

## **A REPORT on ‘International Conference on Accelerators in Materials and Medical Sciences’, held in Amity University, Dubai from 5<sup>th</sup> to 7<sup>th</sup> October**

An International Conference on ‘Accelerator in Materials and Medical Sciences’ ICAMMS, from 5th to 7th October is being jointly organized by Amity Institute of Nanotechnology (ANIT), Amity School of Spintronics Materials (ACSM) and Amity Institute of Applied Sciences (AIAS), Noida in cooperation with Amity University Dubai.



The initiation of the idea of this very timely conference originated through the vision of Founder President, Dr. Ashok K Chauhan, who extended his constant and unflinching support. The perpetual encouragement from Chancellor Dr. Atul Chauhan played a catalytic role. Vice Chancellor Prof. Balwinder Shukla gave her valuable inputs at various stages.

The accelerators have been key to scientific and technical developments and have diverse applications in different branches of science. The electrons, photons and ions produced by the state of art accelerators are widely used for materials characterization, materials engineering, medical sciences, cancer therapy etc. and thus accelerator is a perfect laboratory for interdisciplinary research. Apart from providing the basic understanding in materials and physical sciences, the accelerators have been of great relevance in diagnostics, therapy in medical sciences. The World Wide Web, the internet being used by almost each and every one in entire world is an offshoot of the accelerator laboratory in Geneva. The accelerators have been considered to be the breeding ground of different technologies. It is worth mentioning here that three institutions (ACSM, AINT and AIAS ) at Amity University Noida have a joint project on development of a low energy (50 keV) accelerator in association with Inter University Accelerator Centre New Delhi, funded by Department of Science and Technology, New Delhi. Considering the importance of accelerators an International Conference on ‘Accelerator in Materials and Medical Sciences’ ICAMMS, from 5<sup>th</sup> to 7<sup>th</sup> October is being jointly organized by ANIT, ACSM and AIAS, Amity university Noida in cooperation with Amity University Dubai.

His excellency Abdullah Al Saleh, undersecretary for foreign trade and industry, Ministry of Economy UAE, kindly agreed to be the Chief Guest at the Inaugural Function. Mr. Marwan Abdulaziz the Executive Director of Dubai Science Park grace the occasion as a guest of honor. Other dignitaries present were Dr. Vajahat Hussain, CEO of Amity Dubai, Pro-Vice Chancellor Prof. Ramchandran, Dr. W. Selvamurthy, President of Amity Science & Innovation Foundation, Dr. Ajit K Nagpal, Prof. Ajay Gupta, Director Amity Centre of Spintronics Materials and Admiral Ravi Kochhar, chief of administration, AAUP.



Dr D.K Avasthi, Chairman, ICAMMS gave the brief of the importance of the Accelerators and their use in the interdisciplinary research. He emphasized the significance of the accelerators in interdisciplinary research. The conference will focus around various aspects of ion beam research using Ions, electrons and photons in Medical diagnostics, therapy and medical imaging, Ion beam therapy of cancer, Materials characterization & Materials modification, Engineering of nanostructures, Forensic Sciences & Earth Science, Materials for energy, Radiation damage in materials: Relevant to reactor/ tokamak /space electronics and developments in Accelerators. The inaugural key note lecture was given by Prof. J. Fassbender, Director Ion Beam laboratory, Dresden, on "Ion Beam Modification of Magnetic Materials"

The eminent scientists from all over the world including Germany, France, United Kingdom, Italy, Japan, Kazakhstan and India are delivering key note address, plenary and invited lectures. The networking sessions and interaction with school students are other interesting parts of the ICAMMS. The participants also include faculty and students from Amity Noida campus, Manesar, Mumbai campus and Amity Dubai. The other Indian institutions participating in the conference are Delhi university, Hyderabad university, IIT Kanpur, NISER Bhubaneswar, University of Pune, King George Medical College, Lucknow, etc.

A MOU was also signed between Amity University and IIT Indore during inauguration session.

The conference gave an opportunity to young researchers working in the field of accelerator based research especially in the area of materials and medical science to interact with the international experts. The proceedings of the conference will be published after peer review, in an international Radiation Effects and Defects in Solids by Taylor and Francis. The Ion Beam Society of India (IBSI) is offering the prizes for the best poster presentation by research scholars.

<b>DAY 1</b> <b>5<sup>th</sup> October 2017 (Thursday)</b>	
09:00-10:00	<b>REGISTRATION</b>
10:00-11:15	<b>Inaugural Session</b>
11:15-11:40	<b>HIGH TEA</b>
Technical Session I	
<b>Chair: Christina Trautman</b>	
11:40-12:25	<b>Key Note Address:</b> <b>J. Fassbender</b> - <i>Ion Beam Modification of Magnetic Materials</i>
12:25-12:55	<b>Invited Talk 1 :</b> <b>Amit Roy</b> - <i>Accelerator Development in India: Present Status and Future Perspectives</i>
12:55-14:00	Lunch
Technical Session II	
<b>Chair: M Scholz</b>	
14:00-14:45	<b>Plenary Lecture 1:</b> <b>Katia Parodi</b> - <i>Ion beam therapy: state-of-the-art and research opportunities</i>
14:45-15:10	<b>Invited Talk 2 :</b> <b>V. N. Bhoraskar</b> - <i>Design and development of 6 to 18 MeV electron beam system for medical and other applications</i>
15:10-15:35	<b>Invited Talk 3 :</b> <b>Shu Seki</b> - <i>Organic Functional Nanomaterials by Single Particle Triggered Linear Polymerization</i>
15:35-16:00	<b>Invited Talk 4 :</b> <b>A Kinomura</b> - <i>A simultaneous irradiation system with ion and slow-positron beams for in-situ characterization of radiation damage</i>
16:00-16:10	<b>Oral 01:</b> <b>Jorg Schreiber</b> - <i>Laser-driven ION(LION) sources</i>
16.10- 16.30	TEA
Technical Session III	
<b>Chair: J. Zegenhagen</b>	
16:30-17:15	<b>Plenary Lecture 2:</b> <b>Stephan Roth</b> - <i>Synchrotron radiation in materials science</i>
17.15-17:25	Oral 02: <b>Pallavi Pandit</b> - <i>Morphological tuning of complex polymer-metal nanostructures via process parameters</i>
17:30-18:30	Felicitation ceremony for award of Honorary Professor
18.30-19.30	Early Dinner
19:30-22:30	Tour to Burj Khalifa/ Dubai Mall

**DAY 2 - 6<sup>th</sup> October 2017(Friday)**

**Technical Session IV (GC-06)**

**Chair: G. Mattei**

09:30-10:15	<b>Plenary Lecture 3:</b> <b>Jorg Zegenhagen</b> - <i>Material and Life Sciences in the Light of Synchrotron Radiation</i>
10:15-10:40	<b>Invited Talk 5 :</b> <b>G Amarendra</b> - <i>Overview of Accelerator based Materials science studies using Positron Annihilation and Electron Spectroscopy</i>
10:40-11:05	<b>Invited Talk 6 :</b> <b>Amarjit Kaur</b> - <i>Effect of Swift Heavy Ion Irradiation on Conducting Polymers and Other <math>sp^2</math> Hybridised Materials</i>
11:05-11:30	<b>Invited Talk 7 :</b> <b>P K Sahoo</b> - <i>Hybrid nanodot evolution by ion irradiation of thin films</i>
11:35-12:00	TEA

**Technical Session V(GC-06)**

**Chair : Shu Seki**

12:00-12:25	<b>Invited Talk 8 :</b> <b>Tetsuya Yamaki</b> - <i>Metal Nanocatalysts Prepared by Ion Beam Irradiation for Hydrogen Energy Devices</i>
12:25-12:50	<b>Invited Talk 9 :</b> <b>Akihiro Iwase</b> - <i>Advantages of Using Ion and Electron Accelerators for Radiation Damage Studies and Materials Modifications</i>
12:50-14:00	LUNCH

**Technical Session VI(GC-06)**

**Chair: J. Fassbender**

14.00-14:45	<b>Plenary Lecture 4:</b> <b>Christina Trautmann</b> - <i>Material science and nanostructures produced with GeV heavy ions</i>
14:45-15:10	<b>Invited Talk 10 :</b> <b>Ratnesh Gupta</b> - <i>Influence of Ion beams to tailor the optical properties of metal doped transition metal oxide thin films</i>
15:10-15:35	<b>Invited Talk 11 :</b> <b>Alma Dauletbekova</b> - <i>Formation of ZnO Nanocrystals in SiO<sub>2</sub>/Si Track Templates: Experiment and Computer Simulation</i>
15:35-15:45	Oral 05: <b>S V Bhoraskar</b> – <i>Electrical Characteristics of Silver Nanoparticles Filled Etched Ion-Tracks In Polyimide</i>
15:45-15:55	Oral 06: <b>Nimmala Arun</b> – <i>Hafnia based resistive switching devices for non-volatile memory applications and Effects of ion irradiation and thermal annealing on device performance.</i>
15:55-16:05	Oral 07: <b>Dileep K Mishra</b> – <i>Strain Disorder: new degree of freedom to control structurally dissimilar magnetic phased separation in La<sub>5/8-y</sub>PryCa<sub>3/8</sub>MnO<sub>3</sub> epitaxial thin films.</i>
16.05-16:15	Oral 08: <b>A P Gnana Prakash</b> – <i>5 MeV Proton Irradiation Effects on 200 GHz Silicon-Germanium Heterojunction Bipolar Transistors</i>

**Technical Session VII**

16:15-18:00	POSTER AND TEA (GC-04)
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16:30-17:30	Networking with invited speakers
17:30-18:30	Open House for Dubai School students ( AUDITORIUM)
19:00-22:30	CONFERENCE DINNER ON MARINA CRUISE

## DAY 3 7<sup>th</sup> October 2017 (Saturday)

### Technical Session VIII

**Chair: Katia Parodi**

09:30-10:15	<b>Plenary Lecture 6:</b> <b>M Scholz - Radiation Biophysics Research at GSI for Ion Beam Tumor Therapy</b>
10:15-10:40	<b>Invited Talk 12 :</b> <b>Y Saintigny - Multimodal treatments of radio-resistant cancer: emerging effective combined therapy of PARP-1 inhibitors and high-LET particle therapy</b>
10:40-11:05	<b>Invited Talk 13 :</b> <b>G Mattei - Quantum emitters coupled to plasmonic nanostructures: from quantum efficiency enhancement to nanolasing</b>
11:05-11:15	Oral 09: <b>Anoop Kumar Srivastava – Comparative evaluation of efficacy of electron photon combination versus photon based VMAT</b>
11:15-11:25	Oral 10: <b>Teerthraj Verma – Medical Linear Accelerators in radiotherapy: Dose escalation with improved accuracy in lung cancer</b>
11:25-11:35	Oral 11: <b>K R Nagabhushana – Thermoluminescence studies of <math>Al_2O_3:Tm^{3+}</math> phosphor for carbon beam dosimetry</b>
11:40-12:00	TEA

### Technical Session IX

**Chair: G. Amarendra**

12:00-12:25	<b>Invited Talk 15:</b> <b>Nageshwar Rao - Ion Beam Studies of Hafnium-based high-k Dielectric Materials: Nanoparticles, Thin-films and Devices</b>
12:25-12:35	Oral 12: <b>Renuka Seenivasan – Growth and irradiation studies of organic single crystal</b>
12:35-12:45	Oral 13: <b>Prachi Singhal – Enhanced Electrical Conductivity of Carbon Ion Implanted PMMA/nano graphite Nanocomposites</b>
12:45-12:55	Oral 14: <b>Richa Krishna – Local structural investigation of doped ZnO nanostructure.</b>
12:55-14:00	LUNCH

### Technical Session X

**Chair: A. Roy**

14:00-14:10	Oral 03: <b>Shalendra Kumar – Near edge X-ray absorption fine structure spectroscopy and magnetic properties of Ni doped CeO<sub>2</sub> nanoparticles</b>
14:10-14:20	Oral 04: <b>Gagan Sharma – In situ growth behavior of ultrathin Fe and CoFeB films on MgO using synchrotron x-rays</b>
14:20-14:30	Oral 15: <b>Basant K Sikarwar – Tailoring the wettability of copper surface with Ion</b>

	<b><i>Beam Irradiation</i></b>
14.30-14.40	Oral 16: <b>M D Kirkire</b> – <i>Effect of Swift (200 MeV) Ag<sup>9+</sup> ion irradiation on structural and optical properties of indium phosphide</i>
14:40-14:50	<i>OR-17</i> <b>S. Bera</b> - <i>Evidence of Domain Formation in Langmuir Monolayers of Ternary Lipid Mixtures by X-ray Scattering</i>
CONCLUDING SESSION	
15.00-15:45	Outcome Assessment Meeting, Concluding Session & CERTIFICATE DISTRIBUTION
15:45-16.00	TEA

### **The Concluding Session:**

The concluding remarks were made by Dr. J. Zegenhagen, Diamond Light source UK and Dr. Amit Roy Ex Director of Inter University Accelerator New Delhi.

Dr. J. Zegenhagen expressed his gratitude to AUUP to invite him to the conference and was very happy to see that the conference covered wide range of areas in accelerators based research including Fundamental Sciences, Material Science and Medical Science with the large focus on use of radiations in Cancer Therapy. He expressed that the lectures were coming from all the areas which was more than his expectations. Further, he applauded the idea that Amity is given to start a new center for education research using Photon. He extended the invitation to the students of Amity to the Diamond Lab, UK. As per the interaction with the students, he could see that the students are very knowledge Hungry.

Dr. Amit Roy also expressed that he was really happy to come to Dubai Campus and congratulated the entire team for the well managed conference, in which all the speakers were handpicked and quality of the lecturers was excellent. He further, emphasized that Amity University can make a big impact by encouraging the Ion beam research. He advised that the students should be trained in this area and the in-house facility should be built. He suggested that an Electron Accelerator would be an ideal choice for Accelerator based multidisciplinary research. He further advised that a committee of experts may be formed for electron accelerator which will be responsible for setting up the electron accelerator center at Amity University. He mentioned that the MOU signed with Indore (IIT) is also a break through and would help Amity to capacity building. He further said that the initiative taken by Amity University is welcome and commendable. This will help getting people from all over the world.

One of the student participants, Ms. Debi Garai thanked to Amity University and Dr. Ajay Gupta in particularly which he give her opportunity to work at Dimond Light Source and work with Prof. J.Zegenhagen.

The posters presented by **Ms. Debi Garai** from Diamond Light Source and **Mr. Prabhakar Sahay**, PG student of Amity Institute of Nano-Technology, as judged by a jury, consisting of Dr. Iwase, Dr. Alma and Prof. Boraskar.

Dr. W. Selvamurthy gave the concluding remarks and expressed his sincere thanks to all the speakers who came from all over the globe to be with us. He expressed his great satisfaction that the presentations were of high quality. He emphasized the importance of the fruitful outcome of the conference through creating the interest groups within the larger groups.

He also thanked all the organizers of the conference from Noida & Dubai.