



Chandigarh Region Innovation and  
Knowledge Cluster



<http://crikc.puchd.ac.in>



## **Chandigarh Region Innovation and Knowledge Cluster**

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# About the CRIKC



# CHANDIGARH REGION INNOVATION AND KNOWLEDGE CLUSTER (CRIKC)

Established since 2013

## Chairman CRIKC

**Prof. Arun K. Grover**

Vice Chancellor Panjab University

## Coordinators

**Prof. M. M. Gupta**

Dept. of Physics, Panjab University

**Prof. S. K. Mehta**

Professor of Chemistry and

Director SAIF/CIL, Panjab University

## ABOUT CHANDIGARH REGION INNOVATION AND KNOWLEDGE CLUSTER

CRIKC represents a Cluster of Chandigarh Region Institutions to Promote & Sustain Excellence in Research. Its Mission Statement is to foster academic alliances between institutions of higher education & research in this region, to facilitate innovation & knowledge creation, achieving excellence in all academic spheres without compromising the autonomy of participating institutions. It aims to carry out joint & collaborative research projects, to initiate joint teaching/training programs, to encourage pooling of research facilities, to promote & sustain the following themes for excellence in research: Biomedical Sciences, Applications of Nanoscience & Nanotechnology, Theoretical Studies, Policy Planning for better comprehension of GOI programs & societal needs.

## IMPORTANT EVENTS & ACTIVITIES ORGANIZED UNDER CRIKC

- A visit by **Prof. Venkatraman Ramakrishnan**, Nobel Laureate and President Royal Society, MRC Laboratory of Molecular Biology, Cambridge, UK to Chandigarh was jointly organized by CRIKC institutions from Jan 4-5, 2016. Prof. Ramakrishnan gave a public lecture entitled "On Nobody's Word: Evidence and Modern Science" on Jan 5 at Panjab University (PU, Chandigarh).
- A **joint research collaborating meeting** between **CRIKC institutions and Australian delegates** was held on Oct 20, 2015 at PU for long term relationship in terms of research collaboration via fast track funds, symposia and conferences, both in academic and industrial sector.
- A lecture entitled "**Chemical and Other Bonds**" by **Prof. Nilabh Shastri**, Head, Division of Immunology and Pathogenesis, University of California, U.S.A. was held in the Dept of Chemistry, PU on April 13, 2015.
- **Professor N. Mukunda**, Emeritus Professor, Centre for High Energy Physics, IISc, Bengaluru delivered a seminar entitled "**Science and the Human Predicament**" on March 12, 2015 in the Dept of Physics, PU.
- An MoU was signed on March 11, 2015 between **University of Nottingham (UoN) and PU on behalf of CRIKC institutions** for research collaborations, students exchange and creation of a joint program to develop innovation and discoveries for large scale applications.
- **9<sup>th</sup> Chandigarh Science Congress (CHASCON) - 2015**, was organized by **PU in collaboration with CRIKC institutions** from Feb 25-27, 2015. The conference was inaugurated by Prof. Padmanabhan Balram (Padma Bhushan, Padma Shri) former Director, IISc, Bengaluru, who delivered the key note address 'Chemistry at the Fringes of Biology'.
- On Feb 12, 2015, **Dr. Peter Lund**, Reader in Molecular Microbiology, School of Biosciences, University of Birmingham, U.K. visited **CRIKC institutions - PEC University of Technology and PU**. He delivered a lecture on "Laboratory-based evolution as a technique to probe mechanisms of stress resistance" at PU.
- An outreach program named "**PU OPEN Minds**" (Panjab University Outreach Program for Enlightening and Nurturing Young Minds) for school students was initiated on Jan 28, 2015 by faculty members of PU, with encouragement from CRIKC.
- Interaction of CRIKC institutions with Director Growth and Engagement-Home office London was organized on Dec 12, 2014 in PU. The purpose was to make Indian students aware about study/employment opportunities in England.
- "Conclave on Science Education - A Manifesto for India's Future" was held on Nov 29, 2014 at ICSSR Seminar Hall, PU under the aegis of Observer Research Foundation, Mumbai (ORF, Mumbai) in association with CRIKC and Society for Promotion of Science & Technology in India (SPSTI).
- **First outreach activity under Bio-Club**, set up under CRIKC, was organized on Nov 8, 2014 at Physics Auditorium, PU.
- The **British Council and CRIKC jointly organized an inter-university competition 'The Great Debate - 2014'** on the topic 'Social media has made the world dangerous and unstable'. The event was held on Sep 12, 2014, in the Golden Jubilee Hall at PU.
- A **delegation of 7 members from CRIKC institutions** led by Prof. Arun K. Grover, Vice Chancellor, PU visited U.K., **for study and networking with UK Universities** from Aug 26 to Sep 2, 2014.
- Following a proposal under '**Knowledge Economy Partnerships**' initiated by Prof. M.M. Gupta and Prof. R. Tewari from PU, the British Council sanctioned Rs. 1725250/- for a **study tour of UK universities** by the CRIKC members to foster academic interaction between UK universities and CRIKC institutions. An eight member team led by Prof. A. K. Bhandari, DUI, PU visited four UK institutions from June 23-29, 2014.
- PU along with CRIKC **hosted 79th annual meeting of Indian Academy of Sciences** from Nov 8-10, 2013.
- On July 24, 2013, **Mr. Rob Lynes**, Director British Council in India, visited **PU to explore CRIKC as a facilitator** for promoting interaction between British Universities and Chandigarh region institutions.



**CRIKC**  
**Annual Report**  
**(2013-2014)**

## CRIKC Annual Report 2013-2014

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The idea of Knowledge Hubs/Cluster finds its reference in ‘**Knowledge Commission Report**’ of GOI, recently advocated by ‘**Narayana Murty Report**’ as well as is alluded to in the 12<sup>th</sup> Plan document, Rashtriya Uchchar Shiksha Abhyan (RUSA) document of MHRD, ‘Science Technology Innovative (STI)’ 2013 Policy of GOI. Seizing the opportunity, Panjab University, after several rounds of meetings involving heads of higher education and research institutions in and around Chandigarh, in a meeting held on 24<sup>th</sup> November 2012 it was resolved to create a knowledge hub which was named as ‘**Chandigarh Region Knowledge and Innovation Cluster (CRIKC)**’ and also decided on its Logo. **Finally, on 11<sup>th</sup> May 2013, the Technology Day, heads of fifteen institutions signed on a document agreeing on an academic program to be carried out by the participating institutions. This was followed by lecture entitled, ‘Challenges and Opportunity for Translation of Science for Public Good’ by Dr Girish Sahni, Director CSIR Institute of Microbial Technology (IMTECH). The constituent institutions of CRIKC are as follows:**

Panjab University (P.U.), Sector 14, Chandigarh, 160014	PEC University of Technology, Vidya Path, Sector 12, Chandigarh,160012
Post Graduate Institute of Medical Education and Research (PGIMER) Sector 12 Chandigarh,1600012	CSIR- Central Scientific Instruments Organisation (CSIR-CSIO) Sector 30-C Chandigarh,160030
CSIR-Institute of Microbial Technology (IMTECH) Sector 39-A, Chandigarh-160036.	Terminal Ballistics Research Laboratory (TBRL) , Defence Research and Development Organization (DRDO), Ministry of Defence Sector 30, Chandigarh, 1600030

Government Medical College and Hospital (GMCH) Sector 32 Chandigarh, 160030	Snow & Avalanche Study Establishment (SASE) Defence Research and Development Organization (DRDO) Ministry of Defence Himparisar, Sector 37-A Chandigarh, 160017
National Institute of Technical Teacher Training and Research (NITTTR), Sector 26, Chandigarh 160026.	National Institute of Pharmaceutical Education and Research (NIPER), Sector 67, Sahibzada Ajit Singh Nagar (Mohali), Punjab, 160062.
The Indian Institute of Science Education & Research (IISER), Knowledge city, Sector 81, Sahibzada Ajit Singh Nagar (Mohali)-140306	National Agri-Food Biotechnology Institute (NABI) (Department of Biotechnology) C-127, Industrial Area, Phase 8 Sahibzada Ajit Singh Nagar (Mohali)
Centre of Innovative and Applied Bioprocessing (CIAB) - BPU, Interim Facility C-127, II Floor, Phase-VIII, Industrial Area, Sahibzada Ajit Singh Nagar (Mohali), Punjab, 160071.	<u>Institute of Nano Science and Technology (INST)</u> , Phase - 10, Sector 64, Sahibzada Ajit Singh Nagar (Mohali) Punjab 160062.
Indian Institute of Technology Ropar (IIT- R) Nangal Road, Rupnagar, Punjab INDIA - 140001	

In the mean time, Panjab University submitted a proposal under MPLAD scheme to Shri Pawan Bansal, then MP and PU Senate member, for acquiring buses to run shuttle service to connect the CRIKC institutions as well as to establish infrastructure for CRIKC. The proposal was accepted and the university received Rs 89 Lacs from the scheme for purchasing two AC buses and for developing infrastructure for CRIKC.

The CRIKC idea also received good deal of attention from Planning Commission and MHRD; the latter took keen interest in the idea. In fact, the MHRD ministry invited Panjab University for presentation before its official about the CRIKC proposal. On July 18<sup>th</sup> 201, the Vice Chancellor Panjab University, Professor Arun K Grover, along with Professors Manmohan Gupta and

Rupinder Tewari made presentation before Mr Ashok Thakur, Secretary Higher Education MHRD GOI, and other senior functionaries of the ministry. The proposal was appreciated very much and the Secretary Higher Education suggested that we could approach UGC for funds under 'RUSA' to provide a boost to the activities of CRIKC. In the last one year several activities have already been held under CRIKC, namely:

- In June 2013, the visits of Prof Yehiam Prior, a Distinguished Professor at Weizmann Institute of Science, Rehovot Israel, and Professor Richard Jones, a Distinguished Professor at Oxford University and President Physiological society of U.K., were hosted by CRIKC as one stop interaction point for all the institutions in the region.
- On July 24<sup>th</sup> Mr. Rob Lynes, Director British Council in India, visited PU to explore CRIKC as a facilitator to promote interaction between British Universities and Chandigarh region institutions.
- Panjab University along with CRIKC hosted 79<sup>th</sup> annual meeting of Indian Academy of Sciences from November 8<sup>th</sup> to 10<sup>th</sup> at PU Chandigarh with the activities on 9<sup>th</sup> and 10<sup>th</sup> to be held in other institutions associated with CRIKC, viz., CSIR-IMTECH and IISER Mohali respectively.
- In commemoration of the 125<sup>th</sup> birth anniversary of Sir C V Raman, Chandigarh Science Congress (CHASCON-8) was hosted by CRIKC institutions as a joint activity.
- Prestigious public lecture, 'Doing Science in India' by Bharat Ratna Dr CNR Rao FRS was organized on 2nd March at PGIMER jointly by the CRIKC institutions.
- On 11<sup>th</sup> May 2014, CRIKC celebrated Technology day by holding lecture, entitled, 'Before you learn the answers, learn to ask questions' by Padam Shri Dr Amod Gupta, founder of Advanced Eye Care centre and Dean PGIMER Chandigarh.
- Very recently on a proposal under 'Knowledge Economy Partnerships' initiated by Professor Manmohan Gupta and Professor Rupinder Tewari, the British Council sanctioned Rs 1725250/- for a study tour of UK universities by the CRIKC members to foster academic interaction between UK universities and CRIKC institutions. In this connection, an eight member team led by Prof A. K. Bhandari, DUI PU, visited four UK institutions from June 23<sup>rd</sup> to June 29<sup>th</sup> 2014.



The CRIKC initiative of Panjab University is getting recognition not only in India but also in several other countries. The Australian High Commission has also shown keen interest in this. In fact, a joint meeting between heads of CRIKC institutions and Ms Nicola Watkinson, Minister Commercial and Senior Trade & Investment Commissioner, Australian High Commission, New Delhi, was held on 3<sup>rd</sup> April in Vice Chancellor Committee Room of PU. A follow up meeting of this event is likely to be held in the near future.

The CRIKC initiative of Panjab University has also been appreciated by his Excellency Mr Shiv Raj Patil, Governor Punjab and Administrator Chandigarh. It may also be mentioned that Punjab Government has also appreciated this initiative very much. In fact, in this connection Sardar Prakash Singh Badal, CM Punjab, convened a meeting of all the heads of the CRIKC institutions as well as other heads of institutions to enlarge the scope of CRIKC to include other institutions of higher learning and research in Punjab. This was followed by a meeting of the three Vice Chancellors of the universities located in Chandigarh and Punjab with the Principal Secretary Higher Education Punjab on July 5<sup>th</sup> 2013. As a follow up of this, a meeting was held in GNDU to identify areas of joint research activities about which the three Vice Chancellors again held a meeting with Punjab Chief Minister.

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**Annual Report**  
**(2014-2015)**

## **Chandigarh Region Innovation and Knowledge Cluster (CRIKC)**

### **Annual Report 2014-2015**

The year saw consolidation of CRIKC activities on all fronts. Apart from holding several lectures and other academic activities under CRIKC, in a significant development free shuttle service connecting all the CRIKC institutions around Chandigarh was launched. One of the two shuttle buses, acquired under the MPLAD area fund, regularly makes two rounds on the working days while the other one is used on demand for taking students/scholars to attend lectures at different institutions. The year saw the signing of MoU between University of Nottingham (UoN) and CRIKC for promoting research/teaching activities between UoN and CRIKC institutions as well as expanding of the reach of CRIKC by including two of the private universities under its umbrella. Details of the salient activities carried under CRIKC are available at the website [crikc.puchd.ac.in](http://crikc.puchd.ac.in), a summary of the same is as follows.

- a) A delegation of 7 members from CRIKC institutions lead by Professor Arun Grover, Vice Chancellor, Panjab University visited U.K., for study and networking with UK Universities from August 26 - September 2, 2014. The delegation consisted of
  1. Prof. Arun K. Grover, Vice Chancellor, Panjab University (Leader of the delegation).
  2. Sh. Sandeep Hans, Special Secretary, Technical Education, Chandigarh Administration.
  3. Dr. Girish Sahni, Director, Institute of Microbial Technology, Chandigarh.
  4. Prof. Manoj K. Arora, Director, PEC University of Technology, Chandigarh.
  5. Prof. Anil Monga, Dean Alumni Affairs, Panjab University
  6. Prof. J. S. Bagla, IISER, Mohali.
  7. Dr. Sameer Malhotra, PGIMER, Chandigarh.
- b) The British Council and CRIKC jointly organized an inter-university competition 'The Great Debate – 2014' on the topic 'Social media has made the world dangerous and unstable'. The event was held on 12th September, 2014 at 2:30 pm, in the Golden Jubilee Hall at Panjab University, Chandigarh. The debate was judged by David Lelliott, British Deputy High Commissioner, Chandigarh, Sumita Misra, Secretary, Tourism, Hospitality & Transport, Gaurav Arora, Head of Programmes, North India, British Council and chaired by Ms. Supreet Dhiman, Association of British Scholars.

- c) Department of Computer Science and Engineering of PEC University Technology in association with CRIKC organized a one day 'Research Scholars Congregation' at PEC University of Technology on November 12, 2014. It was decided to create a common interaction platform where researchers from different institutes under CRIKC could congregate and get acquainted with each other's expertise in Computer Science and Engineering domain (Website: [PEC](#))
- d) A delegation consisting of Faculty members of University of Nottingham (UoN) and Officials of Nottingham visited CRIKC institutions on November 24, 2014, to concretise the possibilities of collaborations between the Nottingham University and CRIKC institutions.
- e) "Conclave on Science Education - A Manifesto for India's Future" was held on November 29, 2014, ICSSR Seminar Hall, Panjab University. This conclave was held under the aegis of Observer Research Foundation, Mumbai (ORF, Mumbai) in association with CRIKC and Society for Promotion of Science & Technology in India (SPSTI).
- f) First outreach activity under Bio-Club, set up under CRIKC, was organized on November 8, 2014 at Physics Auditorium, Panjab University.
- g) Interaction of CRIKC institutions with Director Growth & Engagement-Home office London was organized on December 12, 2015 at 1:00 p.m. at Panjab University. The purpose of the interaction was to make Indian students aware about the study and employment opportunities available in England.
- h) An outreach program named as "PU OPEN Minds" (Panjab University Outreach Program for Enlightening and Nurturing Young Minds) for school students was initiated by faculty members of PU, with encouragement from CRIKC. The Outreach program was inaugurated by Prof. Arun Kumar Grover, Vice Chancellor, on 28th January 2015 at 10.30 AM in the Physics auditorium of Panjab University and lectures by two eminent scientists, Professor O. P. Katare from University Institute of Pharmaceutical Sciences (UIPS), Panjab University delivered a lecture entitled "My Life, My Goals: Answers are Easy, Questions are Difficult" and Professor Arvind from Indian Institute of Science Education & Research (IISER), Mohali also delivered a lecture entitled "A glimpse into the Quantum World".
- i) On February 12, 2015, Dr. Peter Lund, Reader in Molecular Microbiology, School of Biosciences, University of Birmingham, U.K. visited CRIKC institutes - PEC University of Technology and Panjab University and interacted with faculty members and delivered a scientific lecture on "Laboratory-based evolution as a technique to probe mechanisms of stress resistance" at Panjab University.
- j) University of Burgundy, France has shown interest in having collaboration with CRIKC institutions. In this connection, Professor Franck Marzani and

Professor Cedric Demonceaux had interaction with CRIKC faculty members from February 13 - 15, 2015.

- k) 9th Chandigarh Science Congress (CHASCON) - 2015, was organized by Panjab University in collaboration with other CRIKC institutions from February 25 - 27, 2015. The conference was inaugurated by noted scientist Professor Padmanabhan Balram (Padma Bhushan, Padma Shri) former Director, Indian Institute of Sciences, Bengaluru, who delivered the key note address, 'Chemistry at the Fringes of Biology'. The inaugural function was presided over by Professor Arun Grover, Vice Chancellor, Panjab University. (Website: [CHASCON 2015](#))
- l) CRIKC acquired on 19<sup>th</sup> Feb two AC buses purchased from the MPLADS funds, which were provided by the then Member of Parliament (2009-14) and PU Fellow, Mr. Pawan Kumar Bansal, Professor Arun Grover, Vice Chancellor, DUI (PU) Prof. A. K. Bhandari, Registrar, Col. G. S. Chadha (Retd.), representatives from CRIKC institutions, Coordinators Professor Manmohan Gupta and Professor Rupinder Tewari, DSW Professor Navdeep Goyal, PU Campus Students Council President and office bearers received the buses on the PU campus. Shri Pawan Kumar Bansal flagged off the first run of the buses on 27<sup>th</sup> February.
- m) An MoU was signed on 11<sup>th</sup> March between UoN and CRIKC institutions. Panjab University (PU), Chandigarh and the University of Nottingham, (UoN), United Kingdom (UK) today signed the Memorandum of Understanding for research collaborations, students exchange & creation of a joint program to develop innovation and discoveries for large scale applications between the two leading universities of India and UK at New Delhi.
- n) Chandigarh Region Innovation and Knowledge Cluster (CRIKC) Institutions celebrated National Technology Day at the Punjab Engineering College (PEC) on 15<sup>th</sup> May. Director Institute of Nano Science and Technology (INST), Professor Ashok K Ganguli delivered lecture on the topic, 'Emerging Trends in Nano-Technology'. Professor Ganguli said that modern science has no barriers and modern scientists and engineers were working on all stream of sciences. He referred to various nano-technology driven applications and innovations. The lecture was presided over by Prof Arun Kumar Grover, Vice chancellor Panjab University, Professor Grover expressed satisfaction over the activities being carried under CRIKC for the last three years of its existence and described it as good beginning as well as informed the audience about the attention received by the CRIKC initiative from the international community. Besides several heads of the CRIKC institutions, good number of faculty members, research scholars and students attended the lecture. The lecture was followed by a meeting of the CRIKC institutions where it was decided to let private sector Universities namely Rayat Bahra and Chitkara Universities, join the CRIKC umbrella as well.
- o) A joint research collaborating meeting between CRIKC institutions and Australia delegates was held on Oct 20, 2015 at PU, for long term

relationship in terms of research collaboration via fast track funds, new symposia and conferences, both in academia and industrial sector.

- p) A lecture entitled "Chemical and Other Bonds" by Dr. Nilabh Shastri, Prof. and Head, Division of Immunology and Pathogenesis, University of California, U.S.A. was held in the Dept of Chemistry, PU on April 13, 2015.
- q) Professor N. Mukunda, Emeritus Professor, Centre for High Energy Physics, IISc, Bengaluru delivered a seminar titled "Science and the Human Predicament" on March 12, 2015 in the Dept of Physics, PU.

# **CRIKC**

# **Presentation**

**by**

**Prof. Arun Kumar Grover**

**Vice Chancellor**

**Panjab University at MHRD**



## Chandigarh Region Innovation & Knowledge Cluster



**Prof. Arun K. Grover**

Vice-chancellor

Panjab University, Chandigarh



# OUTLINE

- **Evolution & Concept**
- **Planning Commission Initiatives**
- **Motivation for Chandigarh cluster**
- **Meeting up**
- **Mission Statement**
- **CRIKC – A broad outline**
- **Phases I, II and III**
- **Lectures summary**
- **Proposal for MHRD**
- **Starting in right earnest**

## Cluster/Knowledge Hub – evolution and concept

- **21<sup>st</sup> century** - Innovation and Knowledge creation are the key drivers of development. The competitiveness of any country is going to be judged by its knowledge resource generation capacities.
- **To accelerate development of India**, it is imperative that high impetus be given to policies and actions which stimulate innovations address contemporary issues tuned specifically to ameliorate the problems being faced by our country.
- National Knowledge Commission (NKC) (constituted June 2005)
- **Sam Pitroda Report** - Underlined the development of excellence in educational and research institutions **facilitating innovation and knowledge creation**.

## PLANNING COMMISSION INITIATIVES

- The twelfth Plan initiatives, amongst other ideas, lay new and strong emphasis on collaborative research at both the national and international level, as well as mentions industry and academia interaction, which is vital for sustainable growth and development.
- The plan document also emphasized **creation of excellence cluster and networks as well as alliances.**
- Local alliances are desired to be created in different cities and interaction across institutions in such hubs need to be enhanced through a structured, highly interactive and collaborative framework
- **The institutions would be incentivized to collaborate and allow their courses to be available for students of other institutions pan India.**

- MHRD has also emphasized the creation of knowledge hubs and clusters in its 'RUSA' Document
- Furthermore, Science, Technology and Innovative (STI) policy of GOI also refers to clusters / hubs as tools for innovation and knowledge creation
- Globally, it is well known that innovation and knowledge clusters lead to accelerated creation of wealth ( i.e. **2/3 of world GDP originates from 40 odd clusters**)



## MOTIVATION FOR CHANDIGARH CLUSTER

- The idea of having knowledge cluster/hub has its genesis in the 'Narayana Murthy Report' April 2012, commissioned by Planning Commission on Corporate Participation in 'Higher Education'.
- Chandigarh provides an ideal location for creating a knowledge cluster or hub, as there are a large number of well established institutions within a radius of 8 – 10 kms.
- **Panjab University** – one of the oldest universities in India and renowned for its contribution towards higher education and research with an increasing list of eminent luminaries as alumni
- **Post Graduate Institute of Medical Education & Research (PGIMER)** – Asia's premier medical education and research institute. Well recognized for its health services, education, research and training facilities, globally.

**The above are nationally and internationally known for their contributions too.**

## Just to name a few....

1. Panjab University	8. TBRL – Terminal Ballistic Research Laboratory
2. PGIMER - Post Graduate Institute of Medical Education & Research	9. ISB – Indian School of Business (Mohali)
3. CSIO – Central Scientific Instrumentation Organization	10. PEC – Punjab Engineering College of Engineering and Technology
4. IMTECH – Institute of Microbial Technology	11. IIT ROPAR
5. IISER – Indian Institute of Science Education & Research (Mohali)	12. National Institute of Technical Teachers' Training and Research
6. NIPER – National Institute of Pharmaceutical Education & Research	13. Govt. Medical College & Hospital
7. NABI – National Agri Food Biotechnology Institute	14. Institute of Nano Science & Nano Technology (Mohali)
	15. Centre for Agro Processing (Mohali)

Broadly these cover higher education and research in medical science, engineering and physical sciences. Also there are many industrial units related to some of the research activities around Chandigarh.

## For example

Chandigarh has all types of institutes

- *Educational:* PU, PEC, IISER, NIPER, ISB, NITTTR
- *Research:* CSIR : **CSIO, IMTECH**; DST: **NSNT**; DBT: **NABI, BPU**; DRDO: **TBRL**; Min. Petroleum & Industry: **NIPER**
- *Medical:* PGIMER, GMCH
- *Engineering:* PEC, IIT-Ropar
- *Industry:* Baddi (H.P.); CII (North) HQ at Chd.

Further Chandigarh region is rich in intellectual resources,

- Over 40 Fellows (INSA, FASc, FNASc) with over 500 active scientists
- CHASCON; Children Science Congress; National/International Conferences/WKSP/ Seminars
- Chandigarh apart from being well planned , is also well connected by Road and Air. Soon, we'll have International Airport

## Chronology of meetings leading to formation of CRIKC

<b>July 25<sup>th</sup> , 2012</b>	Visit of Mr Ashwani Kumar, Honorable Minister of State for Science and Technology, Govt. of India.
<b>August 21<sup>st</sup> 2012</b>	<b>At :</b> NABI (Mohali) on Bio Science Cluster
<b>August 25<sup>th</sup> 2012</b>	<b>At:</b> PU Guest House
<b>October 2<sup>nd</sup> 2012</b>	<b>At the,</b> Director's Office, PGIMER, Chandigarh
<b>October 21<sup>st</sup> 2012</b>	<b>At :</b> IIT Ropar
<b>November 1<sup>st</sup> 2012</b>	<b>At:</b> ISB (Mohali )Convened by Shri Pawan Agarwal, Advisor Higher Education Planning Commission
<b>November 10<sup>th</sup> 2012</b>	<b>At:</b> CSIO Chandigarh on Bio cluster
<b>November 24<sup>th</sup> 2012</b>	<b>At:</b> PU Chandigarh as a follow up to 1 <sup>st</sup> November Meeting.



## And the meetings continued

- CRIKC - christened on 24<sup>th</sup> November 2012 in a meeting held at Panjab University, Chandigarh.
- CRIKC has already received Rs one crore from the local MPLAD scheme for purchasing two AC buses (Rs 50.00 lacs) and another Rs 50.00 lacs for developing infrastructure for starting CRIKC.
- Server / Computers and computer peripherals, video conferencing paraphernalia etc., as well as books for library are to be procured shortly.

Finally, on 11<sup>th</sup> May, the Technology Day, 15 Heads of Institutions approved a document enunciating academic co-operation amongst participating institutions.

## Mission Statement

- **To foster and sustain close academic alliances between institutions of higher education and research in the Chandigarh region.**
- **To facilitate innovation and knowledge creation.**
- **Achieving excellence in all academic spheres without compromising in any manner the autonomy of the participating institutions.**

## CRIKC would Aim For:

1. To identify and carry out joint and collaborative research projects.
2. Attempt to initiate joint teaching/training programs including pre-PhD courses,
3. To encourage the pooling of research facilities of the participating institutions.
4. Nurturing scientific culture from school level.
5. To promote the spirit and philosophy of 'Meta-University' concept.
6. To promote and sustain the following themes for excellence in research:  
*Biomedical Sciences, Applications of Nano-science and Nano-technology, Theoretical Studies*
7. Policy Planning for better comprehension of GOI programs and societal needs.

## Tentative Administrative Structure of CRIKC

- Entire governance of CRIKC would be vested with the **Advisory Committee** consisting of the **Heads of participating institutions**.
- **Advisory Committee** will be chaired by the **Vice-Chancellor, PU, Chandigarh**.
- **Co-ordinators**: Prof. M. Gupta and Prof. R. Tewari of PU, Chandigarh.
- **Core office of CRIKC** will be located on the **PU Campus**.
- **3 Committees** for operational functioning of CRIKC:
  - (i) *Finance committee*
  - (ii) *Academic committee*
  - (iii) *Administrative committee*

## Phase I (Period – 1 year)

1. CRIKC website with a directory of active Scientists in the Chandigarh region.
2. Sharing of library resources
3. Common identity cards
4. Lecture notification amongst different institutions.
5. Free shuttle service to cover institutions under CRIKC.
6. Seamless access to the laboratory facilities of participating institutions.
7. Holding joint seminar/conferences.
8. Joint PhD programs including common courses.
9. Recognition of supervisors on mutual basis.
10. **Setting up of Centre for Theoretical Studies and Policy Planning**
11. **Creation of Research Based Sub-Clusters (Medical) Industrial , Nano-technology, Physical Sciences, Chemical Sciences etc.)**



## Phase II (2<sup>nd</sup> yr)

1. A few joint programs in Bio-sciences and Nano-science
2. Common physical facilities to be created
3. Joint pre-PhD courses
4. Facility of spending a few months in the participating institutions on mutual basis
5. Incentive scheme enabling Ph.D. holder college teacher to take sabbatical leave to work with faculties/scientists in CRIKC institutions.
6. **Create/provide facilities to attract faculty members from abroad to spend sabbatical leave period in CRIKC institutions : Possible partners in this initiative, TCS and Tata Trusts (Discussion with Mr. F.C. Kohli, Emeritus Chairman TCS).**
7. **Initiation of Industry-Academia interaction**
8. Joint admission of PhD students in bio-stream
9. Refresher courses / summer school / college teachers

## Phase III ( 3<sup>rd</sup> yr)

1. Integration of Industry sponsored programs.
2. Setting mission oriented goals.
3. High level of visibility in research.
4. New and innovative schemes to attract talent, in particular, Inspire Post Doctoral Fellows to choose CRUKC institutions as hosts to initiate new programmes.
5. Creating examples where we achieve '**concept to commercialization**'

## Brainstorming sessions which have led us here...

*(visits, lectures, conferences, proposals etc.)*

1. Lecture by **Sam Pitroda** entitled, 'Importance of Information Technology Infrastructure in Growth and Development of the Nation' 23<sup>rd</sup> January, 2013.
2. Lecture by **Shri Pawan Agarwal**, Advisor Higher Education Planning Commission' entitled, Higher Education in the 12<sup>th</sup> Plan and Beyond: Strategy and Approach'
3. **Prof. Yehiam Prior**, a Distinguished Professor in Chemical Physics at **Weizmann Institute of Science Israel** visited P.U. Campus, PGIMER and IISER, Mohali and gave two lectures at P.U. and IISER.
4. **Professor Richard Jones**, a Distinguished Professor at **Oxford University, U.K.** and President Physiological Society, U.K., was hosted by CRIKC at PGIMER as a one stop interaction point for all the institutions in the region. He deliver a lecture entitled: **Spatial  $\text{Ca}^{2+}/\text{H}^{+}$  ion coupling in the heart: a key substrate for arrhythmia?**
5. National Technology Day lecture on May 11, 2013 at P.U., Chandigarh by **Dr Girish Sahni**, Director CSIR Institute of Microbial Technology, 'Challenges and Opportunity for Translation of Science for Public Good'
6. Visit by **Japanese delegation from AIST** at P.U., Campus to explore collaboration in Biological Sciences.



7. Director British Council in India, **Mr. Rob Lynes**, has already visited PU to explore CRIKC as a facilitator to promote interaction between British Universities and Chandigarh region institutions.
8. This is being followed by another visit of **Mr. Rob** on 24<sup>th</sup> July to Chandigarh.
9. **Panjab University along with CRIKC is going to host 79<sup>th</sup> annual meeting of Indian Academy of Sciences from November 8<sup>th</sup> to 10<sup>th</sup> at PU Chandigarh with the activities on 9<sup>th</sup> and 10<sup>th</sup> to be held in other institutions associated with CRIKC, viz., CSIR-IMTECH and IISER Mohali.**
10. CRIKC participation in workshop held at IIT Ropar on 2<sup>nd</sup> July, 2013. The theme of the workshop “Eradicating the problem of open field burning in India: turning agricultural waste into energy”, emerging out of in IIT Ropar - Aston University U.K. initiative.
11. Several proposal amongst the CRIKS institution in the offing:
  - i) Bio-Agro proposal submitted by NABI and DBT.
  - ii) Centre for excellence in detononic (CED) by TBRL, Mohali.
  - iii) Creation of cold room facility by Snow and Avalanche Study Establishment, (SASE – DRDO).





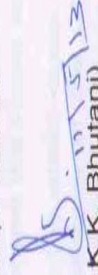
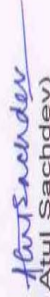
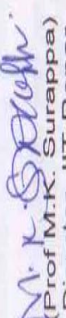

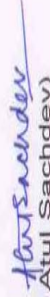

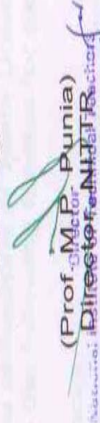

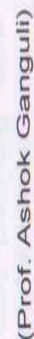


## To start CRIKC activities in right earnest, Initiative taken by Panjab University

- Identification of sufficient space for its immediate needs i.e. Video Conference facility, library, space for visitors, conference room etc.
- Tender for shuttle service busses to be floated shortly
- Equipment procurement for video conference facility and library already on its way
- Hassel free registration of Ph.D. candidates from CRIKC institutions
- For immediate commencement of CRIKC activities funding required as follows:

## Funds required

SR. NO.	HUMAN RESOURCE REQUIREMENT	AMOUNT (per annum)
01	PROJECT OFFICER / SR. SCIENTIFIC OFFICER	6 lakh (50,000 p.m.)
02	PROJECT ASSISTANT / SCIENTIFIC ASSISTANT	3.6 Lakh (30,000 p.m)
03	JUNIOR ASSISTANT / DATA ENTRY OPERATOR	2.4 Lakh (20,000 p.m)
04	3 BUS DRIVERS	9 Lakh @ 25,000 pm. each
	<b>TOTAL</b>	<b>21 Lakhs</b>
	RECURRING EXPENSES	AMOUNT (per annum)
01	DIESEL & MAINTENENCE OF BUSES	30 Lakhs
02	FUNDS FOR HOSTING VISITING SCIENTISTS	15 Lakhs
03	TRAVEL FUNDS	10 Lakhs
04	SEMINARS/CONFERENCES/TRAINING PROGRAMMES	10 Lakhs
05	AMC & MAINTENENCE	4 Lakhs
06	CONTINGENCY FUND (Office infrastructure, consumable, stationary, postage, electricity, water charges, misc. etc.)	5 Lakhs
	<b>GRAND TOTAL FOR 1<sup>ST</sup> YEAR</b>	<b>1 CRORE</b>
	<b>FOR THREE YEARS</b>	<b>3 CRORES</b>

# Participating Institutions

 (Prof. Arun K. Grover) Vice Chancellor P.U., Chandigarh	 (Prof. Y.K. Chawla) Director, PGIMER	 (Dr. Girish Sahni) Director, IMTECH
 (Prof. N. Sathyamurthy) Director, IISER	 (Prof. K.K. Bhutani) Director, NIPER	 (Dr. Rajesh Chakrabarti) Executive Director, ISB
 (Prof. M.K. Surappa) Director, IIT Ropar	 (Prof. Manoj Datta) Director, PEC Institute of Technology	 (Prof. Atul Sachdev) Director Principal, GMCH
 (Dr. Rakesh Tuli) Executive Director, NABI	 (Prof. M.P. Punia) Director, NITRR <small>Address: Training and Research            Sector-26, Chandigarh-160 019</small>	 (Prof. Manjit Singh) Director, TBRL
 (Prof. Ashok Ganguli) Solid State and Nano material Research Lab	 (Prof. Girish Sahni) Director, CSIO	 (Dr. R.S. Sangwan) <small>मुख्य निदेशक अधिकारी            प्रमुख निदेशक अधिकारी            बायो प्रसंस्करण इकाई, मोहाली</small>

Signatories to the formation of CRIKC on May 11<sup>th</sup> 2013



# THANKS



**MOM**  
**on CRIKC**  
**at MHRD**

**on**

**July 18, 2013**

## Minutes of the meeting on Chandigarh Region Innovation and Knowledge Cluster (CRIKC) held by Secretary, Higher Education on 18<sup>th</sup> July, 2013

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A meeting was held by Secretary (HE) on 18<sup>th</sup> July, 2013 with representatives of Panjab University on the Chandigarh Region Innovation and Knowledge Cluster (CRIKC) initiative taken by Panjab University, Chandigarh. The University was represented by Prof. Arun Grover, Vice Chancellor of Panjab University accompanied by Prof. M. M. Gupta and Prof. R. Tiwari also of Panjab University. Bureau Heads of the Department of Higher Education also attended the meeting.

2. A presentation on the CRIKC was made by VC, Panjab University. The highlights of the presentation are as follows.

i. The CRIKC involves all the premier institutions of higher learning and research located in and around Chandigarh such as;

- Post Graduate Institute of Medical Education & Research
- Central Scientific Instrumentation Organization
- Institute of Microbial Technology
- Indian Institute of Science Education & Research
- National Institute of Pharmaceutical Education & Research
- National Agri Food Biotechnology Institute
- Terminal Ballistic Research Laboratory (TBRL)
- Indian School of Business
- Punjab Engineering College of Engineering and Technology
- Indian Institute of Technology
- National Institute of Technical Teachers' Training and Research
- Government Medical College & Hospital
- Institute of Nano Science & Nano Technology
- Centre for Agro Processing

ii. CRIKC's Mission Statement is to foster and sustain close academic alliances between institutions of higher education and research in the Chandigarh region, to facilitate innovation and knowledge creation, achieving excellence in all academic spheres without compromising in any manner the autonomy of the participating institutions.

iii. It aims to identify and carry out joint and collaborative research projects, attempt to initiate joint teaching/training programs including pre-PhD courses, to encourage the pooling of research facilities of the participating institutions, nurturing scientific culture from school level, to promote the spirit and philosophy of Meta University concept, to promote and sustain the following themes for excellence in research: Biomedical Sciences, Applications of Nano-science and Nano-technology, Theoretical Studies; Policy Planning for better comprehension of GOI programs and societal needs.

iv. The governance of CRIKC would be vested with an Advisory Committee consisting of the heads of the participating institutions. The Advisory Committee would be chaired by VC, Panjab University and the core office of CRIKC would be located in Panjab University campus.

4. On conclusion of the presentation, the Secretary (HE) and others lauded the CRIKC initiative.
5. Secretary (HE) made a few suggestions in order to make the CRIKC initiative more comprehensive and effective. He suggested that Panjab University should act as an accreditation body, which through the CRIKC initiative should benchmark standards of education and research in all the participating institutions. Secondly, the participating institutions should seek to attract quality international students and faculty in order for these institutions to measure up to international standards. Thirdly, the concept of community college for imparting skills and vocational education should be implemented through the numerous institutions in Chandigarh region coming together.
6. On the question of providing some financial support to CRIKC, Joint Secretary (HE) informed that since CRIKC aims to realise the idea of a meta university, it could be funded by UGC in accordance with the guidelines on setting up meta universities, as and when they are ready. Secretary (HE) advised the Panjab University team to seek greater involvement of industries and corporates in both research activities and financially supporting the CRIKC initiative.

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**Report of UK  
visit by  
CRIKC  
delegation**

## **KNOWLEDGE ECONOMY PARTNERSHIPS 2014**

### End of Project Report

#### 1. PROJECT DETAILS

<b>Project title &amp; reference</b>	<b>PANJAB UNIVERSITY STUDY TOUR</b>
<b>Name, position &amp; institution of contact completing form</b> (we may contact this person to discuss the report further )	<b>Dr MANMOHAN GUPTA</b> <b>Professor of Physics</b> <b>Co-ordinator CRIKC</b>
<b>Contact telephone &amp; e-mail</b>	<b>+919815627923</b> <b>mmgupta@pu.ac.in</b>
<b>Project website</b>	<b>crikc.puchd.ac.in</b>

Please use totals for the project as a whole in the below boxes.

<b>PROJECT STATISTICS</b>	<b>Numbers</b>
Total number of core project team members involved in UK & India	<b>06</b>
Number of Exchange visits and visitors	<b>UK to India:</b> Visits –04 Visitors - 15 <b>India to UK:</b> Visits – 02 Visitors – 15
Number of academic staff involved in & benefitted	<b>14</b>
Number of other beneficiaries (students, administrators, external body, etc) involved in or benefited. Please include who these individuals are.	Please see Report
Number of publications or media mentions (if any)	<b>Quite a few.</b> <b>Please see Report</b>
Has the project been working directly with a government ministry, department or industries or corporates? If yes, please state which one(s)	<b>NA</b>
Additional funds received in the last 12 months.  Please state funding source, amount (GBP) & if money is available directly or for wider related activities.	<b>Approximately 11000 (GBP).</b> <b>Govt funding only for visits</b>

## 2.0 Project Achievements and Highlights

Please complete the table below detailing the extent to which the project project has achieved the objectives set out in the application form at the inception of the project.

Objectives	Achieved?	Not achieved	Partially achieved	Achieved	Exceeded	How have and/or will stakeholders (for donors, partners) and beneficiaries (for example students, farmers, nurses) benefit from the achievements realised?
a. Developing alliances between CRIKC institutions and UK Universities					The visits of CRIKC delegations have already let to concrete results in the form that MOU has already been signed on 11 <sup>th</sup> March 2015 between Panjab University (on behalf of CRIKC) and University of Nottingham. Another MOU is going to be signed between Brigham University and CRIKC institutions. Lot of interests has been shown by other UK institutions to forge alliance with CRIKC institutions.	The signing of MoUs between CRIKC and UK Universities would lead to large scale exchange of ideas, exchange visits of Faculty / Scholars / Students. The possibility of creation of joint centres of excellence can also be realised through these exchanges.
b. Learning about industry and academia interactions				One of the aim of the visits of the CRIKC delegations was to learn about the industry academia situation in UK in this connection apart from the visits to UoN and BoU and Cambridge, the visit to NCUB was very useful in learning about the latest development in this direction.		Government of India is very much interested in promoting Industry Academia interactions. The UK exposure in this direction will lead to many positive results.
c. Learning about Research Practices in UK institutions				The interaction in various Universities with various research groups have made the CRIKC delegations about the possibilities in various research groups. The CRIKC institutions will leverage this information to go for various collaborative research efforts.		Faculty members of the CRIKC institutions are already planning to have project specific collaborations.

Besides the above mentioned objectives the visits also realised the following:

1. City to City interaction, the second visit of the CRIKC delegation lead by Professor Arun Kumar Grover, Vice-Chancellor, Panjab University, Chandigarh, included Chandigarh City Officials Mr. Sandeep Hans who had extensive detailed discussions with the Nottingham City officials who showed keen interest to visit Chandigarh which was done during their visit on November 23-25, 2014.
2. Both the delegations had extensive interaction with Indian Diaspora who in turn assured their support for any collaborative efforts between UK universities and CRIKC institutions.
3. These visits also generated interests between Industrialists from UK and from India.

Briefly summarise the project's highlights during the lifespan of the project.

The delegation visits have revealed that there is a great deal of interest on both sides for wide ranging engagements involving collaborative projects to exchange programmes. Please see the Report for details

## **2 ENHANCED CAPACITY & IMPACT**

Tell us about how the project has increased staff and/or institution's capacity (for example, in terms of teaching and research capability, technology, quality, innovation, etc). Please include or attach brief examples, feedback, testimonials and reports if available.

The interaction with UK universities has greatly impacted the thinking of many of us in the CRIKC institutions. In fact, CRIKC institutions and UK universities can jointly develop centres of excellence which would be at par with the best in the world.

Describe how the project work has been used to influence changes in policy or practice within your institution, within governments or in other organisations.

The university is definitely thinking in bringing in some of the practices regarding Industry – Academia interaction.  
The exchange of faculty/students/scholars and holding of joint seminars/workshops very much on the cards.

What was the greatest benefit of the project to the Indian partner(s)?

Awareness about several UK-India funds which can be used for collaborative projects.  
Recognition of CRIKC as a facilitator of interaction between institutions of higher education and research on both sides.  
Many areas of research were identified which were joint projects/programs could be executed.  
Laying the foundation for exchange of faculty/scholars/students.

What was the greatest benefit of the project to the UK partner(s)?

Availability of the large pool of CRIKC scientists for collaborations. The young amongst these are available for Post-doc positions in UK.

Firsthand knowledge of CRIKC as a platform for collaboration and for forging

alliances with more than fifteen institutions of higher education and research.

CRIKC as a facilitator for UK students to spend time in Indian institutions.

Building bridges with the Indian Diaspora in UK

Awareness about possibility of Indian students going to UK for higher studies

#### **4 FINANCE AND ACCOUNTABILITY**

Please report a financial report listing the estimated expenditure and the actual expenditure. No supporting documents like invoices or receipts to be submitted unless asked for by the British Council.

**5 ADDITIONAL INFORMATION** - any information that you wish to share and have not had the opportunity to express in the report, please outline here.

The British Council should appoint a person to co-ordinate activities of CRIKC and the council so that we can proceed forcefully to realize the potentialities of the program.

#### **6 BRITISH COUNCIL INFORMATION**

How could we better support you in future? What could we do differently?

The council should keep funding such programs. If need be, this can be discussed in more details.

Thank you!

# **Report of U.K. visits by CRIKC delegations (Under Knowledge Economy Partnership)**

*(June 23<sup>rd</sup> – 28<sup>th</sup>, and 26<sup>th</sup> Aug -3<sup>rd</sup> September 2014)*

**Two visits** by Panjab University and other CRIKC institutions faculty members were organized under the initiative of British Council and Panjab University. The delegation consisted of the following members:

## **First Visit**

1. Professor A K Bhandari, DUI PU Chandigarh (Leader of the delegation)
2. Professor Rupinder Tewari, Dean Science Faculty
3. Professor Ronki Ram Dean Arts faculty
4. Professor U Shivhare Dean Engg Faculty
5. Professor Renu Vig Director UIET
6. Professor Manmohan Gupta (Convener)
7. Professor Manoj Arora Director PEC University of technology
8. Dr R S Sangwan CEO Centre of innovative and applied Bio-processing (CIAB))

## **Second Visit**

1. Prof. Arun K. Grover, Vice Chancellor, Panjab University (Leader of the delegation)
2. Sh. Sandeep Hans, Special Secretary, Technical Education, Chandigarh Administration
3. Dr. Girish Sahni, Director, Institute of Microbial Technology, Chandigarh
4. Prof. Manoj K. Arora, Director, PEC University of Technology, Chandigarh
5. Prof. Anil Monga, Dean Alumni Affairs, Panjab University
6. Prof. J. S. Bagla, IISER, Mohali
7. Dr. Sameer Malhotra, PGIMER, Chandigarh

The first delegation visited the following institutions.

1. June 24: Univ. of Birmingham, Birmingham
2. June 25: (i) National Centre for University Business (NCUB) London  
(ii) School of Asian Studies (SOAS) , London
3. June 26: Univ. of Cambridge, Cambridge.
4. June 27: Univ. of Nottingham, Nottingham

**General Observations:** CRIKC delegates were received warmly by all the institutes. Each institute had a clear cut schedule. Formal lunch by pro- VCs was hosted at University of Birmingham (UoB) and University of Nottingham (UoN). All institutes are open for collaborations at Ph.D. and Post Doctoral level as well as for exchange of faculty.. Hosts suggested some ways of seeking funds, for the visit of scholars, by agencies like Newton



Funding, Wellcome Trust, and Bill Gates Foundation etc. Each Univ. has lot of flexibility/freedom especially University of Cambridge.

1. **Univ. of Birmingham:** Formal presentation was made by UoB. Visited a few departments. Strong biomedical Centre having high end instruments. Chemical Engineering. Department excels in energy programmes. Full-fledged Industry- Institution Centre. Happy to have tie ups with PU.
2. **Univ. of Cambridge (UoC):** No formal presentation was made on behalf the university. Prof. S. Saxena (Physics Deptt.) gave a bird's eye view of the functioning of UoC. This Univ. has Annual system of examination! Teacher student ratio is 1:2! Heavy emphasis on tutorials. Presentation on Industry –UoC linkages was made. Many industrial units have centres in the campus. Boundaries between industry and academia, on campus, seems blurred. It has a very good blend of Industry and academia on the campus. Each faculty member is totally independent to have collaboration with anyone.
3. **Univ. of Nottingham:** Formal presentation was made by UoN. Established Univ. campuses in China and Malaysia. Chris Rudd (Pro-VC) spent lot of time with delegates. The delegates did not visit any department, but there were lots of presentations by various professors belonging to different streams. Well established Industry- Academia Cell. Mr Hardev Singh (from International Cell) keen on establishing collaboration with PU. Chris Rudd and Hardev liked proposal of assisting each other in industry matters e.g. Industry problems which PU cannot solve or work on, will be forwarded to UoN. And UoN will do the same for PU. In addition, if an industrial work taken up by UoN is feasible in PU and is less costly, may be transferred to PU. UoN is good in Food Technology. Our Chem. Engg. Department and BPU (Mohali) can go in for collaboration with them.
4. **National Centre for universities and business (NCUB):** A short presentation was made by Dr Graeme Reid, Strategic Advisor NCUB, followed by detailed discussion on how UK is planning to handle Industry –academia interaction. NCBU would be happy to establish links with similar efforts being carried out in India, in particular the Policy Research provide us with Science Policy of UK, if request routed through the British Council.
5. **London University (SOAS):** Interacted with a Professor Gurharpal Singh a senior professor of Indian origin. He is very keen to work with PU on political and societal aspects.

#### **Conclusions:**

- (i) **The visit revealed several interesting areas of collaborations with the UK universities and their keenness to forge alliances with PU.**

- (ii) Identified several areas where collaborations can be carried out with UK institutions.
- (iii) UoN and Birmingham University were found to be keen to collaborate with PU on a wide spectrum basis.
- (iv) In the follow up visit, the plan was to identify areas where we can work together and lay the foundations for MoU's to be signed.

It was also resolved that in the follow up visit to be led by Prof Arun Grover, keeping in mind the KEP Programme of British Council, the emphasis would be on the following:

- i. Develop alliances with UK Universities like University of Nottingham, University of Birmingham etc.
- ii. Explore partnership of Chandigarh Region Innovation and Knowledge Cluster (CRIKC) institutions with the UK Universities.
- iii. Explore research collaborations in specific areas of science and technology.
- iv. Explore possibilities of faculty/scholar/student exchanges between CRIKC and UK universities.
- v. Explore partnerships with UK Universities for Centre for Policy Research in Industry-Academia collaboration.

## **Follow up Visit (Aug. 26- Sept. 2, 2014)**

### **Visit to Indian High Commission, London, Aug. 27, 2014.**

The delegation had a meeting at Indian High Commission, London, at 4:00pm on Aug. 27, 2014. The meeting was chaired by Sh. Virander Paul, Deputy Indian High Commission and lasted for more than one hour. The meeting was attended by Prof. Grover, Sh. Sandeep Hans, Prof. Arora, Dr. JS Babla, Dr. Sameer Malhotra from the Indian side. The Indian High Commission assured their full support for any collaborative efforts by CRIKC institutions and UK institutions.

On behalf of the delegation, Prof. Grover, explained the purpose of the visit to Mr Paul, who got very excited about this initiative. He promised that the Indian High Commission would provide full support to such initiatives in education sector and in particular referred to the 150 million pounds Newton Bhabha fund, which will be announced soon. In this programme, the Indian scientists would be able to receive grants in association with UK counterparts for research and development activities cutting edge technologies. Mr Paul deputed Mr. Pankaj Sharma, Consul in Consulate General of India, Birmingham, to participate in the discussions of the delegation with the University of Birmingham.

### **Visit to University of Nottingham, Nottingham (Aug. 28 – Aug. 31, 2014).**

During the afternoon of Aug. 28, 2014, the delegation visited Nottingham City Council to have discussions on the upcoming Sports Complex in the Nottingham City. Panjab University also plans to build a similar type of sports complex at the campus, which could augment the needs of sports facilities of various academic institutions and research organisations in Chandigarh. Having an infrastructure like this will surely provide a boost to the sports activities in Chandigarh region.

In the evening of Aug 28, 2014, the delegation was invited to Indian New Art Exchange to interact with Indian community who have made exemplary mark in Indian art and theatre. There were exchange of information between Prof. Grover and the Indian New Art Exchange group to promote theatre and cultural relationships between CRIKC institutions, in particular, Punjab University and the Nottingham Indian community. The interaction was followed with mesmerizing performance by the artists. The delegation was overwhelmed by the performance of Bernhard Schimpelsberger who used a number of non-conventional music instruments to play a number of songs from all over the globe.

The meeting in University of Nottingham was coordinated by Ms Min Rose, Senior Executive, Asia Business Centre, Business Engagement and Innovation Services, University of Nottingham. The delegation reached University of Nottingham in the morning of Aug. 29, 2014 and met the pro-vice chancellor Prof. Hai Sui Yu. After providing an overview of the University of Nottingham, Prof. Yu emphasized that the university has always been a research led university and have produced two Noble Laureates (one in medicine and the other in economic sciences). Prof. Grover, as the leader of the delegation, talked about CRIKC and emphasized the need of pre-PhD courses and PhD training to give boost to research in India. He appreciated the existence of a PhD training institute at the University of Nottingham and corroborated the need of such institutes in India. Prof. Grover and Prof. Arora also threw light on the usefulness of post-doctoral fellows in the university, who act as solid link between the faculty and doctoral students. The postdoctoral research does require a boost in Indian universities to take cutting edge research forward.

**The delegation then went to Hayden Green Institute for Innovation and Entrepreneurship to attend a meeting with the Heads of various research groups of the University of Nottingham from different disciplines at 10:00AM.** The meeting started with presentations from Prof. Grover, Dr. Girish Sahni and Prof Manoj Arora. Prof. Grover talked about CRIKC and threw pointers on how CRIKC institutes can engage in research with different groups at Nottingham University. Dr. Sahni's presentation was on the discovery of new medicine. He emphasized the need of filing patents in order to make scientific research useful for the society. Prof. Arora's talk focused on collaborations between the CRIKC institutes and Nottingham University in Engineering sciences. He said that there is scope for collaboration between the two institutes in a number of ways,

#### **Teaching**

- Dual Degree PhD Programmes in select areas
- Joint Master of Engineering/Science programmes in select areas
- One semester Internships at University or Industry in the city
- Full semester study of courses (Student Exchange)
- Teaching by faculty for one semester as Visiting Faculty (Faculty Exchange)

- Writing joint research proposals and bidding for NERC, UKERI, Newton India and any other such programmes

### **Industry**

- Identifying product and design based joint research problems through industry participation
- Starting of incubators and spin off companies at universities through industry involvement

The presentations by Indian delegates were followed with a number of presentations from the Nottingham University. Dr. Tucker, from School of Biosciences talked on Crops and Soils, crop improvement and genetic diversity. Dr. Phil Williams from School of Pharmacy spoke on biophysics, surface analysis, biomaterials and 3D printing of formulations. Dr. Andy Long, Dean of Engineering, provided an overview of various engineering faculties at the university. He stressed upon the usefulness of the ongoing foundation engineering courses, which prepare the students for different engineering programmes. Steve Hardy talked about prevailing research and graduate services at the university. The key research areas identified are,

- Sustainable Societies
- Health and Well Being
- Culture and Communication
- Digital Futures
- Transformative Technologies

Clearly, all these areas are multi-disciplinary, and therefore the university has a beautiful concept of establishing of multi-disciplinary institutes at the campus. One such institute is the Institute of Geospatial Sciences, which work closely with the faculty of engineering, faculty of science and faculty of social science. Clearly, the aim of these institutes is to work on current research and consultancy problems in multi-disciplinary areas. These institutes work closely with academic departments.

George Rice spoke on technology transfer and support to spin out companies at the campus to promote academic-industry linkages, innovation and development. Prof. Arora then described that already a number of research groups having common interests at both ends have been identified. The research proposals from about 10 such groups were handed over to their International Officer to initiate the networking between the groups. These research proposals are given in Annexure I. Immediately, after the interaction, the research group from Institute Geospatial Institute came over and had discussion with Prof. Arora, Mr. Paul Singh Bhatia, Prof. Stuart Marsh and Dr. Andy Sowter participated in the discussions. They showed keen interest in pursuing joint research in the area of Glaciology, Hyperspectral Remote Sensing, and ongoing Grace programme. They were keen to visit Chandigarh during their next visit to India under their ongoing collaboration. The international office of University of Nottingham shall be contacted again to take the research collaborations between different research groups forward.

The meeting was followed with a lecture by Prof. Grover on the topic, as announced at

[http://www.nottingham.ac.uk/business/businesscentres/hgi/events/how-collaboration-between-academic-institutions-in-india-and-the-uk-can-promote-trade-and-investment-in-both-countries.aspx?utm\\_source=Special+seminar+list&utm\\_campaign=083e5440d4-Seminar August&utm\\_medium=email&utm\\_term=0\\_6288f113c5-083e5440d4-138366457](http://www.nottingham.ac.uk/business/businesscentres/hgi/events/how-collaboration-between-academic-institutions-in-india-and-the-uk-can-promote-trade-and-investment-in-both-countries.aspx?utm_source=Special+seminar+list&utm_campaign=083e5440d4-Seminar+August&utm_medium=email&utm_term=0_6288f113c5-083e5440d4-138366457)

The lecture was attended by more than 100 people from across business community, academicians, researchers and students. The Sheriff of Nottingham graced the occasion with her presence and applauded the initiative between the two groups of institutes and the Nottingham City Council. In between, Dr. Sameer Malhotra, visited Queens Medical Center and City Hospital to have interaction with the medical science group.

On August 31, 2014, Dr. Nigel Trodd, Professor and Associate Head (Business Development and Internationalisation), **Coventry University**, drove from Coventry to Nottingham to meet the delegation for potential collaboration in some thematic areas of interest. The meeting was held in St James Hotel and lasted for about 3 hours. Prof. Grover, Prof. Girish Sahni and Prof. Arora participated in the discussions. Dr. Trodd, after providing an overview of ongoing research activities at the Coventry university, listened to aim and purpose of the delegation, and immediately got interested in having collaboration in following thematic areas to start with,

- Health and Life Sciences
- Environment and Disaster Management.

In fact, as soon as the delegation returned to India, an email (extract given below) was received by Dr. Trodd to start the collaboration in one of the above thematic areas.

In the afternoon of Aug. 31, 2014, Sh. Hardev Singh took Prof. Grover and Prof. Arora to the Notts County Football Club, the Worlds oldest football league club, to have a look at the sports facilities, keeping in mind the aim of the Panjab University to enhance the sports facilities in Chandigarh region as stated earlier. The delegation had a tour of the facility, which was guided by Damien Irvine, Commercial Director. The discussions concluded with the urge of having such a facility in Chandigarh also, keeping in view of the Indian Football League and the craze of this sport in India, in general.

## **Visit to University of Birmingham, (Aug. 31 – Sept 2, 2014).**

The delegation travelled to Birmingham in the afternoon of Aug. 31, 2014. After checking-in the hotel, there was an informal meeting of the delegation with Panjab University alumni in the meeting room of the hotel.

The meeting in University of Birmingham was coordinated by Mr. Wu Wen Wei, International Development Manager (East Asia). The delegation reached in the morning of Sept 1, 2014 to **Muirhead Tower Hospitality Suite** University of Birmingham, for academic meetings with various research groups in University of Birmingham. The whole day session was chaired and coordinated by James P. Warren, Business Development Manager (Education), College of Engineering and Physical Sciences. Mr. Priyank Sharma, a key person who looks into activities on research and knowledge transfer from UoB side was also present throughout the day. Also present was Mr. Pankaj Sharma, Consul, Consulate General of India, Birmingham, from Indian High Commission Side. The meeting was planned based on the research proposals sent by Prof. Arora to Mr. Wu Wenwie in the month of July-Aug., 2014, as a follow up of the 1<sup>st</sup> UK visit of the delegation during June, 2014. Thus, many of the research groups from the UoB side were also present in this academic meeting, as can be seen from the programme given in Annexure II.

The meeting started with a presentation by Prof. Grover, as the leader of the delegation, who talked about CRIKC and emphasized the need of research collaboration between the two sides. Prof. Grover threw pointers on how CRIKC institutes can engage in research with different groups at Nottingham University. Prof. Arora's talk focused on collaborations between the CRIKC institutes and UoB in Engineering sciences. He said that there is scope for collaboration between the two institutes in a number of ways,

### **Teaching**

- Dual Degree PhD Programmes in select areas
- Joint Master of Engineering/Science programmes in select areas
- One semester Internships at University or Industry in the city
- Full semester study of courses (Student Exchange)
- Teaching by faculty for one semester as Visiting Faculty (Faculty Exchange)
- Writing joint research proposals and bidding for NERC, UKERI, Newton India and any other such programmes

### **Industry**

- Identifying product and design based joint research problems through industry participation
- Starting of incubators and spin off companies at universities through industry involvement

This was followed with research group wise presentations from the faculty of UoB. Dr. Kiran Gulia, Laser Technical and Research Manager, School of Metallurgy and Materials, spoke on Advanced Materials Development, Processing and Characterization. She specifically talked on Biomaterials, Photo polymers, Lasers, Metals and Plastics and their usage in Automotive and Aerospace industries. Mr. Priyank Sharma indicated the collaboration between the material research



groups on two sides and suggested to explore the possibility of funding through Horizon 20 programme. Dr. Gulia is a Scottish from Indian origin and was very keen to interact with the Indian material science group. She went on to the extent by saying that now it is payback time and she would volunteer to assist Indian Universities in carrying forward the research in this key area. She showed willingness to visit Chandigarh in near future.

In between, Dr. Samir Malhotra left for College of Medical and Dental Sciences to have discussions with the medical science group. The meeting was coordinated by Dr. Sarah Knaggs, Manager of Postgraduate School and Dr. Junying Jia, International Project Officer.

Dr. Rami Bahsoon, Computer Science, gave a presentation on Search Based Software Engineering, Analysis, Testing and Verification, Computational Intelligence in Software Engineering. He spoke on research in the area software architecture, software testing, cloud software engineering and large scale distributed software systems. He also mentioned that the department of computer science of UoB is rated as 5<sup>th</sup> in UK and was number one last year. He continued to speak on software testing for security, economical models in software testing, regression testing etc. He showed willingness to interact with software testing group in PEC University of Technology, as there are many common areas of interest where joint research can be carried out.

Professor Stefan Dimov, Head of Advanced Manufacturing Technology Centre, School of Mechanical Engineering, threw light on the research in the area of Advanced Manufacturing Technologies and Composite Manufacturing. He emphasized on the need to doing homework through mutual interaction between the two counterparts to identify key areas of mutual collaboration with a focus on Indian manufacturing technologies that have impact in India. Thus, the research proposals can be suitably revised and submitted to the funding agencies for faculty and postdoctoral exchange programmes.

Dr. Neil Cooke, spoke on behalf of School of Electronic, Electrical and Computer Engineering, as an Interactive System Engineering Group leader. He said that there are 8 full time academics and 40 researchers in this group, who are working in wide areas of research, which include,

- Signal processing
- Ergonomics
- Eye tracking technology
- Speech Recognition
- Brain Signal Processing
- Image Processing
- Digital Heritage

He also discussed opportunities for funding from EPSRC and Defence Organisations. He was keen to have collaboration with Indian counterparts and stressed on the need of conducting joint research seminars as a first step towards writing joint research proposals for funding. The seminars can be held through Skype or in the form of workshops at different locations in Chandigarh or UoB. It is thus likely that the research groups on the two sides will take initiative in holding such workshops soon.

Professor Miles Tight, Transport, Energy and Environment Tutor, School of Civil Engineering, Highway Management and Engineering, talked on Transport Policy, Highway Engineering, Asset Management and Rural Road Provisions. Prof. Tight himself is a social scientist working as a faculty in the department of civil engineering. This clearly shows the openness in flexibility in hiring faculty members in different departments, which are conducting research in multi-disciplinary areas. In fact, all applied research is multi-disciplinary in nature and our university system should also allow this kind flexibility when it comes to the recruitment of faculty and staff in a department. He appreciated the need of having a Masters programme in Road Management Engineering. He also indicated that the Rail Research Center of UoB is doing lot of work in the area of Aerodynamics where the faculty from Aerospace Engineering at PEC may be interested. He said that the department would be willing to take students for internships. He also supported the idea of conducting joint workshops as a pre-requisite to writing joint research proposals by the two groups. Prof. Arora also mentioned that a faculty member in Transportation Engineering from PEC shall be visiting UoB during the middle of September, 2014 for a short term course and that the discussions can be taken forward then.

The meeting ended with a brief session that was attended by Professor Richard Williams, Pro-Vice-Chancellor and Head of the College of Engineering and Physical Sciences, and Peter Clack, Director, International Relations. The delegates from the two sides showed keen interest in starting collaboration in identified areas of research. The funding sources identified were Newton Bhaba, Horizon 20, UKIERI, Global Innovation Initiative (UK-USA-India) and EU funding. The concept of holding joint workshops was appreciated. It was also proposed that in order to write good joint research proposals, faculty from academic institutions in Chandigarh may sent for a short term visits for 4-6 weeks to have interaction with the UoB faculty. This will lead to producing good and effective research proposals with a focus on Indian needs.

After the debrief session, the delegation visited the Business Engagement Center of UoB, which acts as a link between the academia and industry. The visit was coordinated by Gurpreet Kler. She explained the role of the center in great detail. The Indian delegation was impressed with the functioning of the center in bridging the gap between academia and industry. At the time of visit, 30 companies were provided space in the center, where the students and faculty can interact with the industry professional to work on innovative ideas and do research on live problems that are relevant to the society. Some of the snapshots of the center are appended here. The Indian delegation strongly voiced the need to such a center in Chandigarh and requested the Business Engagement Center to share their business models.

Later in the evening of Sept 1, 2014, an informal discussion of the delegation was held with the Indian Business/Academic Community. The talks were general and mainly focused on the academic practices adopted in India and UK, the government education policy, role of NRIs in Indian education system etc. Mr. Pankaj Sharma, Consul, was also present in these discussions and ensured support from Indian High Commission in carrying the interaction forward.

## **Conclusions of the two visits:**

- The universities of Nottingham and Birmingham are ready to have comprehensive MoU's with Panjab University on behalf of CRIKC institutions.
- There is good deal of possibility of collaborations between CRIKC and UK institutions on specific scientific topics by using the facility of Newton-Bhabha Fund and many such similar funds.
- CRIKC institutions can host students from UK institutions; details need to be worked out.
- The possibility of faculty/scholar exchanges needs to be explored further.
- Joint carrying out of teaching programs etc also needs to be explored further.
- Interestingly city to city interaction between Chandigarh and Nottingham can also be carried out.

## **Press Notes/Briefings**

There were several press mentions; two of these are included here.

### ***News Released by PTI on 27<sup>th</sup> June 2014.***

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A number of leading universities from Punjab are interested in making collaborations with the UK's prestigious University of Birmingham.

A delegation representing five institutions from the northern Indian state visited Birmingham this week to learn more about how UK universities operate, with the hope of exploring potential partnerships in the future.

"The University of Birmingham has a proud history of engagement with India, welcoming its first Indian student in 1909. Since then, the university has provided education for more than 1,000 Indian students across the institution's five colleges, including for high-ranking government officials," the University of Birmingham said in a statement.

The majority of the visiting academics came from Panjab University, a public state university located in Chandigarh and one of the oldest universities in India.

A number of leading universities from Punjab have expressed their interest in making collaborations with the University of Birmingham, a delegation member said.

The university was also ranked number one in India in the Times Higher Education (THE) World University Rankings for 2013-2014.

It coordinates a group of institutions around Chandigarh, known as the Chandigarh Region Innovation and Knowledge Cluster (CRIKC), to work together to promote and sustain excellence in research.

PEC University of Technology and the Postgraduate Institute of Medical Education and Research (PGIMER), members of CRIKC, had also sent representatives to Birmingham as part of a British

Council initiative to analyse how research is organised in UK universities and how links with industry are developed and sustained.

The visit comes as Lord Karan Bilimoria, the Indian-born founder of Cobra Beer, is set to take over as Chancellor of the University of Birmingham on July 17.

Peter Clack, Director of International Relations, University of Birmingham, said "We are delighted at this opportunity to share knowledge and experience with our friends from the Punjab and we hope that from this visit we are able to build further institutional links with the state."

A press briefing was held at about 1:00 pm, which was published in **Nottingham Times on Aug 29, 2014** with applause.

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**Business** nottinghampost.com/business

## Indian team bowl in with aim to build city trade links

**By Richard Baker**  
richard.baker@nottinghampost.com

THEY'VE flown in from India, they'll be at Trent Bridge tomorrow and they're hoping for a great result.

But these aren't cricketers or cricket fans. They're a group of business people and academics who want to build trade links between Nottingham and Chandigarh, in northern India.

A visit to the one-day international cricket match between England and India is part of a three-day schedule of events that has been organised by their hosts, Nottingham City Council and Nottingham Means Business.

The 11-strong delegation began to arrive yesterday at Nottingham's St James Hotel, where they were welcomed by Chris Henning, the council's director of economic development, and hotel director Harjeet Johal – who is also a member of a forum which promotes trade with India for the Nottingham Means Business organisation.

The visit follows a similar delegation to Chandigarh by a Nottingham team, and Mr Henning says he hopes the reciprocal trip will pave the way for mutual investment.

"What we're doing is building a bridge between Nottingham and India and if we do that effectively, we'll see two things.

"One is investment coming from India into



Outside the St James Hotel – from left: Sam Hopwell, of Invest Nottingham; Mandj Arora, of Punjab Engineering College; Sandeep Hans, special secretary, technical education, in Chandigarh; Samir Maihotra, postgraduate Institute of medical education and research; Arun Kumar Grover, vice-chancellor of Punjab University; Chris Henning, director of economic development of Nottingham City Council; and Harjeet Johal, director of the St James Hotel.



**CRIKC delegation at Birmingham University on 24<sup>th</sup> June 2014**



**CRIKC delegation at NCUB 25<sup>th</sup> June 2014**





**CRIKC delegation at Physics Department, Cambridge 26<sup>th</sup> June 2014**



**CRIKC delegation at Nottingham University on 27<sup>th</sup> June 2014**





**CRIKC delegation with Nottingham City Official on 28<sup>th</sup> August, 2014**



**CRIKC delegation at Nottingham University on 29<sup>th</sup> August 2014**



**Professor Arun Kumar Grover and delegates with Sheriff on Nottingham on 30<sup>th</sup> August 2014**



**Professor Arun Grover with Dr. Nigel Trodd of Coventry University on 31<sup>st</sup> August 2014**





**CRIKC delegation at University of Birmingham on 1<sup>st</sup> September 2014**



**CRIKC delegation with Indian Diaspora at Birmingham on 1<sup>st</sup> September 2014**

# CRIKC in Pictures



**2nd INST-Langmuir Lecture**



**17 04 2015 CRICK**





**2016 Workshop on Solid-state Material Chemistry**



**Crick Nano Science Day**



**Australia-India Scientific Research Foundation**



**1<sup>st</sup> GIAN International Workshop at PU**





**2nd INST-Langmuir Lecture**



**Khorana lecture series**





**crikc-buses-flagged-off**





**INST Foundation Day**



**Visit of Nobel Laureate Sir Venkatraman Ramakrishnan**



uk-pu-mou



1<sup>st</sup> GIAN International Workshop at PU