

Director's Report

May 27, 2017

# CONVOCATION 2017

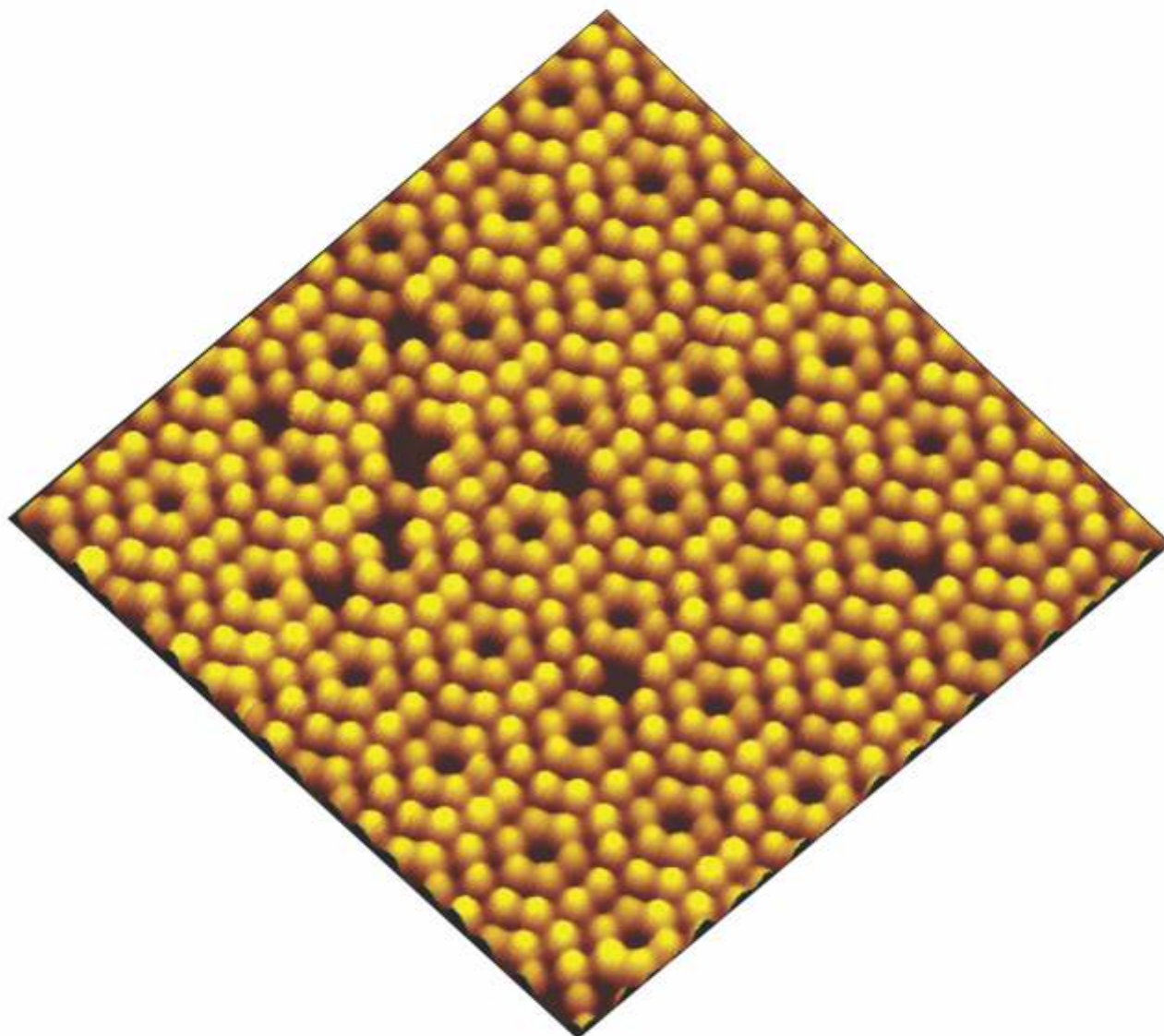


IN PURSUIT OF KNOWLEDGE





## Atomic resolution STM imaging at IISER Mohali



The 7x7 reconstruction of Si (111) surface.

This image was recorded at 300 mk by Anshu Sirohi, Shekhar Das and Goutam Sheet of IISER Mohali using an ultrahigh vacuum (UHV) scanning tunnelling microscope (STM) in August, 2016. The STM facility was funded by DST Nano-mission and IISER Mohali.

## Board of Governors (2016-17)

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Professor N. Sathyamurthy, Director, IISER Mohali  
Dr. P. Bapaiah, Registrar, IISER Mohali, Secretary

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Professor M. K. Surappa, IISc, Bengaluru  
Professor Arun Grover, VC, Panjab University, Chandigarh  
Professor Lilavati Krishnan, Retd. IIT Kanpur  
Professor Arvind, IISER Mohali  
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Professor P. Guptasarma, IISER Mohali  
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Professor J. S. Bagla, IISER Mohali  
Professor I. B. S. Passi, IISER Mohali  
Professor Shobha Madan, IISER Mohali  
Professor Somdatta Sinha, IISER Mohali  
Professor C S Aulakh, IISER Mohali  
Professor Sanjay Mandal, IISER Mohali  
Dr. P. Bapaiah, Registrar, IISER Mohali, Secretary

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Professor R. J. Hans-Gill, Retd. Panjab University  
Professor A. K. Ganguli, Director, INST, Mohali  
Professor Alok Bhattacharyya, JNU, New Delhi  
Professor A. K. Bachhawat, Dean R&D, IISER Mohali/  
Professor P. Guptasarma, Dean R&D, IISER Mohali

## Administration

Director – Professor N. Sathyamurthy  
Registrar – Dr. P. Bapaiah  
Dean Faculty – Professor Kapil H. Paranjape/ Professor Sudeshna Sinha  
Dean Academics – Dr. Ramandeep S. Johal  
Dean Students – Dr. N. G. Prasad  
Dean R & D – Professor P. Guptasarma  
Deputy Librarian- Dr. P. Visakhi  
Honorary Counsellor – Mrs. Suguna Sathyamurthy  
Assistant Registrar – Sh. Sandeep Ahalawat, Sh. Mukesh Kumar, Sh. Bipul Kumar  
Executive Engineer cum Estate Officer – Mr. P.K. Srivastava  
Asst. Security Officer – Sh. Kamaljeet

## IISER Mohali Milestones

September 27, 2006	Foundation stone laid by the Hon'ble Prime Minister of India, Dr. Manmohan Singh
June 18, 2007	Professor N. Sathyamurthy took charge as the Director
July 18, 2007	The first meeting of the Board of Governors, Chairman: Professor P. Rama Rao
August 2, 2007	The first meeting of the Senate, Chairman: Professor N. Sathyamurthy
July 25, 2012	I Convocation Chairman: Dr. R. A. Mashelkar Chief Guest: Sh. Kapil Sibal Guest of Honour: Professor C. N. R. Rao No. of BS-MS graduates: 26 I recipient of Doctor of Philosophy (Honoris Causa): Professor C. N. R. Rao
May 25, 2013	II Convocation Chairman: Professor K. K. Talwar Chief Guest: Professor P. Rama Rao, Founder Chairman No. of BS-MS graduates: 30 No. of PhD degrees awarded: 3
May 23, 2014	III Convocation Chairman: Professor K. K. Talwar Chief Guest: Dr. K. Kasturirangan, Member, Planning Commission No. of BS-MS graduates: 90 No. of PhD degrees awarded: 4
May 29, 2015	IV Convocation Chairman: Professor K. K. Talwar Chief Guest: Dr. M.V. S. Valiathan, National Research Professor, Manipal University No. of BS-MS graduates: 76 No. of MS graduates: 2 No. of PhD degrees awarded: 08
May 24, 2016	V Convocation Chairman: N. Sathyamurthy Chief Guest: Professor T V Ramakrishnan, Indian Institute of Science, Bangalore No. of BS-MS graduates: 82 No. of MS graduates: 09 No. of PhD degrees awarded: 25

## IISER Mohali Milestones

May 27, 2017

VI Convocation

Chairperson: Dr. Madhuchanda Kar

Chief Guest: Dr. Anil Kakodkar, former Chairman, Atomic Energy Commission.

No. of BS graduates: 02

No. of BS-MS graduates: 104

No. of MS graduates: 06

No. of PhD degrees to be awarded: 22

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### List of Graduates (Ph.D.)

Sr. No.	Name	Reg. No.	Title of the Thesis
1.	Nidhi Sharma Dey	PH08014	Studies on Larval Hematopoiesis in Drosophila: the Microenvironment and its Hematopoietic Stem Cells
2.	Venkata Subba Rao R	PH08015	Description of Radio-Frequency (RF) pulses in Quadrupolar nuclei
3.	Junaid Khan	PH09021	Study of Vibrio cholerae OmpU-mediated host-immunomodulation and underlying signaling mechanism
4.	Poonam Aggarwal	PH09025	Studying the role of Decapentaplegic in regulating cell fate alteration in larval imaginal discs of Drosophila
5.	Sivaranjan Uppala	PH09035	Multi-spin analysis of Rotational resonance NMR using Rabi oscillations and Reduced density matrix
6.	Vadla Rajkumar	PH09037	Studies on the Stereo- and Regioselective Synthesis of New Sets of Functionalized Pyrrolidine, Spiro- Pyrrolidine / Pyrrolizidine, Furfurylamine and 2-/3- (Aminoalkyl)-Thiophene Scaffolds via the Azomethine Ylide Cycloaddition and C- H Functionalization Methods
7.	B Chennakesavareddy	PH09039	Studies on Stereoselective Construction of Functionalized Carbo- and Heterocycles through the Barbier-Type Reaction and C-H Activation Strategies
8.	Barkha Khilwani	PH10042	Study of the immunomodulatory responses elicited by Vibrio cholerae cytolysin, a $\beta$ - barrel pore-forming toxin
9.	M Zulkifli	PH10047	Substrate Specificity and Mapping of Residues Critical For Transport in the Yeast Glutathione Transporter, Hgt1p
10.	Sanica Chandrakant Sakharwade	PH10050	Study of modulation of host innate and adaptive immune responses by Vibrio cholerae porin OmpU

Sr. No.	Name	Reg. No.	Title of the Thesis
11	Shelly Gupta	PH1005312	Study of modulation of host-cell death by <i>Vibrio cholerae</i> porin OmpU and the underlying mechanism
12	Shishram Rebari	PH1005413	Low Temperature Dissipation Scenarios in Palladium Nano-mechanical Resonators
13	Reddy Virsinha Venkat	PH1005914	Synthetic Approaches toward Benzannulated N-Heterocycles and Related Natural Products through Metal Catalyzed Domino Electrophilic Cyclization Reactions
14	Amandeep Kaur	PH1006115	Characterization of ChaC2 Proteins and their Role in Glutathione Degradation
15	Kanika	PH1006316	Unconventional magnetic ordering in Heisenberg and Hubbard models
16	Naveen	PH1006417	Studies on The Synthesis of New Classes of Crown Ether-Type/Polyether Macrocycles and Optically Active Aza-Oxo-Thia Polyether Macrocycles
17	Panjab Bhagwatrao Arde	PH1006618	Discovering new organocatalytic organic transformations using N-heterocyclic carbene as a catalyst
18	Saurabh Pandey	PH1007019	Modulation of metabotropic glutamate receptor 1 (mGluR1) intracellular trafficking
19	Shruti Arya	PH1107920	Mechanism of Disorder-to-Order Amyloid Transition: The Role of Conformational Plasticity and Water Mobility of Disordered Proteins
20	Gopal Verma	PH1108321	Unravelling the Nano-Mechanical Effect of Photon Momentum at Fluid Interface Using Optical Techniques
21	Seema Rani	PH11096	One-Pot Approaches for the Synthesis of Annulated Heteroarenes
22	Yogesh Mishra	PH12100	Beautiful Prison: Geopolitics of everyday life in Kashmir



### List of Graduates (MS)

Sr. No.	Name	Reg. No.	Subject
1.	Gurkaran Singh Mehta	MP14001	BIO
2.	Priya Sharma	MP14002	BIO
3.	Pratik Chattopadhyay	MP14005	PHY
4.	Pratyush Kumar Mishra	MP14008	MTH
5.	Jitendra Rathore	MP14009	MTH
6.	Gurdeep Singh	MP14012	CHM

### List of Graduates (BS-MS) MS 10 Batch

Sr. No.	Name	Reg. No.	Subject
1.	Shivprajval Divakar	MS10048	BIO

### MS 11 Batch

Sr. No.	Name	Reg. No.	Subject
1.	Devwrat Dube	MS11015	PHY
2.	Biswajit Panda	MS11051	PHY
3.	Harikrishnan P S	MS11066	PHY
4.	Vivek Singh	MS11067	PHY
5.	Arijit Kant Gupta	MS11073	PHY

## MS 12 Batch

Sr. No.	Name	Reg. No.	Subject
1	Shirina Arora	MS12002	MTH
2	Gaurav Saxena	MS12003	PHY
3	Yengkhom Roja Devi	MS12006	BIO
4	Kanishk Jain	MS12009	PHY
5	Jyosmita Lagachu	MS12010	MTH
6	Anuj Krishnasundar Pennathur	MS12011	CHM
7	Amit Devra	MS12012	PHY
8	Ravi Ranjan	MS12013	CHM
9	Ankit	MS12014	CHM
10	Aditya Vyas	MS12016	PHY
11	Abhijeet Roy	MS12018	PHY
12	Rahul Bansal	MS12021	PHY
13	Bharti Yadav	MS12022	PHY
14	Tejasvinee Atul Mody	MS12023	BIO
15	Ajit Kumar Yadav	MS12024	CHM
16	Sunidhi Taneja	MS12025	MTH
17	Prem Kumar	MS12026	CHM
18	Shivam	MS12028	PHY
19	Shikha Nagal	MS12029	MTH
20	Anirudh C R	MS12032	CHM
21	Nitesh Kumawat	MS12034	MTH
22	Rohan Gupta	MS12035	MTH
23	Harpreet Singh	MS12037	BIO
24	Arpita Nath	MS12038	BIO
25	Medha Sharma	MS12039	BIO
26	Karan Choudhary	MS12040	BIO

## MS 12 Batch

Sr. No.	Name	Reg. No.	Subject
27	Akanksha Singh	MS12041	BIO
28	Parul Janagal	MS12042	PHY
29	Bindia Chawla	MS12045	BIO
30	Shivali Sokhi	MS12046	PHY
31	K T Mushir Ul Hasan	MS12047	CHM
32	Mugdha Thakur	MS12048	MTH
33	Samridhi Panwar	MS12049	BIO
34	Vibhu Joshi	MS12051	BIO
35	Vaishnavi Niraj Nivsarkar	MS12052	BIO
36	Nimisha. E.S	MS12053	BIO
37	Anjali Krishnan	MS12054	PHY
38	Ashutosh Tiwari	MS12055	BIO
39	Sidhant Vivek Wagulde	MS12056	CHM
40	Aarathy. R.G	MS12057	BIO
41	Ateesha Negi	MS12058	BIO
42	Bhupendra Goswami	MS12059	CHM
43	Mohamed Musthafa Iqbal	MS12061	CHM
44	Ketika Garg	MS12062	BIO
45	Megha Treesa Tom	MS12064	BIO
46	Devika.S	MS12065	PHY
47	Sanjib Kumar Das	MS12066	PHY
48	Nimya.S.S	MS12067	CHM
49	Vikram Singh Bhati	MS12068	CHM
50	Satavisa Jana	MS12069	CHM
51	Karan Khurana	MS12074	PHY
52	Dony Varghese	MS12075	MTH

## MS 12 Batch

Sr. No.	Name	Reg. No.	Subject
53	Sruthy K. Chandy	MS12076	CHM
54	Maruthi Prasad M I	MS12077	BIO
55	Martik Chatterjee	MS12079	BIO
56	Neeru Mittal	MS12080	CHM
57	T H Anishya	MS12081	PHY
58	Rishabh Dhiman	MS12082	MTH
59	Vaishnavi Sridhar	MS12083	BIO
60	Amal Mathew	MS12084	BIO
61	Vikas Srivastava	MS12085	MTH
62	Aayush	MS12087	CHM
63	Sushma Thingujam	MS12088	BIO
64	Mishty Ray	MS12089	MTH
65	Malpure Abhishek Pravin	MS12090	MTH
66	Lata Kalra	MS12092	BIO
67	Mohan Lal	MS12094	BIO
68	Karthika Rajeev	MS12095	MTH
69	Shruthi Ravindranath	MS12096	BIO
70	Himanshi Balecha	MS12097	BIO
71	Shrinit Singh	MS12098	MTH
72	Sumit Kumar Agrawal	MS12099	CHM
73	Sande Sumaiya Zakirhusen	MS12100	MTH
74	Ebin George	MS12101	CHM
75	Bharti Sohpaal	MS12102	CHM
76	Jayanth Guhan	MS12104	MTH
77	Angel D S	MS12105	CHM
78	Akanksha Gautam	MS12106	PHY

## MS 12 Batch

Sr. No.	Name	Reg. No.	Subject
79	Sandra U.S	MS12107	BIO
80	Muhammed Shabin.S	MS12108	CHM
81	Athul R Vijayan	MS12109	BIO
82	Pawar Harshal Sanjay	MS12110	BIO
83	Harshita Mahla	MS12111	MTH
84	Pawar Vishakha Vijay	MS12112	MTH
85	Aleena Anna Thomas	MS12115	CHM
86	Rathi Siddhi Sunilkumar	MS12116	BIO
87	Haritha. R	MS12117	PHY
88	Ashish Thampi	MS12118	PHY
89	Ekta	MS12120	BIO
90	Akshay Sangwan	MS12121	BIO
91	Akshay Kumar	MS12123	PHY
92	Anusree. P. V	MS12125	CHM
93	Riya Ahuja	MS12126	BIO
94	Vishnu. P.K	MS12127	PHY
95	Jyoti Rani	MS12128	PHY
96	Ashish Ranjan	MS12129	PHY
97	Boddu Satya Spandana	MS12131	PHY
98	Vijith Kumar. V	MS12133	BIO

## List of Graduates (BS)

Sr. No.	Name	Reg. No.
1	Ushasi Dutta	MS10035
2	Nishant Malik	MS10083



**President's Gold Medal for the best Academic Performance**

Reg. No.	Name
MS12080	Ms Neeru Mittal



**Professor S N Kaul Prize for the best overall performance**

Reg. No.	Name
MS12016	Mr. Aditya Vyas



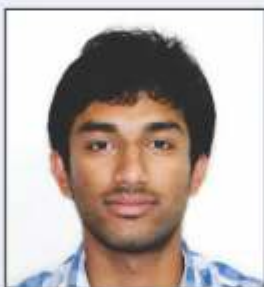
**Academic Excellence Prize in Biology**

Reg. No.	Name
MS12023	Ms Tejasvinee Atul Mody



**Academic Excellence Prize in Chemistry**

Reg. No.	Name
MS12080	Ms Neeru Mittal



**Academic Excellence Prize in Mathematics**

Reg. No.	Name
MS12075	Mr Dony Varghese



**Academic Excellence Prize in Physics**

Reg. No.	Name
MS12127	Mr Vishnu P K

“Remember that your knowledge and intellectual attainment is the most sacred wealth of the nation. You shall, therefore, use it in a manner befitting the honour and dignity of your country and of your alma mater. You shall make every effort, in all circumstances, to uphold the dignity of your profession and integrity of your character. You shall endeavour, in every way, through thought, word and action, to bring about the well being of the people. You must live a well disciplined life. Never forget the commandment of the sacred scriptures: 'Thou shalt perform deeds that are commendable and no others.'”



## Director's Report

Congratulations to the 6<sup>th</sup> batch of graduates from IISER Mohali.

Ten years is a short time in the history of an institution, particularly, the first ten years. When I agreed to become the Director of IISER Mohali in June 2007, I did not know what would take to build an institution. Coming from IIT Kanpur, I had heard so many stories about the building of IIT Kanpur and the role played by the founder Director, Dr. Kelkar, but I had no first-hand experience. Looking back, it is amazing to see how things fell in place with several people participating in institution building and supporting it from within and without. Now we have an institution called IISER Mohali. Full of energy, enthusiasm and potential and raring to go! We have outstanding faculty members and excellent students. Both of them have entered the portals of IISER Mohali through highly competitive processes.

Here I must thank the first three Chairmen, Professor P. Ramarao, Dr. R. A. Mashelkar and Professor K. K. Talwar for their able guidance in the first nine years. I am grateful to our current Chairperson, Dr. Madhuchanda Kar, a well known Oncologist for accepting the position. I am sure, she would guide us into research that would be of value to the society as well. Today's Chief Guest Dr. Anil Kakodkar is a role model for those of us who want to do quality research that is vital to the security of the Nation.

Today, when the students leave IISER Mohali as graduates, they have every reason to look back with satisfaction how the system has added value to them. When they joined as BS-MS students, after +2, they were like lambs. Today, they leave as lions. In the case of PhD graduates, the transformation is equally dramatic. They entered IISER Mohali as raw graduates from various backgrounds. Today, when they leave the campus with a Doctor title in front of their name, they walk out with confidence that they can pursue research, be it in academics or in industry or to become entrepreneurs or administrators.

Year after year, the number of students graduating from IISER Mohali is increasing, slowly but steadily. This year, we have 2 students graduating with a BS degree, 6 graduating with an MS degree, 104 graduating with BS as well as MS degrees and 22 graduating with PhD degrees. Incidentally, the first PhD from the Department of Humanities and Social Sciences is graduating today. His thesis titled, "Beautiful Prison" looks into the geopolitical reality in Kashmir and has received glorious reports.

I congratulate all the graduates of the day. Those who have excelled in their studies are being singled out with medals and honours. Additional felicitations to them.

Something special about IISERs is that the undergraduates pursue research in summer and in their final year. Some of them publish research papers with their seniors and mentors. This year also, a number of them have published research papers. Some of them are landmark papers.

The faculty have done well in terms of their research and have published papers that have received



global attention. Drs. Lolitika Mandal and Sudip Mandal and their students published a paper in *eLife* that has received global attention. The paper by Dr. Mahak Sharma and her collaborators in the *Journal of Cell Biology* identifies how protein machinery present in cellular compartments known as lysosomes receive cargo, which they degrade and recycle for building new molecules. Dr. Yogesh Singh published a paper in *Nature Physics* on spin liquids. Dr. Mandip Singh has been able to get some remarkable results on laser cooling, atom chip and polarization entanglement of photons. Dr. Goutam Sheet has established a state-of-the-art STM lab with support from nanomission. He has been able to achieve atomic resolution in the solid state and has discovered tip-induced superconductivity. The work has been published in *Nature Communications*. The work of Dr. Samrat Mukhopadhyay published in *J. Phys. Chem. Letters* was selected for ACS Liveslides. You can go to the journal website and watch the slides come live.

Our archaeologist Dr Parth Chauhan and his team have been digging in Narmada valley and elsewhere and they have discovered new Paleolithic and vertebrate fossil sites. A conference on rock art was organized by him at IISER Mohali in September 2016. It was sponsored by ICHR, New Delhi.

Dr. Prasad has established himself as an evolutionary biologist of standing in India. He has been organizing the Great Bird Count every year. I understand that IISER Mohali has emerged as a hotspot for birds in Punjab. Please look at our website for the birds of IISER Mohali.

When you do work of quality, recognitions follow. Many students have presented their work in national and international conferences and have received best poster awards. Divya Khatter, a 5<sup>th</sup> yr PhD student received the highly prestigious "ASCB travel award" to attend the annual conference of the American Society of Cell Biology (ASCB) held in San Francisco, USA from Dec 3<sup>rd</sup>- Dec 7<sup>th</sup>, 2016. Karishma Bhasne, a PhD student in the lab of Dr. Samrat Mukhopadhyay was selected for an oral presentation at the Biophysical Society meeting that was held at New Orleans, USA in February 2017. Ms. Vidhika Punjani, PhD student in the lab of Dr. Santanu Pal received The Dewan Jawahar Lal Nayar Memorial prize at the 23<sup>rd</sup> National Conference on Liquid Crystals (NCLC) held at Indian Institute of Technology (Indian School of Mines), Dhanbad, during 7-9 Dec. 2016. Jagadish P. Hazra received the most commendable poster Award at IBS 2017, held in IISER Mohali and Gayathri S. Singharaju received the Best poster award in OWLS 2016 held at TIFR, Mumbai. Kanchan Jaswal received the best poster prize at the EMBO conference on Bacterial Morphogenesis, Survival and Virulence held in Thiruvananthapuram, Kerala, from the 27<sup>th</sup> November to 1st December 2016. Richa Singh got an award for the Best oral presentation and Lata Kalra got a Best poster award in the National Ecology Conference, YETI 2017 held in Tezpur Univ. in January 2017. Dr. Ranjana Jaiswal, an institute RA, received a travel grant to carry out some work on cricket taxonomy and systematics in the Natural History of Museum, Paris. Dr. Seema Rani, a PhD student of Dr. Ramasastry received the Lilly Outstanding Thesis Award for the year 2016. Dr. Chinmoy Sarkar, the first PhD graduate in Earth and Environmental Sciences from IISER Mohali has received the prestigious Fulbright-Kalam Post-Doctoral Fellowship to work with Professor

Guenther in University of California, Irvine, USA. This list is only illustrative of the accomplishments of our students.

Dr. Ramasastry received the Young Scientist award in Chemical Frontiers Meeting held in Goa in August 2016. He has also received the Thieme Chemistry Journal Award 2017. Dr. Mahak Sharma received the "SERB Women Excellence Award" from the Department of Science and Technology, which includes a research grant of Rs.5.00 lakh per annum for a period of 3 years. Dr. Vinayak Sinha received the NASI-SCOPUS Young Scientist award for his work in the area of Earth, oceanographic and environmental studies. Dr. Goutam Sheet received the Swarnajayanti Fellowship from the Department of Science and Technology. Dr. Anu Sabhlok got the Fulbright Nehru Academic and Professional Excellence Fellowship and she will be spending a sabbatical year in the US.

Professor Sudesh Kaur Khanduja, after retirement from IISER Mohali stays on as INSA Senior Scientist. She has been elected Fellow of the World Academy of Sciences, Trieste, Italy. Professor Somdatta Sinha also retired from IISER Mohali, but stays on as a Visiting Professor. She has received a prestigious visiting research Fellowship from the Peter Walls Institute of Advanced Study of the University of British Columbia, Canada. Professor R Gadagkar, Professor at the Indian Institute of Science, Bengaluru and an Honorary Professor at IISER Mohali has been elected Fellow of the American Academy of Arts and Sciences.

In addition to publishing research papers, some of our colleagues have been able to publish books and monographs. Dr. Santanu Pal published a book on Liquid Crystal Dimers. Professor H L Vasudeva, a visiting Professor with us until recently, has published a book on Elements of Hilbert Spaces and Operator Theory. The proceedings of "The first workshop on Beyond Standard Model Physics" held at IISER Mohali in April 2016 is coming out as a special issue of Pramana, a Journal of Physics.

Our colleagues have organized several national and international conferences. One of the largest events was the meeting of the Indian Biophysical Society held in the campus in March 2017. More than 400 people attended the meeting that lasted for 4 days. Dr. Kausik Chattopadhyay and colleagues organized the 11th international symposium on Cell surface macromolecules during February 24-28, 2017. Drs. Mahender Singh and Krishnendu Gongopadhyay organized a Discussion Meeting on Topology and Groups. They have received a huge grant from the Department of Science and Technology for collaboration with Russian mathematicians. Dr. Visakhi, our Librarian and her colleagues hosted the 6th International Library and Information Professionals Summit (I-LIPS 2017) during April 6-8, 2017.

All the Directors of IISERs converged at IISER Mohali on February 25, 2017 and shared their experience in building the different IISERs. Shri K K Sharma, the Secretary, Higher Education sat through the proceedings the whole day. We hope to publish the proceedings soon so that the lessons learned can be of use to others.

While it is too early to talk about national and global ranking of IISERs, the fact remains that four IISERs came within the top 100 institutions in the country. IISER Mohali was ranked 52. What is unique about the IISERs is that they have built a global brand name in a span of 10 years. In chemistry, the IISERs collectively are ahead of the Indian Institute of Science Bangalore and the IITs and CSIR laboratories as reflected in the recent Nature Index.

To become an institute of global importance, global outreach is essential. We have had several outstanding scholars from all over the world visit us. Professor Richard N. Zare from Stanford University was one of them. Professor Shiv Grewal from National Institute of Health, Bethesda, USA was another. The latter is also an adjunct professor at IISER Mohali. As a part of the MHRD initiative, we have organized two GIAN workshops. The one on "Cognition: an interdisciplinary perspective" was organised by Dr. Samarjit Bhattacharya and Prof. Somdatta Sinha along with Prof. Mriganka Sur from MIT as a resource person.

We have signed MOUs with Saitama University, Japan and Cardiff University, UK. The Directors of IISERs are about to visit France to explore the possibilities of collaboration with their Ecoles Normales Superieuries.

Although the logo of the institute says, "In pursuit of knowledge", we are conscious of the need to convert knowledge into wealth. Some of our colleagues have filed national and international patents. The Board of Governors have approved an IPR policy that is progressive and it would facilitate our joining hands with industry. We have set up a Technology based Business Incubator under the StartUp India initiative of the Government of India. Shri Rakesh Sharma will join us as the CEO of the TBI on July 1, 2017. Our neighbour Indian School of Business is an important partner in this endeavour.

Our Chairperson has congratulated the institute for keeping the campus clean. I am grateful to the students and the rest of the community for their contribution in making IISER Mohali a part of Swachh Bharat.

Our students organised the annual cultural event "Insomnia 2017" on a grand scale. The highlight of the event was the performance by Guthrie Govan, the world renowned guitarist.

IISER Mohali has a vibrant set of student clubs that are well supported by the institute. These clubs have participated in and won multiple competitions. Our dance team has won many accolades. Classical Dance group Malhar won the Chandigarh round of MTV Coy6 and went to the zonal round at Mumbai. The Bhangra group has won multiple competitions.

The IISER Mohali Quiz Club, A Brighter lamp has established itself as a strong group in the quizzing circles. Because of their efforts, IISER Mohali was able to host the prestigious TATA Crucible quiz this year. All the clubs came together and organised a month-long series of events during August 2016 designed to help the incoming batch of BS-MS students adjust to life at IISER Mohali. A movie making workshop was conducted by the National Award winning directors Nirmal Chander and Reena Mohan and National Award winning photographer Sonu Singh. As part of this workshop, our students have made five short movies that have been greatly appreciated by professional movie makers.

The sports activity at IISER Mohali have developed very well. Our sports teams performed very well in Inter IISER sports meet held at IISER Kolkata. The Badminton men, women and mixed double teams were winners. Our lawn Tennis men's team were also winners. Our students won gold in Shot-Putt and Long Jump. They were runners up in many sports including football and Kho-Kho.

Yoga classes are being held regularly on campus. We were a proud part of the world Yoga day celebrations led by the Prime Minister at Chandigarh last year. We have established a state of the art Gym facility at IISER Mohali.

YATN (Youth's Attempt To Nurture) organised a three day camp for 80 under-privileged kids in collaboration with the MakeADifference organisation.

We are proud of our alumni. The Board of Governors have approved setting up of an Alumni association. While it is too early to talk about the accomplishments of our alumni, I can share the good news that Asif Equbal and Sumit Mittal of 2008 batch, who graduated with a Masters in 2013, have completed their PhD degrees from Denmark and Germany, respectively. Rishi Raj Trivedi of the pioneer (2007) batch has completed his PhD degree programme from the University of Wisconsin, Madison, Wisconsin a few days ago. He also earned a PhD minor in Business and a graduate certificate in Entrepreneurial Management.

Some of our doctoral graduates have already become faculty members in some of the academic institutes in different parts of the country. What is particularly worth mentioning is the fact that two of them have become faculty members in IISER Berhampur. One of them, Dr. Bodhisatta Nandy received the INSPIRE faculty fellowship earlier and has recently been awarded the Young Scientist Medal from the Indian National Science Academy, New Delhi.

IISER Mohali is an active member of the Chandigarh Region Innovation and Knowledge Cluster (CRIKC). We have signed an MOU with the Semiconductor Laboratory, Mohali.

Several distinguished visitors gave Public Lectures during the year, the latest being by Professor K S Valdiya on "The Himalayan-born River Saraswati: A Victim of River Piracy" on April 3, 2017.

Training the trainers is an important task in the hands of enlightened faculty. Professor Arvind, Coordinator, Outreach has been active in interacting with the Punjab Government and organizing workshops for the teachers in the region. He has also been responsible for reaching out to a large number of students and colleagues from the region and from far off places.

In addition to hosting a large number of summer interns coming through the Academies, IISER Mohali from its inception has been organizing summer programmes for undergraduates. This year also, we have about 50 such interns working with our faculty in the campus. We hosted a workshop for students from North East.

IISER Mohali is about to start its decennial celebrations. While it is important for us to celebrate what we have accomplished in the last ten years, it is equally important to take stock of things and review the progress made thus far. In addition to review of each department, an appraisal of the institute as a whole was undertaken through a committee appointed by the Board of Governors. A curriculum

review committee with Professor Kapil Paranjape as the Chairman has been appointed by the Senate and we hope to have its report soon. The Department of Earth and Environmental Sciences is keen to start a major in the subject. The Department of Humanities and Social Sciences is keen to start a Masters Programme in Science, Environment and Society.

To grow further, IISER Mohali needs money, money in large quantity, to build buildings and to improve the infrastructure. Contributions to IISER Mohali will receive tax exemption under Section 35 of the income tax Act of India. I hope all of you will come forward and contribute liberally in cash or kind to the growth of IISER Mohali.

Jai Hind!

# Discovery of special stem cells in fruit flies to help study diseases

IISER team says model will come in handy as it shares similarities with humans

R. PILLAI

**DELHI** For the first time, researchers have discovered hematopoietic stem cells in *Drosophila* (fruit flies), thus providing an invertebrate model to study hematopoietic stem cells. Hematopoietic stem cells are the stem cells that give rise to all the other blood cells.

Until date there has been no evidence of hematopoietic stem cells in fruit flies and only the progenitor cells, which are precursors to differentiated cells, were found in these flies. The results were published in the journal *eLife*.

Many diseases in humans are linked to the development of blood cells. For instance, leukaemia and haemostatic anaemia take root at an early embryonic stage. But studying how the development of blood cells in humans leads to these diseases has been difficult as the early hematopoietic stem cell development takes place in a six-week-old embryo.

## Embryonic stage

"There are technical difficulties in studying hematopoietic stem cell development in human embryos as it would involve sacrificing the embryo. Also, when we take the hematopoietic stem cells and culture them in a plate, the signal produced might not be identical to the ones produced by cells inside the organism. So we need an animal model to study how this development takes place in the embryo. The fruit fly model comes handy," says Dr. Lohika Mandal from the Indian Institute of Science



**TOP IMAGE:** (From left) Dr. Lohika Mandal, Nidhi Sharma Dey and Parvathy Ramesh have discovered the hematopoietic stem cells in *Drosophila* (fruit flies). — PHOTO: ANS/ANAND

Education and Research (IISER), Mohali, and the corresponding author of the paper.

"Fruit fly will serve as a good model as it shares many similarities with humans — the signalling pathways and a lot of molecules and processes are common. Also, the way the HSCs (hematopoietic stem cells) are generated and the early process of blood cell development are similar in vertebrates and in fruit flies," says Nidhi Sharma Dey from IISER, Mohali, and the first author of the paper.

Progenitor cells that have already been found in the lymph gland (blood-forming organ) of fruit fly larvae give rise to mature blood cells. This led Dr. Mandal and her team to wonder if there are cells that actually give rise to these progenitor cells. "This search led us to discover the

hematopoietic stem cells in flies," she says.

## Multipotent cell

Using genetic techniques, the researchers could confirm the presence of a transient, hitherto unknown multipotent cell in the early larval stages of *Drosophila*.

The team went beyond discovering the hematopoietic stem cells that give rise to blood cells to describe the signals that are required for maintaining the status of stem cells. In the absence of signaling, the stem cells would all convert to mature blood cells leaving no stem cells behind.

"The signals that are required to maintain the hematopoietic stem cells in fruit flies are the same as seen in humans," Dr. Mandal says. The fruit fly model mimics everything of the vertebrates at

the level of genesis as well as maintenance."

In vivo imaging of the fruit fly model will allow researchers to tease out the genetic information required for normal development and the diseased condition. It will now become possible to study the early pathogenesis, which has not been possible so far.

## Ease of access

"While there is only one HSC in vertebrates in the early blood development stage, fruit flies have 4-5 HSCs. Also, there is an easy access to these HSCs for manipulation in the case of flies," says Ms. Dey.

"Though the concept of stem cell biology was launched from a vertebrate model, the first in vivo evidence of any stem cell has come from the *Drosophila* model," says Dr. Mandal.

## SCIENCE & TECHNOLOGY

# A brewing debate on evolution theory picks up in India

Is the construction a revolutionary concept in evolutionary biology?

ANAND K. PILLAI

The phenomenon of niche construction in evolutionary biology has been proposed to be a key concept that is being neglected in evolutionary biology. But just that, it has been termed a 'concept' as yet with no real definition. The Indian evolutionary biologists convened to discuss the concept of niche construction at the IISER, Mohali, on the 10th of August. Apart from being the author of the concept, the speaker, Dr. Parvathy Ramesh, has also written a paper on the topic. The paper is expected to be published in the journal *eLife*.

Over the last few decades, niche construction has become a buzzword in evolutionary biology. It is the process by which evolving organisms modify their environment, which in turn influences or constrains their own evolution. The concept has been widely used in the literature. Proponents of the theory have argued that it has been neglected in the field of evolutionary biology, which therefore needs to be re-examined. This has been the focus of the paper by the speaker, "Niche construction in the theory of evolution: a new paradigm level of evolution."

## A niche concept

It is interesting that evolutionary biologists from India are engaging in this debate on the concept of evolutionary theory. Niche construction, one of the key authors of the paper, remarks, "The individual has been largely added to the construction of this, sometimes ignored, niche construction and evolutionary biology is there, which concept, but hardly ever



**DEBATORS:** (From left) R. Pillai, Parvathy Ramesh, Anand K. Pillai and T.R. Sreejith. They got together periodically to work on conceptual issues in the foundations of genetic evolutionary biology. — PHOTO: ANAND K. PILLAI

in fundamental debates about the conceptual foundations of the subject. For example, the evolutionary debate within evolutionary biology for the past 50 years have been dominated by selection from North America and Western Europe."

One of the contributors of the article is the concept of the niche construction, which has been proposed by many authors to explain phenomena, more before the term, "niche construction" was coined. One of the examples they give is of an experimental study done by Bussell and others in 1981. The experiment involved breeding lines of fruit fly, *Drosophila melanogaster*, in an environment where food was contained and

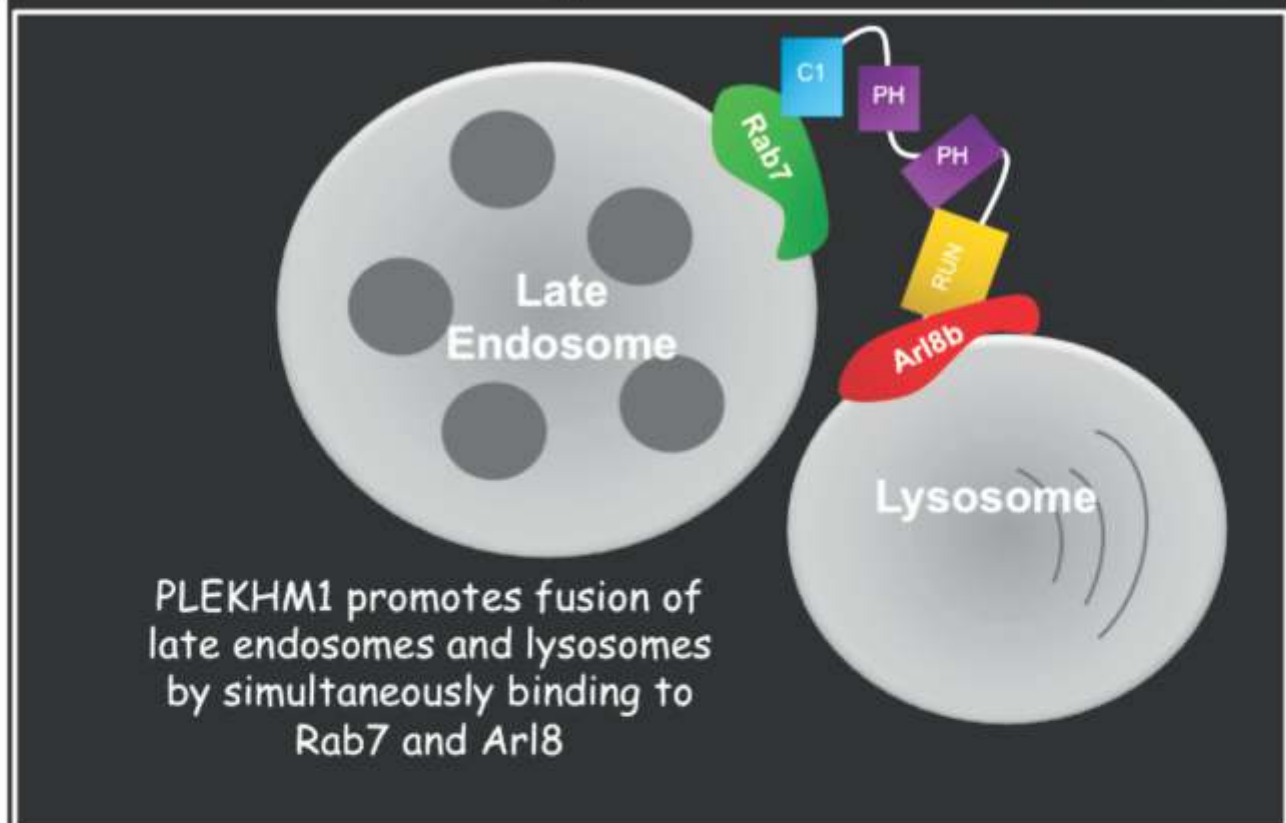
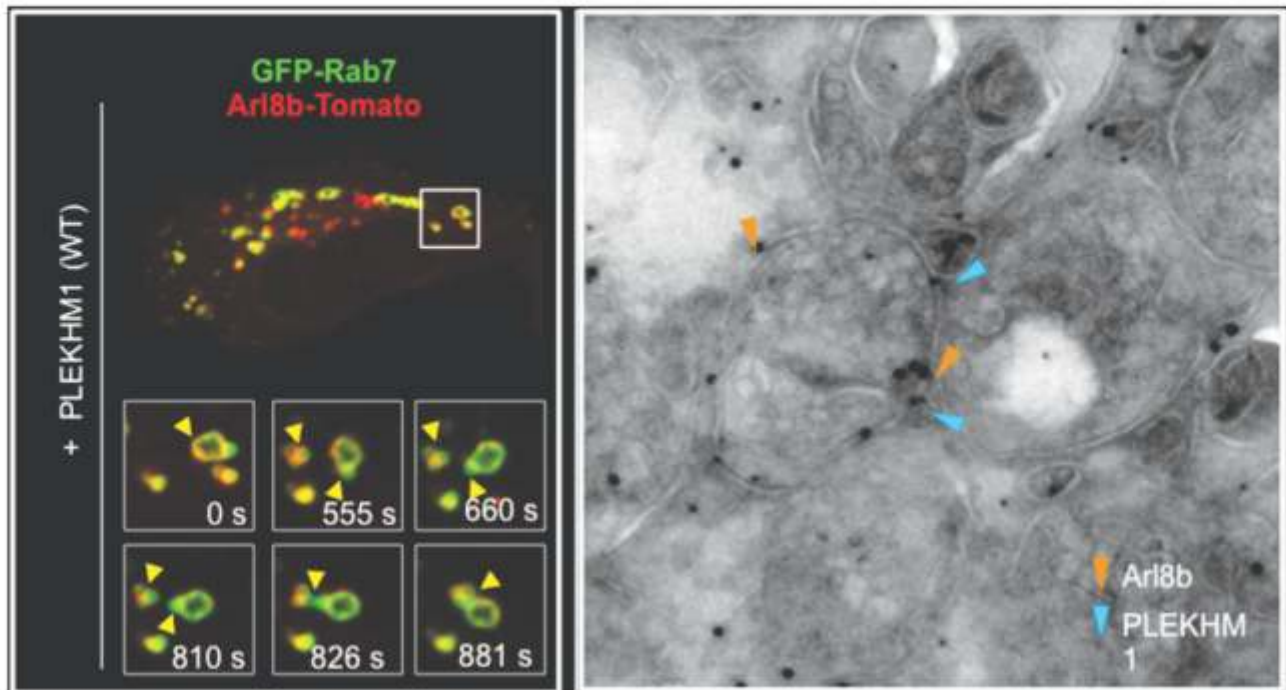
provision of nitrogenous waste was restricted. It was observed that even when the population that had been bred with no waste was introduced, it would not survive. This, while not predicted, they were able to observe the effect of provision of waste on the population that was added by the authors. The theory has been proposed by the authors of the article. They found that it involved the above phenomenon, except that the waste products and waste removal types.

Proponents of the construction view the following evolution: when the use of niche is used by humans, which is based on the evolution along with niche construction, and the fact that humans are not an evolved species, it is possible when

there is a provision of niche, due to the construction. The authors defend the claim by citing references of the above concept already being used within the concept of theory.

## Other claims

They also claim that the concept of niche construction is not a new concept, but it is a new concept. The authors defend the claim by citing references of the above concept already being used within the concept of theory. The article has been the subject of the International Conference on Evolutionary Biology, which was held in Mohali, India, in 2014. The authors defend the claim by citing references of the above concept already being used within the concept of theory. The article has been the subject of the International Conference on Evolutionary Biology, which was held in Mohali, India, in 2014.





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