

6. ACADEMIC ACTIVITIES

6.1 BEAM UTILIZATION BY USERS

6.1.1 LEIBF (Positive and Negative Ion) Beam Time Utilization and Experiments Performed (April, 2018 to March, 2019)

Users	No. of Shifts used (1 Shift =8Hrs.)	Project in	
		Materials Science	Atomic Physics
A. Universities/Colleges			
Amity University, Noida	3	1	
Anna University, Chennai	4	1	
Bharathiar University, Coimbatore	6	1	
Central University of Jammu, Jammu	6	1	
Chitkara University, Solan	15		1
Cochin University of Science & Technology, Kochi	6	1	
Deenbandhu Chhotu Ram University of Science and Technology, Murthal	6	1	
Guru Gobind Singh Indraprastha University, Delhi	11	1	
Guru Nanak Dev University, Amritsar	7	2	
Gurudas College, Kolkata	6	1	
Jamia Millia Islamia University, New Delhi	2	1	
Jawaharlal Nehru University, Delhi	12	3	
Kalindi College, New Delhi	9		1
Madurai Kamaraj University, Madurai	6	1	
Punjabi University, Patiala	9		1
Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur	9	2	
Sheffield Hallam University, Sheffield	6	1	
Tezpur University, Tezpur	7	1	
University and Petroleum & Energy Studies, Dehradun	3	1	
University of Calcutta, Kolkata	6	1	
University of Delhi, New Delhi	3	1	
University of Mysore, Mysuru	3	1	
B. Institutions			
Amrita Vishwa Vidyapeetham, Bangaluru	6	1	
Dayalbagh Educational Institute, Agra	6	1	
Indian Association for the Cultivation of Science, Kolkata	2	1	
Indian Institute of Science, Bengaluru	7	2	
Indian Institute of Science Education and Research Mohali, Mohali	2	1	
Indian Institute of Technology Bhubaneswar, Khordha	9	2	
Indian Institute of Technology Madras, Chennai	4	1	
Indian Institute of Technology Hyderabad, Sangareddy	5	1	
Institute of Physics, Bhubaneswar	20	2	
Institute for Plasma Research, Gandhinagar	3	1	
Inter-University Accelerator Centre, New Delhi	34	8	2

Users	No. of Shifts used (1 Shift =8Hrs.)	Project in	
		Materials Science	Atomic Physics
Malaviya National Institute of Technology Jaipur, Jaipur	3	1	
Solid State Physics Laboratory, DRDO, New Delhi	8	3	
S.N. Bose National Centre for Basic Sciences, Kolkata	6	1	
Facility Test	2	1	
TOTAL	262	50	5

6.1.2 Pelletron Beam Time Utilization and Experiments Performed (April, 2018 to March, 2019)

Users	No. of Shifts Used (1 Shift= 8 Hrs.)	Project in				
		Nuclear Physics	Materials Science	Radiation Biology	Atomic Physics	AMS
A.Universities/Colleges						
Aligarh Muslim University, Aligarh	36	2	1			
Amity University, Noida	5		2	1		
Andhra University, Visakhapatnam	15	1				
Anna University, Chennai	30					1
Banaras Hindu University, Varanasi	44	3				
Bharathiar University, Coimbatore	3		1			
Birla College of Arts, Science and Commerce, Kalyan	3		1			
Central University of Jharkhand, Ranchi	18	1				
Central University of Kerala, Kasaragod	15	1				
Central University of Punjab, Bathinda	3		1			
Central University of Rajasthan, Ajmer	9		2			
Deccan College Post-Graduate and Research Institute, Pune	34					2
Delhi Technological University, Delhi	14					1
Devi Ahilya Vishwavidyalaya, Indore	6		1			
Dr. Babasaheb Ambedkar Marathwada University, Aurangabad	6		2			
Doon University, Dehradun	6		2			
D.A.V. College, Amritsar	3		1			
Gauhati University, Guwahati	15	1				
Gautam Buddha University, Greater Noida	1		1			
Goa University, Plateau	4					1
Govind Ballabh Pant Univ. of Agriculture and Technology, Pantnagar	3		1			

Users	No. of Shifts Used (1 Shift= 8 Hrs.)	Project in				
		Nuclear Physics	Materials Science	Radiation Biology	Atomic Physics	AMS
Gujarat University, Ahmedabad	3		1			
Guru Ghasidas Vishwavidyalaya, Bilaspur	3		1			
Guru Gobind Singh Indraprastha University, Delhi	10		3			
Guru Nanak Dev University, Amritsar	7		2			
Himachal Pradesh University, Shimla	18	1				
Jamia Millia Islamia University, New Delhi	2		1			
Jawaharlal Nehru University, Delhi	31		1			2
Karnataka University, Dharwad	16	1				
Kalindi College, New Delhi	18				1	
Kanya Mahavidyalaya, Jalandhar	3		1			
Kongunadu Arts & Science College, Coimbatore	3		1			
Kyoto University, Kyoto	6		1			
Mangalore University, Mangaluru	30					1
Nirma University, Ahmedabad	3		1			
North-Eastern Hill University, Shillong	40					1
Panjab University, Chandigarh	24	1				
Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur	3		1			
Shiv Nadar University, Greater Noida	3		1			
Sikkim University, Gangtok	3		1			
Tamil University, Thanjavur	7					1
The Maharaja Sayajirao University of Baroda, Vadodara	18	1	1			
Tripura University, Suryamaninagar	3		1			
University College of Engineering, Arni	3		1			
University of Calicut, Kerala	12	1				
University of Delhi, New Delhi	43	1	2			2
University of Hyderabad, Hyderabad	5		1			
University of Kalyani, Kalyani	3			2		
University of Kashmir, Srinagar	6					1
University of Mysore, Mysuru	3		1			
Visvesvaraya Technological University, Belgaum	3		1			

Users	No. of Shifts Used (1 Shift= 8 Hrs.)	Project in				
		Nuclear Physics	Materials Science	Radiation Biology	Atomic Physics	AMS
B. Institutions						
Archaeological Survey of India, Bhubaneswar	8					1
Archaeological Survey of India, Patna	20					1
Bhabha Atomic Research Centre, Mumbai	3		1			
Birbal Sahni Institute of Palaeobotany, Lucknow	20					1
Dr. B.R. Ambedkar National Institute of Technology, Jalandhar	3		1			
Indian Institute of Science Education and Research Mohali, Mohali	2		1			
Indian Institute of Technology Jodhpur, Jodhpur	3		1			
Indian Institute of Technology Kharagpur, Kharagpur	2		1			
Indian Institute of Technology Roorkee, Roorkee	49	1				2
Indian Institute of Technology Ropar, Rupnagar	18	1				
Indian Institute of Technology (ISM), Dhanbad	20					1
Indian Space Research Organisation, Bengaluru	18		1			
Indira Gandhi Centre for Atomic Research, Kalpakkam	3		1			
Inter-University Accelerator Centre, New Delhi	94	2	4			2
Kalinga Institute of Industrial Technology, Bhubaneswar	3		1			
Malaviya National Institute of Technology Jaipur, Jaipur	11		3			
National Institute of Oceanography, Dona Paula	34					2
National Institute of Technology, Srinagar	3		1			
Saha Institute of Nuclear Physics, Kolkata	21	1				
Sant Longowal Institute of Engineering & Technology, Sangrur	5		1			
UGC-DAE-CSR, Kolkata	30	2				
Visva-Bharati, Santiniketan	48	3				
Wadia Institute of Himalayan Geology, Dehradun	45					1
C. Facility Tests	9	2			1	
TOTAL	1077	27	57	3	2	24

6.1.3 List of Users

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

(A) UNIVERSITIES – (131)

1.	Acharya Nagarjuna University	Guntur (Andhra Pradesh)
2.	Alagappa University	Karaikudi (Tamil Nadu)
3.	Aligarh Muslim University	Aligarh (Uttar Pradesh)
4.	Amity University	Noida (Uttar Pradesh)
5.	Andhra University	Visakhapatnam (Andhra Pradesh)
6.	Anna University	Chennai (Tamil Nadu)
7.	Assam University	Silchar (Assam)
8.	Babasaheb Bhimrao Ambedkar University	Lucknow (Uttar Pradesh)
9.	Banaras Hindu University, Varanasi (formerly Central Hindu College)	Varanasi (Uttar Pradesh)
10.	Bangalore University	Bangalore (Karnataka)
11.	Berhampur University	Berhampur (Odisha)
12.	Bharathiar University	Coimbatore (Tamil Nadu)
13.	Bharathidasan University	Tiruchirappalli (Tamil Nadu)
14.	Central University of Haryana	Mahendragarh (Haryana)
15.	Central University of Jammu	Jammu (Jammu and Kashmir)
16.	Central University of Jharkhand	Ranchi (Jharkhand)
17.	Central University of Kerala	Kasaragod (Kerala)
18.	Central University of Punjab	Bathinda (Punjab)
19.	Central University of Rajasthan	Ajmer (Rajasthan)
20.	Central University of South Bihar	Gaya (Bihar)
21.	Chaudhary Charan Singh University, Meerut (formerly Meerut University)	Meerut (Uttar Pradesh)
22.	Chaudhary Devi Lal University	Sirsa (Haryana)
23.	Chitkara University	Solan (Himachal Pradesh)
24.	Cochin University of Science & Technology	Kochi (Kerala)
25.	Darmstadt University of Technology	Darmstadt (Germany)
26.	Deenbandhu Chhotu Ram University Of Science And Technology (formerly Chhotu Ram State College of Engineering)	Murthal (Haryana)
27.	Delhi Technological University (formerly Delhi College of Engineering)	Delhi
28.	Devi Ahilya Vishwavidyalaya	Indore (Madhya Pradesh)

29.	Dr. Babasaheb Ambedkar Marathwada University	Aurangabad (Maharashtra)
30.	Dr. Bhimrao Ambedkar University (formerly Agra University)	Agra (Uttar Pradesh)
31.	Doon University	Dehradun (Uttarakhand)
32.	Gauhati University	Guwahati (Assam)
33.	Gautam Buddha University	Greater Noida (Uttar Pradesh)
34.	Goa University	Plateau (Goa)
35.	Govind Ballabh Pant University of Agriculture and Technology	Pantnagar (Uttarakhand)
36.	Gujarat Technological University	Ahmedabad (Gujarat)
37.	Gujarat University	Ahmedabad (Gujarat)
38.	Gulbarga University	Gulbarga (Karnataka)
39.	Guru Ghasidas Vishwavidyalaya	Bilaspur (Chhattisgarh)
40.	Guru Gobind Singh Indraprastha University (formerly Indraprastha University)	Delhi (Delhi)
41.	Guru Jambheshwar University of Science & Technology	Hisar (Haryana)
42.	Guru Nanak Dev University	Amritsar (Punjab)
43.	Hemwati Nandan Bahuguna Garhwal University	Srinagar (Uttarakhand)
44.	Himachal Pradesh University	Shimla (Himachal Pradesh)
45.	Indira Gandhi National Open University	New Delhi (Delhi)
46.	Indira Gandhi University Meerpur	Meerpur (Haryana)
47.	I.K. Gujral Punjab Technical University (formerly Punjab Technical University)	Kapurthala (Punjab)
48.	Jai Prakash Vishwavidyalaya	Chhapra (Bihar)
49.	Jamia Millia Islamia University	New Delhi (Delhi)
50.	Jawaharlal Nehru University	Delhi (Delhi)
51.	Karnataka University	Dharwad (Karnataka)
52.	Kiel University	Kiel (Germany)
53.	Kolhan University	Chaibasa (Jharkhand)
54.	Kurukshetra University	Kurukshetra (Haryana)
55.	Kuvempu University, Shankaraghatta	Shimoga (Karnataka)
56.	Kyoto University	Kyoto (Japan)
57.	K.R. Mangalam University	Gurgaon (Haryana)
58.	Ludwig-Maximilians-Universität München	Munich (Germany)
59.	Madurai Kamaraj University	Madurai (Tamil Nadu)
60.	Maharaja Krishnakumarsinhji Bhavnagar University (formerly Bhavnagar University)	Bhavnagar (Gujarat)
61.	Maharshi Dayanand University	Rohtak (Haryana)

62.	Maharishi Markandeshwar University	Mullana (Haryana)
63.	Mahatma Gandhi University	Kottayam (Kerala)
64.	Mahatma Jyotiba Phule Rohilkhand University	Bareilly (Uttar Pradesh)
65.	Manav Rachna International Institute of Research and Studies (formerly Manav Rachna International University)	Faridabad (Haryana)
66.	Mangalore University	Mangaluru (Karnataka)
67.	Manipur University	Imphal (Manipur)
68.	Manonmaniam Sundaranar University	Tirunelveli (Tamil Nadu)
69.	Marwadi University	Rajkot (Gujarat)
70.	Mohanlal Sukhadia University (also called University of Udaipur)	Udaipur (Rajasthan)
71.	Nirma University	Ahmedabad (Gujarat)
72.	North Carolina State University	Raleigh (USA)
73.	North-Eastern Hill University	Shillong (Meghalaya)
74.	North Maharashtra University (renamed as Kavayitri Bahinabai Chaudhari North Maharashtra University)	Jalgaon (Maharashtra)
75.	North Orissa University	Baripada (Odisha)
76.	Odisha University of Agriculture and Technology	Bhubaneswar (Odisha)
77.	Osaka University	Osaka (Japan)
78.	Osmania University	Hyderabad (Telangana)
79.	Panjab University	Chandigarh (Punjab)
80.	Patna University	Patna (Bihar)
81.	Periyar University	Salem (Tamil Nadu)
82.	Pondicherry University	Pondicherry (Pondicherry)
83.	Punjab Agricultural University	Ludhiana (Punjab)
84.	Punjabi University	Patiala (Punjab)
85.	Rani Durgavati Vishwavidyalaya (also known as University of Jabalpur)	Jabalpur (Madhya Pradesh)
86.	Rashtrasant Tukadoji Maharaj Nagpur University (formerly Nagpur University)	Nagpur (Maharashtra)
87.	Ravenshaw University	Cuttack (Odisha)
88.	Sabancı University	Tuzla/İstanbul (Turkey)
89.	Saint Petersburg Polytechnic University	Russia (Russia)
90.	Saurashtra University	Rajkot (Gujarat)
91.	Savitribai Phule Pune University (formerly University of Pune)	Pune (Maharashtra)
92.	Sharda University	Greater Noida (Uttar Pradesh)
93.	Sheffield Hallam University	Sheffield (UK)

94.	Shiv Nadar University	Greater Noida (Uttar Pradesh)
95.	Shivaji University	Kolhapur (Maharashtra)
96.	Shri Mata Vaishno Devi University	Katra (Jammu and Kashmir)
97.	Sikkim University	Gangtok (Sikkim)
98.	Sri Krishnadevaraya University	Anantapur (Andhra Pradesh)
99.	Tamil University	Thanjavur (Tamil Nadu)
100.	Tezpur University	Tezpur (Assam)
101.	The Maharaja Sayajirao University of Baroda	Vadodara (Gujarat)
102.	The NorthCap University, (formerly ITM University)	Gurgaon (Haryana)
103.	The University of Burdwan	Bardhaman (West Bengal)
104.	The University of Sheffield	Sheffield (UK)
105.	Tilka Manjhi Bhagalpur University (formerly Bhagalpur University)	Bhagalpur (Bihar)
106.	Tripura University	Suryamaninagar (Tripura)
107.	Tumkur University	Tumkur (Karnataka)
108.	University and Petroleum & Energy Studies	Dehradun (Uttarakhand)
109.	University of Allahabad	Prayagraj (Uttar Pradesh)
110.	University of Calcutta	Kolkata (West Bengal)
111.	University of Calicut	Kerala (Kerala)
112.	University of Delhi	New Delhi (Delhi)
113.	University of Hyderabad	Hyderabad (Telangana)
114.	University of Kalyani	Kalyani (West Bengal)
115.	University of Kashmir	Srinagar (Jammu and Kashmir)
116.	University of Lucknow	Lucknow (Uttar Pradesh)
117.	University of Madras	Chennai (Tamil Nadu)
118.	University of Maryland	Maryland (USA)
119.	University of Mumbai (known earlier as University of Bombay)	Mumbai (Maharashtra)
120.	University of Mysore	Mysuru (Karnataka)
121.	University of Notre Dame	Notre Dame (USA)
122.	University of Padova	Padova (Italy)
123.	University of Rajasthan	Jaipur (Rajasthan)
124.	University of Stuttgart	Stuttgart (Germany)
125.	University of Surrey	Guildford (UK)
126.	Heavy Ion Laboratory, University of Warsaw	Poland (Poland)
127.	Utkal University (also known as Vani Vihar)	Bhubaneswar (Odisha)
128.	Vikram University	Ujjain (Madhya Pradesh)

- | | | |
|------|---|-----------------------|
| 129. | Visva-Bharati University | Bolpur (West Bengal) |
| 130. | Visvesvaraya Technological University | Belgaum (Karnataka) |
| 131. | Maulana Abul Kalam Azad University of Technology
(formerly West Bengal University of Technology) | Kolkata (West Bengal) |

(B) COLLEGES – (74)

- | | | |
|-----|--|------------------------------|
| 1. | Aligarh College of Engineering and Technology | Aligarh (Uttar Pradesh) |
| 2. | Anand International College of Engineering | Jaipur (Rajasthan) |
| 3. | Ananda Mohan College | Kolkata (West Bengal) |
| 4. | Armed Forces Medical College | Pune (Maharashtra) |
| 5. | Bareilly College | Bareilly (Uttar Pradesh) |
| 6. | Beant College of Engineering & Technology | Gurdaspur (Punjab) |
| 7. | Bharatiya Jain Sanghatana's Arts, Science and Commerce College | Pune (Maharashtra) |
| 8. | Bhiwandi College | Mumbai (Maharashtra) |
| 9. | Birla College of Arts, Science and Commerce | Kalyan (Maharashtra) |
| 10. | B.N.N. College | Bhiwandi (Maharashtra) |
| 11. | Deen Dayal Upadhyaya College | New Delhi (Delhi) |
| 12. | Doodhsakhar Mahavidyalaya | Kolhapur (Maharashtra) |
| 13. | Dum Dum Motijheel College | South Dum Dum (West Bengal) |
| 14. | D.A.V. College | Amritsar (Punjab) |
| 15. | D.A.V. College | Jalandhar (Punjab) |
| 16. | D.A.V. College | Kanpur (Uttar Pradesh) |
| 17. | D.A.V. College | Mumbai (Maharashtra) |
| 18. | D.B.S. (P.G.) College | Dehradun (Uttarakhand) |
| 19. | Ewing Christian College | Prayagraj (Uttar Pradesh) |
| 20. | Gandhi Faiz-E-Aam College | Shahjahanpur (Uttar Pradesh) |
| 21. | Goalpara College | Assam (Assam) |
| 22. | Government Arts College | Rajahmundry (Andhra Pradesh) |
| 23. | Government College | Ajmer (Rajasthan) |
| 24. | Government College | Kota (Rajasthan) |
| 25. | Government College | Mahendragarh (Haryana) |
| 26. | Guru Nanak Girls College | Ludhiana (Punjab) |
| 27. | Gurudas College | Kolkata (West Bengal) |
| 28. | Iswar Chandra Vidyasagar College (formerly Belonia College) | Belonia (Tripura) |

29.	Jai Hind College	Mumbai (Maharashtra)
30.	Kalindi College	New Delhi (Delhi)
31.	Kandi Raj College	Kandi (West Bengal)
32.	Kanya Mahavidyalaya	Jalandhar (Punjab)
33.	Kishinchand Chellaram College	Mumbai (Maharashtra)
34.	Kongunadu Arts & Science College	Coimbatore (Tamil Nadu)
35.	Koshi College	Khagaria (Bihar)
36.	Krishnath College	Baharampur (West Bengal)
37.	K.J. Somaiya College of Science & Commerce	Mumbai (Maharashtra)
38.	Lalbaba College	Howrah (West Bengal)
39.	Maharajah's Post Graduate College	Vizianagaram (Andhra Pradesh)
40.	Maharani Shri Jaya College	Bharatpur (Rajasthan)
41.	Mahila Vidyalaya PG College	Lucknow (Uttar Pradesh)
42.	Marwari College	Ranchi (Jharkhand)
43.	M.M.H. College	Ghaziabad (Uttar Pradesh)
44.	Nayagarh College	Nayagarh (Odisha)
45.	Nizam College	Hyderabad (Telangana)
46.	N.S.A.M. College	Mangaluru (Karnataka)
47.	Poornaprajna College and Post Graduate Centre, Udupi	Udupi (Karnataka)
48.	Punjab Engineering College	Chandigarh (Chandigarh)
49.	Raja Balwant Singh College (formerly known as Balwant Rajput College)	Agra (Uttar Pradesh)
50.	R.D. & D.J. College	Munger (Bihar)
51.	R.P.G. College	Ratnagiri (Maharashtra)
52.	Sanatan Dharma College	Ambala Cantt (Haryana)
53.	School of Physical Sciences	Nanded (Maharashtra)
54.	School of Physical Sciences	New Delhi (Delhi)
55.	School of Technology & Applied Sciences	Kochi (Kerala)
56.	Sharnbasveshwar College of Science	Gulbarga (Karnataka)
57.	Shri Varshney College	Aligarh (Uttar Pradesh)
58.	Smt. Chandibai Himathmal Mansukhani College	Thane (Maharashtra)
59.	Sree Narayana College	Kollam (Kerala)
60.	Sri Bhuvanendra College	Karkala (Karnataka)
61.	Sri S. Ramasamy Naidu Memorial College	Sattur (Tamil Nadu)
62.	Sri Venkateswara College	New Delhi (Delhi)
63.	St. Edmund's College	Shillong (Meghalaya)

64.	St. Xavier's College	Kolkata (West Bengal)
65.	St. Xavier's College	Mumbai (Maharashtra)
66.	Swami Shraddhanand College	New Delhi (Delhi)
67.	S.D.M. College	Mysuru (Karnataka)
68.	S.D.M. College	Uijre (Karnataka)
69.	S.S. Jain Subodh P.G. (Autonomous) College	Jaipur (Rajasthan)
70.	University College of Engineering (a constituent College of Anna University)	Arni (Tamil Nadu)
71.	University College of Science & Technology	Kolkata (West Bengal)
72.	Vaish College of Education	Rohtak (Haryana)
73.	Vardhaman College	Bijnor (Uttar Pradesh)
74.	Zakir Husain Delhi College	Delhi (New Delhi)

(C) OTHER INSTITUTIONS – (118)

1.	All India Council For Technical Education	New Delhi (Delhi)
2.	All India Institute of Medical Sciences	New Delhi (Delhi)
3.	Amity Institute of Nanotechnology	Noida (Uttar Pradesh)
4.	Amity School of Engineering & Technology	New Delhi (Delhi)
5.	Amrita School of Engineering (Amrita School of Engineering is an engineering institution, part of Amrita Vishwa Vidyapeetham)	Bangaluru (Karnataka)
6.	Amrita Vishwa Vidyapeetham,	Bangaluru (Karnataka)
7.	Archaeological Survey of India	Agra (Uttar Pradesh)
8.	Archaeological Survey of India	Bhubaneswar (Odisha)
9.	Archaeological Survey of India	Janpath (Delhi)
10.	Archaeological Survey of India	Patna (Bihar)
11.	Archaeological Survey of India	Red Fort Complex (Delhi)
12.	Archaeological Survey of India	Vadodara (Gujarat)
13.	Atal Bihari Vajpayee Indian Institute of Information Technology and Management	Gwalior (Madhya Pradesh)
14.	AFM/XPS Laboratory	Bhubaneswar (Odisha)
15.	Bangabasi Morning College	Kolkata (West Bengal)
16.	Bhabha Atomic Research Centre	Mumbai (Maharashtra)
17.	Birbal Sahni Institute of Palaeobotany	Lucknow (Uttar Pradesh)
18.	Birla Institute of Technology	Mesra (Jharkhand)

19.	Bose Institute	Kolkata (West Bengal)
20.	Calcutta Institute of Engineering and Management	Kolkata (West Bengal)
21.	Central Electronics Engineering Research Institute	Pilani (Rajasthan)
22.	Centre for Cellular and Molecular Biology	Hyderabad (Telangana)
23.	Centre de Sciences Nucléaires et de Sciences de la Matière	France
24.	Centre for Superconductivity Research	USA
25.	CSIR-Institute of Minerals and Materials Technology (Formerly Regional Research Laboratory)	Bhubaneswar (Odisha)
26.	Dayalbagh Educational Institute	Agra (Uttar Pradesh)
27.	Deccan College Post-Graduate and Research Institute	Pune (Maharashtra)
28.	Defence Laboratory	Jodhpur (Rajasthan)
29.	Defence Metallurgical Research Laboratory	Hyderabad (Telangana)
30.	Defence Research & Development Organization	Dehradun (Uttarakhand)
31.	Dr. B.R. Ambedkar National Institute of Technology (formerly Regional Engineering College Jalandhar)	Jalandhar (Punjab)
32.	Flerov Laboratory of Nuclear Reactions JINR	Russia
33.	Genetic Institute of Manufacturing Technology	Singapore (Singapore)
34.	GSI Helmholtzzentrum für Schwerionenforschung GmbH	Darmstadt (Germany)
35.	Harcourt Butler Technological Institute	Kanpur (Uttar Pradesh)
36.	Homi Bhabha National Institute	Kolkata (West Bengal)
37.	Indian Association for the Cultivation of Science	Kolkata (West Bengal)
38.	Indian Institute of Engineering Science and Technology	Howrah (West Bengal)
39.	Indian Institute of Information Technology (Formerly Bengal Engineering and Science University, Shibpur)	Allahabad (Uttar Pradesh)
40.	Indian Institute of Information Technology Design & Manufacturing Jabalpur	Jabalpur, Madhya Pradesh
41.	Indian Institute of Science	Bengaluru (Karnataka)
42.	Indian Institute of Science Education and Research Kolkata	Mohanpur (West Bengal)
43.	Indian Institute of Science Education and Research Mohali	Mohali (Punjab)
44.	Indian Institute of Space Science and Technology	Valiamala (Kerala)
45.	Indian Institute of Technology Gandhinagar	Gandhinagar (Gujarat)
46.	Indian Institute of Technology Jodhpur	Jodhpur (Rajasthan)
47.	Indian Institute of Technology Kanpur	Kanpur (Uttar Pradesh)
48.	Indian Institute of Technology Kharagpur	Kharagpur (West Bengal)
49.	Indian Institute of Technology Roorkee	Roorkee (Uttarakhand)
50.	Indian Institute of Technology Ropar	Rupnagar (Punjab)
51.	Indian Institute of Technology (BHU)	Varanasi (Uttar Pradesh)

52.	Indian Institute of Technology Bhubaneswar	Khordha (Odisha)
53.	Indian Institute of Technology Bombay	Mumbai (Maharashtra)
54.	Indian Institute of Technology Delhi	New Delhi (Delhi)
55.	Indian Institute of Technology Hyderabad	Sangareddy (Telangana)
56.	Indian Institute of Technology (ISM) (formerly known as Indian School of Mines)	Dhanbad (Jharkhand)
57.	Indian Institute of Technology Madras	Chennai (Tamil Nadu)
58.	Indian Institute of Tropical Meteorology	Pune (Maharashtra)
59.	Indian Space Research Organisation	Bengaluru (Karnataka)
60.	Indira Gandhi Centre for Atomic Research	Kalpakkam (Tamil Nadu)
61.	Institute for Plasma Research	Gandhinagar (Gujarat)
62.	Institute of Basic Science	Agra (Uttar Pradesh)
63.	Institute of Energy and Climate Research, Forschungszentrum Jülich	Jülich (Germany)
64.	Institute of Materials Science	Bhubaneswar (Odisha)
65.	Institute of Nuclear Medicine & Allied Sciences	New Delhi (Delhi)
66.	Institute of Physics	Bhubaneswar (Odisha)
67.	International Centre for Genetic Engineering and Biotechnology	New Delhi (Delhi)
68.	INFN Legnaro National Laboratory (LNL)	Legnaro (Italy)
69.	IUC-DAEF, Calcutta Centre	Kolkata (West Bengal)
70.	IUC-DAEF, Indore Centre	Indore (Madhya Pradesh)
71.	Jawaharlal Nehru Centre For Advanced Scientific Research	Bengaluru (Karnataka)
72.	Jaypee Institute of Information Technology	Noida (Uttar Pradesh)
73.	Joint Institute for Nuclear Research	Dubna (Russia)
74.	Kalinga Institute of Industrial Technology	Bhubaneswar (Odisha)
75.	Malaviya National Institute of Technology Jaipur	Jaipur (Rajasthan)
76.	Massachusetts Institute of Technology	Cambridge (USA)
77.	Maulana Azad National Institute of Technology (also known as National Institute of Technology)	Bhopal (Madhya Pradesh)
78.	Ministry of Defence (R & D Orgn)	Delhi
79.	Motilal Nehru National Institute of Technology (formerly Motilal Nehru Regional Engineering College)	Allahabad (Uttar Pradesh)
80.	Nanocrystals Technology	USA
81.	National Institute of Material Sciences	Japan
82.	National Institute of Oceanography	Dona Paula (Goa)
83.	National Institute of Science Education and Research	Pune (Maharashtra)
84.	National Institute of Science Education and Research Bhubaneswar	Khurda (Odisha)

85.	National Institute of Technology	Silchar (Assam)
86.	National Institute of Technology	Tiruchirappalli (Tamil Nadu)
87.	National Institute of Technology Hamirpur	Hamirpur (Himachal Pradesh)
88.	National Institute of Technology Kurukshetra	Kurukshetra (Haryana)
89.	National Institute of Technology Rourkela	Rourkela (Odisha)
90.	National Institute of Technology Srinagar	Srinagar (Jammu and Kashmir)
91.	National Museum	New Delhi (Delhi)
92.	National Physical Laboratory	New Delhi (Delhi)
93.	NCCCM/BARC	Hyderabad (Telangana)
94.	NCSR	France
95.	Oak Ridge National Laboratory	USA
96.	Physical Research Laboratory	Ahmedabad (Gujarat)
97.	P.E.S. Institute of Technology	Bengaluru (Karnataka)
98.	Raja Ramanna Centre for Advanced Technology	Indore (Madhya Pradesh)
99.	Research Centre Imarat, DRDO	Hyderabad (Telangana)
100.	Saha Institute of Nuclear Physics	Kolkata (West Bengal)
101.	Sant Longowal Institute of Engineering & Technology	Sangrur (Punjab)
102.	Semi-Conductor Laboratory	Mohali (Punjab)
103.	Shree Devi Institute of Technology	Mangaluru (Karnataka)
104.	Solid State Physics Laboratory, DRDO	New Delhi (Delhi)
105.	S.N. Bose National Centre for Basic Sciences	Kolkata (West Bengal)
106.	SUNAG Laboratory, Institute of Physics	Bhubaneswar (Odisha)
107.	Tata Institute of Fundamental Research	Mumbai (Maharashtra)
108.	Thapar Institute of Engineering & Technology (Thapar University)	Patiala (Punjab)
109.	The Institute of Science	Mumbai (Maharashtra)
110.	The National Academy of Sciences	Prayagraj (Uttar Pradesh)
111.	The National Centre for Polar and Ocean Research (formerly known as the National Centre for Antarctic and Ocean Research)	Goa
112.	UGC-DAE-Consortium For Scientific Research	Indore (Madhya Pradesh)
113.	UGC-DAE-Consortium For Scientific Research	Kolkata (West Bengal)
114.	UM-DAC Centre for Excellence in Basic Sciences	Mumbai (Maharashtra)
115.	Variable Energy Cyclotron Centre	Kolkata (West Bengal)
116.	Vidya Prasarak Mandal's Polytechnic	Thane (Maharashtra)
117.	Visva-Bharati	Santiniketan (West Bengal)
118.	Wadia Institute of Himalayan Geology	Dehradun (Uttarakhand)

6.2 STUDENT PROGRAMMES

6.2.1 IUAC Summer Programme 2018 for B.Sc. (Physics) Students

The B.Sc(Physics)Summer Students Programme which is being held annually in IUAC, was organized and held at IUAC in the last year during the period June 04th-29th, 2018. A total of 270 applications from 24 states/ union territories were received through the online portal. In order to limit the total number of projects which were subjected to availability of IUAC resource personnel to guide the students in their respective areas of specialization and availability of accommodation in IUAC hostel and guest house, a criterion point with a cut-off value of 90 % was selected to restrict the number of selected candidates to ~ 15. Location of the current affiliation (college/university/institution) was considered for determining each candidate's representation from a particular state/union territory. Effectively 14 students joined and were assigned various projects related to Materials Science, Atomic and Molecular Physics, Nuclear Physics, Accelerator Mass Spectrometry and Accelerator Physics. Special lectures by experts from various disciplines were organized to cater to the students, a wide area of research possibilities. All students have successfully completed their projects and it has benefitted both IUAC and the students.



Summer Students, 2018

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. 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. Applications can be submitted online only. This flexibility allows the students to choose the project period without hampering their main study course. Following students participated in this programme.

S.No.	Name	Affiliation
1	Ayushi Tyagi	JMI, New Delhi
1	Ms Queena Dhiman	H P University, Shimla
2	Udit Gupta	H N B University
3	Ms Uzma kthar	J M I University
4	Ms Monika Semwal	Banasthali Vidyapith
5	Mr Tanmay Singhvi	Sir Padampat Singhania University
6	Ms. Rajni Rawat	Pt. L. M. S Government post graduate college Rishikesh DEHRADUN

S.No.	Name	Affiliation
7	Mr. Agrim Jetwani	Sri Venkateswara College, University of Delhi
8	Ms Sneha Chaudhary	IIT Roorkee
9	Ms Sajal N T	Department of Physics, Cochin University of Science and Technology
10	Mr. Robin Dahiya	Jamia Millia Islamia University
11	Mr Vimal Narayan Sahoo	Pondicherry Central University
12	Ms Jyotirmayee Acharya	Pondicherry Central University

Details of this programme can be accessed at: <http://www.iuac.res.in/sc/msc/index.html>

Online Application Portal: <http://www.iuac.res.in/indico/event/mscop>

6.2.3 PhD Teaching Programme

P. N. Prakash and S. Muralithar

IUAC offers a 16 credit course work conforming to UGC guidelines for the PhD students pursuing research using energetic ion beams. The course work is spread over two semesters. The first semester, held during August-December, offers courses in Advanced Classical & Quantum Mechanics, Experimental Physics, and Accelerator Physics, while the second semester, held during January-May, offers courses in Advanced Condensed Matter Physics, Advanced Nuclear Physics, and Research Methodology. All the courses, except Research Methodology, are of 3 credit points each. The course on Research Methodology, which includes the course on Computational Techniques, is a 4 credit points course.

During the last academic year the PhD teaching programme continued to receive excellent response from students across the country. About a month before the semester commences, a poster giving details of the course modules, schedule, etc. is uploaded on the IUAC website. The printed version of the poster is also sent to the physics departments of various universities and colleges for inviting applications from research scholars and interested faculty members. Accommodation and TA/DA is provided to the selected participants (around 10-15). The details of the course modules offered in semester-I and semester-II during the academic year 2018-19 are given in the following.

A new dedicated lecture hall for conducting classes for the PhD students was setup during this academic year. The aesthetically designed lecture hall is equipped with modern facilities such as an integrated digital podium, ultra-short throw projector which can convert the projection white screen into a smart board, a recording camera with face recognition feature, document reader, audio system, additional camera for holding a web conference, provision for conducting interactive classes in up to 3 additional remote classrooms, large size lacquered glass board, etc. The lecture hall can accommodate 40 students and has desk and chair type sitting arrangement. Power points are provided on each desk for charging laptops. A photograph of the new lecture hall is shown below.

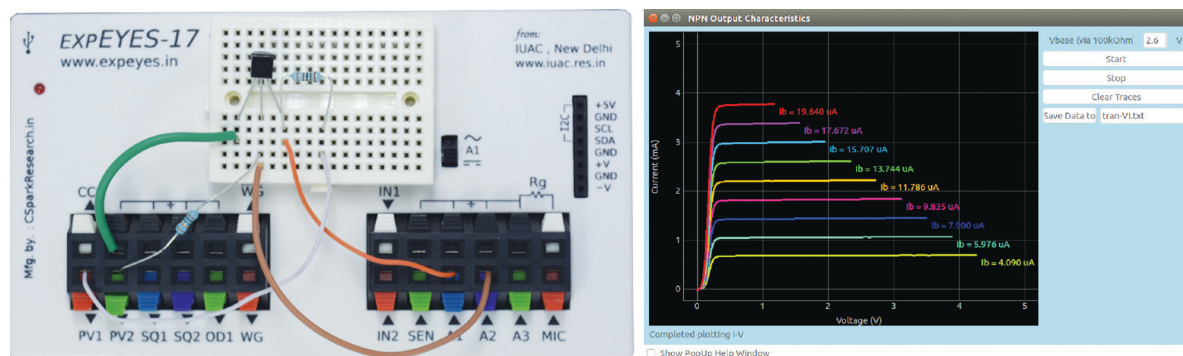


The new lecture hall setup for conducting classes for PhD students.

6.2.4 Teaching Laboratory Activities

Ajith Kumar B P. & V V V Satyanarayana

As a part of IUAC's outreach program, we continue to develop computer interfaced science experiments and train teachers in modern experimental data acquisition and analysis methods. A general purpose computer interface named ExpEYES-17 (Experiments for Young Engineers and Scientists) was released this year under PHOENIX project at IUAC. It is meant to be a tool for learning by exploration, suitable for high school classes and above. The teacher training program is conducted twice a year at IUAC and the one day workshops at colleges/universities all over India. During this year we have conducted two One-Week Training Programs for college teachers at IUAC. One Day Workshops were conducted at PRS University Raipur, Carmel College Goa and IIT Kanpur.



Transistor Output Characteristics experiment using expEYES-17



Six days training Program (3 April to 5 May 2018) at IUAC

6.3 LIBRARY ACTIVITIES

Priyambada Nayak

Salient features

Working hours:

Round the clock, all days of the week

Total Books:

~2900 (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.

Current E-Journals:	> 2500
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:	170
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 "KOHA" has been used for the computerization of library documents. Apart from the current online journals, Journal archives (AIP, IOP, APS, ACS, Science Direct, Springer, Science, Nature) are also being subscribed by the library. "**Turn-it-in**", the originality check software is being used to prevent plagiarism. "**Web of Science**" is being subscribed by the library and used by the scholars for citation analysis and other purposes. The library is a member of UGC-INFONET Consortium and more than 2500 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 2018-19

30 April-5 May, 2018	Training Programme on Computer interfaced Science Experiments (Contact Person: Ajith Kumar B.P./ V.V.V. Satyanarayana)
7-18 May, 2018	School on Accelerator Science & Technology (Contact Person: Rajeev Mehta)
4-29 June, 2018	Summer Programme for B.Sc. (Physics) Students (Contact Person: G.O. Rodrigues)
5-7 July, 2018	Users Workshop
8 July, 2018	64th AUC Meeting
12-18 July, 2018	International School on Ion Beams in Energy Materials (Contact Person: P.K. Kulriya/ Fouran Singh)
13-14, 16 August, 2018	IUAC Academic Workshop (Contact Person: P. Sugathan)
20 August, 2018	PhD Programme : Fall Semester starts (Contact Person: P.N. Prakash)
7 September, 2018	Acquaintance Programme at Lucknow University, Lucknow (Contact Person: R.P. Singh)
24-29 September, 2018	Training Programme on Computer Interfaced Science Experiments (Contact Person: Ajith Kumar B.P./ V.V.V. Satyanarayana)

3-7 October, 2018	International School on Ion Beams in Materials Science (Contact Person: I. Sulania/ A. Pripathi)
9-12 October, 2018	International Conference on Ion Beams in Materials Engineering and Characterization (Contact Person: S.A. Khan/ A. Tripathi)
29 October, 2018	Acquaintance Programme at Central University of Kerala, Kasaragod (Contact Person: Subir Nath)
12-16 November, 2018	School on Modern Techniques in Nuclear Structure Studies (Contact Person: R.P. Singh/ S. Muralithar)
16-18 December, 2018	Users Workshop
19 December, 2018	Foundation Day Programme & 65th AUC Meeting
21 January, 2019	Ph. D. Programme: Winter Semester starts (Contact Person: S. Muralithar)
13-16 February, 2019	Asian Committee for Future Accelerators (ACFA) Meeting and Asian Forum for Accelerators and Detectors (AFAD) Workshop (Contact Person: S. Ghosh)
18-20 February, 2019	National Workshop on Isotopes in Earth, Ocean and Atmospheric Sciences at CSIR-NIO, Goa (Contact Persons: S. Chopra and R. Saraswat (NIO))
26-27 February, 2019	IUAC Academic Workshop (Contact Person: P. Sugathan)
28 February, 2019	National Science Day (Contact Person: Saif A. Khan)
6-7 March, 2019	Group Presentations on AY/FY 2018-19 and plans for AY/FY 2019-20 (Contact Person: N. Madhavan)
14-15 March, 2019	Workshop on Disruptive Technologies (Contact Persons: S. Mookerjee)

6.5 FORTHCOMING EVENTS: 2019

25 April, 2019	IUAC Acquaintance Programme at Rajiv Gandhi Central University, Itanagar (Contact Person: R.P. Singh)
29 April-4 May, 2019	Training Programme on Computer Interfaced Science Experiments (Contact Person: B.P. Ajith Kumar)
3-28 June, 2019	Summer Programme for B.Sc. (Physics) Students (Contact Person: G.O. Rodrigues)
5-7 July, 2019	Users' Workshop
8 July, 2019	66th AUC Meeting
15-20 July, 2019	School on Nuclear Reactions (Contact Persons: S. Nath and K. S. Golda)
29 July, 2019	IUAC Acquaintance Programme at DDU University, Gorakhpur (Contact Person: N. Madhavan)

19 August, 2019	Ph. D. Programme: Monsoon Semester starts (Contact Person: S. Muralithar)
21-23 August, 2019	IUAC Academic Workshop (Contact Person: P. Sugathan)
10-14 September, 2019	School on Ion Beams in Materials Science (Contact Person: K. Asokan)
17-18 September, 2019	Workshop on Results from recent INGA Campaign and Future Perspectives (Contact Persons: R.P. Singh and S. Muralithar)
30 Sept.-5 Oct., 2019	Training Programme on Computer Interfaced Science Experiments (Contact Person: V.V.V. Satyanarayana)
15-19 October, 2019	International Conference on Nanostructuring with Ion Beams at IGCAR, Kalpakkam (Contact Persons: A. Tripathi and B.K. Panigrahi (IGCAR))
21 October, 2019	IUAC Acquaintance Programme at Kanchi Mamunivar Centre for Postgraduate Studies, Pondicherry (Contact Person: P. Sugathan)
1-15 November, 2019	School and Workshop on Detectors (Contact Person: A. Jhingan and Archana Sharma (CERN))
11 November, 2019	IUAC Acquaintance Programme at Patna University, Patna (Contact Person: P.N. Prakash)
18-21 November, 2019	Indian Particle Accelerator Conference - InPAC-2019 (Contact Person: R. Mehta)
26-29 November, 2019	In Silico Quantum Modeling Studies (Contact Person: S. Mookerjee)
16-18 December, 2019	Users' Workshop
19 December, 2019	Foundation Day Programme & 67th AUC Meeting

6.6 LIST OF PH.D AWARDEES

The following scholars have completed the Ph.D thesis work during 2018-19

- **Prashant Sharma. Thesis title:** "Study of Atomic phenomena associated with highly charged ions produced during nuclear reactions".
- **Arkaprava Das. Thesis title:** "Study of phase transformations in Cadmium oxide based thin films and nanocomposites for optoelectronic applications".

6.7 LIST OF PUBLICATIONS IN THE YEAR 2018-19

A. NUCLEAR PHYSICS

1. **Fission like events in the $^{14}\text{N}+^{181}\text{Ta}$ system**, V. R. Sharma, R. Kumar, S. Mukherjee, E. F. Aguilera, M. Shuaib, P. P. Singh, A. Yadav, R. Dubey, S. Appannababu, J. C. Morales-Rivera, S. Kumar, B. P. Singh and R. Prasad, *Phys. Rev. C* **99**, 034617 (2019).
2. **Evaporation residue cross-section measurements for $^{16}\text{O}+^{203,205}\text{Tl}$** , J. Gehlot, A. M. Vinodkumar, N. Madhavan, S. Nath, A. Jhingan, T. Varughese, T. Banerjee, A. Shamlath, P. V. Laveen, M. Shareef, P. Jisha, P. Sandya Devi, G. N. Jyothi, M. M. Hosamani, I. Mazumdar, V. I. Chepigin, M. L. Chelnokov, A. V. Yeremin, A. K. Sinha and B. R. S. Babu, *Phys. Rev. C* **99**, 034615 (2019).
3. **Systematic study of incomplete-fusion dynamics below 8 MeV/nucleon energy**, H. Kumar, S. A. Tali, M. Afjal Ansari, D. Singh, R. Ali, A. Ali, S. Parashari, P. K. Giri, S. B. Linda, R. Kumar, R. P. Singh and S. Muralithar, *Phys. Rev. C* **99**, 034610 (2019).

4. **Measurement of incomplete fusion cross sections in ${}^6\text{Li}+{}^{238}\text{U}$ reactions**, A. Pal, S. Santra, D. Chattopadhyay, A. Kundu, A. Jhingan, P. Sugathan, B. K. Nayak, A. Saxena and S. Kailas, *Phys. Rev. C* **99**, 024620 (2019).
5. **Nuclear dissipation at high excitation energy and angular momenta in reaction forming ${}^{227}\text{Np}$** , M. Shareef, E. Prasad, A. Jhingan, N. Saneesh, K. S. Golda, A. M. Vinodkumar, M. Kumar, A. Shamlath, P. V. Laveen, A. C. Visakh, M. M. Hosamani, S. K. Duggi, P. Sandya Devi, G. N. Jyothi, A. Tejaswi, P. N. Patil, J. Sadhukhan, P. Sugathan, A. Chatterjee and S. Pal, *Phys. Rev. C* **99**, 024618 (2019).
6. **Mass and isotopic yield distributions of fission-like events in the ${}^{19}\text{F}+{}^{169}\text{Tm}$ system at low energies**, M. Shuaib, V. R. Sharma, A. Yadav, S. Thakur, M. K. Sharma, I. Majeed, M. Kumar, P. P. Singh, D. P. Singh, R. Kumar, R. P. Singh, S. Muralithar, B. P. Singh and R. Prasad, *Phys. Rev. C* **99**, 024617 (2019).
7. **Detailed statistical model analysis of observables from fusion-fission reactions**, T. Banerjee, S. Nath and S. Pal, *Phys. Rev. C* **99**, 024610 (2019).
8. **Sub-barrier fusion in the ${}^{37}\text{Cl}+{}^{130}\text{Te}$ system**, R. N. Sahoo, M. Kaushik, A. Sood, P. Kumar, A. Sharma, S. Thakur, P. P. Singh, P. K. Raina, M. M. Shaikh, R. Biswas, A. Yadav, J. Gehlot, S. Nath, N. Madhavan, V. Srivastava, M. K. Sharma, B. P. Singh, R. Prasad, A. Rani, A. Banerjee, U. Gupta, N. K. Deb and B. J. Roy, *Phys. Rev. C* **99**, 024607 (2019).
9. **Insights into the low energy incomplete fusion**, R. N. Sahoo, M. Kaushik, A. Sood, P. Kumar, V. R. Sharma, A. Yadav, P. P. Singh, M. K. Sharma, R. Kumar, B. P. Singh, S. Aydin and R. Prasad, *Nucl. Phys. A* **983**, 145 (2019).
10. **Shell-model description in ${}^{99}\text{Rh}$ and systematics of odd-A Rh isotopes**, S. Kumar, S. Sihotra, V. Singh, J. Rather, M. Kaur, J. Goswamy, N. Singh, D. Mehta, T. Trivedi, R. P. Singh, S. Muralithar and R. Palit, *Acta. Phys. Pol. B* **50**, 159 (2019).
11. **Abrupt phase change of the core rotation in the ${}^{143}\text{Sm}$ nucleus**, S. Rajbanshi, R. Raut, H. Pai, S. Ali, A. Goswami, G. Gangopadhyay, S. Bhattacharyya, G. Mukherjee, S. Muralithar, R. P. Singh, M. Kumar Raju, P. Singh and R. K. Bhowmik, *Phys. Lett. B* **782**, 143 (2018).
12. **Extremely asymmetric shears band in ${}^{143}\text{Sm}$** , S. Rajbanshi, R. Raut, H. Pai, S. Ali, A. Goswami, S. Bhattacharyya, G. Mukherjee, R. K. Bhowmik, S. Muralithar, R. P. Singh, G. Gangopadhyay, M. Kumar Raju and P. Singh, *Phys. Rev. C* **98**, 061304 (2018).
13. **Incomplete fusion in ${}^{16}\text{O}+{}^{89}\text{Y}$ reactions at energies of ≈ 7 MeV/nucleon**, M. Gull, K. Kumar, S. Ali, T. Ahmad, S. Dutt, I. A. Rizvi, A. Agarwal and R. Kumar, *Phys. Rev. C* **98**, 034603 (2018).
14. **Systematic study of ${}^{192,202,206,210}\text{Po}$ compound nuclei using neutron multiplicity as a probe**, R. Mahajan, B. R. Behera, M. Thakur, G. Kaur, P. Sharma, K. Kapoor, A. Kumar, P. Sugathan, A. Jhingan, A. Chatterjee, N. Saneesh, A. Yadav, R. Dubey, N. Kumar, H. Singh, A. Saxena and S. Pal, *Phys. Rev. C* **98**, 034601 (2018).
15. **Mass distributions of fission fragments from nuclei populated by multi nucleon transfer or incomplete fusion channels in ${}^6\text{Li}+{}^{238}\text{U}$ reactions**, A. Pal, S. Santra, D. Chattopadhyay, A. Kundu, A. Jhingan, P. Sugathan, N. Saneesh, M. Kumar, N. L. Singh, A. Yadav, C. Yadav, R. Dubey, K. Kapoor, K. Rani, H. Arora, A. C. Visakh, D. Kaur, B. K. Nayak, A. Saxena, S. Kailas and K. H. Schmidt, *Phys. Rev. C* **98**, 031601 (2018).
16. **Measurement of mass-gated neutron multiplicity for the ${}^{48}\text{Ti}+{}^{208}\text{Pb}$ reaction at 57.4 MeV excitation energy**, M. Thakur, B. R. Behera, R. Mahajan, G. Kaur, P. Sharma, K. Kapoor, K. Rani, P. Sugathan, A. Jhingan, N. Saneesh, R. Dubey, A. Yadav, A. Chatterjee, M. B. Chatterjee, N. Kumar, S. Mandal, S. K. Duggi, A. Saxena, S. Kailas and S. Pal, *Phys. Rev. C* **98**, 014606 (2018).
17. **Coexistence of principal and tilted axis rotation in ${}^{110}\text{Ag}$** , B. Das, P. Datta, S. Chattopadhyay, S. Roy, R. Raut, R. K. Bhowmik, A. Goswami, H. C. Jain, R. Kumar, S. Muralithar, D. Negi, S. Pal, R. Palit and R. P. Singh, *Phys. Rev. C* **98**, 014326 (2018).
18. **Effects of projectile break-up on fusion cross sections at energies near and above the Coulomb barrier: A case of incomplete fusion**, M. Shuaib, V. R. Sharma, A. Yadav, M. K. Sharma, P. P. Singh, D. P. Singh, R. Kumar, R. P. Singh, S. Muralithar, B. P. Singh and R. Prasad, *Phys. Rev. C* **98**, 014605 (2018).
19. **Measurement of excitation functions of evaporation residues in the ${}^{16}\text{O}+{}^{124}\text{Sn}$ reaction and investigation of the dependence of incomplete fusion dynamics on entrance channel parameters**, D. Singh, S. B. Linda, P. K. Giri, A. Mahato, R. Tripathi, H. Kumar, S. A. Tali, S. Parashari, A. Ali, Ra. Dubey, M. Afzal Ansari, R. Kumar, S. Muralithar and R. P. Singh, *Phys. Rev. C* **97**, 064610 (2018).
20. **Role of input angular momentum and target deformation on the incomplete-fusion dynamics in the ${}^{16}\text{O}+{}^{154}\text{Sm}$ system at E_{Lab} = 6.1 MeV/nucleon**, D. Singh, S. B. Linda, P. K. Giri, A. Mahato, R. Tripathi, H. Kumar, M. Afzal Ansari, N. P. M. Sathik, R. Ali, R. Kumar, S. Muralithar and R. P. Singh, *Phys. Rev. C* **97**, 064604 (2018).

21. **Rotational band on a three-quasineutron isomer in ^{127}Xe** , S. Chakraborty, H. P. Sharma, S. S. Tiwary, C. Majumder, P. Banerjee, S. Ganguly, S. Rai, Pragati, S. Modi, P. Arumugam, Mayank, S. Kumar, R. Palit, A. Kumar, S. S. Bhattacharjee, R. P. Singh and S. Muralithar, *Phys. Rev. C* **97**, 054311 (2018); Erratum *Phys. Rev. C* **98**, 059902 (2018).
22. **Parity doublet structures in doubly-odd ^{216}Fr** , Pragati, A. Y. Deo, S. K. Tandel, S. S. Bhattacharjee, S. Chakraborty, S. Rai, S. G. Wahid, S. Kumar, S. Muralithar, R. P. Singh, I. Bala, R. Garg and A. K. Jain, *Phys. Rev. C* **97**, 044309 (2018).
23. **Investigation of fusion hindrance in a soft asymmetric system deep below the barrier**, M. M. Shaikh, S. Nath, J. Gehlot, T. Banerjee, I. Mukul, R. Dubey, A. Shamlath, P. V. Laveen, M. Shareef, A. Jhingan, N. Madhavan, T. Rajbongshi, P. Jisha, G. N. Jyothi, A. Tejaswi, R. N. Sahoo, A. Rani, *J. Phys. G: Nucl. Part. Phys.* **45**, 095103 (2018).
24. **High spin states in ^{63}Cu** , S. Rai, B. Mukherjee, U. S. Ghosh, A. Biswas, A. Chakraborty, A. K. Mondal, S. Chakraborty, G. Mukherjee, I. Bala and R. P. Singh, *Eur. Phys. J. A* **54**, 84 (2018).

B. MATERIALS SCIENCE

1. **100keV H^+ ion irradiation of as-deposited Al-doped ZnO thin films: An interest in tailoring surface morphology for sensor applications**, S. K. Sahoo, S. Mangal, D. K. Mishra, U. P. Singh, and P. Kumar, *Surf. Interface Anal.* **50**, 705 (2018).
2. **500 keV Ar^{2+} ion irradiation induced anatase to brookite phase transformation and ferromagnetism at room temperature in TiO_2 thin films**, B. Bharati, N. C. Mishra, D. Kanjilal, and C. Rath, *Appl. Surf. Sci.* **428**, 723 (2018).
3. **A facile strategy to synthesize a novel and green nanocomposite based on gum Salai guggal - Investigation of antimicrobial activity**, A. K. Sharma, B. S. Kaith, B. Gupta, U. Shanker, and S. P. Lochab, *Mater. Chem. Phys.* **219**, 129 (2018).
4. **An insight to origin of ferromagnetism in ZnO and N implanted ZnO thin films: Experimental and DFT approach**, P. Kumar, H. K. Malik, A. Ghosh, R. Thangavel, and K. Asokan, *J. Alloy. Compd.* **768**, 323 (2018).
5. **Anisotropic super-paramagnetism in cobalt implanted rutile- TiO_2 single crystals**, S. R. Joshi, B. Padmanabhan, A. Chanda, N. Shukla, V. K. Malik, D. Kanjila, and S. Varma, *J. Magn. Magn. Mater.* **465**, 122 (2018).
6. **Annealing of deep level defects in GaAs nanostructures by ion beam irradiation**, O. Mangla, S. Roy, S. Annapoorani, and K. Asokan, *Mater. Lett.* **217**, 231 (2018).
7. **Antifungal efficacy of Au@ carbon dots nanoconjugates against opportunistic fungal pathogen, Candida albicans**, E. Priyadarshini, K. Rawat, T. Prasad, and H. B. Bohidar, *Colloid Surf. B-Biointerfaces* **163**, 355 (2018).
8. **Antimicrobial and biocompatibility of highly fluorescent ZnSe core and ZnSe@ZnS core-shell quantum dots**, I. A. Mir, H. Alam, E. Priyadarshini, R. Meena, K. Rawat, P. Rajamani, M. S. Rizvi, and H. B. Bohidar, *J. Nanopart. Res.* **20**, 11, 174 (2018).
9. **Bandgap Tunable AgInS based Quantum Dots for High Contrast Cell Imaging with Enhanced Photodynamic and Antifungal Applications**, I. A. Mir, V. S. Radhakrishanan, K. Rawat, T. Prasad, and H. B. Bohidar, *Sci Rep* **8**, 12, 9322 (2018).
10. **$\text{BaSO}_4:\text{Eu}$ as an energy independent thermoluminescent radiation dosimeter for gamma rays and C^{6+} ion beam**, K. Sharma, S. Bahl, B. Singh, P. Kumar, S. P. Lochab, and A. Pandey, *Radiat. Phys. Chem.* **145**, 64 (2018).
11. **Broadband strip-line ferromagnetic resonance spectroscopy of soft magnetic CoFeTaZr patterned thin films**, S. Gupta, D. Kumar, T. L. Jin, R. Nongjai, K. Asokan, A. Ghosh, M. Aparnadevi, P. Suri, and S. N. Piramanayagam, *AIP Adv.* **8**, 6, 056125 (2018).
12. **Carbon doping controlled thermoluminescent defect centers in nanoporous alumina for ion beam dosimetry**, S. Bhowmick, S. Pal, D. Das, V. K. Singh, S. A. Khan, R. Hubner, S. R. Barman, D. Kanjilal, and A. Kanjila, *J. Appl. Phys.* **124**, 6, 134902 (2018).
13. **Clustered vacancies in ZnO: chemical aspects and consequences on physical properties**, S. Pal, N. Gogurla, A. Das, S. S. Singha, P. Kumar, D. Kanjilal, A. Singha, S. Chattopadhyay, D. Jana, and A. Sarkar, *J. Phys. D-Appl. Phys.* **51**, 12, 105107 (2018).
14. **Combined effect of oxygen annealing and La-doping in broadening the phase transition of $\text{Ba}(\text{Zr}_{0.2}\text{Ti}_{0.8})\text{O}_3$ ceramics**, R. Kumar, K. Asokan, S. Patnaik, and B. Birajdar, *J. Alloy. Compd.* **737**, 561 (2018).

15. **Comparative studies on thermoluminescence glow curves of calcium oxide nanophosphor irradiated with various ionizing radiations**, K. R. Nagabhushana, D. Prakash, F. Singh, S. H. Tatumi, R. R. Rocca, and S. Watanabe, *J. Alloy. Compd.* **735**, 1949 (2018).
16. **Conductivity and dielectric studies of Li³⁺-irradiated PVP-based polymer electrolytes**, D. Singh, D. Kanjilal, G. V. S. Laxmi, P. K. Singh, S. K. Tomar, and B. Bhattacharya, *High Perform. Polym.* **30**, 978 (2018).
17. **Controlling room temperature ferromagnetism and band gap in ZnO nanostructured thin films by varying angle of implantation**, R. V. Hariwal, H. K. Malik, A. Negi, and A. Kandasami, *RSC Adv.* **8**, 6278 (2018).
18. **Correlated PL, TL and EPR study in gamma-rays and C⁶⁺ ion beam irradiated CaMg₂(SO₄)₃:Dy³⁺ triple sulphate phosphor**, S. Tamboli, R. M. Kadam, B. Rajeswari, B. Singh, and S. J. Dhoble, *J. Lumines.* **203**, 267 (2018).
19. **Design optimisation of C ion implantation of alpha-Al₂O₃ for medical dosimetry**, M. Agarwal, S. K. Garg, K. Asokan, S. Thulkar, S. Chander, M. K. Dalai, and P. Kumar, *Mater. Des.* **153**, 317 (2018).
20. **Design, development, and testing of a thermopower measurement system by studying the electron transport properties on indium and nitrogen co-doped sputtered ZnO films**, S. K. Kedia, A. Singh, and S. Chaudhary, *Measurement* **117**, 49 (2018).
21. **Detailed optical analysis of 100 MeV Ni⁷⁺ ion irradiated WO₃ thin films using Surface Plasmon Resonance**, S. Sharma, A. Paliwal, M. Tomar, F. Singh, N. K. Puri, and V. Gupta, *Radiat. Phys. Chem.* **153**, 51 (2018).
22. **Dewetting induced Au-Ge composite nanodot evolution in SiO₂**, D. P. Datta, A. Chettah, V. Siva, D. Kanjilal, and P. K. Sahoo, *Appl. Surf. Sci.* **428**, 676 (2018).
23. **Dimethylglyoxime modified swift heavy oxygen ions irradiated polyaniline/single walled carbon nanotubes composite electrode for detection of cobalt ions**, H. K. Patil, M. A. Deshmukh, G. A. Bodkhe, S. M. Shirsat, K. Asokan, and M. D. Shirsat, *Mater. Res. Express* **5**, 8, 065048 (2018).
24. **Dosimetric properties of ZrO₂ and ZrO₂:Sm³⁺ exposed to beta rays**, H. S. Lokesha, N. Chauhan, K. R. Nagabhushana, and F. Singh, *Ceram. Int.* **44**, 18871 (2018).
25. **Effect of 120 MeV Au⁹⁺ ion irradiation on the structure and surface morphology of ZnO/NiO heterojunction**, P. K. Das, R. Biswal, R. J. Choudhary, V. Sathe, V. Ganesan, S. A. Khan, N. C. Mishra, and P. Mallick, *Surf. Interface Anal.* **50**, 954 (2018).
26. **Effect of carbon ion-beam irradiation on graphene oxide film**, C. Tyagi, S. A. Khan, S. Ojha, D. K. Avasthi, and A. Tripathi, *Vacuum* **154**, 259 (2018).
27. **Effect of gamma irradiation on AlInGaN/AlN/GaN heterostructures grown by MOCVD**, S. Pradeep, R. Loganathan, S. Surender, K. Prabakaran, K. Asokan, and K. Baskar, *Superlattices Microstruct.* **120**, 40 (2018).
28. **Effect of low energy (keV) ion irradiation on structural, optical and morphological properties of SnO₂-TiO₂ nanocomposite thin films**, V. Kumar, M. K. Jaiswal, R. Gupta, J. Ram, I. Sulania, S. Ojha, X. Sun, N. Koratkar, and R. Kumar, *J. Mater. Sci.-Mater. Electron.* **29**, 13328 (2018).
29. **Effect of nitridation temperature on formation and properties of GaN nanowall networks on sapphire (0001) grown by laser MBE**, C. Ramesh, P. Tyagi, B. S. Yadav, S. Ojha, K. K. Maurya, M. S. Kumar, and S. S. Kushvaha, *Mater. Sci. Eng. B-Adv. Funct. Solid-State Mater.* **231**, 105 (2018).
30. **Effects of gamma-ray irradiation on the optical properties of amorphous Se_{100-x}Hg_x thin films**, S. Ahmad, S. Islam, M. Nasir, K. Asokan, and M. Zulfeqar, *J. Phys. Chem. Solids* **117**, 122 (2018).
31. **Effects of high-energy ion-beam irradiation on structural and optical properties of (Mg_{0.95}Co_{0.05}) TiO₃ thin films**, T. S. Kumar, A. Vinod, M. S. Rathore, A. P. Pathak, F. Singh, D. Pamu, and N. S. Rao, *Radiat. Eff. Defects Solids* **173**, 128 (2018).
32. **Electrical relaxation and conduction mechanisms in iron doped barium strontium titanate**, A. Kaur, L. Singh, and K. Asokan, *Ceram. Int.* **44**, 3751 (2018).
33. **Electronic excitation induced defect dynamics in HfO₂ based MOS devices investigated by in-situ electrical measurements**, N. Manikantababu, S. Vajandar, N. Arun, A. P. Pathak, K. Asokan, T. Osipowicz, T. Basu, and S. Rao, *Appl. Phys. Lett.* **112**, 5, 131601 (2018).
34. **Electronic excitation induced modifications in the ferroelectric polarization of BiFeO₃ thin films**, A. Ravalia, B. Kataria, S. Katba, S. Jethva, M. Vagadia, K. Asokan, S. Gautam, K. H. Chae, and D. G. Kuberkar, *Vacuum* **155**, 572 (2018).
35. **Electronic structure of Cr doped Fe₃O₄ thin films by X-ray absorption near-edge structure spectroscopy**, C. L. Chen, C. L. Dong, K. Asokan, G. Chern, and C. L. Chang, *Solid State Commun.* **272**, 48 (2018).

36. **Electronic structure of $\text{Ln}_2\text{O}_2\text{Te}$ ($\text{Ln} = \text{La}, \text{Sm}$ and Gd) by X-ray absorption spectroscopy**, S. Gautam, K. H. Chae, J. Llanos, O. Pena, and K. Asokan, *Vacuum* **158**, 39 (2018).
37. **Energetic ion-induced modification of embedded Au nanoparticles size: a three-dimensional kinetic lattice Monte Carlo study**, S. A. Khan, D. K. Avasthi, and S. Hooda, *Appl. Phys. A-Mater. Sci. Process.* **124**, 9, 351 (2018).
38. **Engineering bright fluorescent nitrogen-vacancy (NV) nano-diamonds: Role of low-energy ion-irradiation parameters**, R. Kumar, P. Pandit, P. Pal, S. R. Dhakate, R. P. Pant, R. Kumar, D. K. Avasthi, and D. K. Singh, *AIP Adv.* **8**, 18, 085023 (2018).
39. **Engineering of electronic properties of single layer graphene by swift heavy ion irradiation**, S. Kumar, A. Kumar, A. Tripathi, C. Tyagi, and D. K. Avasthi, *J. Appl. Phys.* **123**, 7, 161533 (2018).
40. **Enhanced electrical conductivity in Xe ion irradiated CNT based transparent conducting electrode on PET substrate**, Surbhi, V. Sharma, S. Singh, P. Garg, K. Asokan, and K. Sachdev, *Mater. Res. Express* **5**, 10, 025037 (2018).
41. **Enhanced magnetic behaviour and cell proliferation of gamma irradiated dual metal ions co-doped hydroxyapatite - poly(methyl methacrylate) composite films**, J. R. Ramya, K. T. Arul, P. Sathiamurthi, K. Asokan, N. R. Singh, and S. N. Kalkura, *React. Funct. Polym.* **123**, 34 (2018).
42. **Enhanced visible light photodegradation activity of RhB/MB from aqueous solution using nanosized novel Fe-Cd co-modified ZnO**, D. Neena, K. K. Kondamareddy, H. Bin, D. Z. Lu, P. Kumar, R. K. Dwivedi, V. O. Pelenovich, X. Z. Zhao, W. Gao, and D. J. Fu, *Sci Rep* **8**, 12, 10691 (2018).
43. **Enhancement of magnetostrictive properties of Galfenol thin films**, L. R. Nivedita, P. Manivel, R. Pandian, S. Murugesan, N. A. Morley, K. Asokan, and R. T. R. Kumar, *J. Magn. Magn. Mater.* **451**, 300 (2018).
44. **Enhancement of third-order nonlinear optical properties of HMTA stabilized pure and doped ZnS nanoparticles and their electronic structures**, K. V. Anand, G. Vinitha, S. Gautam, K. H. Chae, R. Mohan, K. Asokan, T. R. Ravindran, and R. Jayavel, *J. Nonlinear Opt. Phys. Mater.* **27**, 15, 1850016 (2018).
45. **Evidence of Ion-Beam-Induced Annealing in Graphene Oxide Films Using in Situ X-Ray Diffraction and Spectroscopy Techniques**, C. Tyagi, S. A. Khan, I. Sulania, R. Meena, D. K. Avasthi, and A. Tripathi, *J. Phys. Chem. C* **122**, 9632 (2018).
46. **Evolution of Visible Photocatalytic Properties of Cu-Doped CeO_2 Nanoparticles: Role of Cu^{2+} -Mediated Oxygen Vacancies and the Mixed-Valence States of Ce Ions**, K. S. Ranjith, C. L. Dong, Y. R. Lu, Y. C. Huang, C. L. Chen, P. Saravanan, K. Asokan, and R. T. R. Kumar, *ACS Sustain. Chem. Eng.* **6**, 8536 (2018).
47. **Formation of Anisotropic Nanostructures on Rutile $\text{TiO}_2(110)$ Surfaces and Their Photo-Absorption Properties**, V. Solanki, S. R. Joshi, I. Mishra, D. Kanjilal, and S. Varma, *Metall. Mater. Trans. A-Phys. Metall. Mater. Sci.* **49A**, 3117 (2018).
48. **Formation of graphitic and diamond-like carbon by low energy carbon ion implantation on c plane sapphire substrate**, S. Pradeep, S. Surender, K. Prabakaran, M. Jayasakthi, S. Singh, K. Asokan, and K. Baskar, *Thin Solid Films* **649**, 12 (2018).
49. **Gold -graphene oxide nanocomposites for enzyme-less glucose monitoring**, C. Tyagi, G. Lakshmi, V. Jaiswal, D. K. Avasthi, and A. Tripathi, *Biomed. Phys. Eng. Express* **4**, 11, Unsp 065002 (2018).
50. **Grain fragmentation and phase transformations in hafnium oxide induced by swift heavy ion irradiation**, M. Dhanunjaya, D. K. Avasthi, A. P. Pathak, S. A. Khan, and S. Rao, *Appl. Phys. A-Mater. Sci. Process.* **124**, 10, 587 (2018).
51. **High spin state driven magnetism and thermoelectricity in Mn doped topological insulator Bi_2Se_3** , V. K. Maurya, C. L. Dong, C. L. Chen, K. Asokan, and S. Patnaik, *J. Magn. Magn. Mater.* **456**, 1 (2018).
52. **Highly selective and reversible NO_2 gas sensor using vertically aligned MoS₂ flake networks**, R. Kumar, P. K. Kulriya, M. Mishra, F. Singh, G. Gupta, and M. Kumar, *Nanotechnology* **29**, 9, 464001 (2018).
53. **Hydrogen loss and its improved retention in hydrogen plasma treated a-SiN_x:H films: ERDA study with 100 MeV Ag^{7+} ions**, R. K. Bommali, S. Ghosh, S. A. Khan, and P. Srivastava, *Nucl. Instrum. Methods Phys. Res. Sect. B-Beam Interact. Mater. Atoms* **423**, 16 (2018).
54. **Identification of swift heavy ion induced defects in Pt/n-GaN Schottky diodes by in-situ deep level transient spectroscopy**, A. Kumar, J. Dhillion, S. Verma, P. Kumar, K. Asokan, and D. Kanjilal, *Semicond. Sci. Technol.* **33**, 6, 085008 (2018).

55. **Imidazolium based ionic liquid induced DNA gelation at remarkably low concentration**, P. K. Pandey, K. Rawat, V. K. Aswal, J. Kohlbrecher, and H. B. Bohidar, *Colloid Surf. A-Physicochem. Eng. Asp.* **538**, 184 (2018).
56. **Impact of substrate bias and dielectrics on the performance parameters of symmetric lateral bipolar transistor on SiGe-OI for mixed signal applications**, L. B. Devi, K. Singh, and A. Srivastava, *Microelectron. J.* **81**, 28 (2018).
57. **Impedance spectroscopic study on microwave sintered (1-x) Na_{0.5}Bi_{0.5}TiO_{3-x}BaTiO₃ ceramics**, H. S. Mohanty, A. Kumar, B. Sahoo, P. K. Kurliya, and D. K. Pradhan, *J. Mater. Sci.-Mater. Electron.* **29**, 6966 (2018).
58. **Improved deep ultraviolet light photosensitivity of nanocomposite ZnO-Ag films deposited with substrate heating**, V. V. S. Kumar, *Mater. Res. Express* **5**, 10, 096203 (2018).
59. **Improvement in crystallinity of ZnO and Zn₂SiO₄ phases by rf sputter deposition; effect of substrate bias**, V. V. S. Kumar and M. K. Sharma, *Vacuum* **157**, 72 (2018).
60. **Influence of 100 keV Ar⁺ implantation on electrical and optical properties of TiO₂/Ag/TiO₂ multilayer films**, S. Singh, V. Sharma, D. Saini, S. Shekhawat, K. Asokan, and K. Sachdev, *Mater. Sci. Semicond. Process* **75**, 18 (2018).
61. **Influence of deposition rate on the structural, optical and electrical properties of electron beam evaporated SnO₂ thin films for transparent conducting electrode applications**, N. Kumar, B. Joshi, and K. Asokan, *J. Semicond.* **39**, 7, 083002 (2018).
62. **Influence of post-deposition annealing on structural, optical and transport properties of nanocomposite ZnO-Ag thin films**, V. V. S. Kumar and D. Kanjilal, *Mater. Sci. Semicond. Process* **81**, 22 (2018).
63. **Influence of thermal annealing and radiation enhanced diffusion processes on surface plasmon resonance of gold implanted dielectric matrices**, K. D. Devi, S. Ojha, and F. Singh, *Radiat. Phys. Chem.* **144**, 141 (2018).
64. **In-situ transport and microstructural evolution in GaN Schottky diodes and epilayers exposed to swift heavy ion irradiation**, A. Kumar, R. Singh, P. Kumar, U. B. Singh, K. Asokan, P. A. Karaseov, A. I. Titov, and D. Kanjilal, *J. Appl. Phys.* **123**, 6, 161539 (2018).
65. **Interface and transport properties of gamma irradiated Au/n-GaP Schottky diode**, N. Shiwakoti, A. Bobby, K. Asokan, and B. Antony, *Mater. Sci. Semicond. Process* **74**, 1 (2018).
66. **Investigation of C-60 and C-70 fullerenes under low energy ion impact**, R. Singhal, J. Bhardwaj, R. Vishnoi, A. Sharma, G. D. Sharma, and D. Kanjilal, *J. Mater. Sci.-Mater. Electron.* **29**, 14762 (2018).
67. **Investigation of graphene oxide-hydrogen interaction using in-situ X-ray diffraction studies**, C. Tyagi, P. K. Kurliya, S. Ojha, D. K. Avasthi, and A. Tripathi, *Int. J. Hydrog. Energy* **43**, 13339 (2018).
68. **Investigation of ionic conduction in PEO-PVDF based blend polymer electrolytes**, S. K. Patla, R. Ray, K. Asokan, and S. Karmakar, *J. Appl. Phys.* **123**, 11, 125102 (2018).
69. **In-vitro dosimetry of radioactive patches incorporating Rhenium-188 for local radionuclide therapy**, P. Gupta, S. P. Lochab, G. P. Bandopadhyaya, and C. S. Bal, *Eur. J. Nucl. Med. Mol. Imaging* **45**, S245 (2018).
70. **Ion beam assisted fortification of photoconduction and photosensitivity**, P. Kumar, N. Saxena, F. Singh, and V. Gupta, *Sens. Actuator A-Phys.* **279**, 343 (2018).
71. **Ion-beam-induced ferromagnetism in Ca-doped LaMnO₃ thin films grown on Si (100)**, K. Sultan, S. A. ul Islam, Z. Habib, M. Ikram, and K. Asokan, *Radiat. Eff. Defects Solids* **173**, 184 (2018).
72. **Low energy nitrogen ion beam implanted tungsten trioxide thin films modified indium tin oxide electrode based acetylcholine sensor**, A. C. Anithaa, K. Asokan, and C. Sekar, *J. Taiwan Inst. Chem. Eng.* **84**, 11 (2018).
73. **Magnetic and electronic structures of Co ion implanted CeO₂ thin films**, P. Kumar, B. Ahmad, F. Chand, and K. Asokan, *Appl. Surf. Sci.* **452**, 217 (2018).
74. **Magneto-dielectric studies on multiferroic composites of Pr doped CoFe₂O₄ and Yb doped PbZrTiO₃**, R. Samad, M. U. D. Rather, K. Asokan, and B. Want, *J. Alloy. Compd.* **744**, 453 (2018).
75. **Material engineering to fabricate rare earth erbium thin films for exploring nuclear energy sources**, A. Banerjee, S. R. Abhilash, G. R. Umopathy, D. Kabiraj, S. Ojha, and S. Mandal, *Nucl. Instrum. Methods Phys. Res. Sect. A-Accel. Spectrom. Dect. Assoc. Equip.* **887**, 34 (2018).
76. **Mechanistic insights into the interaction between energetic oxygen ions and nanosized ZnFe₂O₄: XAS-XMCD investigations**, J. P. Singh, B. Kaur, A. Sharma, S. H. Kim, S. Gautam, R. C. Srivastava, N. Goyal, W. C. Lim, H. J. Lin, J. M. Chen, K. Asokan, D. Kanjilal, S. O. Won, I. J. Lee, and K. H. Chae, *Phys. Chem. Chem. Phys.* **20**, 12084 (2018).

77. **Microstructural and surface morphological studies on Co doped ZnS diluted magnetic semiconductor thin films**, S. P. Patel, J. C. Pivin, G. Maity, R. P. Yadav, R. Chandra, D. Kanjilal, and L. Kumar, *J. Mater. Sci.-Mater. Electron.* **29**, 13541 (2018).
78. **Mixing ratio dependent complex coacervation versus bicontinuous gelation of pectin with in situ formed zein nanoparticles**, P. Kaushik, K. Rawat, V. K. Aswal, J. Kohlbrecher, and H. B. Bohidar, *Soft Matter* **14**, 6463 (2018).
79. **Modelling of Pinning-Depinning Reversal Mechanism in Ion-Irradiated Co/Al₂O₃ Thin Films**, R. Goyal, R. Gupta, A. Negi, K. Asokan, D. Kanjilal, S. Lamba, and S. Annapoorni, *Phys. Status Solidi A-Appl. Mat.* **215**, 8, 1800141 (2018).
80. **Modification in the transport and morphological properties of solid polymer electrolyte system by low-energy ion irradiation**, H. Manjunatha, R. Damle, K. Pravin, and G. N. Kumaraswamy, *Ionics* **24**, 3027 (2018).
81. **Modification of Structural and Magnetic Properties of Masked Co-Pt Films Induced by High-Energy Ion Implantation**, D. Kumar, S. Gupta, T. L. Jin, R. Nongjai, K. Asokan, and S. N. Piramanayagam, *IEEE Magn. Lett.* **9**, 5, 4500305 (2018).
82. **Modifications in structural, optical and electrical properties of epitaxial graphene on SiC due to 100 MeV silver ion irradiation**, P. D. Kaushik, A. Aziz, A. M. Siddiqui, G. Greczynski, M. J. Jafari, G. Lakshmi, D. K. Avasthi, M. Syvajarvi, and G. R. Yazdi, *Mater. Sci. Semicond. Process* **74**, 122 (2018).
83. **Morphological investigations on the growth of defect-rich Bi₂Te₃ nanorods and their thermoelectric properties**, M. Sinduja, S. Amirthapandian, P. Jegadeesan, P. Magudapathy, and K. Asokan, *Crystengcomm* **20**, 4810 (2018).
84. **Multifunctional hybrid diode: Study of photoresponse, high responsivity, and charge injection mechanisms**, J. Singh, R. G. Singh, S. K. Gautam, and F. Singh, *J. Appl. Phys.* **123**, 10, 174503 (2018).
85. **Nanocrystalline SnO₂ formation by oxygen ion implantation in tin thin films**, V. Kondkar, D. Rukade, D. Kanjilal, and V. Bhattacharyya, *Mater. Res. Express* **5**, 7, 035015 (2018).
86. **NTO/Ag/NTO multilayer transparent conducting electrodes for photovoltaic applications tuned by low energy ion implantation**, S. Singh, V. Sharma, K. Asokan, and K. Sachdev, *Sol. Energy* **173**, 651 (2018).
87. **n-ZnO/p-Si heterojunction nanodiodes based sensor for monitoring UV radiation**, P. D. Sahare, S. Kumar, S. Kumar, and F. Singh, *Sens. Actuator A-Phys.* **279**, 351 (2018).
88. **Observation of Kondo behavior in the single crystals of Mn-doped Bi₂Se₃ topological insulator**, R. R. Urkude, A. Sagdeo, R. Rawat, R. J. Choudhary, K. Asokan, S. Ojha, and U. A. Palikundwar, *AIP Adv.* **8**, 11, 045315 (2018).
89. **On the study of the C⁶⁺ ion beam and gamma-ray induced effect on structural and luminescence properties of Eu doped LiNaSO₄: explanation of TSL mechanism using PL, TL and EPR study**, K. K. Gupta, R. M. Kadam, N. S. Dhoble, S. P. Lochab, and S. J. Dhoble, *Phys. Chem. Chem. Phys.* **20**, 1540 (2018).
90. **Optical properties of Cu-C-70 nanocomposite under low energy ion irradiation**, R. Singhal, S. Gupta, R. Vishnoi, S. Aggarwal, G. D. Sharma, A. Sharma, and S. Ojha, *Mater. Res. Express* **5**, 13, 035044 (2018).
91. **Origin of magnetic properties in carbon implanted ZnO nanowires**, Y. F. Wang, Y. C. Shao, S. H. Hsieh, Y. K. Chang, P. H. Yeh, H. C. Hsueh, J. W. Chiou, H. T. Wang, S. C. Ray, H. M. Tsai, C. W. Pao, C. H. Chen, H. J. Lin, J. F. Lee, C. T. Wu, J. J. Wu, Y. M. Chang, K. Asokan, K. H. Chae, T. Ohgashi, Y. Takagi, T. Yokoyama, N. Kosugi, and W. F. Pong, *Sci Rep* **8**, 13, 7758 (2018).
92. **Oxygen mediated phase transformation in room temperature grown TiO₂ thin films with enhanced photocatalytic activity**, D. Banerjee, A. Barman, S. Deshmukh, C. P. Saini, G. Maity, S. K. Pradhan, M. Gupta, D. M. Phase, S. S. Roy, and A. Kanjilal, *Appl. Phys. Lett.* **113**, 5, 084103 (2018).
93. **Photoluminescence, thermoluminescence and defect centres in Y₂O₃ and Y₂O₃:Tb³⁺ under 100 MeV swift Ni⁸⁺ ion beam irradiation**, N. J. Shivaramu, B. N. Lakshminarasappa, F. Singh, E. Coetsee, and H. C. Swart, *Mater. Res. Bull.* **102**, 62 (2018).
94. **Photoluminescence, thermoluminescence glow curve and emission characteristics of Y₂O₃:Er³⁺ nanophosphor**, N. J. Shivaramu, B. N. Lakshminarasappa, K. R. Nagabhushana, H. C. Swart, and F. Singh, *Spectroc. Acta Pt. A-Molec. Biomolec. Spectr.* **189**, 349 (2018).
95. **Preparation and characterization of indium chalcogenide thin films: A material for phase change memory**, M. Pandian, P. Matheswaran, B. Gokul, R. Sathyamoorthy, and K. Asokan, *Appl. Surf. Sci.* **449**, 55 (2018).

96. **Probing the impact of energetic argon ions on the structural properties of ZnO:Al/TiO₂ heterostructures**, C. P. Saini, A. Barman, N. Kumar, R. Cours, S. Joulie, V. Serin, A. Claverie, A. K. Sinha, D. Kanjilal, and A. Kanjilal, *J. Appl. Phys.* **124**, 7, 155305 (2018).
97. **Radiation stability of CBD grown nanocrystalline CdS films against ion beam irradiation for solar cell applications**, N. Saxena, P. Kumar, V. Gupta, and D. Kanjilal, *J. Mater. Sci.-Mater. Electron.* **29**, 11013 (2018).
98. **Raman spectroscopic analysis on Li, N and (Li,N) implanted ZnO**, A. Mondal, S. Pal, A. Sarkar, T. S. Bhattacharya, A. Das, N. Gogurla, S. K. Ray, P. Kumar, D. Kanjilal, K. D. Devi, A. Singha, S. Chattopadhyay, and D. Jana, *Mater. Sci. Semicond. Process* **80**, 111 (2018).
99. **Raman spectroscopic study of He ion implanted 4H and 6H-SiC**, A. A. Ali, J. Kumar, V. Ramakrishnan, and K. Asokan, *Mater. Lett.* **213**, 208 (2018).
100. **Reinforcement of polyaniline and poly-(o-toluidine) with SWNTs and tuning of their physicochemical properties by heavy ion beams**, H. K. Patil, M. A. Deshmukh, G. A. Bodkhe, S. M. Shirsat, K. Asokan, and M. D. Shirsat, *Appl. Phys. A-Mater. Sci. Process.* **124**, 11, 491 (2018).
101. **Remarkable effect of halogenation of aromatic compounds on efficiency of nanowire formation through polymerization/crosslinking by high-energy single particle irradiation**, A. Horio, T. Sakurai, K. Kayama, G. Lakshmi, D. K. Avasthi, M. Sugimoto, T. Yamaki, A. Chiba, Y. Saito, and S. Seki, *Radiat. Phys. Chem.* **142**, 100 (2018).
102. **Resistive switching behavior in oxygen ion irradiated TiO_{2-x} films**, A. Barman, C. P. Saini, P. K. Sarkar, G. Bhattacharjee, G. Bhattacharya, S. Srivastava, B. Satpati, D. Kanjilal, S. K. Ghosh, S. Dhar, and A. Kanjilal, *J. Phys. D-Appl. Phys.* **51**, 7, 065306 (2018).
103. **Reversible phase transformation phenomenon in titanium dioxide films: Evidence beyond interface-nucleation and dissolution-precipitation kinetics**, S. K. Gautam, J. Singh, D. K. Shukla, E. Pippel, P. Poddar, and F. Singh, *Acta Mater.* **146**, 253 (2018).
104. **Self-Stabilized Carbon-L1(0) FePt Nanoparticles for Heated Dot Recording Media**, R. Medwal, S. Gautam, S. Gupta, K. H. Chae, K. Asokan, G. R. Deen, R. S. Rawat, R. S. Katiyar, and S. Annapoorni, *IEEE Magn. Lett.* **9**, 5, 5504105 (2018).
105. **Structural and thermoelectric properties of Se doped In₂Te₃ thin films**, P. Mannu, M. Palanisamy, G. Bangaru, S. Ramakrishnan, M. Ramcharan, and A. Kandasami, *AIP Adv.* **8**, 11, 115015 (2018).
106. **Structural phase transformation and modification of optical absorption of SHI induced nanostructured CdS films**, P. K. Mochahari, F. Singh, and K. C. Sarma, *J. Mater. Sci.-Mater. Electron.* **29**, 582 (2018).
107. **Structural response of Nd-stabilized zirconia and its composite under extreme conditions of swift heavy ion irradiation**, C. Nandi, V. Grover, P. K. Kulriya, A. K. Poswal, A. Prakash, K. B. Khan, D. K. Avasthi, and A. K. Tyagi, *J. Nucl. Mater.* **499**, 216 (2018).
108. **Structural, dielectric and ferroelectric properties of rare earth substituted lead zirconate titanate**, R. Samad, M. U. D. Rather, K. Asokan, and B. Want, *J. Mater. Sci.-Mater. Electron.* **29**, 4226 (2018).
109. **Structural, electrical and magnetic properties of multiferroic BiFeO₃-SrTiO₃ composites**, T. Murtaza, J. Ali, M. S. Khan, and K. Asokan, *J. Mater. Sci.-Mater. Electron.* **29**, 2110 (2018).
110. **Structural, electrical and magnetic properties of multiferroic NdFeO₃-SrTiO₃ composites**, T. Murtaza, M. S. Khan, J. Ali, T. Hussain, and K. Asokan, *J. Mater. Sci.-Mater. Electron.* **29**, 18573 (2018).
111. **Structural, optical and electrical properties of In₂(Te_{1-x}Se_x)₃ thin films**, M. Pandian, P. Matheswaran, B. Gokul, R. Sathyamoorthy, and K. Asokan, *Vacuum* **147**, 107 (2018).
112. **Structural, optical and photoelectrical properties of thermally annealed amorphous In₁₅Sb₁₅Se₇₀ chalcogenide films**, S. Sharma, R. Sharma, P. Kumar, R. Thangaraj, K. Asokan, and M. Mian, *Appl. Phys. A-Mater. Sci. Process.* **124**, 9, 357 (2018).
113. **Surface structuring in polypropylene using Ar⁺ beam sputtering: Pattern transition from ripples to dot nanostructures**, M. Goyal, S. Aggarwal, A. Sharma, and S. Ojha, *Appl. Surf. Sci.* **439**, 380 (2018).
114. **Synthesis of OSL nanophosphor Li₃B₇O₁₂:Mn and its dosimetric properties**, M. Agarwal, K. Asokan, S. K. Garg, E. Dhamija, and P. Kumar, *J. Radiol. Prot.* **38**, 1311 (2018).
115. **Tailoring optical properties of TiO₂-Cr co-sputtered films using swift heavy ions**, R. Gupta, S. Sen, D. M. Phase, D. K. Avasthi, and A. Gupta, *Appl. Surf. Sci.* **440**, 403 (2018).
116. **Tailoring the structural and magnetic properties of masked CoPt thin films using ion implantation**, D. Kumar, S. Gupta, T. Jin, R. Nongjai, K. Asokan, and S. N. Piramanayagam, *AIP Adv.* **8**, 5, 056504 (2018).
117. **Temperature-dependent OSL properties of nano-phosphors LiAlO₂:C and alpha-Al₂O₃:C**, M. Agarwal, S. K. Garg, K. Asokan, and P. Kumar, *Appl. Surf. Sci.* **444**, 819 (2018).

118. **The Effect of Low Energy Nitrogen Ion Implantation on Graphene Nanosheets**, M. Mishra, S. Alwarappan, D. Kanjilal, and T. Mohanty, *Electron. Mater. Lett.* **14**, 488 (2018).
119. **The effect of Ti⁺ ion implantation on the anatase-rutile phase transformation and resistive switching properties of TiO₂ thin films**, A. Manna, A. Barman, S. R. Joshi, B. Satpati, P. Dash, A. Chattaraj, S. K. Srivastava, P. K. Sahoo, A. Kanjilal, D. Kanjilal, and S. Varma, *J. Appl. Phys.* **124**, 10, 155303 (2018).
120. **The effects of high-energy ion irradiations on the I-V characteristics of silicon NPN transistors**, A. P. G. Prakash, M. N. Bharathi, V. N. Hegde, T. M. Pradeep, N. Pushpa, and A. Tripathi, *Radiat. Eff. Defects Solids* **173**, 683 (2018).
121. **Thermal annealing and transient electronic excitations induced interfacial and magnetic effects on Pt/Co/Pt trilayer**, N. Sehdev, R. Medwal, R. Malik, A. Kandasami, D. Kanjilal, and S. Annapoorani, *Nucl. Instrum. Methods Phys. Res. Sect. B-Beam Interact. Mater. Atoms* **420**, 50 (2018).
122. **Thermoluminescence properties of 100MeV Si⁷⁺ ion-irradiated Al₂O₃**, S. S. Reddy, K. R. Nagabhushana, and F. Singh, *Radiat. Eff. Defects Solids* **173**, 504 (2018).
123. **Three-dimensional hybrid silicon nanostructures for surface enhanced Raman spectroscopy based molecular detection**, V. S. Vendamani, S. Rao, S. V. Rao, D. Kanjilal, and A. P. Pathak, *J. Appl. Phys.* **123**, 8, 014301 (2018).
124. **TL/OSL properties of beta irradiated Al₂O₃:Tm³⁺ phosphor synthesized by microwave combustion method**, S. S. Reddy, N. Chauhan, K. R. Nagabhushana, and F. Singh, *Mater. Res. Bull.* **104**, 236 (2018).
125. **Topographic evolution and scaling study of ZnO (0001) single crystal after, low-energy atom beam irradiation**, V. Solanki, D. Kabiraj, D. K. Avasthi, and S. Varma, *Nucl. Instrum. Methods Phys. Res. Sect. B-Beam Interact. Mater. Atoms* **434**, 56 (2018).
126. **Universal Validity of Einstein Relation and Size-Dependent Viscosity and Surface-Active Characteristics of Nanofluids**, A. Sukumaran, K. Das, K. Rawat, and H. B. Bohidar, *Int. J. Nanosci.* **17**, 7, 1850006 (2018).
127. **Zener diode behavior of nitrogen-doped graphene quantum dots**, J. Nag, K. Rawat, K. Asokan, D. Kanjilal, and H. B. Bohidar, *Physica E* **104**, 36 (2018).

C. OTHERS

1. **Radio frequency planar coil based on-chip probe for portable nuclear magnetic resonance**, Manish Gupta, C. P. Safvan, Kundan Singh, D. K. Lobiyal, Preeti Yadav and Shailja Singh, *IEEE Sensors Journal* **19**, 2500 (2019).
2. **Power-law decay of doubly ionized ethylene**, K. Takahashi, K. Yokokawa, A. Mizumura, J. Matsumoto, H. Shiromaru, H. Kumar, P. Bhatt and C. P. Safvan, *Phys. Rev. A* **98**, 062708 (2018).
3. **Plasmon excitation and subsequent isomerization dynamics in naphthalene and azulene under fast proton interaction**, M. V. Vinitha, P. K. Najeeb, A. Kala, P. Bhatt, C. P. Safvan, S. Vig and U. Kadhane, *J. Chem. Phys.* **149**, 194303 (2018).
4. **Experimental investigations of plasma instabilities by Fourier analysis in an Electron cyclotron resonance ion source**, Sarvesh Kumar, Jyotsna Sharma, Prashant Sharma, Shatendra Sharma, Yaduvansh Mathur, Devendra Sharma and Manish K. Kashyap, *Phys. Rev. Accel. Beams* **21**, 093402 (2018).
5. **Anisotropy in multiple ionisation of CO by ion collisions at intermediate interaction strengths**, Deepak Sharma, Bhas Bapat, Pragya Bhatt and C. P. Safvan, *J. Phys. B: At. Mol. Opt. Phys.* **51**, 195202 (2018).
6. **Multiparticle time-domain analysis of coherent undulator radiation**, Vipul Joshi and Subhendu Ghosh, *Phys. Rev. Accel. Beams* **22**, 020702 (2019).
7. **Theoretical and simulation study of ‘Comb’ electron beam and THz generation**, V. Joshi, U. Lehnert, J. Karmakar, N. Kumar, B. Karmakar, S. Tripathi, A. Aryshev, S. Ghosh, J. Urakawa, R. K. Bhandari and D. Kanjilal, *Nucl. Instrum. Methods A* **913**, 28 (2019).
8. **Disentangling the bulk and exit surface contribution on projectile-charge-state evolution**, Prashant Sharma and Tapan Nandi, *Phys. Rev. Accel. Beams* **22**, 034501 (2019).
9. **Present status of theoretical understanding of charge changing processes at low beam energies**, Deepak Swami and T. Nandi, *Radiation Physics and Chemistry* **153**, 120 (2018).

6.8 LIST OF SEMINARS CONDUCTED IN THE YEAR 2018-19

S.No.	Date	Title	Name & Affiliation
1.	29/05/2018	Production & Applications of Radioisotopes at RIKEN RI Beam Factory	Prof. Hiromitsu Haba, Nishina Centre for Accelerator-Based Science. RIKEN, Wako, Saitama 351-0198, Japan
2.	06-06-2018	Accelerators for Science and Society	Dr. S. Kailas, Bhabha Atomic Research Centre & UM-DAE Centre for Excellence in Basic Sciences, Mumbai
3.	11-07-2018	Superconducting MRI Project	Dr. Soumen Kar, IUAC, N. Delhi
4.	20-07-2018	Detectors and Detection Techniques for a Dark Matter Search Experiment: An Indian Initiative	Prof. Satyajit Saha SINP, Kolkata
5.	10-08-2018	Tera Hertz (THz) sources and detectors using modified bulk, surface and antenna structures	Prof. S.S. Prabhu TIFR, Mumbai
6.	05-09-2018	Application of Thz Spectroscopy to Study Biologically Important Phenomena	Prof. Rajib Kr. Mitra, S.N. Bose National Centre for Basic Science, Salt Lake, Kolkata
7.	17-10-2018	Risk Assessment and Life Management of Nuclear Plant Systems	Prof. Mahesh Pandey NSERC-UNENE Industrial Research Chair, University of Waterloo, Waterloo, Ontario, Canada
8.	08-11-2018	Supernova Footprint on the Doorstep	Dr. Gunther Korshinek Accelerator Mass Spectrometry Group Technical University Munich, Garching, Germany
9.	22-11-2018	Penning Trap Physics at an Accelerator Facility”	Prof. Manuel Vogel GSI, Darmstadt, Germany
10.	26-12-2018	Facility for Rare Isotope Beams	Dr. Jiban Jyoti Das, Michigan State University, USA
11.	22-01-2019	Some Applications of ¹⁴ C and ¹²⁹ I using AMS	Prof. A.J. Timothy Jull Arizona University, Tucson, USA
12.	07-02-2019	Prevention of Sexual Harassment at Workplace Act 2013	Mrs. Kuljit Kaur, All India Womens’ s Conference, New Delhi. Designation: Hon) Member Incharge.
13.	08-02-2019	Why must Universities in 21st Century Engage in Scientific Research: An Interactive Discussion!	Prof. Yoginder Pal Chugh Fellow, National Academy of Inventors and Professor Emeritus and Visiting Professor, Southern Illinois University, Carbondale, Illinois, USA
14.	21-02-2019	Models for the description of Track Formation	Prof. M. Toulemonde, CIMAP (CEA, CNRS, Ensicaen Univ. Caen, 14070 Caen, France)

S.No.	Date	Title	Name & Affiliation
15.	22-02-2019	Material Transformation: Interaction between Nuclear, Electronic and Potential Energy Deposition	Prof. M. Toulemonde, CIMAP (CEA, CNRS, ENSICAEN, Univ. Caen, 14070 Caen, France)
16.	01-03-2019	Digital system for multi-parametric analysis in physics application	Carlo Tintori (CAEN SpA - Chief of Front-End Division)
17.	08-03-2019	General Awareness about Women's Health	Dr. Meera Chawla, Gynaecologist Dr. Chawla Clinic B-10, Vasant Kunj, New Delhi
18.	19-03-2019	Photons for Food and Medicine	Prof. Rangacharyulu Chary, University of Saskatchewan, Canada
19.	25-03-2019	An introduction to the work of the Cockcroft Institute	Prof. Peter Ratoff, Director Cockcroft Institute, Daresbury, UK
20.	25-04-2019	Chirality, Wobbling and Chirals Wobblers	Prof. Umesh Garg, Prof. Of Physics, Univ. Of Notre Dame, USA
21.	29/04/2019	Symmetry Breaking of CP- Can it explain our pressure in the country	Prof. Natarajan P., DOP and Astrophysics, Univ. Of Delhi

6.9 SCHOOLS, WORKSHOPS, ACQUAINTANCE PROGRAMMMES, FOUNDATION DAY & NATIONAL SCIENCE DAY CELEBRATIONS

School on Accelerator Science and Technology - 2018 (SAST-2018)

Rajeev Mehta

Introduction:

Inter-University Accelerator Centre (IUAC) hosted a School on Accelerator Science & Technology during May 7-18, 2018 under the sponsorship of Department of Science & Technology (DST). This school was third in the series of DST sponsored accelerator school. The aim of the school was to provide educational opportunities for young scientists, engineers, faculty members, post-doctoral fellows and research scholars in this important and advanced field of research and development (R&D) and to encourage them to contribute effectively in this challenging area of R&D

This school gave an overview and status of the existing accelerator system and also explored the possibilities of the upcoming facilities. The school covered basic physics and technologies related to the accelerators. Series of lectures were delivered by experts from various prestigious accelerator based research institutes in India. There were interactive classroom tutorials sessions, special review talks by eminent scientists and engineers on some of the advance topics related to the accelerators. During hands-on experiments session participants were exposed to some of the technologies and equipment related to accelerators.

The school was offered to graduate, postgraduate students, junior researchers and young scientists etc. from all over the India who are highly motivated to pursue their carrier in accelerator science and technology.

Programme Schedule:

The school duration was two weeks starting from 7 May 2018. The program had intensive lectures, tutorials and hands on experiments on the wide range of technologies that form the base of the particle accelerator technology. School covered the areas like Beam Dynamics, RF Accelerator (Linear & Circular), Operational Aspect of Accelerator, Ion Sources, Vacuum, Instrumentations, High Power Devices, Radiation Safety etc. The overall program had 62 sessions

- 38 Lectures
- 10 Special Review Talks and talks on major Indian projects
- 6 Tutorials
- 4 Hands on Experiments of 2 hours each (total 8 sessions)

“Hands on Experiments” was another feature that gave the participants an exposure to some of the technologies of accelerator physics. Following experiments were performed:

- 1) Leak Detection Techniques
- 2) Operational Aspects of Turbo Pump
- 3) Low level RF Measurement Techniques: Bead Pull & Q Measurement
- 4) High Power RF Test of Cavity

Interactive tutorial sessions were held, where participants were divided into four groups and were asked to solve the problem on the board. Marking system was introduced and the winner group was facilitated in the concluding session.

Participants Detail:

All major accelerator based laboratory, Institutes & Universities in India were asked to nominate upto three participants for this school. The applications were invited online through website of the school. We received overwhelming response to the school. 20 participants were selected to attend the school. Total 38 participants attended the school.

Financial Aid:

The school was fully funded by Department of Science & Technology (DST). All the participants, speakers were provided with local hospitality and accommodation by the school Organizers. Selected participants were provided with travel assistance by 3rd AC train fare.

Excursion Trip & Special Dinners:

An excursion trip was organized for the participants. The excursion trip was free for all the participants. During this trip participants visited Akshardham Temple



International School on Ion Beams In Materials Science (IBMS) 2018

Chairman: Ambuj Tripathi

Convener: Indra Sulania

This school is a regular feature on every year's calendar of events of IUAC, which is held mostly to cater to the academic interest of research students. This year's school was held from 3-7, October, 2018 and convened by Dr Indra Sulania in the able guidance of Dr A Tripathi. More than 50 participants gained knowledge through the lectures delivered by renowned scientists and professors working in this field from India (8 speakers) and abroad (5 speakers). It provided a platform to PhD students from India and abroad to hear to lectures of researchers and academicians from top Institutes and Universities, from all over the world, who works mostly with ion beams. Hands on training was also provided for the usage of key software such as SRIM, RUMP, SIMNRA etc.



Inaguration of the IBMS 2018 with dignitaries on the dais.



Participants of IBMS 2018

International School on Ion Beams in Energy Materials

P. K. Kulriya & Fouran Singh

An International school on ion beams in energy materials was organized from July 12-18th, 2018 in the seminar hall at IUAC. The 12 eminent resource persons from the national institutes and universities like IIT/D, BARC Mumbai, IPR Gandhi Nagar, NPL Delhi, NCL Pune, IGCAR Kalpakkam, University of Delhi, LNMIIT Jaipur, BHU Varanasi including IUAC New Delhi were invited to deliver the lectures. Though, there are various types of energy materials, however this school was mainly focused on the light-harvesting materials/devices, materials for nuclear reactor applications and thermoelectric materials. The school was attended by 38 PhD scholars and young faculties from various universities across the country and 25 candidates from IUAC. The school was inaugurated by the Director IUAC, followed by the keynote address by Professor R. K. Bhandari (former Director VECC Kolkata and Raja Ramanna Fellow) on the structural materials for nuclear applications. The visit to various facilities at IUAC was also arranged during the school. Photograph of the workshop is shown below.



Modern techniques of γ -ray spectroscopy for nuclear structure studies

Five day school on “Modern techniques of γ -ray spectroscopy for nuclear structure studies” was held at our Center from 12th November in 2018. About 30 Ph.D. Students from different universities and national institutes attended this school. The talks covered range of topics in gamma ray spectroscopy by experts in the field. About ten faculties from different institutes gave lectures in this school. The topics covered in this school ranged from basic techniques to contemporary in gamma ray spectroscopy, lifetime measurements, linear polarisation of γ -rays, g-factor measurement techniques and gamma ray tracking. The young researchers using Indian National Gamma Array (INGA) benefited as they could use these techniques in the data reduction and interpretation.



IUAC Acquaintance Workshop at Lucknow University

A one day IUAC acquaintance workshop was held at Department of Physics, Lucknow university on 19th September 2018. More than 100 people participated in this workshop. The participants included faculties of Lucknow university, research scholars and M.Sc. students from Lucknow university and neighbouring colleges. Prof. Pallavi Jha, head of the physics department, gave a brief introduction of Physics department. Dr. R. P. Singh gave an overview of the accelerator programs at IUAC. He then gave detailed talk on research in the areas of nuclear structure and nuclear reactions with INGA, NAND, HIRA and HyRA setups. Dr. Pawan Kulriya gave a detailed description of reaserch in the area of material science using heavy ion beams and associated facilities at IUAC. Prof. Balak Das of university of Lucknow gave a brief summary of the research programs being carried out by his group using IUAC setups. The workshop ended with an discussion and interactive session with the faculties and students.



IUAC acquaintance workshop at physics department Lucknow university.

IUAC Acquaintance Programme at the Central University of Kerala, Kasaragod on October 29, 2018



IUAC Acquaintance Programme and One Day National Workshop on Accelerator Based Science Research were conducted at the Department of Physics, Central University of Kerala (CUK), Kasaragod on October 29, 2018. Dr. E. Prasad from CUK was the local convener of the Programme which was attended by more than one hundred and fifty participants from CUK and other colleges and universities of Kerala, Tamil Nadu and Karnataka. Dr. S. Nath and Dr. A. Tripathi talked about the available experimental facilities and the research programmes pursued at IUAC. Prof. K. M. Varier and Prof. A. M. Vinodkumar from Calicut University (CU) delivered lectures based on their works in nuclear reactions carried out using the experimental facilities of IUAC. Dr. Senoy Thomas from Cochin University of Science and Technology (CUSAT) talked about his works in materials science performed in collaboration with IUAC. Prof. B. R. S. Babu from CU and Dr. Rhine Kumar from CUSAT presented their recent results in theoretical nuclear physics. Queries of the participants about the research opportunities and procedures to submit research proposals at IUAC were answered in an open session at the end of the day.

International workshop on 10th. Asian Forum on Accelerators and Detectors (AFAD) at IUAC (Feb. 14-15, 2019)

Asian Forum for Accelerator and Detectors (AFAD), regulated by Asian Committee of Future Accelerator (ACFA), has been created to promote collaboration among universities, research institutes and industries in Asia and Oceania. This Workshop is being held annually since about ten years and was organised in China, Korea, Japan, Australia, Russia, Taiwan, etc. The major focus of the Forum is dedicated to the fields of accelerators, detectors and related technologies as well as their applications which are being developed in the research institutes and universities. The 10th Asian Forum for Accelerators and Detectors “AFAD2019” was organized in the newly inaugurated Maharshi Kanad Auditorium of Inter University Accelerator Center, New Delhi during February, 14-15, 2019. The key topics discussed during the Workshop were:

- Accelerated and related technologies for photon science
- Detector technology development
- Accelerator Technologies for medical and industrial application
- Innovative acceleration techniques
- Accelerator and related technologies for hadron science
- Network and Computing
- Cryogenic, Cryomodule and Superconductivity for Accelerators

The workshop was by invitation only. About 80 participants from China, Japan, Korea, Taiwan, Russia and Australia and about 100 Indian participants had participated in the workshop. During the two day’s workshop of AFAD2019, there were 8 Plenary talks, 120 talks in the seven parallel session and 7 Summary talks. The picture of the Inauguration session and the participants of AFAD2019 are shown in figure 1 and 2.



Figure 1. Inauguration ceremony



Figure 2. Participants of AFAD2019

National Workshop on Isotopes in Earth, Ocean and Atmospheric Sciences, held at NIO Goa during Feb 18-20, 2019

Under the mandate of geochronology project IUAC organizes national workshop on a regular basis to generate awareness about the available and upcoming instruments under geochronology project. This year workshop was organized in collaboration with National Institute of Oceanography (NIO), Goa to make aware the researchers majorly from Goa region as well as from other part of country. The theme of the workshop was kept on “Isotopes in Earth, Ocean and Atmospheric Sciences” and workshop dates were decided during February 18-20, 2019.

In response to the advertisement a total of 280 (180 outstation and 100 local) applications were received for the participation in the workshop. However, due to limited accommodation availability at NIO Guest house, only 85 outstation participants were shortlisted based on their research interest and academic credentials. Participation from all the universities, gender and geographical representation was also kept in mind while short listing the participants. All the local applicants were allowed to participate in the workshop. All together 185 participants (96 PhD students, 65 faculties, scientists, research associates and postdoctoral fellows, and 24 invited speakers) from the countrywide 22 different universities and 25 institutes participated in the workshop. The total outstation participants were 85 and the female to male participant ratio was 1/3. The event hosted 8 plenary sessions, 2 brainstorming sessions and 2 poster sessions. In total, 25 invited plenary lectures were delivered by invited speakers and 5 posters about the research facilities at IUAC were presented.

Invited speakers were from IUAC, NIO, University of Kashmir, BHU, IIT Kaharagpur, University of Delhi, PRL, Ahmedabad, WIHG Dehradun, NCPOR, Goa, IISER Bhopal, NGRI Hyderabad, Colorado University, IISER Kolkata and IISER Pune.

The major outcomes of the workshop are as below.

Outcomes

- Most of the participants and speakers suggested organizing this kind of workshop on a regular basis (yearly) at different locations of the country.
- Awareness among the research community about IUAC and its research facilities is generated.
- Some of the students showed their desire to utilize AMS and other geochronology facilities at IUAC and came to know about the procedure for it.
- The interaction among the students and resource persons clarified their doubts. Students got some new ideas about the research.



Group Photograph of the workshop participants

29th FOUNDATION DAY PROGRAMME

P.N. Prakash

The 29th Foundation Day function of IUAC was held on December 19, 2018 in the auditorium of National Institute of Plant Genome Research. The Foundation Day lecture titled, “Adventures of a Particle Physicist and Why you should care!”, was delivered by Dr. Archana Sharma, Principal Physicist & Project Manager, CMS Muon GEM Upgrade, CERN, Geneva, Switzerland. Prof. D.P. Singh, Hon’ble Chairman, UGC, presided over the function. Director, IUAC presented a status report on the activities of the Centre during the past one year. Prof. D.P. Singh delivered the presidential remarks. As in the past years, science students of classes XI and XII from nearby schools were invited to attend the programme. After attending the lecture in the morning, in the post-lunch session they were taken on a tour to show the particle accelerators and experimental facilities in IUAC. In addition, some interesting experiments to demonstrate basic physics concepts were shown to them. Around 17 schools participated in the function with each school sending 4 students accompanied by a science teacher.



Clockwise from top left:

- (i) (R to L) Prof. D.P. Singh, Hon’ble Chairman, UGC, Dr. Archana Sharma, 29th Foundation Day speaker and Dr P.N. Prakash, Convener
- (ii) Dr. Archana Sharma and Prof. D.P. Singh on the dais,
- (iii) Dr Archana Sharma delivering the 29th Foundation Day Lecture,
- (iv) Dr Archana Sharma being honoured by Prof. Avinash Chandra Pandey, Director, IUAC.

National Science Day Programme

A one day workshop on the occasion of National Science Day was organized in the Maharshi Kanad Auditorium of IUAC on 28th February 2019. A total number of 215 teachers and students of B. Sc. (Physics) of 14 colleges/universities of NCR participated in the workshop. IUAC’s director Prof. A. C. Pandey opened the proceedings with an opening remark. The guest speaker, Prof. Ajoy Ghatak (Professor Meghnad Saha Fellow, The National Academy of Sciences, India) briefly discussed the significance of Einstein’s famous equation $E = mc^2$ and explained how light was created. He also presented a very simple derivation of that equation.



Prof. A. Ghatak addressing the participants



Participants and resource persons in the Maharshi Kanad Auditorium of IUAC during the National Science Day programme.

Mr. S. Ojha (IUAC) described the Accelerator Mass Spectrometry and its applications to the participants while Dr. N. Madhavan (IUAC) motivated the students to work in experimental nuclear physics by listing the exciting aspects of the field. In the post lunch session, the convenor, Dr. S. A. Khan (IUAC), thanked the participants for visiting IUAC and the resource persons for their help in organizing the workshop. Thereafter, the participants toured few of the experimental facilities in the centre. They were also shown the experimental demonstrations setup in the auditorium by the resource persons from IUAC. The workshop concluded with the distribution of the certificates to the participants.

IUAC Sports and Cultural Committee

Soumen Kar, Sudarshan Sharma, ET Subramaniam, Asiti Sharma, VVV Satyanarayana, Mohan Nishal, Rajesh Hariwal and Indu Bala.

Independence Day and Republic Day Celebration

Independence day was celebrated at IUAC by organizing competition among children on various topics like “on the spot painting”, elocution, acting, and debate. Similarly, The Republic Day was also celebrated by organizing sports competitions among the children and residents of the campus.



(a)



(b)

Figure 1. (a) Prof. A.C. Pandey, Director IUAC hoisting the National Flag on 26th January 2019, (b) the sports event organized on 26th January 2019

Independence day was celebrated at IUAC by organizing competition among children on various topics like “on the spot painting”, elocution, acting, and debate. Similarly, The Republic Day was also celebrated by organizing sports competitions among the children and residents of the campus.

International Yoga Day Celebration

The Sports and Cultural Committee of IUAC organized a yoga awareness camp to celebrate the International Yoga Day on June 21, 2018. About 70 people participated in the yoga awareness camp under the guidance of yoga experts from Sivananda Yoga Vedanta Centre, New Delhi



Community Lighting on Diwali



Figure 2. Community lighting on Diwali at IUAC campus.

To encourage the cracker-free Diwali celebration, IUAC Sports and Cultural committee organized a Community Lighting Ceremony at the football ground of the IUAC campus. Almost 250 residents participated in the celebration by lighting the diyas and candles.

Annual Cultural Program “Spandan”



Figure 3. The annual cultural program: SPANDAN-2018 at IUAC campus.

The annual cultural festival “SPANDAN” of IUAC for the year 2018 was organized by the Sports & Cultural Committee on 17th November 2018. About 70 children supported by the elders, participated in the event adorned by various regional dances, songs, instrumental music, skit, and drama. IUAC employees and students presented a Hindi drama “Pappu ki Parriksha” based on Fritz Karinthy’s Refund.

Sports Flooring for Badminton Court



Fig. 4. (a) Inauguration of the renovated badminton court by Prof. A.C.Pandey, Director, IUAC, (b) the renovated badminton court at IUAC campus.

The badminton court was renovated by laying tiles-based sports flooring on the existing concrete court.

Installation of Outdoor Gym



Fig. 5. Newly installed outdoor gym items at the IUAC campus.

An outdoor gym has been installed at the IUAC campus. About fifteen number of various outdoor gym items have been installed inside the IUAC campus.