

6. ACADEMIC ACTIVITIES

6.1 PELLETRON BEAM UTILIZATION BY USERS

6.1.1 Pelletron Beam Time Utilization and Experiments performed (April, 2013 to March, 2014)

Users	No. of Shifts used (1 Shift =8Hrs.)	Project in				
		Nuclear Physics	Materials Science	Radiation Biology	Atomic Physics	AMS
A. Universities/Colleges						
Aligarh Muslim University (AMU), Aligarh	15	1				
Allahabad University, Allahabad	8		2			
Cochin University of Science and Technology, Cochin	3		1			
Delhi University, Delhi	12	1				
Dr. B.R. Ambedkar University, Agra	5		2			
Gauhati University, Assam	3		1			
Gujarat University, Ahmedabad	3		1			
Guru Gobind Singh Indraprastha Univ (GGSIPU) Delhi	6		2			
Guru Jambheshwar University of Scie. & Tech., Hissar	3		1			
Guru Nanak Dev University (GNDU), Amritsar	3		1			
HNBG University, Garhwal	6		2			
Hyderabad University, Hyderabad	6		1			
Jamia Milia Islamia (JMI), New Delhi	1		1			
Kalyani University, West Bengal	2			1		
Mumbai University, Mumbai	5		2			
Mysore University, Mysore	6		2			
Panjab University (PU), Chandigarh	63	3				
Pondicherry University, Pondicherry	5		1			
RTM Nagpur University, Nagpur	3		1			
Sharda University, Greater Noida	2		1			
Shri Mata Vaishno Devi University, Katra	3		1			
Tezpur University, Tezpur (Assam)	3		1			
University of Calcutta, Kolkata	5		1	1		
University of Lucknow, Lucknow	2		1			
University of Rajasthan, Jaipur	2		1			
Utkal University, Bhubaneswar	6		2			

Users	No. of Shifts used (1 Shift =8Hrs.)	Project in				
		Nuclear Physics	Materials Science	Radiation Biology	Atomic Physics	AMS
B. Institutions						
All India Inst. of Medical Sciences (AIIMS) New Delhi	2		1			
Bangabasi Morning College, Kolkata	3		1			
Bareilly College, Bareilly	6		1			
Bhabha Atomic Research Centre (BARC), Mumabi	11		2			
Guru Nanak Girls College, Ludhiana (PNJ)	15	1				
Indian Institute of Technology (IIT)-BHU, Varanasi	3		1			
Indian Institute of Technology (IIT), Delhi	7		2			
Indian Institute of Technology (IIT), Rajasthan	3		1			
Indian School of Mines (ISM), Dhanbad	3		1			
Institute for Plasma Research (IPR), Gandhinagar	3		1			
Inter-University Accelerator Centre (IUAC), New Delhi	111	4	5	1	2	1
ISRO Satellite Centre, Bangalore	7	1				
K.J.S. College of Science & Commerce, Mumbai	2		1			
Maulana Azad National Institute of Technology (MANIT), Bhopal	3		1			
National Institute for Material Sciences (NIMS), Japan	3		1			
National Inst. of Science Edu. and Res., Bhubaneswar	5		1			
National Institute of Technology (NIT), Jalandhar	2		1			
National Institute of Technology (NIT), Kurukshetra	3		1			
National Institute of Technology (NIT), Srinagar	1		1			
P.E.S. Institute of Technology, Bangalore	3		1			
Saha Institute of Nuclear Physics (SINP), Kolkata	12	1				
UGC-DAE-CSR, Indore	4		1			
Variable Energy Cyclotron Centre (VECC), Kolkata	15	1				
C. Facility Tests	19	2	2			
TOTAL	427	15	56	3	2	1

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 - (97)

1. Acharya Nagarjuna University

Andhra Pradesh

2.	Aligarh Muslim University	Aligarh
3.	Amity University	Noida
4.	Andhra University	Waltair
5.	Anna University	Chennai
6.	Assam University	Silchar
7.	Babasaheb Bhimrao Ambedkar University	Lucknow
8.	Banaras Hindu University	Varanasi
9.	Bangalore University	Bangalore
10.	Berhampur University	Berhampur
11.	Bharathiar University	Coimbatore
12.	Bharathidasan University	Tiruchirappalli
13.	Bhavnagar University	Bhavnagar
14.	Calicut University	Calicut
15.	Central University of Jharkhand	Ranchi
16.	Central University of Kerala	Kerala
17.	Chaudhary Charan Singh University	Meerut
18.	Cochin University of Science & Technology	Cochin
19.	Delhi Technological University	Delhi
20.	Devi Ahilya University	Indore
21.	Dr. Babasaheb Ambedkar Marathwada University	Aurangabad
22.	Dr. B.R. Ambedkar Univ. (Agra University)	Agra
23.	Gauhati University	Guwahati
24.	Goa University	Goa
25.	Govind Ballabh Pant University of Agriculture and Technology	Pantnagar
26.	Gujarat University	Ahmedabad
27.	Gulbarga University	Gulbarga
28.	Guru Ghasidas Vishwavidyalaya	Bilaspur
29.	Guru Gobind Singh Indraprastha University	New Delhi
30.	Guru Jambheshwar University of Science & Technology	Hisar
31.	Guru Nanak Dev University	Amritsar
32.	Hemwati Nandan Bahuguna Garhwal University	Srinagar, Garhwal
33.	Himachal Pradesh University	Simla
34.	Indira Gandhi National Open University	New Delhi
35.	Jamia Millia Islamia University	New Delhi
36.	Jawaharlal Nehru University	Delhi
37.	Karnataka University	Dharwad
38.	Kiel University	Germany
39.	Kurukshetra University	Kurukshetra
40.	Kuvempu University	Shankaraghatta, Shimoga
41.	Ludwig-Maximilians-Universität München	Germany
42.	Maharshi Dayanand University	Rohtak

43.	Maharishi Markandeshwar University	Ambala
44.	Mahatma Gandhi University	Kottayam
45.	Mahatma Jyotiba Phule Rohilkhand University	Bareilly
46.	Manav Rachna International University	Faridabad
47.	Mangalore University	Mangalore
48.	Manipur University	Imphal
49.	Manonmaniam Sundaranar University	Tirunelveli
50.	Mohanlal Sukhadia University	Udaipur
51.	Rashtrasant Tukadoji Maharaj Nagpur University	Nagpur
52.	North Carolina State University	USA
53.	North Eastern Hill University	Shillong
54.	North Maharashtra University	Jalgaon
55.	North Orissa University	Baripada
56.	Osmania University	Hyderabad
57.	Panjab University	Chandigarh
58.	Patna University	Patna
59.	Periyar University	Kerala
60.	Pondicherry University	Pondicherry
61.	Punjab Agricultural University	Ludhiana
62.	Punjabi University	Patiala
63.	P.E.S. Institute of Technology	Bangalore
64.	Rani Durgavati Vishwavidyalaya	Jabalpur
65.	Saurashtra University	Rajkot
66.	Sharda University	Noida
67.	Shivaji University	Kolhapur
68.	Shri Mata Vaishno Devi University	Katra
69.	Sri Krishnadevaraya University	Anantapur
70.	Technische Universität Darmstadt	Darmstadt, Germany
71.	Tezpur University	Tezpur
72.	The Maharaja Sayajirao University of Baroda	Vadodara
73.	The University of Burdwan	Burdwan
74.	Tilka Manjhi Bhagalpur University	Bhagalpur
75.	Tumkur University	Tumkur
76.	University and Petroleum & Energy Studies	Dehradun
77.	University of Allahabad	Allahabad
78.	University of Calcutta	Kolkata
79.	University of Delhi	Delhi
80.	University of Hyderabad	Hyderabad
81.	University of Jammu	Jammu
82.	University of Kalyani	Kalyani
83.	University of Kashmir	Srinagar

84.	University at Lucknow	Lucknow
85.	University of Madras	Chennai
86.	University of Maryland	Maryland, USA
87.	University of Mumbai	Mumbai
88.	University of Mysore	Mysore
89.	University of Notre Dame	Notre Dame, USA
90.	University of Padova	Italy
91.	University of Pune	Pune
92.	University of Rajasthan	Jaipur
93.	University of Stuttgart	Germany
94.	Utkal University	Bhubaneswar
95.	Vikram University	Ujjain
96.	Vishwa Bharti University	Bolpur
97.	West Bengal University of Technology	Kolkata

(B) COLLEGES - (62)

1.	Ananda Mohan College	Kolkata
2.	Armed Forces Medical College	Pune
3.	Bareilly College	Bareilly
4.	Beant College of Engineering & Technology	Gurdaspur
5.	Bharatiya Jain Sanghatana College	Pune
6.	Bhiwandi College	Mumbai
7.	B.N.N. College	Bhiwandi
8.	College of Engineering and Technology	Aligarh
9.	Doodhsakhar Mahavidyalaya	Bidri, Maharashtra
10.	D.A.V. College	Jalandhar
11.	D.A.V. College	Kanpur
12.	D.A.V. College	Mumbai
13.	D.B.S. College	Dehradun
14.	Ewing Christian College	Allahabad
15.	Govt. Art College	Rajahmundry, AP
16.	Govt. College	Ajmer
17.	Govt. College	Kota
18.	Govt. College	Mahendragarh
19.	Govt. M.S.J. College	Bharatpur
20.	Goalpara College	Goalpara, Assam
21.	Gurudas College	Kolkata
22.	Guru Nanak Girls College	Ludhiana (PNJ)
23.	G.F.(PG) College	Shahjahanpur

24.	Iswar Chandra Vidyasagar College (formerly Belonia College)	Belonia, Tripura
25.	Jai Hind College	Mumbai
26.	Jai Prakash Vishwavidyalaya	Chapra
27.	Kandi Raj College	Murshidabad, (WB)
28.	Kishinchand Chellaram College	Mumbai
29.	Kongunadu Arts & Science College	Coimbatore
30.	Koshi College	Khagaria, Bihar
31.	Krishnath College	West Bengal
32.	K.J. Somaiya College of Science & Commerce	Mumbai
33.	KIIT University	Bhubaneswar
34.	Mahila Degree College	Lucknow
35.	Malviya Regional Engg. College	Jaipur
36.	Marwari College	Ranchi
37.	M.M.H. College	Ghaziabad
38.	M.R. College	Vizianagaram (AP)
39.	Nayagarh College	Nayagarh
40.	Nizam College	Hyderabad
41.	N.S.A.M. College	Mangalore
42.	Orissa Univ. of Agriculture & Tech.	Bhubaneswar
43.	Poorna Prajna College	Udupi, Karnataka
44.	Punjab Engineering College	Chandigarh
45.	Regional Engineering College	Kurukshetra
46.	R.B.S. College	Agra
47.	R.D.&D.J. College	Munger, Bihar
48.	R.P.G. College	Ratnagiri
49.	School of Physical Sciences	JNU, New Delhi
50.	School of Physical Sciences	Nanded, Maharashtra
51.	School of Tech. & Applied Sciences	Kottayam, Kerala
52.	Smt. Chandibai Himathmal Mansukhani College	Ulhasnagar, Maharashtra
53.	Sharanabasaveshwar College of Science	Gulbarga
54.	Sri Bhuvanendra College	Karkala
55.	St. Edmunds College	Shillong
56.	Swami Shraddhanand College	New Delhi
57.	SDM College	Ujire, Mysore
58.	S.N. College	Kollam
59.	S.V. College	Aligarh
60.	University College	Kurukshetra
61.	University College of Science & Tech.	Kolkata
62.	Vaish College	Rohtak

(C) OTHER INSTITUTIONS – (81)

1.	Amrita Vishwa Vidyapeetham	Bangalore
2.	Amity School of Engineering	New Delhi
3.	Amity Institute of Nanotechnology	Noida
4.	AICTE	New Delhi
5.	AIIMS	New Delhi
6.	Bangabasi Morning College	Kolkata
7.	Bhabha Atomic Research Centre	Mumbai
8.	Centre for Superconductivity research	USA
9.	C.E.E.R.I.	Pilani
10.	CAT	Indore
11.	CCMB	Hyderabad
12.	CSNSM, Orsay Cedex	France
13.	Dayalbagh Educational Institute	Agra
14.	Defence Laboratory	Jodhpur
15.	Defence Research & Development Organ.	Dehradun
16.	Dr. B.R. Ambedkar National Institutes of Technology	Jalandhar
17.	D.M.R.L.	Hyderabad
18.	Genetic Institute of Manufacturing Technology	Singapore
19.	GSI	Germany
20.	Harcourt Butler Technological Institute	Kanpur
21.	Homi Bhabha National Institute	Kolkata
22.	ICGEB	New Delhi
23.	IISER	Kolkata
24.	I.G.C.A.R.	Kalpakkam
25.	Indian Institute of Science	Bangalore
26.	Indian Institute of Technology-BHU	Varanasi
27.	Indian Institute of Technology	Chennai
28.	Indian Institute of Technology	Kanpur
29.	Indian Institute of Technology	Kharagpur
30.	Indian Institute of Technology	Mumbai
31.	Indian Institute of Technology	New Delhi
32.	Indian Institute of Technology	Rajasthan
33.	Indian Institute of Technology	Roorkee
34.	Indian School of Mines	Dhanbad
35.	Indian Space Research Organisation	Bangalore
36.	Institute for Plasma Research	Gandhinagar
37.	Institute of Basic Sciences	Agra
38.	Institute of Materials Science	Bhubaneswar
39.	Institute of Physics	Bhubaneswar
40.	Institute of Science	Mumbai

41.	International Centre for Genetic Engineering and Biotechnology	New Delhi
42.	INFN-LEGNARO	Italy
43.	INMAS	New Delhi
44.	IUC-DAEF, Calcutta Centre	Kolkata
45.	IUC-DAEF, Indore Centre	Indore
46.	Jaypee Institute of Information Technology	Noida
47.	Joint Inst. of Nuclear Research	Dubna, Russia
48.	Malaviya National Institute of Technology	Jaipur
49.	Massachusetts Inst. of Technology	USA
50.	Maulana Azad National Inst. of Technology	Bhopal
51.	Motilal Nehru National Institute of Technology	Allahabad
52.	Nanocrystals Technology	USA
53.	National Academy of Science	Allahabad
54.	National Institute of Material Sciences	Japan
55.	National Institute of Oceanography	Goa
56.	National Institute of Technology, Hamirpur	Himachal Pradesh
57.	National Institute of Technology	Jalandhar
58.	National Institute of Technology	Kurukshetra
59.	National Institute of Technology	Rourkela
60.	National Institute of Technology	Silchar
61.	National Institute of Technology	Srinagar
62.	National Institute of Technology	Tiruchirapalli
63.	National Physical Laboratory	New Delhi
64.	NCAOR	Goa
65.	NCCCM/BARC	Hyderabad
66.	NISER	Bhubaneswar
67.	NCSR	France
68.	Oak Ridge National Laboratory	USA
69.	Physical Research Laboratory	Ahmedabad
70.	Research Centre Imarat (RCI), DRDO	Hyderabad
71.	Saha Institute of Nuclear Physics	Kolkata
72.	Sant Longowal Institute of Engineering & Technology	Sangrur
73.	SSPL	New Delhi
74.	Tata Institute of Fundamental Research	Mumbai
75.	Thapar Inst. of Engg. & Technology	Patiala
76.	UGC-DAE-CSR	Indore
77.	UGC-DAE-CSR	Kolkata
78.	UM-DAC Centre for Excellence in Basic Sciences	Mumbai
79.	Variable Energy Cyclotron Centre	Kolkata
80.	Visva-Bharati	Santiniketan
81.	Wadia Institute of Himalayan Geology	Dehradun

6.2 STUDENT'S PROGRAMME

6.2.1 Summer Project for B.Sc. (Physics) Students

P.N.Prakash and A.M.Mandal

The Summer Project for B.Sc. (Physics) students was held at IUAC from 3rd June to 3rd July, 2013. Fourteen students from different parts of the country and five students from Delhi region were invited to carry out small projects under the supervision of an IUAC staff member. The list of students, their affiliation, supervisor's name and project title are given in table 1. At the end of the program, each student made a ten minute presentation, briefly giving details of the project work carried out during the course of their stay. In addition to the project work, four special lectures were delivered by eminent scientists covering accelerator physics and other areas of ion-beam based research. A lab tour was also organized to provide the students an opportunity to see the accelerators and experimental facilities at IUAC. The students participated in the projects with enthusiasm and felt motivated that they got some flavour of how research is generally conducted.

Table 1. List of students, their affiliation, supervisor and project title, invited to IUAC for the Summer Project for B.Sc. (Physics) students.

S.No.	Name & Affiliation of Students	Supervisor	Project Title
1.	Mr. Shreyas Gupta Indian Inst. of Science Bangalore	Dr. P. Sugathan	Detection of neutrons and γ -rays using liquid organic scintillator.
2.	Mr. Rajesh Kr. Dash Utkal University, Odisha	Dr. Ajith Kr. B.P.	Study in LCR circuits.
3.	Mr. Shiroya Mehul S.V. Nat. Inst. of Technology, Surat, Gujrat	Dr. Fouran Singh	Learning of Raman spectroscopy as tool for materials characterizations.
4.	Mr. Abhigyan Central Univ. of Jharkhand Ranchi, Jharkhand	Ms. Indu Bala	Resolution and efficiency of a HPGe detector at different energies.
5.	Mr. Rohan Biswas IISER, Kolkata W. Bengal	Mr. Sarvesh Kumar	Principles and design of a 45° bending magnet.
6.	Mr. Harsh Bhatt UM-DAE CBS Mumbai Maharashtra	Mr. Pawan Kumar Kulriya	Characterization of materials using X-ray techniques.
7.	Ms. Tarbiya Jamil Patna Women's College Patna University, Bihar	Dr. K. Asokan	Synthesis and characterization of Mn doped Cobalt Ferrite.
8.	Mr. Rupam Phukan Gauhati University Assam	Mr. Rajeev Mehta	DC and RF Accelerators at IUAC and some basic RF measurements.

S.No.	Name & Affiliation of Students	Supervisor	Project Title
9.	Ms. Sumabhanu Battula IIT, Roorkee Uttarakhand	Mr. P.N. Patra	Measurement and damping of mechanical vibrations in IUAC Quarter Wave Resonator.
10.	Mr. Rajwinder Singh Guru Nanak Dev University Amritsar, Panjab	Dr. S.P. Lochab	Development of nanocrystalline thermoluminescence materials for radiation dosimetry.
11.	Ms. Merin A.P. St. Thomas College University of Calicut Kerala	Dr. D. Kabiraj	Study of surface plasmon resonance (SPR) of Ag in TiO ₂ matrix.
12.	Mr. Arpit Sharma Govt. P.G. College University of Kota Rajasthan	Mr. Raj Kumar	Study and characterization of a table top accelerator.
13.	Mr. Nripesh Kumar Guru Ghasi Das University Chattisgarh	Mr. Pankaj Kumar	Multi anode gas ionization chamber.
14.	Ms. Arpita Dwivedi Mahila Mahavidyalaya BHU, Varanasi Uttar Pradesh	Mr. Ashutosh Pandey	Amplitude and phase locking of a Quarter Wave Resonator.
15.	Ms. Namrata Gurung Gargi College Delhi University, Delhi	Mr. Sunil Ojha	Analysis of sample using Rutherford Backscattering Spectroscopy (RBS) technique.
16.	Mr. Taresh Aggarwal Ramjas College Delhi University, Delhi	Mr. G.O. Rodrigues	Studies on 2.45 GHz microwave ion source.
17.	Mr. Ankit Patel Hindu College Delhi University, Delhi	Mr. Sarvesh Kumar	Principle and design of a water cooled quadrupole magnet.
18.	Mr. Ojasvi Khare St. Stephen College Delhi University, Delhi	Mr. Saif A khan	Surface morphology studies of thermally annealed thin metal (Ag, Au and Pt) by Atomic Force Microscopy
19.	Ms. Karishma Thakran Kalindi College Delhi University, Delhi	Dr. Pravin Kumar	Studies of composite electron cyclotron resonance (ECR) plasma

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.

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

Table 2. List of students and their affiliations

S.No.	Name	Affiliation
1	Mr. Ajay Kumar	M L S M College, HP
2	Mr. Ashish Thatavarthy	M L S M College, HP
3	Ms. Ekta Goyat	Department of Physics & Astrophysics, Delhi University
4	Ms. Sameeksha	Bareilly College, UP
5	Mr. Sunil Kumar	Bareilly College, UP
6	Mr. Jeev Raj	Central University of Rajasthan
7	Ms. Sangeeta Chaudhary	Central University of Rajasthan
8	Ms. Nidhi Jain	Hansraj College, Delhi
9	Ms. Sarita Rajput	Hansraj College, Delhi
10	Ms. Priyanka	Indore, MP
11	Ms. Vaishali	Indore, MP
12	Ms. Neha Saxena	SM College, Chandausi, UP
13	Mr. Sumit K Singh	SM College, Chandausi, UP
14	Mr. P Naveen Kumar	University of Hyderabad, AP
15	Mr. Madhurra P Talukdar	Tezpur University, Assam
16	Ms. Paromita Dutta	Hindu College, Delhi
17	Ms. Swati Gangawar	MJP Rohilkhand University, Bareilly, UP

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

6.2.3 PhD Teaching Programme

A.Mandal and P.N. Prakash

The two semester Ph.D teaching programme for research students of IUAC, other universities in India and for new trainee scientists 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 during August-December in which courses on computers in instrumentation & data acquisition and advanced course on Materials Science and Nuclear Physics are 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. In addition, a course on Engineering Drawing is also offered as a part of the Experimental Physics module to give some basic understanding about engineering drawing.

One month before the semester commences, a poster containing details of the course modules is printed and circulated to physics departments of various universities and colleges inviting applications for attending the courses. The poster is also made available on the IUAC website. Accommodation and TA/DA are provided to the selected participants.

6.2.4 Teaching Laboratory Activities

K. Asokan and B.P. Ajithkumar

This lab was established, in 2005, for developing modern laboratory equipment for teaching science at the university level and training teachers. A computer interfaced device, called ExpEYES, capable of performing a number science experiments has been developed and made commercially available. It has received very good feedback, with more than 1000 units in circulation. This equipment is included in the syllabus of some universities and many others are using it for student projects. The technology is open and the equipment is currently available from several vendors.

The device was presented at the RMLL 2013 conference, held in Brussels, during July 2013. Proposal for developing Mechanics and Sound experiments for ExpEYES was selected for funding under Google Summer of Code, 2014. To train teachers, IUAC periodically conducts “Six Days Training Programs” and also “One day workshops” at different places to create awareness. They are trained on computer interfaced science experiments; data analysis and visualization using open source educational software tools. For more details refer to <http://expeyes.in>

The figure shows the usage of expEYES to study a PN junction.

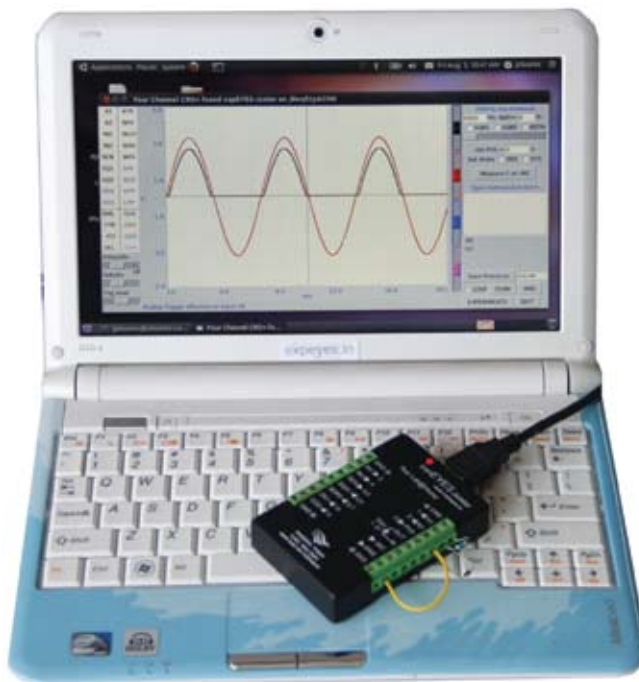


Fig. the usage of expEYES to study a PN junction

6.3 LIBRARY

Priyambada Nayak

Salient features

Working hours:	Round the clock, all days of the week
Total Books:	~2866 (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 2013-14:	31
Current Journals:	52
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:	150
Clientele:	Apart from IUAC staff and students, the library is consulted by students, teaching and research staff from over 100 and research institutions in different parts of the country.

The technical reports and technical 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 4600 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 2013-14

4-5 April, 2013	Conference on Particle Accelerators : Technology & Applications in Science (Contact Person : D. Kanjilal)
29 April-4 May, 2013	Workshop on Innovative Experiments (Contact Person : Ajith Kumar B.P./V.V.Satyanarayan, IUAC)
29 April-4 May, 2013	Workshop on High Performance Computing (Contact Person : S. Mookherjee)
3 June, 2013	Summer Program for B.Sc Physics students (Contact Person : A. Mandal)
3-4 July, 2013	Workshop on Ancillary Equipments for Nuclear Physics (Contact Person : N. Madhavan, S. Muralithar)

6-7 July, 2013	Users' Workshop
8 July, 2013	54th AUC Meeting
19 July, 2013	Acquaintance Programme at Bilaspur (Contact Person : S. Muralithar)
12 August, 2013	Ph.D Programme, Fall semester starts (Contact Person : A. Mandal)
12-14 August, 2013	IUAC Academic Workshop (Contact Person : P. Sugathan)
20 September, 2013	Acquaintance Programme at Meerut University (Contact Person : Pravin Kumar)
15-20 October, 2013	Workshop on Innovative Experiments (Contact Person : Ajith Kumar B.P./V.V. Satyanarayan, IUAC)
21-22 October, 2013	School on Ion Beam in Materials (Contact Person : D.K. Avasthi)
23-25 October, 2013	Conference on Nanostructuring by ion beam (Contact Person : D.K. Avasthi, IUAC, Y.K. Vijay, Jaipur University)
14-15 November, 2013	Workshop on Secondary RIB using HYRA (Contact Person : N. Madhavan, P. Sugathan)
15 November, 2013	Acquaintance Programme at Madurai (Contact Person : A. Mandal, IUAC, N. Soundararajan, Madurai Univ.)
25-29 November, 2013	Workshop on Radiation Biology (Contact Person : Asiti Sarma)
17-18 December, 2013	Users' Workshop
19 December, 2013	Foundation Day & 55th AUC Meeting
20 January, 2014	Ph.D Programme: Spring Semester starts (Contact Person : A. Mandal)
21-22 February, 2014	School on Nuclear Reactions around the Coulomb barrier (Contact Person : N. Madhavan)
24-28 February, 2014	International Conference: Fusion 14 (Contact Person : N. Madhavan)
28 February, 2014	National Science Day (Contact Person : Indra Sulaniya)
19-20 March, 2014	IUAC Academic Workshop (Contact Person : P. Sugathan)
28 March, 2014	Acquaintance Programme at Mizoram (Contact Person : D.K. Avasthi)

6.5 FORTHCOMING EVENTS: 2014

21-26 April, 2014	School on Nuclear Structure Physics (Contact Person : S. Muralithar)
28 April-3 May, 2014	Workshop on Innovative Experiments (Contact Person : Ajith Kumar B.P./V.V.V. Satyanarayana)
5-6 May, 2014	Workshop on High Performance Computing (Contact Person : S. Mookherjee)
12-23 May, 2014	School on Accelerator Physics (Contact Person : Rajeev Mehta)
27 May, 2014	Summer Programme for B.Sc. Physics Students (Contact Person : P.N. Prakash)
13 June, 2014	Acquaintance Programme at Kashmir University (Contact Person : R.P. Singh)
6-7 July, 2014	Users' Workshop
8 July, 2014	56th AUC Meeting

19 July, 2014	Acquaintance Programme at Ahmedabad (Contact Person : S. Muralithar)
11 August, 2014	Ph.D Programme, Fall Semester Starts (Contact Person : A. Mandal)
20-22 August , 2014	IUAC Academic Workshop (Contact Person : P. Sugathan)
11-12 September, 2014	Workshop on Accelerator based Atomic Physics (Contact Person : T.K. Nandi)
8-13 October, 2014	International School on Ion Beams in Material Science (Contact Person : A. Tripathi)
14-17 October, 2014	International Conference on SHIMEC (Contact Person : D.K. Avasthi)
27-31 October, 2014	Workshop on Innovative Experiments (Contact Person : Ajith Kumar B.P./V.V.V. Satyanarayana)
18 November, 2014	Acquaintance Programme at VTU, Belgaoun (Contact Person : K. Asokan)
16-18 December, 2014	Users' Workshop
19 December, 2014	Foundation Day & 57th AUC Meeting

6.6 LIST OF PH.D AWARDEES

The list of Ph.D awardee during 2013-14:

The following persons have been awarded Ph.D degree from Jawaharlal Nehru University.

- **Gayatri Mohanto**
- **Udai Bhan Singh**
- **Ish Mukul**
- **Tanuj Kumar**
- **R. P. Singh**
- **Saif Ahmad Khan**
- **T. S. Datta**
- **N. Madhavan**

6.7 LIST OF PUBLICATIONS IN THE YEAR 2013-14

A. A. NUCLEAR PHYSICS

1. **Candidates for twin chiral bands in ^{102}Rh** , D. Tonev, M.S. Yavahchova, N. Goutev, G.de Angelis, P. Petkov, R.K. Bhowmik, R.P. Singh, S. Muralithar, N. Madhavan, R. Kumar, M. Kumar Raju, J. Kaur, G. Mohanto, A. Singh, N. Kaur, R. Garg, A. Shukla, Ts.K. Marinov and S. Brant, Phys. Rev. Lett. 112, 052501 (2014).
2. **Band structures in doubly odd ^{98}Rh** , S. Kumar, S. Sihotra, K. Singh, V. Singh, Sandeep, J. Goswamy, N. Singh, D. Mehta, S.S. Malik, R. Palit, R. Kumar, R.P. Singh, S. Muralithar and R. K. Bhowmik, Phys. Rev. C **89**, 034303 (2014).
3. **Role of incomplete fusion of the projectile in the $^{16}\text{O}+^{115}\text{In}$ interaction at low energies**, Kamal Kumar, Tauseef Ahmad, Sabir Ali, I.A. Rizvi, Avinash Agarwal, R. Kumar and A.K. Chaubey, Phys. Rev. C **89**, 054614 (2014).

4. **Experimental study of incomplete fusion reactions in the $^{16}\text{O}+^{130}\text{Te}$ system below 6 MeV/nucleon**, Devendra P. Singh, Vijay R. Sharma, Abhishek Yadav, Pushpendra P. Singh, Unnati, M.K. Sharma, R. Kumar, B.P. Singh and R. Prasad, Phys. Rev. C **89**, 024612 (2014).
5. **Influence of a one-neutron-excess projectile on low-energy incomplete fusion**, Vijay R. Sharma, Abhishek Yadav, Pushpendra P. Singh, Devendra P. Singh, Sunita Gupta, M.K. Sharma, InduBala, R. Kumar, S. Muralithar, B.P. Singh and R. Prasad, Phys. Rev. C **89**, 024608 (2014).
6. **Anomalous deviations from statistical evaporation spectra for the decay of the ^{73}Br and ^{77}Rb compound systems**, Maninder Kaur, B.R. Behera, Gulzar Singh, Varinderjit Singh, Rohit Sandal, A. Kumar, H. Singh, Gurpreet Singh, K.P. Singh, N. Madhavan, S. Nath, A. Jhingan, J. Gehlot, K.S. Golda, P. Sugathan, DavinderSiwal, Sunil Kalkal, E. Prasad and S. Appannababu, Phys. Rev. C **89**, 034621 (2014).
7. **Measurement of evaporation residue excitation functions for the $^{19}\text{F}+^{194,196,198}\text{Pt}$ reactions**, Varinderjit Singh, B.R. Behera, Maninder Kaur, A. Kumar, K.P. Singh, N. Madhavan, S. Nath, J. Gehlot, G. Mohanto, A. Jhingan, IshMukul, T. Varughese, JhilaM Sadhukhan, Santanu Pal, S. Goyal, A. Saxena, S. Santra and S. Kailas, Phys. Rev. C **89**, 024609 (2014).
8. **Observation of a breakup-induced α -transfer process for some bound states of ^{16}O populated by the $^{12}\text{C}(\text{Li,d})^{16}\text{O}^*$ reaction**, S. Adhikari, C. Basu, I.J. Thompson, P. Sugathan, A. Jhingan, K.S. Golda, A. Babu, D. Singh, S. Ray and A.K. Mitra, Phys. Rev. C **89**, 044618 (2014).
9. **Detector system for the study of low energy heavy ion reactions using kinematic coincidence technique**, Akhil Jhingan, S. Kalkal, P. Sugathan, K.S. Golda, R. Ahuja, J. Gehlot, N. Madhavan, B.R. Behera and S.K. Mandal, Nuclear Instruments and Methods in Physics Research A **745**, 106 (2014).
10. **High spin structure in $^{130,131}\text{Ba}$** , Navneet Kaur, A. Kumar, G. Mukherjee, Amandeep Singh, S. Kumar, Rajbir Kaur, Varinderjit Singh, B.R. Behera, K.P. Singh, G. Singh, H.P. Sharma, Suresh Kumar, M. Kumar Raju, P.V. Madhusudhan Rao, S. Muralithar, R.P. Singh, Rakesh Kumar, N. Madhvan and R.K. Bhowmik, The European Physical Journal A **50**, 5 (2014).
11. **Probing of complete and incomplete fusion dynamics in heavy-ion collision**, D. Singh, Rahbar Ali, M. Afzal Ansari, B.S.Tomar, M.H. Rashid, R. Guin, S.K. Das, R. Kumar, R.P. Singh, S.Muralithar and R.K.Bhowmik, Pramana – Journal of Physics **82**, 683 (2014).
12. **Understanding the onset of incomplete fusion**, Pushpendra P. Singh, Abhishek Yadav, Vijay R. Sharma, D.P. Singh, R. Kumar, R.P. Singh, S.Muralithar, B.P. Singh, R.K.Bhowmik and R. Prasad (the AMU-IUAC collaboration), Journal of Physics: Conference Series **515**, 012021 (2014).
13. **Electromagnetic transition from the 4^+ to 2^+ resonance in ^8Be measured via the radiative capture in $^4\text{He}+^4\text{He}$** , V.M. Datar, D.R. Chakrabarty, Suresh Kumar, V. Nanal, S. Pastore, R.B. Wiringa, S.P. Behera, A. Chatterjee, D. Jenkins, C.J. Lister, E.T. Mirgule, A. Mitra, R.G. Pillay, K. Ramachandran, O.J. Roberts, P.C. Rout, A. Shrivastava and P. Sugathan, Phys. Rev. Lett. **111**, 062502 (2013).
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17. **Influence of projectile breakup on the $^{16}\text{O}+^{115}\text{In}$ reaction at energies $\approx 4\text{--}7$ MeV/nucleon**, Kamal Kumar, Tauseef Ahmad, Sabir Ali, I.A. Rizvi, Avinash Agarwal, R. Kumar and A. K. Chaubey, Phys. Rev. C **88**, 064613 (2013).

18. **Evaporation residue excitation function and spin distribution for $^{31}\text{P}+^{170}\text{Er}$** , G. Mohanto, N. Madhavan, S. Nath, J. Gehlot, IshMukul, A. Jhingan, T. Varughese, A. Roy, R.K. Bhowmik, I. Mazumdar, D.A. Gothe, P.B. Chavan, J. Sadhukhan, S. Pal, Maninder Kaur, Varinderjit Singh, A.K. Sinha and V.S. Ramamurthy, *Phys. Rev. C* **88**, 034606 (2013).
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B. MATERIALS SCIENCE

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3. **Ion beam irradiation-induced tuning of SPR of Au nanoparticles in fullerene C70 matrix: dependence of energy loss**; R. Singhal, J. C. Pivin and D. K. Avasthi; *J Nanopart Res.* 15 (2013) 1641.
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7. **Coexistence of intrinsic and extrinsic origins of room temperature ferromagnetism in as implanted and thermally annealed ZnO films probed by x-ray absorption spectroscopy**, P Satyarthi, S. Ghosh, B Pandey, P Kumar, C L Chen, C L Dong, W F Pong, D Kanjilal, K Asokan, P Srivastava, *Journal of Applied Physics*, 113 (18) (2013) 183708
8. **Controlled and selective area growth of monolayer graphene on 4H-SiC substrate by electron-beam-assisted rapid heating**, P Dharmaraj, K Jeganathan, V. Gokulakrishnan, P Sundara Venkatesh, R Parameshwari, V Ramakrishnan, S. Balakumar, K Asokan, K Ramamurthi, *Journal of Physical Chemistry C*, 117 (37) (2013) 19195.
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12. **Investigation of Au⁹⁺ swift heavy ion irradiation on CdS/CuInSe₂ thin films**, R.A. Joshi, V.S. Taur, Fouran Singh, and R. Sharma, *Radiation Physics and Chemistry* 91(2013) 81.
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21. **Correlation between the dielectric properties and local electronic structure of copper doped calcium titanate**, J P Singh, S Gautam, P Kumar, A Tripathi, J M Chen, K H Chae, K Asokan, *Journal of Alloys and Compounds*, 572 (2013) 84.
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23. **Study of structural, morphological and electrical properties of Ce doped NiFe₂O₄ nanoparticles and their electronic structure investigation**, G Dixit, J P Singh, C L Chen, C.L Dong, R C Srivastava, H M Agrawal, W F Pong, K Asokan, *Journal of Alloys and Compounds*, 581 (2013) 178.
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6.8 LIST OF SEMINARS CONDUCTED IN THE YEAR 2013-14

S.No.	Date	Title	Name
1.	15/04/13	Recent results of fission dynamics from IUAC LINAC facility	Dr. B.R. Behera, DOP, Panjab University, Chandigarh
2.	10/05/13	Nuclear Physics and its Spin offs...and Overview	Dr. S.S. Kapoor, BARC, Mumbai
3	09/05/13	Digital Accelerator- A new all Ion Accelerator	Dr. Tanuja Dixit, SAMEER. R&D Lab of Gov.t od India, IIT Campus, Powai, Mumbai
4.	09/05/13	RF Photo Cathode Gun Activity	Sh. Abhay Pandey, Scientist, SAMEER. R&D Lab of Gov.t od India, IIT Campus, Powai, Mumbai
5.	13/05/13	Rare Isotope Investigation Using Position-Sensitive Germanium Detectors	Prof. Hans Juergen Wollersheim GSI, Germany
6.	14/05/13	Targets for Accelerator-Based Nuclear Research	Anna Stolarz. Heavy Ion Laboratory, University of Warsaw, Poland
7.	21/05/13	Polyster Composite Thermal Neutron Scientillation Films for Use in Radiation Portal Monitors	Dr. Indraneel Sen. VECC, Kolkata
8.	28/05/13	Supermagnetism	Dr. Subhankar Bedanta, NISER, Bhubneswar
9.	31/05/13	Prospect of tapping electricity from waste heat	Dr. Gunadhori S. Okram, UGC-DAE Consortium for Scientific Research, Indore
10.	24/06/13	Recent trends in in-complete fusion reactions: Work done at IUAC	Dr. Abhishek Yadav, DOP, AMU, Aligarh
11.	05/08/13	Post-Mortem Analysis of BPM-Interlock Triggered Beam Dumps at Petra-III	Dr. G.K. Sahu, DESY Germany
12.	06/08/13	Surface Treatments Applied to Nuclear Physics@LNL-INFN: Ultra cleaning for Cu CUORE Experiment and Magnetron Sputtering on to isolate QWR	Giorgio Keppel, Laboratori Naionali Di Legnaro, Italy
13.	24/09/13	Nucleus: A Unique, Enigmatic Quantum System	Prof. Shriprakash B. Patel, UM-DAE Centre for Excellence in Basic Sciences (CBS), University of Mumbai

S.No.	Date	Title	Name
14.	27/09/13	Optical Nonlinearity in Nanostructured Materials	Reji Philip, Raman Research Institute, Bangalore
15.	03/10/13	Cryogenic Gas Gap Heat Switch	Dr. Isabel Catarino & Mr. Daniel Martins Cryogenics Laboratory, FCT/UNL Faculty of Science & Technology, New University of Lisbon, Portugal
16.	01/11/13	Recent Coulomb Excitation Activities at Inter-University Accelerator Centre	Dr Rakesh Kumar, IUAC
17.	19/11/13	AGATA PRESPEC campaign 2014	Dr. Magdalena Gorska, GSI, PRESPEC Group Germany
18.	27/11/13	Is Buck converter a DC transformer?	Prof. Satish Dhawan, Yale University, USA
19.	05/12/13	Proof-of-principle experiment for pre-bunched FEL with photo-cathode RF gun at LUCX	Prof. Junji Urakawa, KEK, Japan
20.	06/12/13	Modern approaches to the design of a compact accelerator complex for radiation physics	Dr Alexander Aryshev, KEK, Japan
21.	12/12/13	Opportunities for Research using the Australian Synchrotron and the OPAL Research-Possibilities for Collaboration in Materials Science, Physics, Chemistry and structural Biology between India and Australia	Dr Robert Robinson, Bragg Institute, Australian Nuclear Science and Technology Organization, Australia
22.	16/12/13	Studying Nanomaterials by X-ray Microspectroscopy	Prof. W.F. Pong, Department of Physics, Tamkang University, Taiwan
23.	24/12/13	Plasma Focus Device-High energy density transient plasma multiple radiation and particle source for plasma nanotechnology	Dr R.S. Rawat, National Institute of Education, Nanyang Technological University, Singapore
24.	03/01/14	Nuclear Incompressibility: How far can you squeeze a star?	Prof. Umesh Garg, University of Notre Dame, USA
25.	08/01/14	Fair - On the road to a new International large scale accelerator facility	DrHabilHans-JurgenWollersheim, GSI Helmholtzzentrum Fur Schwerionenforschung GmbH, Germany

S.No.	Date	Title	Name
26.	09/01/14	An innovative purification technique of 6 GHz TESLA type Nb mono cell seamless superconducting cavities in UHV system	Dr Ram Krishna Thakur, National Institute for Nuclear Physics, ITALY
27.	10/02/14	Superconducting RF Cavities	Mr. Ashutosh Pandey, IUAC
28.	17/02/14	Single Walled Carbon Nanotubes and their Composites as Hydrogen Storage Media	Dr. V. Vasu, Madurai Kamaraj University, Madurai
29.	27/03/14	Present status of university of tsukuba acceleration center and studies of ion-implanted materials by means of positron annihilation	Prof. Akira Uedono, University of Tsukuba, Ibaraki
30.	27/03/14	Structural transitions in ODD-Z rare earth proton emitters	Dr. Mamta Aggarwal, University of Mumbai, Mumbai
31.	28/03/14	Superconducting radio frequency technology comes full circle	Dr. Ganapati Rao Mayneni, Thomas Jefferson Accelerator Facility, Newport News, Virginia, USA

6.9 LIST OF TECHNICAL REPORTS /MEMOS (2013-14)

A. List of Technical Reports

Sl.	Title	Authors	Category	Reference No.
1	Design and development of Geodesic structure and scattering chamber for National Array of Neutron Detectors (NAND)	T.Varughese, K.S. Golda, A. Jhingan, P. Sugathan	Nuclear Science Department	IUAC/TR/2013-14/01
2	Renovation of Old Guest House Flat (No. 12) Of IUAC Campus	Harshwardhan	CIVIL	IUAC/TR/Harshwardhan/2013-14/02
3	Activities towards developing a 2.45GHz ECRIS based experimental facility	P.S. Lakshmy, Y.Mathus, Narender Kumar, R. Ahuja & G. Rodrigues	Development activity	IUAC/TR/PSL/2013-14/03

6.9 LIST OF TECHNICAL REPORTS /MEMOS (2013-14)

A. List of Technical Reports

Sl.	Title	Authors	Category	Reference No.
1	Repairing of 30kV, 20mA High Voltage Power Supply	Yaduvansh Mathur, P.S. Lakshmy, G.O. Rodrigues	Instrumentation	IUAC/TM/ 2013-14/01
2	Troubleshooting of 35kW, 48.5MHz Amplifier for RFQ	Y. Mathur, U.K. Rao, Sugam Kumar	Instrumentation	IUAC/TM/ 2013-14/02
3	PKDELIS Cryo Cooler Tripping Problem	Y. Mathur, G.O. Rodrigues, A.J. Malyadari	Instrumentation	IUAC/TM/ 2013-14/03
4	Troubleshooting of HTS Electronics for Solenoid Coils of PKDELIS	Y. Mathur & G.O. Rodrigues	Instrumentation	IUAC/TM/ 2013-14/04
5	Problems in Commissioning and Running of Traveling Wave Tube Amplifier	U.K. Rao, Kedarmal, Y. Mathur, Praveen Kumar & C.P. Safvan	Instrumentation	IUAC/TM/ 2013-14/05