

Indian Particle Accelerator Conference (InPAC-2022)

Organized by Variable Energy Cyclotron Centre, Kolkata

Under the aegis of Indian Society of Particle Accelerators (ISPA) & sponsored by DAE-BRNS

22-25 March, 2022

DETAILED PROGRAMME

[DAY-1] 22/03/2022 TUESDAY

9:30-10:00 Inaugural Session WebEx MAIN LECTURE HALL

- **Welcome of delegates and ceremonial lighting of Lamp**
- **Opening remarks by Arup Bandyopadhyay, Convenor InPAC-2022**
- **Welcome Address by Sumit Som, Director VECC & Chairman, InPAC-2022, and E-release of book “Rare Isotope Beams – Concepts and Techniques”**
- **Address by Srinivas Krishnagopal, President, ISPA**
- **Inaugural Address by Padmabhushan Prof. Bikash Chandra Sinha, Chief Guest and Former Director VECC**
- **Vote of Thanks by Uttam Bhunia, Secretary, InPAC-2022**
- **National Anthem**

10:00-10:45 Plenary Session - 1 Chair : Amit Roy

WebEx MAIN LECTURE HALL

P-1 Overview of Accelerators and other Scientific & Technological Activities at VECC, Sumit Som

11:00-11:30 HIGH TEA

[DAY-1] 22/03/2022 TUESDAY CONT...

11:30-13:00 Parallel Sessions ORAL-1,2,3,4

[IO : Invited oral duration 20+5 min ; CO : Contributed oral duration 15+5 min]

Parallel Session ORAL-1 WebEx LECTURE ROOM-1	11.30 - 11.55	IO-1 Efforts and achievements in the Superconducting RF Technologies, related infrastructure and proton accelerator R & D activities at RRCAT Purushottam Shrivastava, RRCAT
	11.55 - 12.20	IO-2 Magnets - the motivating force for higher luminescence Sanjay Malhotra, BARC
	12.20 - 12.40	CO-1 B3/308 LEHIPA Commissioning to 6.8 MeV by acceleration through the first DTL tank Jose V. Mathew, BARC
	12.40 - 13.00	CO-2 B2/15 K130 Room Temperature Cyclotron - an overview Prodyut Sankar Chakraborty, VECC
Parallel Session ORAL-2 WebEx LECTURE ROOM-2	11.30 - 11.55	IO-3 Accelerator RF - Convergence of Science and Technology Manjiri Pande, BARC
	11.55 - 12.20	IO-4 RF Power Sources for Cyclotrons Aditya Mandal, VECC
	12.20 - 12.40	CO-3 B3/297 Engineering of the LEHIPA DTL used for 6.8 MeV acceleration Piyush Jain, BARC
	12.40 - 13.00	CO-4 B3/254 Field Tuning and Stabilization of the LEHIPA DTL1 Tank Manas Ranjan Mishra, BARC
Parallel Session ORAL-3 WebEx LECTURE ROOM-3	11.30 - 11.55	IO-5 Overview of RIB development activities at VECC Vaishali Naik, VECC
	11.55 - 12.15	CO-5 A2/317 Development of 9.5MeV, 10kW linac meeting energy regulations on food irradiation R. Sandha, RRCAT
	12.15 - 12.35	CO-6 B1/288 Developmental Activities and Performance of 14 UD Pelletron Accelerator J.A. Gore, TIFR
	12.35 - 12.55	CO-7 G6/277 Development of large scale irradiation set up for induced-mutation of grains using low flux proton beam in air at 14 UD Pelletron Accelerator Jayprakash Nair, TIFR
Parallel Session ORAL-4 WebEx LECTURE ROOM-4	11.30 - 11.55	IO-6 Physics design issues in travelling wave electron linacs Vinit Kumar, RRCAT
	11.55 - 12.20	IO-7 Development status of 18 MeV Medical Cyclotron at VECC Atanu Dutta, VECC
	12.20 - 12.40	CO-8 B3/261 Physics design of a 40 MeV Medium Energy High Intensity Proton Accelerator (MEHIPA-I) Shweta Roy, BARC
	12.40 - 13.00	CO-9 A4/235 Beam dynamics with anti-bend and super-bend in low emittance storage ring Riyasat Husain, RRCAT

13:00-14:00 LUNCH BREAK

[DAY-1] 22/03/2022 TUESDAY CONT...

14:00-16:00 Parallel Sessions POSTER PRESENTATION - 1,2,3,4

[Poster presentation duration 8+4 min]

Parallel Session POSTER-1 WebEx LECTURE ROOM-1	TRACK-A	ID 11,52,55,61,62,75,76,94,130,157
Parallel Session POSTER-2 WebEx LECTURE ROOM-2	TRACK-A	ID 200,205,206,209,212,229,233, 234,241,257
Parallel Session POSTER-3 WebEx LECTURE ROOM-3	TRACK-A	ID 264, 270,273,276,298,299,301, 319,320,321
Parallel Session POSTER-4 WebEx LECTURE ROOM-4	TRACK-A TRACK-G	ID 322,323,324,327 ID 51,65,73

16:00-16:30 TEA BREAK

16:30-18:30 Parallel Sessions POSTER PRESENTATION-5,6,7,8

Parallel Session POSTER-5 WebEx LECTURE ROOM-1	TRACK-B	ID 16,17,28,34,35,37,59,67,78,83
Parallel Session POSTER-6 WebEx LECTURE ROOM-2	TRACK-B	ID 89,108,136,180,187,202,204,210, 218,226
Parallel Session POSTER-7 WebEx LECTURE ROOM-3	TRACK-B	ID 240,248,249,253,262,281,293, 300,302
Parallel Session POSTER-8 WebEx LECTURE ROOM-4	TRACK-B TRACK-D	ID 306,311 ID 58,88,193,199,219,252

END OF DAY-1 PROGRAMME

[DAY-2] 23/03/2022 WEDNESDAY

09:30-11:00 Plenary Session - 2 Chair : R.K.BHANDARI

[P : Plenary talk duration 30+5 min and IT : Invited Talk duration 20+5 min]

Plenary Session-2	09.30 - 10.05	P-2 Status report on the particle accelerator programme at BARC S. Krishnogopal, BARC
WebEx	10.05 - 10.30	IT-1 RF systems development, commissioning and operation at RRCAT - an overview Mahendra Lad, RRCAT
MAIN LECTURE HALL	10.30 - 10.55	IT-2 Electron Linacs and E-beam Irradiation Facilities at RRCAT Jishnu Dwivedi, BARC

11:00-11:30 TEA BREAK

11:30-13:00 Parallel Sessions ORAL-5,6,7,8

[IO : Invited oral duration 20+5 min ; CO : Contributed oral duration 15+5 min]

Parallel Session ORAL-5 WebEx LECTURE ROOM-1	11.30 - 11.55	IO-8 Commissioning of Compact FEL-THz facility at IUAC and production of the first electron beam from the electron gun Subhendu Ghosh, IUAC
	11.55 - 12.20	IO-9 Transverse emittance measurement of 100 keV electron gun based on second moment distribution using solenoid scan Siddhartha Dechoudhury, VECC
	12.20 - 12.40	CO-10 A6/152 Saturation of Lasing of the IR-FEL at RRCAT Bhaskar Biswas, RRCAT
	12.40 - 13.00	CO-11 A9/236 Design, fabrication and characterization of prototype undulator of 56 mm period length GAUTAM SINHA, RRCAT
Parallel Session ORAL-6 WebEx LECTURE ROOM-2	11.30 - 11.50	CO-12 C1/26 Revisiting the optics of K-500 Cyclotron extraction beam line for efficient transport Uttam Bhunia, VECC
	11.50 - 12.10	CO-13 C6/18 Phase space characteristics of space charge dominated bunched beam in AVF cyclotron Animesh Goswami, VECC
	12.10- 12.30	CO-14 F1/98 Control system for a novel beam chopper for the study of long half-lives Sanjoy Pal, TIFR
	12.30 - 12.50	CO-15 E1/48 Optimisation of frequency tuner, coupler and pick-up probes of the 1.3 GHz RF deflector cavity developed for the ANURIB facility Dipta Pratim Dutta
	12.50 - 13.10	CO-16 F1/274 Development of Diagnostic Devices for the Measurement of Beam Parameters of Electron Gun and Linac-3 Akhilesh Karnewar, RRCAT

[DAY-2] 23/03/2022 WEDNESDAY CONT...

Parallel Session ORAL-7 WebEx LECTURE ROOM-3	11.30 – 11.50	CO-17 D7/46 An application based table-top neutron source Darpan Bhattacharjee, IPR
	11.50 – 12.10	CO-18 C7/150 A real time beam emittance and twiss parameter measurement system for hydrogen ion source Kuldeep Singh, RRCAT
	12.10 – 12.30	CO-19 D1/95 Laser-driven energetic particle ion sources Bhuvanesh Ramakrishna, IIT HYDERABAD
	12.30 – 12.50	CO-20 D5/178 Installation and Commissioning of 2.45 GHz ECR source for RIB Charge Breeder Line at VECC Mahuwa Bhattacharjee, VECC
	12.50 – 13.10	CO-21 A7/146 Design and development of 90 kV triode electron gun Yashwant Wanmode, RRCAT
Parallel Session ORAL-8 WebEx LECTURE ROOM-4	11.30 – 11.50	CO-22 B7/92 Operational experience with the VECC MC18 multi-cusp Ion source ATANU DUTTA, VECC
	11.50 – 12.10	CO-23 E1/275 Design and testing of high-power RF couplers for the LEHIPA DTL Mentes Jose, BARC
	12.10 – 12.30	CO-24 E1/154 Advancement in RF power coupler development for Radio Frequency Quadrupole Ramesh Kumar, RRCAT
	12.30 – 12.50	CO-25 E3/196 Multi-coupler power feeding for 80 MHz rod type radio frequency quadrupole (RFQ) Linac: Theoretical and experimental studies HEMENDRA PANDEY, VECC
	12.50 – 13.10	CO-26 F11/149 Commissioning of Digital LLRF systems for RFQ, Buncher and DTL at LEHIPA, BARC ALOK AGASHE, BARC

13:00-14:00 LUNCH BREAK

14:00-16:00 Parallel Sessions POSTER PRESENTATION -9,10,11,12

[Poster presentation duration 8+4 min]

Parallel Session POSTER-9 WebEx LECTURE ROOM-1	TRACK-C	ID 99, 113, 168,244,246,250,255, 256,259,263
Parallel Session POSTER-10 WebEx LECTURE ROOM-2	TRACK-C	ID 266,279,285,289,290,292,296, 314,325

[DAY-2] 23/03/2022 WEDNESDAY CONT...

Parallel Session POSTER-11 WebEx LECTURE ROOM-3	TRACK-E1	ID 24,54,120,139,162,166,174,192
Parallel Session POSTER-12 WebEx LECTURE ROOM-4	TRACK-E11 TRACK-E12 TRACK-E9	ID 29,30,33 ID 105,231 ID 116,117,175,183,223

16:00-16:30 TEA BREAK

16:30-18:30 Parallel Sessions POSTER PRESENTATION -13,14,15,16

[Poster presentation duration 8+4 min]

Parallel Session POSTER-13 WebEx LECTURE ROOM-1	TRACK-E15	ID 64,74,77,110,112,119,215,222, 309,326
Parallel Session POSTER-14 WebEx LECTURE ROOM-2	TRACK-E2	ID 47, 60, 80, 93, 115, 121, 138,147, 161,163
Parallel Session POSTER-15 WebEx LECTURE ROOM-3	TRACK-E2	ID 165, 177, 239, 245,265, 268,271,312
Parallel Session POSTER-16 WebEx LECTURE ROOM-4	TRACK-E4	ID 45, 190, 225, 267, 280, 316

END OF DAY-2 PROGRAMME

[DAY-3] 24/03/2022 THURSDAY

09:30-11:00 Plenary Session - 3 Chair : D. KANJILAL

[P : Plenary talk duration 30+5 min and IT : Invited Talk duration 20+5 min]

Plenary Session-3	09.30 - 10.05	P-3 Status of the Accelerator Facilities at IUAC A.C. Pandey, IUAC
	10.05 - 10.30	IT-3 Advances in FEL activity at RRCAT K.K. Pant, RRCAT
WebEx MAIN LECTURE HALL	10.30 - 10.55	IT-4 Beam extraction from Superconducting Cyclotron at VECC and its present status Jayanta Debnath, VECC

11:00-11:30 TEA BREAK

11:30-13:00 Parallel Sessions ORAL-9,10,11,12

[IO : Invited oral duration 20+5 min ; CO : Contributed oral duration 15+5 min]

Parallel Session ORAL-9	11.30 - 11.55	IO-10 Digital technology based RF control and instrumentation for accelerators Paresh Motiwala, BARC
	11.55 - 12.15	CO-27 E3/122 Status of Indigenous Development Program of Solid state RF amplifiers at BARC Jitendra Mishra, BARC
WebEx LECTURE ROOM-1	12.15 - 12.35	CO-28 E3/86 Status and Operational Experiences of RF & Microwave Amplifiers at IUAC Yaduvansh Mathur, IUAC
	12.35 - 12.55	CO-29 E3/173 OPERATIONAL EXPERIENCE OF HIGH-POWER SOLID-STATE RF AMPLIFIERS DEPLOYED AT RRCAT Akhilesh Jain, RRCAT
	12.55 - 13.15	CO-30 A4/201 Commissioning of Upgraded 31.6 MHz RF System in Booster Synchrotron and Indus-1 SRS Pritam Singh Bagduwal, RRCAT
Parallel Session ORAL-10	11.30 - 11.50	CO-31 C6/251 Comparison studies of the 90 degree stopband in a DTL for different focusing lattices Rajni Pande, BARC
	11.50 - 12.10	CO-32 C6/258 Lyapunov exponent and fixed-point analysis for an intense charged particle beam propagating through a periodic focusing channel Monika Phogat, BARC
WebEx LECTURE ROOM-2	12.10 - 12.30	CO-33 B1/91 Status of FRENA accelerator Chinmay Basu, SINP
	12.30 - 12.50	CO-34 D4/272 Production and measurement of RIB of 43K+ in the LASER spectroscopy beam-line of ISOL facility at VECC Ayan Ray, VECC
	12.50 - 13.10	CO-35 A3/90 UPGRADATION OF DEE-INSET AND PULLER DRIVE SYSTEM FOR K-130 CYCLOTRON Niraj Chaddha, VECC

[DAY-3] 24/03/2022 THURSDAY CONT...

Parallel Session ORAL-11 WebEx LECTURE ROOM-3	11.30 - 11.50	CO-36 B3/137 Design fabrication assembly and integration of eccentricity measurement system with cavity tuning machine NITIN NIGAM, RRCAT
	11.50 - 12.10	CO-37 E8/79 Indigenous Development of Titanium coated Alumina Ceramic UHV Chambers for Pinger Magnets of Indus-2 BK Sindal, RRCAT
	12.10 - 12.30	CO-38 E4/237 Design and Development of compact Combined Function Magnet for Indus-1 SREERAMULU K, RRCAT
	12.30 - 12.50	CO-39 E5/41 Design, development and testing of 6T prototype conduction cooled magnet assembly for high intensity proton accelerators Kumud Singh, BARC
	12.50 - 13.10	CO-40 E1/50 Magnetic measurement systems for accelerator magnets Vikas Teotia, BARC
Parallel Session ORAL-12 WebEx LECTURE ROOM-4	11.30 - 11.50	CO-41 E2/176 EXPERIENCE OF SURFACE PROCESSING AND TESTING OF HIGH PERFORMANCE 650 MHz 5-CELL SUPERCONDUCTING RF CAVITY AT RRCAT S Raghavendra, RRCAT
	11.50 - 12.10	CO-42 E2/195 Development of X-link tuner as co-axial tuner for 1300 MHz and as end tuner for 650 MHz SCRF cavities Vikas Jain, RRCAT
	12.10 - 12.30	CO-43 E15/141 Development of Data Acquisition and Control system for Tuning of SCRF Cavities Shrirang Vinayak Kokil, RRCAT
	12.30 - 12.50	CO-44 E2/167 Qualification of beta=0.92 650 MHz Superconducting RF Dressed Cavities of RRCAT for HB650 prototype CM of PIP-II Vikas Jain, RRCAT
	12.50 - 13.10	CO-45 E7/214 Design of Liquid Helium Cryostat for Testing of Superconducting Magnets Nidhin S L, RRCAT

13:00-14:00 LUNCH BREAK

14:00-16:00 Parallel Sessions POSTER PRESENTATION-17,18,19,20

[Poster presentation duration 8+4 min]

Parallel Session POSTER-17 WebEx LECTURE ROOM-1	TRACK-E3	ID 19, 20, 21, 25, 97, 111, 118, 123, 142, 143
Parallel Session POSTER-18 WebEx LECTURE ROOM-2	TRACK-E3	ID 148, 153, 184, 185, 188, 224, 243, 318
	TRACK-E5	ID 43

[DAY-3] 24/03/2022 THURSDAY CONT...

Parallel Session POSTER-19 WebEx LECTURE ROOM-3	TRACK-E6	ID 23, 31, 40, 81, 85, 87, 102, 103, 107, 140
Parallel Session POSTER-20 WebEx LECTURE ROOM-4	TRACK-E6 TRACK-E7 TRACK-E8	ID 151, 155, 159, 304, 313 ID 109, 284 ID 10, 44

16:00-16:30 TEA BREAK

16:30-18:30 Parallel Sessions POSTER PRESENTATION -21,22,23,24

[Poster presentation duration 8+4 min]

Parallel Session POSTER-21 WebEx LECTURE ROOM-1	TRACK-E8 TRACK-F3 TRACK-F4	ID 156, 160, 170, 186, 191,221,310 ID 135 ID 303
Parallel Session POSTER-22 WebEx LECTURE ROOM-2	TRACK-F1	ID 56, 72, 84, 145, 197, 230, 232, 260, 282, 283
Parallel Session POSTER-23 WebEx LECTURE ROOM-3	TRACK-F1 TRACK-F11	ID 286, 287 ID 13, 14, 49, 57,125,158,171,172
Parallel Session POSTER-24 WebEx LECTURE ROOM-4	TRACK-F11 TRACK-F12 TRACK-F7 TRACK-F8	ID 238 ID 38, 42, 124, 126, 131 ID 207, 295, 305 ID 68

END OF DAY-3 PROGRAMME

[DAY-4] 25/03/2022 FRIDAY

09:30-11:00 Plenary Session -4 Chair : ALOK CHAKRABARTI

[P : Plenary talk duration 30+5 min and IT : Invited Talk duration 20+5 min]

Plenary Session-4	09.30 - 10.05	P-4 Status of Indus Synchrotron Radiation sources and upgrades Tushar Puntambekar, RRCAT
	10.05 - 10.30	IT-5 Industrial Electron Accelerator Programme at BARC Archana Sharma, BARC
WebEx MAIN LECTURE HALL	10.30 - 10.55	IT-6 Geochronology program at IUAC: Accelerator Mass Spectrometers (AMS) and High Resolution Mass Spectrometers with their applications in Geochronology Sandeep Chopra, IUAC

11:00-11:30 TEA BREAK

11:30-13:00 Parallel Sessions ORAL-13,14,15,16

[IO : Invited oral duration 20+5 min ; CO : Contributed oral duration 15+5 min]

Parallel Session ORAL-13	11.30 - 11.50	CO-46 E3/104 Testing and commissioning of 1 MW, 352 MHz klystron system for 10 MeV DTL of LEHIPA S. Shrotriya, BARC
	11.50 - 12.10	CO-47 E3/22 Status of Commissioning of the High-Power Waveguide Systems for LEHIPA Venkataramarao B, BARC
WebEx LECTURE ROOM-1	12.10 - 12.30	CO-48 E1/179 Design and Development of 650 MHz high power RF circulator Ashish Tiwari, RRCAT
	12.30 - 12.50	CO-49 E6/144 Power supplies for RF amplifiers at RRCAT Akhilesh Tripathi, RRCAT
	12.50 - 13.10	CO-50 F2/294 Status of Indus-2 Control System Rajesh Kumar Agrawal, RRCAT
Parallel Session ORAL-14	11.30 - 11.50	CO-51 E6/96 Initial operation of -55kV, 6MW pulse step modulation based high voltage power supply Dishang Upadhyay, ITER/IPR
	11.50 - 12.10	CO-52 F11/12 Digital Predistortion technique for RF power amplifier linearization: Modelling and Simulations Rajesh Keshwani, RRCAT
WebEx LECTURE ROOM-2	12.10 - 12.30	CO-53 F3/315 Development of Software for Optimization of Indus-2 Beam Injection System Power Supplies using MFO Algorithm Surendra Yadav, RRCAT
	12.30 - 12.50	CO-54 E6/128 Analysis and Design of Two-switch Forward Converter for Time-varying Load Conditions Abhishek Srivastava, RRCAT
	12.50 - 13.10	CO-55 F11/247 Commissioning of LLRF system for control of field in AES-10 SCRF cavity in HTS at RRCAT P. Motiwala, BARC

[DAY-4] 25/03/2022 FRIDAY CONT...

Parallel Session ORAL-15 WebEx LECTURE ROOM-3	11.30 - 11.55	IO-11 Overview of the manufacturing technologies for the development of future particle accelerators Sanjay Chouksey, RRCAT
	11.55 - 12.15	CO-56 F11/70 Development of Digital LLRF system for BARC-TIFR Superconducting LINAC Gurunath Randale, TIFR
	12.15 - 12.35	CO-57 F11/203 Design and Development Methodologies of LLRF Systems for Accelerators at RRCAT Pritam Singh Bagduwal, RRCAT
	12.35 - 12.55	CO-58 E15/307 On the FMR and magnetic properties of high density ferrimagnetic garnets for high power cw RF circulators with garnet disc resonators Lakshmikanta Aditya, BARC
Parallel Session ORAL-16 WebEx LECTURE ROOM-4	11.30 - 11.50	CO-59 F5/329 Induced Air activation and radiation shielding adequacy study of ANURIB building at Rajarhat site Kolkata R. Ravishankar, BARC/VECC
	11.50 - 12.10	CO-60 F5/27 Graded Approach Based Safety Review of Medical Cyclotron Facilities (MCFs) in India Manas Kumar Pathak, AERB/VECC
	12.10 - 12.30	CO-61 G1/36 Measurement of energy differential neutron flux and estimation of ambient dose from ${}^7\text{Li}(p,n){}^7\text{Be}$ reaction Arup Singha Roy, VECC
	12.30 - 12.50	CO-62 E11/71 Preparation of LiF targets in FRENA Target Laboratory Lalit Kumar Sahoo, SINP
	12.50 - 13.10	CO-63 E15/106 Design and development of Interlock, Protection and Monitoring System of 20 kW Solid State Amplifier for Indian accelerator Sandip Shrotriya, BARC

13:00 - 14:00 LUNCH BREAK

14:00 - 16:00 Parallel Sessions POSTER PRESENTATION-25,26

[Poster presentation duration 8+4 min]

Parallel Session POSTER-25 WebEx LECTURE ROOM-1	TRACK-F2	ID 63, 66, 69, 101, 127, 132, 134, 181, 189, 194
Parallel Session POSTER-26 WebEx LECTURE ROOM-2	TRACK-F2 TRACK-F5	ID 216, 217, 291 ID 39, 53, 82, 182, 208, 227, 228

[DAY-4] 25/03/2022 FRIDAY CONT...

14:00-16:00 Parallel Sessions THESIS PRESENTATION

Parallel Session THESIS presentation WebEx LECTURE ROOM-3	Thesis-1 14.00 - 14.45	1. Electromagnetic design & beam dynamics studies in elliptic superconducting radio frequency (SRF) cavities Arup Ratan Jana, RRCAT
	Thesis-2 14.45 - 15.30	2. Beam dynamics and RF design of 80 MHz four-rod type RFQ Chiranjib Das, VECC

16:00-16:30 TEA BREAK

16:30-18:30 PLENARY SESSION WebEx MAIN LECTURE HALL

ISPA MEETING and AWARD CEREMONY

END OF CONFERENCE