CdS quantum dots.** P Kumar, N Saxena, F Singh, A Agarwal, *Physica B: Condensed Matter* 407 (2012) 3347
38. **Modifications on CdS thin films due to low-energy ion bombardment.** Indra Sulania, Dinesh Agarwal, Surya K. Tripathi & Mushahid Husain; *Radiation Effects and Defects in Solids: Incorporating Plasma Science and Plasma Technology*; 167(2012)59-68
39. **Study of surface morphology and grain size of irradiated MgO thin films.** Jitendra Pal Singh, I. Sulania, Jai Prakash, S. Gautam, K. H. Chae, D. Kanjilal, K. Asokan, *Advance material letters*, 3(2012) 112-117.
40. **Conducting nano-channels in an induced piezoelectric polymeric matrix using swift heavy ions and subsequent functionalization.** Karun Kumar Jana, Biswajit Ray, Devesh K. Avasthi and Pralay Maiti, *J Mater. Chem.* 22(1012)3955
41. **Surface-enhanced Raman scattering and fluorescence emission of gold nanoparticle–multiwalled carbon nanotube hybrids.** Himani Sharma, Dinesh C. Agarwal, A. K. Shukla, D. K. Avasthi, V. D. Vankar, *J Raman Spectroscopy* (2012) in press
42. **Ion irradiation studies of silver/amorphous carbon nanocomposite thin film.** R. Singhal, J.C. Pivin, R. Chandra, D.K. Avasthi, *Surf. & Coat Tech.* (2012) in press
43. **Synthesis and characterization of Au–alumina nanocomposites prepared by atom beam co-sputtering.** Manisha Tiwari, D. C. Agarwal, S. Mohapatra, J. C. Pivin, D. K. Avasthi, S. Annapoorni, *Physica Status Solidi (a)* (2012)
44. **Study of ion beam synthesized nanostructured PbTe surface,** Srashti Gupta. D.C. Agarwal, S.K. Tripathi, A. Tripathi, S. Neeleshwar, D.K. Avasthi, *Appl Surf. Sci.* (2012) in press
45. **Evolution of microstructure and crack pattern in NiO thin films under 200 MeV Au ion irradiation.** P. Mallick, D.C. Agarwal, Chandana Rath, D. Behera, D.K. Avasthi, D. Kanjilal, N.C. Mishra, *Rad. Phys. And Chem.* 81(2012)647
46. **Ion beam induced effects on the ferromagnetism in Pd nanoparticles.** PK Kulriya, BR Mehta, DC Agarwal, K Agarwal, P Kumar, SM Shivaprasad, DK Avasthi, *AIP Conference Proceedings* 1447(2012) 401
47. **Study of Structural property of Co ferrite thin film grown by pulsed laser deposition technique.** Razia Nongjai, Shakeel Khan, Hilal Ahmad, Imran Khan, K. Asokan, *AIP Conf. Proc.* 1451 (2012), 163.

### C. OTHERS

1. **Fast ion surface energy loss and straggling in the surface wake fields,** T. Nandi, K. Haris, Hala, Gurjeet Singh, Pankaj Kumar, Rajesh Kumar, S.K. Saini, S.A. Khan, Akhil Jhingan, P. Verma, A. Tauheed, D. Mehta and H. G. Berry, *Phys. Rev. Lett.* 110 (2013) 163203.
2. **Synthesis and thermoluminescence characteristics of gamma and proton irradiated nanocrystalline MgB<sub>4</sub>O<sub>7</sub>:Dy,Na,** Shaila Bahl, S.P. Lochab, A. Pandey, V.E. Aleynikov, A.G. Molokanov, A.A. Rupasov and Pratik Kumar, *Journal of Luminescence* 134 (2013) 691.

3. **Swift heavy ion induced structural and optical properties of  $Y_2O_3:Eu^{3+}$  nanophosphor**, S. Som, S.K. Sharma and S.P. Lochab, *Materials Research Bulletin* 48 (2013) 844.
4. **A novel time stamping technique for distributed data acquisition systems**, E.T. Subramaniam, *Rev. Sci. Instrum.* 83 (2012) 123508.
5. **Pre-gamma dose thermoluminescence characteristics of muscovite mica**, Navjeet Kaur, Lakhwant Singh, Mohan Singh and S.P. Lochab, *Nucl. Instr. Meth. B* 290 (2012) 1.
6. **Luminescence characteristics of Eu and Ti doped  $LiNaF_2$  phosphor**, S.P. Puppalwar, S.J. Dhoble, S.P. Lochab and A. Kumar, *Nucl. Instr. Meth. B* 285 (2012) 6.
7. **Studies on luminescence properties and energy transfer in Ce/Dy co-doped CaS nanophosphors**, Geeta Sharma, S.W. Gosavi, S.P. Lochab and Nafa Singh, *Journal of Luminescence* 132 (2012) 2619.
8. **Role of Mg in the thermoluminescence of LiF crystals grown by edge defined film fed growth (EFG) technique**, Pooja Seth, Shruti Aggarwal, Leena Garg, Shaila Bahl, S.P. Lochab and S.M. Rao, *Nucl. Instr. Meth. B* 278 (2012) 46.
9. **Thermoluminescence and photoluminescence study on 150 MeV proton beam irradiated  $K_2Ca_2(SO_4)_3:Eu$  phosphor**, Shaila Bahl, S.P. Lochab, A. pandey, V.E. Aleynikov, A.G. Molokanov, A.A. Rupasov and Pratik Kumar, *Radiation physics and Chemistry* 81 (2012) 1683.

## 6.8 LIST OF SEMINARS CONDUCTED IN THE YEAR – 2012-13

S.No.	Date	Title	Name
1.	09/04/12	Knockout Reactions and Nuclear Structure Information	Dr. Arun K Jain, Nuclear Physics Division, BARC, Mumbai
2.	16/04/12	Recrystallisation nucleation, static and dynamic	Prof. Yves Brechet, Academie des Sciences, France
3	16/04/12	Accelerator R&D at the SLAC National Accelerator Laboratory	Dr. Vinod Bhardwaj, Stanfor Linear Accelerator Laboratory USA
4.	19/04/12	Electron Beam Welding of Niobium Superconducting Cavities Process Optimization	Dr. J. Dutta Majumdar, Department of Metallurgical and Materials Engineering, I.I.T. Kharagpur, West Bengal
5.	20/04/12	New Functional materials: Interplay of synthesis and crystallography	Dr. A.K. Tyagi, Chemistry Division, BARC Mumbai
6.	24/04/12	Cavity Optomechanics of Bose Einstein Condensates	Dr. Aranya B Bhattacharjee, Asso. Prof., Department of Physics, ARSD College, University of Delhi
7.	14/05/12	The Physics of the Expanding Universe	Prof. T.R. Seshadri, Department of Physics and Astro-Physics, Delhi University.

S.No.	Date	Title	Name
8.	20/06/12	TAMU-TRAP facility for weak interaction Physics	Dr. Praveen D. Shidling, Texas A & M University, USA
9.	13/07/12	Space Plasma Missions and Instrumentation	Mr. D.O. Kataria, Mullard Space Science Laboratory, University Cokkege of London, UK
10.	16/07/12	Proton and Ion Acceleration using a new scheme "RITA" of Laser-Plasma Interaction	Dr. Akash Sahai, Duke University, USA
11.	27/07/12	Camphor-Grown Carbon Nanotubes: From Laboratory to Industry	Dr. Mukul Kumar, Dept. of Mat. Science and Engineering, Meijo University, Japan
12.	24/09/12	Near Threshold Resonances and their Role in Nuclear Physics	Dr. Brajesh K. Jain, Univ. Of Mumbai
13.	17/10/12	Exotic Quantal Rotation in Nuclei	Prof. Umesh Garg, Notredam Univ. USA
14.	18/10/12	RF Injectors and their relevance as photon source	Dr. Ms. Triveni Rao, BNL, USA
15.	19/10/12	Structural Studies of Dielectric Sr Ta O <sub>2</sub> N and Superconducting(Nb <sub>0.9</sub> Mo <sub>0.1</sub> ) N <sub>0.9</sub> O <sub>0.1</sub> ) where M=Mg, Al orSi	Prof. Shinichi Kikkawa Hokkaido University, Japan
16.	09/11/12	Polymer Nanocomposites for Functional Applications	Prof. F. Faupel, Albrechts University, Kiel, Germany
17.	09/11/12	Investigating Electron Correlations using Heavy Ions: A Nuclear Solid State Physics Study	Dr. Sanjeev Kumar Srivastava, IIT Kharagpur, Kharagpur
18.	15/01/13	Experimental Challenges at Heavy Ion Laboratory (HIL) in Warsaw	Dr. Pawel J. Napiorkowski, Heavy Ion Lab. Warsaw, Poland
19.	16/01/13	Main Scientific Activities at IFJ PAN Krakow (Poland) and Shape evaluation of Heated and Rapidly Rotating Nuclie Studied With GDR	Prof. Dr hab. Adam Mai, IFJ PAN Drakow (Poland)
20.	23/01/13	Observation of Paramagnetic Fe <sup>3+</sup> in Mn/Fe implanted ZnO	Prof. K Bharuth Ram, School of Physics, University of KwaZulu-Natal, South Africa
21.	15/02/13	Rejoice: For you are doing basic research	Dr. Dinesh Kr. Srivastava, FNASc, VECC, Kolkata

S.No.	Date	Title	Name
22.	07/03/13	A Discussion on Medical Insurance Scheme	Mr. Dhruv Sarin & Pritha Barman Business Unit Head and Assistant Manager Policy Bazaar.com, Gurgaon
23.	11/03/13	Swift Heavy Ions And Nanoparticles Induced Chemical And Physical Changes In Polymer	Prof. Pralay Maiti, IIT, Banaras Hindu University, Varanasi
24.	14/03/13	Fabrication of Different Nano- Microstructures by Flame Transport Synthesis: From Electronic to Biomedical Application.	Dr. Yogesh Kr. Mishra, University of Kiel, Germany
25.	15/04/13	Recent Results of Fission Dynamics From IUAC LINAC Facility	Dr. B.R. Behera, DOP, Panjab University, Chandigarh

## 6.9 LIST OF TECHNICAL REPORTS /MEMOS (2012-13)

### A. List of Technical Reports

Sl.	Title	Authors	Category	Reference No.
1	Use of Plastic Pipes in Buildings	M.K. Gupta	Civil	IUAC/TR/ MKG/2012-13/01
2	Heat and Fluid Flow Simulation of Prototype RFQ	A.Kothari, R. Ahuja, Sugam Kumar, C.P. Safvan		IUAC/TR/ AK/2012-13/02
3	Design, Fabrication & Testing of High Vacuum Chambers of the Final RFQ	R.Ahuja, A.Kothari, P.Ram Sankar, C.P. Safvan, D. Kanjilal		IUAC/TR/ RA/2012-13/03
4	Dual Gate Valve Interlock	Y.Mathur, P.Barua, P.S. Lakshmy & G.O. Rodrigues	Instrumentation	IUAC/TR/ YM/2012-13/04
5	Travelling Wave Tube Amplifier for HCI (PKDELIS)	Y.Mathur, P.S. Lakshmy, G.O. Rodrigue & U.K.Rao	Instrumentation	IUAC/TR/ YM/2012-13/05
6	Mafnet Interlock for .45 GHz ECR Source	Y.Mathur, P.S. Lakshmy, G.O. Rodrigue	Instrumentation	IUAC/TR/ YM/2012-13/06

Sl.	Title	Authors	Category	Reference No.
7	Methods adopted for improving the collection efficiency in vacuum evaporation technique.	Abhilash S.R., S.K. Saini, D. Kabiraj	Instrumentation	IUAC/TR/ ASR/2012-13/07
8	Fabrication and installation of S.S. Piping for New Helium Liquefier	Suresh Babu M.V., Anup Choudhury, Manoj Kumar, Souman Kar, Jacob Chacko & T.D. Datta	Development	IUAC/TR/ SBMV/2012-13/08
9	Performance study of LN2 distribution system during the LINAC run	Suresh Babu M.V., Anup Choudhury, R.N. Dutt, Manoj Kumar, Joby Antony, Souman Kar, Jacob Chacko & T.D. Datta	Maintenance	IUAC/TR/ SBMV/2012-13/09
10	High Voltage (3K V/250mA) Power Supply for Saddle Field Fast Atom Beam (FAB) Source	SK Suman, Rajesh Kr., DKA, A Mandal	Instrumentation	IUAC/TR/ SKS/2012-13/10
11	Installation and testing of liquid Helium based sample cooling unit with in-situ XRD setup at the material science beam line of the LINAC accelerator facility	P K Kulriya, Renu Kumari, R Ahuja, D K Avasthi	Material Science	IUAC/TR/ PKK2012-13/11
12	Beam Transport System of High Current Injector	Sarvesh Kr., A Mandal	Beam Transport Lab	IUAC/TR/ SK/2012-12/12
13	A Report on Offline Test of LINAC Resonators and Beam Run through LINAC – I, LINAC-II, LINAC-III	A.Pandey, S Ghosh, A Rai, B. K. Sahu, G.K.Chaudhari, P.Patra, D.S. Mathuria, R.N.Dutt, J. Karmakar, S.S.K.Sonti, K.K.Mistri, J. Jacob, A.Choudhuri, S. Kar, S. Babu, M. Kumar, J. Antony, P.N.Prakash, D.Kanjilal, A Roy	Accelerator	IUAC/TR/ AP/2012-13/13

**B. List of Technical Memos**

<b>Sl.</b>	<b>Title</b>	<b>Authors</b>	<b>Category</b>	<b>Reference No.</b>
7	Steerer Power Supply for 2.45 GHz ECR Source	Yaduvansh Mathur, P.S. Lakshmy and G.O. Rodrigues	Instrumentation	IUAC/TM/YM/2012-2013/01
8	Troubleshooting of 2.45 GHz Microwave Power Generator	Yaduvansh Mathur, P.S. Lakshmy and G.O. Rodrigues	Instrumentation	IUAC/TM/YM/2012-2013/02
9	Repairing Gamma Area Monitors	Birender Singh, S.P. Lochab, Rajan Joshi, D. Sen	Instrumentation	IUAC/TM/BS/2012-2013/03
10	Repairing of TLD Reader	Birender Singh, S.P. Lochab, Rajan Joshi, D. Sen	Instrumentation	IUAC/TM/BS/2012-2013/04
11	Repairing of Extractor Power Supply of LEIBF	U.K. Rao	Instrumentation	IUAC/TM/BS/2012-2013/05