CURRICULUM VITAE

Prof. Mushahid Husain
Vice Chancellor
M.J.P. Rohilkhand University, Bareilly
Former Director
Centre for Nanoscience and Nanotechnology &
Professor, Department of Physics
Jamia Millia Islamia
New Delhi-110025

CURRICULUM VITAE

1.	**Name**	**: PROF. MUSHAHID HUSAIN**
2.	**Designation**	: Vice Chancellor M. J. P. Rohilkhand University, Bareilly **Former**- Director (On Deputation) Centre for Nanoscience and Nanotechnology & Professor Department of Physics, JMI
3.	**Institution**	: M. J. P. Rohilkhand University Bareilly
4.	**Date of Birth**	: Jan. 18, 1952
5.	**Mailing Address**	: Vice Chancellor's Office, M. J. P. Rohilkhand University Bareilly 243006, (U.P.) India **E-mail** : mush_phys@rediffmail.com **Tel.**: 011-26988332(O), 09811214084 (M) **Fax:** 011-26981753, 26987707
6.	**Qualification**	: M.Sc. Physics (Electronics) Ph.D. (Solid State Physics)
7.	**Field of Specialization**	: Materials Science (Amorphous Semiconductor X-ray Spectroscopy, ECR Plasma Etching, Nanostructures)
8.	**Teaching Experience**	: **31 Years (Prof. since 23 Nov. 2002)**
9.	**Research Experience**	: **31 Years**
10.	**Particulars of Guiding Research**	:
(i)	No. of candidates who have been awarded/submitted the Ph.D.	: **41**
(ii)	No. of candidates presently working for Ph.D.	: **06**
11.	**Publications**	
(i)	Research Papers (**in Journals**)	: **188 (International: 180, National: 08)**
(ii)	Research Papers	: **50 (**In Conference Proceedings)
(iii)	Review Articles	: **06**
(iv)	Invited Talks	: **115**

(v) Books : (i) **Advances in Physics of Materials** (Today and Tomorrow Publisher and Printer, New Delhi) 1989.
: (ii) **Advances in Nanomaterials** Springer,ISBN 978-81-322-2668-0,2015

(vi) Book Chapters : **Nanotechnology for Biological Sciences,** Discovery Publishing House Pvt. Ltd., 2015 (India) ISBN: 978-93-5056-749-4.

12. Administrative Responsibilities :

❖ **Vice Chancellor,** M.J.P. Rohilkhand University Bareilly, since 18th December, 2013 – to date.

M.J.P. Rohilkhand University was established in 1975 as an affiliating University. This University at Bareilly is an educational federation of University Departments and Colleges spread over nine districts of Rohilkhand region in Uttar Pradesh. At present besides the university campus the university has 319affiliated colleges in its jurisdiction. In the session 2014-15 the number of students enrolled in the university campus and in its affiliated colleges were about 4500 about 4,30,000, respectively.

University is making efforts to rise to the level of a high class institution to create new horizons in the arena of general and technical education and research. I joined the University as a Vice Chancellor on 18th December, 2013. After that, the main academic and research achievements of the University during the session - 2014-15 are as follows:

- **Strengthening and Transparency in the Evaluation System:**

The university has taken a giant leap ahead in the direction of improving the evaluation system. From the session 2014-15 coding system has been adopted by the university for the campus as well as for all the affiliated colleges of the university.

- **Introduced Subject Combination Pattern at the Undergraduate Level:**

From the session (2014-15) the university has introduced subject combination system for undergraduate students. This system has minimised the anomalies in the choice of subjects by students.

- **On- Line Submission of Examination Forms:**

From the session 2014-15 online submission of examination form has been introduced in the university. This system has reduced the unnecessary workload on the university administration and at the same time it is an effective step in students' welfare and to bring transparency in the system.

- **Introduced M. Pharma Programme:**

Bachelor of Pharmacy course has been running in this university since 1997 and there was great demand from the students, parents and from the society in general to start M.Pharma. programme, as most of the students who wanted to pursue masters course in pharmacy had to face immense difficulties in the absence of this facility. For the department of Pharmacy, AICTE has given approval for starting M.Pharma. programme in the field of Pharmacology and Pharmaceutics.

- **Strengthened Ph. D. Programme:**

After the UGC's Ph. D. regulation 2009, the Ph.D. programme in the university was completely standstill and students were highly anxious regarding their academic future. In 2014 the university has prepared Ph.D.

ordinance and the same has been approved by the Hon'ble Chancellor. Now the process of Ph. D. was initiated in the university and therefore Pre- Ph.D. course work has been started in all the subjects in University campus and some affiliated colleges.

- **Research Projects Completed/ongoing in the Campus:**

Research activities are in full swing as reflected by the number of research programmes and projects. Several Departments have research projects funded/aided by the UGC, DST, DRDO, ICSSR, AICTE and MHRD. During the academic session 2014-15, 18 research projects are currently being run/completed in the different Departments of university campus:

- **Research Papers Published in National and International Journals:**

The University has given priority to the research activities of the faculty members and has encouraged them for more publication of research based papers and articles. During the year 2014-15 in all 127 research papers and 05 books have been published by the faculty members of the university campus.

- **Resource Lectures Organized by the Departments:**

During the year 2014-15 in the university campus 36 resource lectures were organized in different departments. Besides, organizing resource lectures in the university campus, the faculty members of the different departments also delivered 21 extension / Public awareness lectures and resource lectures in community places, industries and different institutions of higher education in state/outside the state.

- **Seminar/Workshops/Conferences attended/ organized by the faculty members:**

During the year 2014-15 the faculty members of the university campus have attended 105 national and international Seminars, Conferences and Workshops. The faculty members of different departments of the university campus have also organized 21 seminars /workshops in the university campus.

- **Centre for UGC-NET Examination:**

Due to rigorous efforts of the university centre for UGC-NET Examination Dec., 2014 was given to University by UGC after a long gap of 17-18 years and the same has been successfully conducted on 28.12.2014.

- **Activities under RUSA :**

In 2013, a scheme named Rashtriya Uchchatar Shiksha Abhiyan (RUSA) was initiated by Ministry of Human Resource Development (MHRD). As follow up of RUSA guidelines, the university has submitted proposals in 2014 to Higher Education Council of U.P. Government for release of grant under RUSA scheme. So far under this programme a grant of Rs. 1.83 crores has been allotted to the university by the U P state government.

- **Raging-free environment in the University campus**
- **Revision/upgradation of curriculum:**
- **Preparation for Two Year B.Ed. Programme:**

❖ **Founding Director,** Centre for Nanoscience & Technology, Jamia Millia Islamia, since 9 Dec. 2011 – 17 Dec. 2013.

An International Workshop under my Secretary-ship on, "Physics of Semiconductor Devices" was organized by the Department of Physics, JMI in the year 1997. The Workshop was inaugurated by the Late President A.P.J. Abdul Kalam. This Workshop had a special session dedicated to Nanostructures. Taking inspiration from this session, we organized ***three*** conferences in the field of Nanomaterials, in the year 2002, 2003 and 2004.

The Department of Physics under my coordinator-ship, started a *two-year* M. Tech. Nanotechnology course in 2007. This innovative Masters level course was designed to produce highly knowledgeable and specially trained post graduates in fast developing area of nanotechnology which is already making major economic contributions, impacting on products ranging from satellite TV, biomedical implants, structural and high-end avionics to sunscreens and even car dashboards.

I was the Principal Investigator in a Project entitled "Growth of Single Wall Carbon Nanotubes for Semiconducting Applications" funded by Department of Information Technology, Ministry of Communications & Information Technology, New Delhi (**with a sanctioned amount Rs. 380.761 Lakhs**). Before this, I had also completed a project entitled "Growth of Multi-Walled Carbon Nanotubes Suitable for Device Application" funded by Defense Research and Development Organization (Ministry of Defence) over the period 2007-2011 (sanctioned amount Rs. 38.998 Lakhs).

The success of these two projects became a turning point and a strong need was felt to meet the ever increasing challenges in the growing area of nanotechnology in terms of fundamental and applied research as well as the availability of trained human resource.

Inspired by the above developments and motivation to pursue research and teaching in the area of nanoscience, I initiated the process of creating a new state of the art Centre, namely the Centre for Nanoscience and Nanotechnology in Jamia Millia Islamia. A comprehensive plan of Centre was submitted and after receiving the formal approval from the UGC the Centre was formally established in Jamia Millia Islamia, New Delhi, in the month of December 2011. I worked as ***Founding Director of Centre for Nanoscience and Nanotechnology since December 9, 2011 to December 17, 2013***. The Centre is now declared as a Centre for Excellence by the UGC.

❖ **Chairman,** Central Admission Co-ordination & Monitoring Committee (CACMC) Jamia Millia Islamia, for University admissions (2010-2013).

CACMC is the highest body of the University for Co-ordination & monitoring of the admission process of all the courses of the university. Under the

supervision of CACMC the entrance test, coding, decoding of the answer sheets and preparation of the results are carried out. The chairman also takes care of the queries made by Deans and Heads of various Faculties & Departments related to the admission process and he also takes the appropriate decisions.

- **Chief Coordinator**, Ph.D. Admissions (2010-2013), JMI

  "The Chief Coordinator Ph.D. Admissions is responsible for all the Ph.D. admissions related process."

- **Coordinator, M. Tech Nano Technology Course**.
  "The planning and execution of this course was done by me. An advance laboratory has been set up in the Department of Physics.
- Prepared Project for starting the M. Tech. Nano Technology Course in the Department.
- Established the Lab. facilities for the M. Tech. Nano Technology Course.
- **Member**, Board of Management of the Centre for Theoretical Physics, JMI
- **Ex-UGC Nominee** – Member, Board of Governors, NIT, Kurukshetra.
- **External Member Academic Council**:

  1) Dr. B.R Ambedkar University, Agra.
  2) Central University of Punjab, Bhatinda (2010-2013)
  3) ITM University, Gurgaon, Haryana (2010-2013)

- **External Member, Board of Studies:**

  1) Deptt. of Physics National Institute of Technology, Srinagar.
  2) Dept. of Applied Sciences, F/O Engg. & Technology, JMI.
  3) Dept. of Electronics Engg, F/O Engg. & Technology, JMI.
  4) Deptt. of Physics, Vanasthali Vidhyapeeth
  5) Deptt. of Physics, Jiwaji University Gwalior
  6) Dept. of Applied Physics, F/O Engg. & Technology, AMU

- **External Member, Faculty Committee,** Faculty of Science, Punjab University, Patiala
- **External Member, Faculty Committee,** Faculty of Science, Aligarh Muslim University, Aligarh
- **Ex-Elected-Member, Academic Council,** Jamia Millia Islamia, New Delhi-25 (1999-2002)

- **Coordinator,** Central Admission Co-ordination & Monitoring Committee (CACMC) Jamia Millia Islamia, for University admissions (July 1994 –July 1996).

- **Advisor,** Jamia Physics Association (1986-94).

- **Incharge Property Department,** JMI, (Oct. 94-Jan 95).

- **Assistant Superintendent** of Examination or conducting Jamia's Annual Examinations (1988-89 & 1989-90).

13. International/National Conferences/Workshops Organized:

13a. International Conferences/Workshops Organized:

Co-Chairman
17th International Workshop on **Physics of Semiconductor Devices**, IWPSD-2013 Amity University, Noida, (Dec. 10-13, 2013).

Member Steering committee
16th International Workshop on **Physics of Semiconductor Devices**, IWPSD-2011 IIT Kanpur, (Dec. 18-22, 2011)

Chairman
15th International Workshop on **Physics of Semiconductor Devices**, IWPSD-2009 Jamia Millia Islamia, (Dec. 15-19, 2009).

Member Organizing Committee
14th International Workshop on **Physics of Semiconductor Devices**, IIT Mumbai (Dec. 16-20, 2007).

Joint Secretary
13th International Workshop on **Physics of Semiconductor Devices**, IIT Delhi (Dec. 13-17,2005).

Joint Secretary
International Workshop on **Physics of Semiconductor Devices**, IIT Chennai, (Dec. 14-18, 2003)

Joint Secretary
International Workshop on **Physics of Semiconductor Devices**, IIT Delhi (Dec. 11-15, 2001)

Joint Secretary
International Workshop on **Physics of Semiconductor Devices**, IIT Delhi (Dec. 14-19, 1999)

Joint Secretary
International Workshop on **Physics of Semiconductor Devices**, Jamia Millia Islamia, New Delhi. (Dec. 16-21, 1997)

Organizing Secretary
VI International Workshop on **Physics of Materials**, Jamia Millia Islamia, New Delhi (Nov. 23 to Dec. 05, 1987)

13b. National Conferences/Workshops Organized:

Convener
Workshop on **"Nano-materials and Devices"**, Jamia Millia Islamia, (Jan. 30, 2008).

Convener
Workshop on **"Nano-materials"**, Jamia Millia Islamia, (March 11,2003).

Convener
Workshop on **"Nano-materials"**, Jamia Millia Islamia, (Nov. 1, 2002).

Co-Convener
National Seminar on **Physics of Materials**, Jamia Millia Islamia (Feb. 29 - March 1, 2002).

Organizing Secretary
Workshop on **Patent Awareness**, Jamia Millia Islamia, New Delhi (Oct.-11,2000)

Convener
National Seminar on **Materials Research and Environment Issues**, Department of Physics, Jamia Millia Islamia, New Delhi-25 (Oct. 23,1997)

Organizing Secretary
National Seminar on **Recent Trends in Nuclear, Particle and Condensed Matter Physics**, Department of Physics, Jamia Millia Islamia, New Delhi (March 06-07, 1997)

Organizing Secretary
National Seminar on **Advances in Physics of Materials**, Department of Physics, Jamia Millia Islamia, New Delhi (Feb. 25-26, 1991)

14. Foreign Visits :

(i) **Nepal:** Iinvited to deliver a Special Guest Lecture on at the 2ndInternational Conference on Infectious Diseases and Nanomedicine-2015 [ICIDN-2015] held from December 15-18, 2015 in Kathmandu, Nepal.

(ii) **Saudi Arabia:** Invited by Jamia Millia Islamia Alumni Association, Riyad, as chief guest on the occasion of 8th Annual meet on 14th

May, 2015, and also delivered lectures at Nanocentre, King Abdul Aziz University, Jeddah on 18th May, 2015.

(iii) **IRAN:** Visited Amirkabir University of Technology and Allameh Tabataba'i University, the Islamic Republic of Iran as Govt. nominee to sign MOU between M.J.P Rohilkhand University and above mentioned university from 18-25 Nov. 2014.

(iv) **SAUDI ARABIA:** Invited to deliver a series of lectures on Nanomaterials/carbon nanotubes at Department of Physics, King Abdulaziz University, Jeddah, and at Department of Physics, King Saud University, Riyadh, Saudi Arabia from 18th April to 26th April, 2013.

(v) **SINGAPORE:** invited to deliver a lecture on Chalcogenide glass waveguides for optical communication at "International conference on Optical Material and Communication (ICOMC 2012), Singapore, December 30-31, 2012.

(vi) **SAUDI ARABIA:** Invited to deliver a series of lectures on Nanomaterials specially carbon nanotubes at Department of Physics, King Abdulaziz University, Jeddah, Saudi Arabia from 2nd Oct. to 07th October, 2011.

(vii) **GERMANY:** Collaborative visit and delivered a lecture at Institute of Ion Beam & Vacuum Technologies, Esslingen, Germany 17-24 April, 2011.

(vi) **IRAN:** Delivered invited lectures at the **" 3rd International Conference on Nanostructures" 10-12 March, 2010.**

(vii) **SAUDI ARABIA:** Delivered invited lectures at the **"International Conference on Nanotechnology: Opportunities And Challenges"** 14 – 19 June 2008

(viii) **SAUDI ARABIA:** Visted Department of Physics, King Abdulaziz University, Jeddah, Saudi Arabia to deliver a series of lectures on **Condensed Matter Physics (amorphous semiconductor, superconductivity and nano-materials)** and exploring the possibilities collaboration. (Nov 18 to Jan 07, 2007

(ix) ***USA:*** Visited the US Naval Research Lab., Washington and delivered a talk on **Syntheses and Characterization of Carbon Nanotubes.** (Aug. 25-28, 31, 2006)

Visited University of Arkansas, Fayetteville and delivered a talk on **Syntheses and Characterization of Carbon Nanotubes Using Fe-Pt as Catalyst.** (Aug. 29-30, 2006)

(x) ***MEXICO***: Participated in the International Symposium on **Solar Hydrogen Fuel Cell-10** as an Invited Speaker at Cancun, Mexico (Aug. 21-24, 2006) and delivered talk on **Growth of Fe-Pt Catalysed Carbon Nanotubes (CNTs): a Potential materials for Hydrogen Storage** .

(xi) ***TAIWAN:*** Participated in the Taiwan International Conference on **Nano Science and Technology** as an Invited Speaker at National Tsing Hua University, Taiwan (June 30- July 3, 2004)

(xii) ***SAUDI ARABIA:*** Participated in The Second Saudi Science Conference as an Invited Speaker at Department of Physics, King Abdulaziz University, Jeddah, Saudi Arabia (March 15 to March 17, 2004)

(xiii) ***BANGLADESH:*** Participated in the Bi-annual Symposium on **Physics and Modern Development** as Invited Speaker at Atomic Energy Center, Dhaka, Bangladesh (March 30 - 31, 2002)

(xiv) ***UNITED KINGDOM***: Visited Department of Physics & Astronomy, Southampton University, Southampton and delivered a talk on **Optical and dielectric properties of Amorphous Semiconductors** (Sept.10-14, 2001)

(xv) ***U.S.A.:*** Visited the US Naval Research Lab., Washington and delivered a talk on **Recent Developments in Amorphous Semiconductors** (Sept. 05 - 08, 2001)

(xvi) ***MEXICO***: Participated in the International Symposium on **New Materials for Hydrogen Fuel – Cell 5 Photovoltaic Systems-I** as an Invited Speaker at Cancun, Mexico (Aug. 26-30, 2001) and visited CENTRO DE INVESTIGACION EN ENERGIA, Temixco, Mexico (Sept. 01-03, 2001) and delivered a talk on "Amorphous Semiconductors".

(xvii) ***U.S.A.:*** Visited Department of Physics & Electrical Engineering at University of Princeton, New Jersey and Bridge Water State College, Bridge Water (Sept. 10 - 13, 1997)

(xviii) ***MEXICO***: Participated in the International Symposium on **New Materials for Hydrogen Fuel – Cell –Photovoltaic Systems - I** as an Invited Speaker at Cancun, Mexico (Sept.01-09, 1997).

(xix) ***BANGLADESH:*** Participated in the International Conference on **Recent Trends in Physics** as a Invited Speaker at Bangladesh University of Science & Technology, Dhaka, Bangladesh (March 20 - 22, 1997)

(xx) ***MALAYSIA:*** Visited (i) Advanced Materials Research Centre at Standards and Industrial Research Institute of Malaysia and delivered a talk on **Advanced Materials** (Nov. 06- 08, 1996) (ii) Centre for Advanced Studies, University of Malaya, Kulalampur, Malaysia.

(xxi) ***SINGAPORE:*** Visited Department of Physics, National University of Singapore (Nov. 04 - 05, 1996)

(xxii) ***BANGLADESH:*** Participated in the International Workshop on **Recent Developments in Condensed Matter Physics and Nuclear Science** as an Invited Speaker at Rajshahi University, Rajshahi, Bangladesh (Oct. 28 - Nov. 01, 1996)

(xxiii) ***ITALY:*** Participated in Third School on the **Use of Synchrotron Radiation in Science & Technology** (Oct. 30 -Dec. 01, 1995)

(xxiv) ***PAKISTAN:*** Participated in Workshop on **Solid State Devices**, University of Karachi (Aug.17-20, 1991).

(xv) ***UNITED KINGDOM***: Visited South Bank Polytechnic, London and University of Cambridge (Sept.28-Oct.4, 1989)

(xvi) ***ITALY:*** Participated in Research Workshop on **Condensed Matter Physics** at I.C.T.P., Trieste (Aug.20-Sept.27, 1989)

(xvii) ***PAKISTAN:*** Participated in Nathiagali Summer College on **Superconductivity** (June-July 1988)

(xviii) ***ITALY:*** Participated in Workshop on **Materials Science and Non-Conventional Energy Sources** at I.C.T.P., Trieste (Aug.31-Oct.4, 1987)

15. Scientific Collaborations:

(i) Laboratorio de Energia SolarInstituto De Investigaciones En Materials, Temixco, Mexico.

(ii) MOCVD Division, Solid State Physics Laboratory, (Ministry of Defence), Lucknow Road, Delhi.

(iii) Superconductivity Division, National Physical Laboratory, Delhi.

16. Academic Distinctions:

(i) **Ex-Associate Member**
Third World Academy of Sciences, ICTP, Trieste (Italy)

(ii) **Fellow,** Meteorological Society of India.

(iii) **Referee,** X-ray Spectrometry (A Scientific Journal of USA)

(iv) **Referee,** Physica B (U.S. A.)

(v) **Referee**, Indian Journal of Pure & Applied Physics (CSIR)

(vi) **Referee**, Indian Journal of Physics, (IPA)

(vii) **Referee**, Central European J. of Physics (Poland)

(viii) **Referee**, J. of Non-Crystalline Solids (U. K.)

(ix) **Member – Editorial Board,** Indian Science Abstract, The Council of Scientific and Industrial Research, New Delhi 2008.

INVITED TALKS

Total = 115; International = 38; National = 77

115. "Carbon Nanotube for medical applications" at the 2nd International Conference on Infectious Diseases and Nanomedicine-2015 [ICIDN-2015] held from December 15-18, 2015 in Kathmandu, Nepal.

114. Delivered four lectures on (i) Recent Advances in Conducting Polymers (ii) Recent Developments in Nanoscience and Nanotechnology (iii) Recent developments in High Temperature Superconductivity (iv) Synthesis and Characterization of Carbon Nanotubes at Science Academies' Refresher Course on Thin films and Nanoscience held at Tripura University, Tripura from 4th May, 2015 to 18th May, 2015.

113. Carbon nanotubes and its applications in the "National Conference on Advance research and innovation in Science and Technology" organized by Teerthankar Mahavir University Gajraula on 17 May 2014.

112. Carbon Nanotubes: An emerging material of 21st Century for futuristic devices, in the "International workshop on futuristic material; characterization properties and technology" organized by M.J.P Rohilkhand University Bareilly from 17-22 Jul 2014.

111. Carbon Nanotubes: Emerging cold cathode material for futuristic field emission based devices, International Workshop on Physics of Semiconductor Devices, organized by Amity Institute of Advanced Research and Studies (materials & devices), Amity University, Noida, Uttar Pardesh.

110. Carbon Nanotubes: Emerging cold cathode material for futuristic electron field emission devices, National Conference on Nanomaterials and Devices

(NANOCAD-2013), organized by Department of Physics, NIT Srinagar, Kashmir.

109. Carbon Nanotubes: An emerging material of 21st Century for futuristic devices in the National Seminar on "Signal Processing and Communication Technology" organized by Delhi College of Technology and Management (DCTM) from 26-27 May, 2013.

108. Synthesis of Single wall Carbon Nanotubes for sensor applications, delivered in the Department of Physics, King Saud University, Riyadh, Saudi Arabia on 23rd April, 2013.

107. Carbon Nanotubes: Emerging cold cathode material for futuristic display devices and Recent Developments Of Nanotechnology delivered in the Department of Physics, King Abdul Aziz University, Jeddah, Saudi Arabia on 22nd and 25th April, 2013 respectively.

106. Carbon Nanotubes: An emerging material of 21st century for futuristic device applications" at national seminar on recent trends and development in nano materials, organized by IIMT, Meerut

105. Carbon Nanotubes: An Emerging Material for Futuristic Device at National Workshop on Nanotechnology and its Applications in Science and Engineering (NASE-2013) in National Institute of Technology, Manipur from 23-24 March 2013.

104. Recent development in the field of Nanotechnology, at National Conference on Nanoscience and Nanotechnology organized by Aligarh Muslim University on 15th March, 2013

103. Carbon Nanotubes: A Materials of 21st Century at Workshop on inspiring humanity for environmental protection and energy conservation organized by Al-Falah School of Engineering and Technology on 14th March, 2013.

102. Carbon nanotubes and its applications at National Conference on Advanced Trends in Nanoscience and Nanotechnology, organized by Department of Applied Science and Humanities, JMI, 25th February, 2013.

101. Potential Applications of Carbon Nanotubes as Electron Field Emitter at International conference on Material Science (ICMS-2013) in Department of Physics, Tripura University (A central University), Tripura from 21-23 Feb. 2013.

100. Carbon Nanotubes: An Emerging Electronic Material for Futuristic Devices at Second International Symposium on Semiconductor Materials and Devices (ISSMD-2), in University of Jammu, from 31 Jan. 2013 to 2 Feb. 2013.

99. Chalcogenide glass waveguides for optical communication at "International conference on Optical Material and Communication (ICOMC 2012), Singapore, 30 December 2012.

98. Mathematics and Nanotechnology at 11th Biennial Conference of ISIAM on Emerging Mathematical Methods, Models & Algorithms for Science and Technology in Gautam Buddha university, Greater Noida, UP From 15-16 December 2012.

97. Carbon Nanotubes : A material of 21st Century at National Conference on Indian Development in Recent and ideal Semiconductors for Novel Applications (NC IDRIS - 2012) in Department of Physics, Arts, Commerce, Science college, Navapur Maharastra from 5-7 october 2012.

96. Series of lectures in Refresher Course in Department of Physics, Manipur University, Canchipur, Imphal, on 14 and 15th September 2012.

95. Carbon nanotube based field emission display, Recent Trends in Material Science Research, Department of Chemistry and Physics, NIT, Srinagar, Kashmir, 3rd-5th September, 2012.

94. Emerging scenario for Nanotechnology Applications-Challenges and Threats
Also Chief Guest in "National Seminar on Nanoscience, Technology and their Societal Impact"
Babu Banarsi Das Institute of Technology, 07th April, 2012

93. Carbon Nanotube based Field Emission Display, at "International Conference and Workshop on Nanostructured Ceramics & other Nanomaterials, University of Delhi, 14th March, 2012,

92. Synthesis and characterization of Carbon Nanotubes
National Conference on Materials for Advanced Technologies
ABV-Indian Institute of Information Technology and Management
Gwalior, 27th – 29th Feb, 2012

91. Field Emission Properties of CNTs
India Singapore Joint Physics Symposium (ISJPS 2012) on "Advanced Materials" in Indian Institute of Technology Delhi, New Delhi, India from Feb. 21, 2012

90. Carbon Nanotubes: A Materials of 21st Century
4th National Conference on Nanomaterials and Nanotechnology
Department of Physics, University of Lucknow, Lucknow
From 21st -23rd Dec, 2011

89. Carbon Nanotube: A 21st Century Material
National Conference on Recent Trends in Synthesis and Applications of Advanced Materials (RTSAAM2011), Maharaja Agrasen Institute of Technology, Delhi from 5-6 Dec., 2011

88. Carbon Nanotubes and its different applications
Department of Physics, King Abdulaziz University, Jeddah, Saudi Arabia from 2nd Oct. to 07th October, 2011.

87. Field Emission Property of Carbon Nanotubes
Aligrah Nano-I, Workshop on Nanoscience and Nanotechnology
March 26-27, 2011
Department of Applied Physics, Z.H.College of Engg. & Tech. AMU, Aligrah-202002

86. Recent Development of Nanotechnology
INSPIRE Programme of DST
Orgnised by University of Tripura, Agartala
9-13 March 2011,

85. Carbon nanotubes and its applications
National conference on NANOSCIENCE & TECHNOLOGY,
Feb 21-22, 2011
Department of Physics Science College, Congress Nagar, Nagpur-440012

84. Carbon Nanotubes: A Material of 21st Century,
National Seminar on Contribution of Material Science to the world today, 18-19 January 2011. Department of Physics, D.B.S College, Kanpur

83. Carbon Nanotubes: A Material of 21st Century
Department of Applied Physics, M.J.P. Rohilkhand University, Bareilly

82. Carbon Nanotubes for Medical Applications
Mahavir Cancer Sansthan & Research Centre
Phulwarisharif, Patna

81. Nanotechnology and its Medical Applications
ISARCON 2010
13-14 November, 2010
University College of Medical Science, (University of Delhi) & Guru Teg Bahadur Hospital, Delhi India - 110095

80. Mathematics and Nanotechnology
ICM 2010, Mathematics in Science and Technology
15-17 August 2010, SHARDA University, Greater Noida,

79. National Conference on Energy Technologies for Rural Applications
June 7, 2010
Department of Mechnical and Automobile Engineering, ITM University Gurgaon (Harayana)

78. Carbon Nanotubes Based Field Emission Display
Nano conference on Recent Trends in Materials and Devices, RTMD-2010,

20-22 May 2010, Amity Institute of Applied Science & Amity School of Engineering and Technology, Amity University, Noida

77. Fundamentals of Nanoscience $ Nanotechnology
Seminar on Scientific Development and their impact on Society
Jiwaji University, Gwalior, March 26-27, 2010

76. Carbon nanotubes & Field Emission Display
DRS Seminar on Semiconductor, Nanomaterials & Devices
Jammu University, Jammu, March 25, 2010

75. Carbon Nanotubes: A Materials of 21st Century
Refresher course, Academic staff College
Delhi University, Delhi
March 19, 2010

74. Carbon nanotubes based Field Emission Display
3rd International conference on Nanostructures
Sharif University of Technology, International campus, Kish Island, Iran. March 08-14, 2010

73. Fundamentals of Nanotechnology
International Conference on Naomaterials
Department of Physics & Chemistry
Dr. B.R. Ambedakar University, Agra, 23rd December 2009.

72. Carbon Nanotubes based field emission display
International Workshop on Physics of Semiconductor Devices, JMI, New Delhi (December16, 2009).

71. Fundamentals of Nanoscience & Nanotechnology
Uttarakhand Science Congress, B.B. Pant University, 11th November 2009.

70. Carbon Nanotube: An Advanced Material of 21st Century
A National Seminar on "Recent Trends in Physics"
Ch. Devi Lal University, Sirsa (Haryana) 24th Oct. 2009.

69. Nanotechnology: Carbon Nanotubes
National Seminar on Advanced Materials
NIIT Srinagar, 3rd Oct, 2009.

68. Field Emission Property of Carbon Nanotubes
"National Conference on "Recent Drifts, Breaks in Applied Sciences & its Technology for Innovation Management"
Krishna Institute of Engineering & Technology, Ghaziabad, U.P (7-9 August, 2009)

67. Carbon Nanotubes: A Materials of 21st Century

"National Conference on Synthesis & Characterization of New Materials and It's Application" Kamla Nehru Mahavidyalaya, Sakkardara Square, Nagpur.

66. Key note address: Nanotechnology-A technology of next generation
A National Seminar Organized by Acharya Jagadish Chaudhuri College, Calcutta (14th March, 2009)

65. Application of Carbon Nanotube: Field Emission Display
"Fourteenth APAM Conference on State of Materials Research and New Trends in Materials Science"
ILTP workshop on Problems of Nanoscience & Technology, National Physical Laboratory, New Delhi (18-20 November 2008).

64. Carbon Nanotube based Field Emission Display
International Conference on Advances in Nanotechnology (ICANAT-2008) Mats University, Raipur, Chattishgarh, India (Nov. 6-8 2008).

63. Field Emission Properties of Carbon Nanotubes
"National Seminar on Frontiers in Electronics, Communication, Instrumentation and Information Technology (FECIIT – 2008), ISMU, Dhanbad, India (October 13-15 2008).

62. Conducting Polymers and Nano Polymer composites, Department of Chemistry, King Abdul Aziz University, Jeddah (22 June 2008).

61. Field Emission Properties of Carbon Nanotubes "International Conference on Nanotechnology : Opportunities and Challenged" 17 – 19 June 2008, Centre of Nanotechnology, King Abdul Aziz University, Jeddah.

60. Fundamentals of Nano Science and Nanotechnology in Pre-conference *Tutorial* "International Conference on Nanotechnology: Opportunities And Challenged" 14 – 16 June 2008, Centre of Nanotechnology, King Abdul Aziz University, Jeddah.

59. Nanotechnology and its Applications
S.O.S in Electronics, Jiwaji University, Gwalior (30th March 2008).

58. Nanotechnology – Carbon Nanotubes (A material of 21st Century), National Workshop on advances in Material Science and Nano- technology (AMSNT – 2008), Mandsaur Institute of Technology, Mandsaur (4-5th March 2008).

57. Recent advances in Material's Sciences, National Seminar in Department of Applied Physics, I.S.M. University, Dhanbad (15-17th February 2008).

56. Recent Developments in Nanotechnology
Academic Staff College, University of Delhi (North Campus), Delhi (May 18 2007)

55. Carbon Nanotubes and its possible applications
Annual meeting of Saudi Physics association, King Abdulaziz City of Science and Technology (Dec 18-28.2006)

54. Syntheses and Characterization of Carbon Nanotubes.
King Abdulaziz University Jeddah, Saudia Arabia. (Dec. 16, 2006)

53. Carbon nanotubes, A material of 21st Century.
One day Seminar on Applications of conducting Polymers and Nanomaterials in Science and Technology, (September 19, 2006).

52. Syntheses and Characterization of Carbon Nanotubes.
US Naval Research Lab., Washington DC. (Aug. 25-28, 31, 2006)

51. Syntheses and Characterization of Carbon Nanotubes Using Fe-Pt as Catalyst.
University of Arkansas, Fayetteville. (Aug. 29-30, 2006)

50. Electrical And Optical Properties Of Thin Films Based On Poly [2-Methoxy-5 (2'-Ethyl Hexyloxy)-1,4-Phenylene Vinylene] Doped With Acridine Orange Dye.
International Symposium on Photovaltaics Solar Energy Materials and Thin Films as an Invited Speaker at Cancun, Mexico (Aug. 21-24, 2006)

49. Growth of Fe-Pt Catalysed Carbon Nanotubes (CNTs): a Potential material for Hydrogen Storage.
International Symposium on Solar Hydrogen Fuel Cell-10 as an Invited Speaker at Cancun, Mexico (Aug. 21-24, 2006)

48. Conducting Polymers and their Applications
Department of Chemistry, NIT, Srinagar, (July 29, 2006)

47. Recent Developments in Nanoscience and Nanotechnology
National Seminar on Recent Trends in Nanotechnology, University of Kashmir (June 19, 2006)

46. Basic Aspects of Carbon Nanotubes
National Seminar on Recent Trends in Nanotechnology, University of Kashmir (June 19, 2006).

45. Nanotechnology and Nanomaterials.
Academic Staff College, University of Jammu, Jammu (Feb. 25, 2006)

44. Syntheses and Characterization of Carbon Nanotubes
International Workshop on Physics of Semiconductor Devices, NPL, New Delhi (December16, 2005)

43. Carbon Nanotubes and its Applications
Academic Staff College, Aligarh Muslim University, (UP), India (Nov. 24, 2005)

42. Recent developments in amorphous Semiconductors

Academic Staff College, Aligarh Muslim University, (November 24, 2005)

41. Nanomaterials and Carbon Nanotubes
Government Degree College, Bemina, Srinagar

40. Carbon Nanotubes and its Applications
National Conference on Nanotechnology, CIT, MR Education, Faridabad

39. Nanotechnology-Carbon Nanotubes
NIT, Hazratbal, Srinagar

38. Growth and Characterization of Carbon Nanotubes
M.P. Science Congress, Govt. Nutan College, Bhopal

37. High Temperature Superconductivity and Carbon Nanotubes
Rai University, (Badarpur Complex), New Delhi (19th Jan 2005)

36. Recent Developments in High Temperature Conductivity
Rai University, (Dwarka Complex), New Delhi (17th December 2004)

35. Effect of ECR Plasma Exposure on Optical Constants of $Se_{80}Te_{20-x}Pb_x$ Thin Films
Taiwan International Conference on Nano Science and Technology, National Tsing Hua University, Taiwan (June 30 – July 3, 2004)

34. ECR Plasma Etching of III-V Semiconductor Compounds
Department Mat. Science and Engineering, Hsinchu 300, Taiwan (July 8, 2004)

33. Recent development in Chalcogenide Glasses
The Second Saudi Science Conference at Department of Physics, King Abdul Aziz University, Jeddah, Saudi Arabia (March 14, 2004)

32. The Wonderful World of Carbon Nanotubes
The Second Saudi Science Conference at Department of Physics, King Abdul Aziz University, Jeddah, Saudi Arabia (March 15, 2004)

31. Recent Developments of Amorphous Semiconductors
Condensed Matter Physics Laboratory, Department of Physics, University of Rajasthan, Jaipur, India (Jan. 16-01-2004)

30. Recent development of high temperature superconductivity
Condensed Matter Physics Laboratory, Department of Physics, University of Rajasthan, Jaipur, India (Jan. 17-01-2004)

29. Thermal and Optical Properties of Amorphous Semiconductor
Proceedings of the XIIth IWPSD, Chennai, India, Vol I, Page No. 96- 99, December 2003

28. Advances in amorphous semiconductors.
Annual memorial lecturer at Department of Physics, KNI, Sultanpur, U.P. (Jan. 30, 2003)

27. Negative Dielectric Constants in Amorphous Semiconductors

National Conference on Materials and devices-2003, T. M. Bhagalpur University, Bhagalpur, Bihar, India (Jan. 27-28,2003)

26. Comparison of Plasma Etching Results of GaAs in $CCl_2F_2/Ar/O_2$ discharge in RIE and ECR techniques
Condensed Matter Days- 2002, T. M. Bhagalpur University, Bhagalpur, Bihar, India (August 29-31,2002)

25. Effect of Annealing on the Optical parameters of Amorphous Chalcogenide thin films
II National Conference on Thermophysical Properties, Department of Physics, University of Rajasthan, Jaipur, India (September 19-21, 2002)

24. High Temperature Superconductor
Academic Staff College, H. P. University, Shimla (HP), India. (July 02, 2002)

23. Semiconductor Physics
Academic Staff College, H. P. University, Shimla (HP), India. (July 03, 2002)

22. Recent developments in amorphous Semiconductors
Academic Staff College, H. P. University, Shimla (HP), India. (July 04, 2002)

21. ECR plasma etching of III-V compounds
Academic Staff College, H. P. University, Shimla (HP), India. (July 04, 2002)

20. Recent developments in amorphous semiconductors
Biannual Symposium on Physics and Modern Developments, Atomic Energy Center, Dhaka, Bangladesh. (30-31 March, 2002)

19. (i) Optical, Electrical and Structural Investigation on $Cd_{1-x}Zn_xSe$ sintered films for photovoltaic applications
(ii) GaAs/Ge Solar Cells by MOVPE
International Symposium on New Materials for Hydrogen Fuel – Cell 5- Photovoltaic Systems-I
Cancun, Mexico (Aug. 26-30, 2001)

18. Amorphous Semiconductors
Centro De Investigacion En Energia, Temixco, Mexico (Sept. 01-03, 2001)

17. Recent Developments in Amorphous Semiconductors
US Naval Research Lab., Washington and delivered a talk on (Sept. 05 - 08, 2001)

16. Optical and dielectric properties of Amorphous Semiconductors
Department of Physics & Astronomy, Southampton University, Southampton (Sept.10-14, 2001)

15. Electrical Transport Studies of Amorphous Semiconductors
Academic Staff College, H. P. University, Shimla (HP), India.
(July 31-Aug. 03, 2001)

14 Structural Studies of Amorphous Semiconductors
Academic Staff College, H. P. University, Shimla (HP), India.
(July 31-Aug. 03, 2001)

13. Optical Studies of Amorphous Semiconductors

Academic Staff College, H. P. University, Shimla (HP), India.
(July 31-Aug. 03, 2001)

12. Dielectric Studies of Amorphous Semiconductors
Academic Staff College, H. P. University, Shimla (HP), India.
(July 31-Aug. 03, 2001)

11. Dielectric Studies of Amorphous Semiconductors
Tenth International Workshop on Physics of Semiconductors Devices (December 14-18, 1999), I.I.T. New Delhi, India

10. a-$Se_{80-x}Ga_{20}M_x$, A Material for Photovoltaic Applications
International Symposium on New Materials Hydrogen Cell Fuel Photovoltaic System-I
(Sept. 01-04, 1997), Cancun, Mexico

9. X-ray Absorption Studies in Amorphous Ga-Se Alloys
VI National Seminar on X-ray Spectroscopy and allied Areas, Govt. P.G. Arts and Science College, Ratlam (MP) (Nov. 17-19, 1997)

8. Electrical Transport in Amorphous Semiconductors
International Conference on Recent Trends in Physics, Bangladesh University of Science & Technology, Dhaka, Bangladesh (March 20-22, 1997)

7. Advanced Materials
Advanced Materials Research Center, Standards and Industrial Research Institute of Malaysia, Kulalampur, Malaysia (Nov. 06-08, 1996)

6. X-ray Absorption Studies in Amorphous Semiconductors
International Workshop on Recent Developments in Condensed Matter Physics and Nuclear Sciences, Rajshahi University, Rajshahi, Bangladesh (Oct. 28 - Nov. 01, 1996)

5. X-ray Absorption Edge Studies in a-Semiconducting Alloys
National Seminar on Disordered Materials, University of Rajasthan, Jaipur (Oct. 24-26, 1994)

4. Absorption studies in Glassy Materials
IV National Seminar on X-ray Spectroscopy, organised by Deviahilya University at CAT, Indore (Jan. 9-11, 1992)

3. Characterization of materials by chemical shift of X-ray absorption edges
Second National Conference on Disordered Materials, HBTI, Kanpur
(Dec. 21-23, 1991)

2. Electrical and Structural Studies in glassy semiconducting $Se_{100-x}In_x$ alloys
International Workshop on Solid State Devices, University of Karachi, Pakistan (Aug. 17-20, 1991)

1. Chemical shift of X-ray absorption edges

Symposium on EXAFS and allied phenomena, Motilal Vigyan Mahavidyalaya, Bhopal (July 19-21, 1985)

17. Life Membership of Academic Societies:

(i) **President,** Society for Nano Science and Technology

(ii) **Fellow/Academician**, Asia Pacific Academy of materials (APAM)

(iii) **Ex-Vice President,** Indian Physical Society.

(iv) **Ex-Vice President,** Semiconductor Society, India.

(v) **Executive Member**, Indian Physical Society

(vi) ***Secretary*,** Society for Semiconductor Devices.

(vii) The Indian Association of Physics Teachers.

(viii) Indian Association of X-ray Spectroscopy and Allied Area Council Member.

(ix) Indian Science Congress Association.

(x) Indian Society of Disordered Materials (Treasurer)

(xi) Metrological Society of India.

(xii) Indian Chapter of International Center for Theoretical Physics.

(xiii) ***Joint Secretary***, Society for the Promotion and Development of Eco-Friendly Polymers (SEFP)

18. WORK UNDERTAKEN

(a) Synthesis and characterization of carbon nanotubes.

(b) Studies of conjugated polymers

(c) Preparation and Characterization of the Amorphous Semiconductors

19. Research Projects (for brief report see Appendix "I")

(a) Ongoing Projects :

Project entitled **"Growth of Single Wall Carbon Nanotubes for semiconducting Applications"** funded by Department of Information Technology, New Delhi-03 **(Amount Rs. 380.761 Lakhs)**

(b) Completed :

Project entitled **"Growth of Multi-Walled Carbon Nanotubes Suitable for Device Application"** funded by Defense Research and Development Organization (Ministry of Defence), New Delhi (2007-2011) **(Amount Rs. 38.998 Lakhs)**

Project entitled ***"High Temperature Superconductivity"*** funded by the University Grants Commission, New Delhi. (1989- 2009) **(Amount Rs. 32.90 Lakhs)**

Project entitled "**Design and Fabrication of Photon-Drag Detectors and Transversely Excited Carbon-dioxide Laser for their Evaluation "** funded by Defense Research and Development Organization (Ministry of Defence), New Delhi (2006-2009) **(Amount Rs. 37.31 Lakhs)**

Project entitled ***"Studies of Mechanisms of New Dye-Lasers Materials and their Organic Hosts*** funded by Defense Research and Development Organization (Ministry of Defence), New Delhi (2003-2006) **(Amount Rs. 28 Lakhs)**

Project entitled ***"ECR Etching for III-V and II-VI group Compound Materials"*** funded by Defence Research and Development Organization (Ministry of Defence), New Delhi (2003-2005) **(Amount Rs. 5 Lakhs)**

Project entitled ***"Development of Diffusive Optical Pump Cavities for Solid State Lasers"*** funded by Defence Research and Development Organization (Ministry of Defence), New Delhi. (1999-2003) **(Amount Rs. 26.2 Lakhs)**

Project entitled ***"Thermal Studies of Amorphous Semiconductors"*** funded by Council of Scientific and Industrial Research, New Delhi. (2000-2003) **(Amount Rs. 4.25 Lakhs)**

Project entitled ***"ECR Etching for III-V group Compound Materials"*** funded by Defense Research and Development Organization (Ministry of Defense), New Delhi.(1998-2001) **(Amount Rs. 41 Lakhs)**

Project entitled ***"Dielectric Properties of Amorphous Semiconductors"*** funded by the University Grants Commission, New Delhi (1997-2000) **(Amount Rs. 3.04 Lakhs)**

Project entitled ***"Thermo-electric Power and X-rays Studies in Amorphous Semiconductors"*** funded by Department of Science and Technology, New Delhi (1988-1991) **(Amount Rs. 1 Lakh)**

Project entitled ***"Chemical Shift X-ray Absorption Edges"*** funded by University Grants Commission, New Delhi (1984-1986)

20. Awards :

(i) **Materials Research Society of India- Medal for 2016**

((ii) Young Scientist Best Paper Award by MAAS.

(iii) National Scholarship at B.Sc. Level

21. Name and Addresses of Referees:

(i) Prof. Vikram Kumar
Former Director (NPL)
Deptt. of Physics
IIT Delhi, New Delhi.

(ii) Prof. (Dr.) S. B. Qadri
Scientist
US Navel Research Lab.
Washington, USA

(ii) Prof. P. J. Sebastian
Laboratoriode Energia Solar
Instituto De Investigaciones
En Materials, Temixco,
Morelos, Mexico

(iv) Dr. Krishan Lal
Former President,
Indian National Science Academy
Ex-Director, National Physical Lab
Hill side Road, New Delhi

THESIS AWARDED/Submitted

Nanotechnology:	**Eight**
Semiconductor/Superconductivity:	**Twenty Three**
Conducting Polymers:	**Two**
Others:	**Eight**
Total:	**Forty one**

Number of students working for Ph.D.

Nanotechnology:	**Six**
Total:	**Six**

Details of Theses Awarded/Submitted

(41) Topic : Synthesis and Characteristion of Polyaniline Nanocomposites
Name of the Student Ms. Shumaila

(40) Topic : Transport and Interface Study of Hole

Transporting Organic Semiconductors

Name of the Student : Ms. Omwati

(39) Topic : Synthesis of Multi-walled Carbon Nanotubes (MWNTs) and their Characterization

Name of the Student : Mr. Javid Ali, year 2014

(38) Topic : Growth and Characterization of Carbon Nanotubes using Catalyst.

Name of the Student : Mr. Avshish Kumar, year 2014

(37) Topic : Synthesis and Characterization of ZnO Nanostructure.

Name of the Student : Mr. Ravi Keshwar Kumar, year 2014

(36) Topic : Synthesis of Silicon Nanowires dor Solar Cell Applications.

Name of the Student : Mr. Dinesh Kumar, year 2013

(35) Topic : Superconductivity in pure and doped Iron Arsenide Oxy-Pinctides compounds

Name of the Student : Mr. Anand Pal, Year 2013.

(34) Topic : Superconductivity in Ga-O, Nb-O, Fe-O, Co-O, Mo-O & Ru-O Redox Layer based RE-Ba-Cu-O Systems.

Name of the Student : Mr. Shiva Kumar Singh, Year 2013.

(33) Topic : Design and Fabrication of Photon Drag-Detectors and TEA CO_2 Laser as their Evalution, and Study the Effect of the Laser Irradiation on Amorphous Semiconductor.

Name of the Student : Mr. Adam Abdullah Bahishti, Year 2012

(32) Topic : Group II-VI Semiconductor Nano-crystal for Photo and Electroluminescence Applications.

Name of the Student : Ms Sonal, Year 2012

(31) Topic : Fabrication of Diffused Junction Crystalline Silicon Solar Cells with Texturization and Different Antireflection Coatings and Study of their Photovoltaic properties.

Name of the Student : Mr. Firoz Khan, Year 2011.

(30) Topic : Synthesis and characterization of Nano-structures.

Name of the Student : *Mr. Karunapati Tripathi, Year 2011*

(29) Topic : Studies of partially coherent optical fields and

their applications.

Name of the Student *Ms Swati Raman, Year 2011*

(28) Topic : Thermal and Dielectric Properties of Amorphous Semiconductor.

Name of the Student *Mr. Nadeem Musahwar, Year 2010*

(27) Topic : Fabrication,characterization and other related studies for performance improvement of crystalline silicon solar cells.

Name of the Student *Ms Priyanka Singh, Year 2010*

(26) Topic : Thermal and Optical Properties of chalcogenide Glasses

Name of the Student *Mr. Anis Ahmad, Year 2009*

(25) Topic : Synthesis and Physical Property Characterization of Pure and Nano-Magnetic Ions Doped Vacuum Annealed MgB_2 superconductors

Name of the Student *Mr. Kongkham Premjit Singh, Year 2008*

(24) Topic : Study of fluctuation induced conductivity and magnetic properties of Nano-metal oxide doped MgB_2 superconductors

Name of the Student *Mr. Intikhab Aalam Ansari, Year 2008*

(23) Topic : Growth and characterization of Carbon Nanotubes grown on Fe and Fe-Pd films.

Name of the Student *Ms. Monika Aggarwal, Year 2008*

(22) Topic : High Power Laser Interaction Studies.

Name of the Student *Mr. Nilratan Das, Year 2008*

(21) Topic : Synthesis and characterization of Conjugated Polymers.

Name of the Student *Ms. Samrana Kazim, Year 2008*

(20) Topic : Synthesis, doping and characterization of Polyaniline blendes.

Name of the Student *Ms. Sadia Ameen, Year 2008*

(19) Topic : Dielectric relaxation and high field conduction studies of Chalcogenide glasses.

Name of the Student *Mr.Satish Kumar Saini, Year 2007*

(18) Topic : Structural Studies on Ga_2Se_3 and related Compounds.

Name of the Student *Mr. Mohd. Alim Khan, Year 2006*

(17) **Topic** : Study on Time and Temperature Induced Phase Transformation in 2.22 Cr-1Mo Steel
Name of the Student *Mr. V. Jayan, Year 2003*

(16) **Topic** : ECR Etching of II-VI Compound Semiconductors and their Surface Studies by spectroscopic analysis.
Name of the Student *Mr. Kamla Pati Tiwari, Year 2005*

(15) **Topic** : Parametric Studies of Jet Type Singlet Oxygen Generator
Name of the Student *Mr. R. Rajesh, Year 2004*

(14) **Topic** : Crystallization Kinetics & Phase change in Chalcogenide Glasses.
Name of the Student *Mr. Shamshad Ahmad Khan, Year 2003*

(13) **Topic** : Density of Localized state in Chalcogenide Glasses.
Name of the Student *Mr. Mohd. Abdul Majeed Khan, Year 2003*

(12) **Topic** : High energy plasma satellites in the X-ray excited auger spectra of solids.
Name of the Student *Mr. Sharad Srivastava, Year 2002*

(11) **Topic** : Interaction of Surface Plasmon and Phonon and Poloriton Modes in Spherical Polar Semiconductors.
Name of the Student *Mr. Daya Shanker, Year 2002*

(10) **Topic** : Studies of Infra-red Sensitive Films.
Name of the Student *Mr. Sushil Kumar, C.C.S. University, Meerut, Year 2001*

(09) **Topic** : Investigations of Materials under High Pressure
Name of the Student *Mr. Dharambir Singh, Jamia Millia Islamia, Year 2000*

(08) **Topic** : Electrical, Optical and Dielectric Studies of Glassy Semi-conducting Alloys.
Name of the Student *Mr. Mohd. Ilyas, Jamia Millia Islamia, Year 1997*

(07) **Topic** : High Field Conduction in Chalcogenide Glasses.
Name of the Student *Mrs. Shagufta Bano Husain, Jamia Millia Islamia, Year 1997*

(06) **Topic** : Electrical and Optical Characterization of Amorphous Semiconductors.
Name of the Student *Mr. Zishan Husain Khan, Jamia Millia Islamia,*

Year 1996

(05) **Topic** : Electrical Characterization of Semiconducting Materials and Devices.
Name of the Student *Mr. Harsh, Jamia Millia Islamia, Year 1995*

(04) **Topic** : Electrical and Structural Studies of Chalcogenide Glasses.
Name of the Student *Mr. Mohammad Manzar Malik, Jamia Millia Islamia, Year 1992*

(03) **Topic** : Electrical and X-ray Studies of Amorphous Semiconductors.
Name of the Student *Mr. Arvind Kumar, Jamia Millia Islamia, Year 1992*

(02) **Topic** : Chemical Shift of X-ray Absorption Edges and its Applications.
Name of the Student *Mrs. Alka Batra, Bhopal University, Year 1991*

(01) **Topic** : Electronegativity and Chemical Shift of X-ray Absorption Edges.
Name of the Student *Mr. Iqbal Ahmad Khan, Bhopal University, Year 1986*

LIST OF PUBLICATIONS

PUBLISHED IN INTERNATIONAL/NATIONAL JOURNALS

Nanomaterials/Carbon Nanotubes

188. Selective Growth of Single Wall Carbon Nanotubes Uniformly Grown by Plasma Enhanced Chemical Vapor Deposition System
Mohd Yaseen Lone, Avshish Kumar, Shama Parveen, Samina Husain, Mohammad Zulfequar, Mushahid Husain, Advanced Science Letter, 2015 (In Press).

187. A comparative study of nitrogen plasma effect on field emission characteristics of single wall carbon nanotubes synthesized by plasma enhanced chemical vapour deposition
Avshish Kumar, Shama Parveen, Samina Husain, Javid Ali, Mohammad Zulfequar, Harsh and Mushahid Husain, Applied Surface Science, 322 (2014) 236–241.

186. Field Emission study of MWCNT/Conducting Polymer Nanocomposites
M.A.Alvi, A. A. Al-Ghamdi, M.Husain
Physica B, 454, 31-34, (2014).

185. Effect of Parametric Variation on the Performance of SWCNT Based Field Effect Transistor
Avshish Kumar, Mubashshir Husain, Ayub Khan, Mushahid Husain, Physica E, 64 (2014)178–182.

184. Effect of Oxygen Plasma on Field Emission Characteristics of Single Wall Carbon Nanotubes Grown by Plasma Enhanced Chemical Vapour Deposition System
Avshish Kumar, Shama Parveen, Samina Husain, Javid Ali, Mohammad Zulfequar, Harsh, Mushahid Husain,
Journal of Applied Physics, 115, 084308(1-6) (2014).

183. Field Emission Characteristics of Polyaniline/SE Nanocomposites
Shumaila, S.Parveen, Masood Alam, Azher M. Siddiqui and M.Husain
Journal of Nanoscience and Nanotechnology 14, 1-5, (2014).

182. Improved field emission properties of carbon nanotubes by dual layer deposition
Shama Parveen, Samina Husain, Avshish Kumar, Javid Ali and Mushahid Husain,
Journal of Experimental Nanoscience, 2013 (In Press)

181. Field Emission Behaviour of the Single Wall Carbon Nanotubes Grown by Plasma Enhanced Chemical Vapour Deposition (PECVD) System
Avshish Kumar, Shama Parveen, Samina Husain, Javid Ali, Harsh, M. Husain,
Journal of Nano and Electronic Physics, 5, 02012, 2013.

180. Enhanced Field Emission Properties of Carbon Nanotube Based Field Emitters by Dynamic Oxidation
Shama Parveen, Samina Husain, Avshish Kumar, Javid Ali, M. Husain,
Current Nanoscience, vol 9, no 5, pp 619-623 (2013).

179. Field Emission of MWCNTs PANi Nanocomposites Prepared by Ex Situ and In Situ Polymerization Methods
Samina Husain, Shumaila, Shama Parveen, Javid Ali, Avshish Kumar, M. Husain
Polymer Composites, Vol 34, No. 8 pp. 1298-1305 (2013)

178. Fabrication and electro-optic properties of a MWCNT driven novel electroluminescent lamp
D. Harnath, Sonal Sahai, Savvi Mishra , M. Husain and Virendra Shanker,
Nanotechnology, 23, 435704, 2012.

177. Study of J-E Curve with Hysteresis of carbon nanotubes field emitters
Shama Parveen, Samina Husain, Avshish Kumar, Javid Ali, Harsh, M. Husain
ISRN Nanomaterials, Vol. 2012, doi:10.5402/2012/971854, 2012.

176. Adsorption sites of hydrogen atom on pure and Mg-Doped Multi-walled carbon nanotubes

A. A. Al-Ghamdi, E. Shalaan, F. S. Al-Hazmi, Adel S. Faidah, S. Al-heniti, and M. Husain
Journal of Nanomaterials, Vol. 2012, doi:10.1155/2012/484692, 2012.

175. Field emission study of Carbon Nanotube forest and array grown on Si using Fe as catalyst deposited by electro-chemical method
Avshish kumar, Samina Husain, Javid Ali, Harsh and M Husain.
Journal of Nanoscience and Nanotechnology,Vol. 12, 2829-2832, 2012.

174. Dynamical response of the non-linear vibration of single-wall carbon nanotubes (SWCNTs)
Ayub Khan, Samina Husain, Mohammad Shehzad, S. B. Qadri and M. Husain
Journal of Computational and Theoretical Nanoscience Vol. 9, 360-370, 2012.

173. Estimation of Effective Area of Carbon Nanotubes based field Emitters
Shama Parveen, Samina Husain, Avshish Kumar, Javid Ali, Mushahid Husain
Nanoscience and Nanotechnology Letters, 3 (6), 794-797, 2011.

172. Morphological Variations and Structural Properties of ZnO nanostructures grown by Rapid Thermal CVD
Ravi K. Kumar, M. Husain, Z.A. Ansari
Journal of Nanoscience and Nanotechnology, **11**, 6940-6945, 2011

171. Effect of catalyst-deposition methods on the alignment of carbon nanotubes grown by LPCVD
Javid Ali, Avshish Kumar, Samina Husain and M. Husain
Nanoscience & Nanotechnology Letters, **3**, 175-178, 2011

170. Characterization and field emission studies of uniformly distributed Multi-walled Carbon nanotubes (MWCNTs) film grown by low-pressure chemical Vapour deposition (LPCVD)
Javid Ali, Avshish Kumar, Samina Husain and M. Husain
Current Nanoscience, **7**, 333-336, 2011

169. Variable Range Hopping in Carbon Nanotubes
H. Khan, Zishan; Husain, Samina; Husain, M.
Current Nanoscience, **6**, 626-641, 2011

168. Facile synthesis and step by step enhancement of blue photoluminescence from Ag-doped ZnS quantum dots
Sonal Sahai, Mushahid Husain, Virendra Shanker , Nahar Singh , D.Haranath
Journal of Colloid and Interface Science **357,** 379–383, 2011

167. Optical and electrical characterization of ZnO thin film
Zishan H. Khan, Islamuddin, Numan Salah, Sami Habib, S. M. Abdallah El-Hamidy, M. Rafat And M. Husain
International Journal of Nanoscience, **9**, 1-7, 2010

166. Highly emissive and low refractive index layers from doped silica nanospheres
for solar cell applications
D. Haranath, Namita Gandhi, Sonal Sahai, M. Husain, Virendra Shanker
Chemical Physics Letters **496,** 100–103, 2010

165. Room temperature growth of wafer-scale silicon nanowire arrays and their Raman characteristics
Dinesh Kumar, Sanjay K. Srivastava, P. K. Singh, K. N. Sood, V. N. Singh, Nita Dilawar, M. Husain
J Nanopart. Res., **12**, 2267-2276, 2010

164. Electrical and optical properties of thin film of a-Se70Te30 nanorods,
Zishan Husain Khan, M. Husain,
Journal of Alloys and Compounds, **486**, 774-779, 2010

163. Optical properties of selenium–tellurium nanostructured thin film grown by thermal evaporation,
Karunapati Tripathi, Adam A. Bahishti, M.A. Majeed Khan, M. Husain, M. Zulfequar,
Physica B, **404**, 2134-2137, 2009

162. J-E characteristics of Ni-catalyzed multiwalled carbon nanotubes
Zishan H. Khan, Sami Habib, Numan Salah, Shamshad A. Khan, Samina Khan and M. Husain
Int. J. Nano-Biomaterials, **2**, 226-233, 2009.

161. Electrical Transport via variable range hopping in an individual multi-wall carbon nanotube;
Zishan Husain Khan, M Husain, T P Perng, Numan Salah and Sami Habib
J. Phys: Condens. Matter, **20**, 475207 (7 pp), 2008

160. Variable-range hopping in Fe70Pt30 catalyzed multi-walled carbon nanotubes
Monika Aggarwal, Samina Khan, M. Husain, T. C. Ming, M. Y. Tsai, T. P. Perng and Zishan Husain Khan
European Physical Journal B, : Condensed Matter, **60** (3), 319-324, 2007

159. Field Emission of Fe70Pt30 catalyzed Multi-walled Carbon Nanotubes
Samina Khan, K. N. Tripathi, Monika Aggarwal, K. P. Tripathi, Zishan H. Khan, M Husain
Journal of Experimental Nanoscience, **2** (3), 215-228, 2007

158. Synthesis of carbon nanotubes using Ni95Ti5 nanocrystalline film as catalyst
Samina Khan, Zishan H. Khan, K. N. Tripathi and M. Husain
Journal of Nanoscience & Nanotechnology, **7**, 1-5, 2007

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11. Effect of Ag impurity on Electrical and Dielectric properties of Se-Te System
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Proceedings of the XI International Workshop on The Physics of Semiconductor Devices SSPL, New Delhi, India, Vol. II, 1300-1303, 2001

4. Superconductivity in Pr Substituted Y-Ba-Cu-O System: Some Novel Features
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3. (i) High Field Conduction Studies in thin films of a-Bi-Se-Cd System
(ii) Optical Properties of a-$Se_{80-x}Ga_{20}Bi_x$ Semiconducting thin films
(iii) Electrical Transport Properties of Glassy Semiconducting a-$Se_{80-x}Ge_{30}In_x$
(iv) Electrical Conductivity and Thermo-electric Power in a-$Se_{70-x}Te_{30}Ga_x$
Proceedings of the National Seminar on Disordered Materials, University of Rajasthan, Jaipur, Oct 24-26, 1994

2. Chemical Shift of the X-ray K-absorption edge of glassy semiconducting GeSe
Proceedings of Saha Centenary International Symposium on Spectroscopy and Astrophysics, p.193, 1993

1. Structural and Electrical Studies in Glassy Semiconducting $Se_{70}Te_{30}$ and $Se_{70-x}Te_{30}In_x$ Alloys
Proceedings of National Sysposium on Solid state Physics, Institute of Science, Nagpur, Jan. 28-30, 1991

PARTICIPATION/PRESENTATION IN WORKSHOPS/CONFERENCES

64. Chaired a session in International Workshop on Physics of Semiconductor Devices (IWPSD-2011), held at IIT Kanpur from 19th December to 22th December, 2011

63. Characterization of Carbon Nanotubes Grown on $Fe_{70}Pd_{30}$ Film
XXVII Annual Meeting of EMSI and Conference on Electron Microscopy and Allied Fields, NPL, New Delhi, 156-157, 2004

62. Thermal and Optical studies of a-$Se_{80}Te_{20-x}Pb_x$: A phase change material for optical recording
The Second Saudi Science Conference, King Abdulaziz University, Jeddah, 15-17 March 2004

61. Participated in CSIO INAE Conference on Nanotechnology, Chandigarh December 22-23 2003

60. Electron Cyclotron Resonance (ECR) Plasma Etching of AgAs in CCl_2F_2/Ar discharge
Biannual Symposium on Physics and Modern Developments, Atomic Energy Center, Dhaka, Bangladesh. (30-31 March, 2002)

59. (i) Optical & Electrical Properties of a-Ga_5 Se_{95-x} Sb_x Alloys
(ii) A study of Transient Photoconductivity in a-$Ga_{20}Se_{80-x}Bi_x$ Semiconducting Alloys
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International Conference on Advance Materials, Ch. Charan Singh University, Merrut (Dec.26-28, 2000)

58. (i) Optical properties of Glassy Ga_{10} Te_{90-x} Sb_x
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National Conference on MASTER-2000, G.B.Pant University, Pantnagar (Nov.8-10, 2000)

57. Study of Density of Localized State of $Se_{100-x}Bi_x$ using SCLC measurement
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56. (i) Crystallization Kinetics in a- $Se_{100-x}Bi_x$ alloys
(ii) Electrical Conductivity and Determination of density of states in a- $(Bi_5Se_{95})_{100-x}$ Te_x Thin Films
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International Workshop on Physics of Semiconductors Devices, held at I.I.T, New Delhi (Dec. 14-19, 1999)

55. (i) Compositional dependence optical studies of a-Se-Ga-Sb thin films
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(iii) Electrical and Dielectric Studies of a- Ga_xSe_{100-x} Alloys
International Workshop on Physics of Semiconductors Devices, held at New Delhi (Dec. 16-21, 1997)

54. Participated in the Seminar on Science & Technology in 21st century (ST2000), Jointly organized by Faculty of Engg. & Technology and Faculty of Natural Sciences, Jamia Millia Islamia, New Delhi (Feb. 25-26, 1998)

53. (i) Calculation of Number of Electrons Participating in Plasmon Oscillations Using Chemical Shift of the X-ray Absorption Edges Data
(ii) X-ray K-absorption edge of Glassy Semiconducting Ga-Se Alloys
VI National Seminar on X-ray Spectroscopy and allied Areas, Govt. P.G. Arts and Science College, Ratlam (MP) (Nov. 17-19, 1997)

52. Participated in the National Seminar on Materials Research and Environmental Issues, Department of Physics, Jamia Millia Islamia, New Delhi, Oct. 23, 1997

51. a-$Se_{80-x}Ga_{20}M_x$, A Material for Photovoltaic Applications
International Symposium on New Materials Hydrogen Cell Fuel Photovoltaic System-I (Sept. 01-04, 1997), Cancun, Mexico

50. Participated in International Conference on Recent Trends in Physics, Bangladesh University of Science & Technology, Dhaka, Bangladesh (March 20-22, 1997)

49. Participated in National Seminar on Recent Trend in Nuclear, Particle and Condensed Matter Physics, Department of Physics, Jamia Millia Islamia, New Delhi, March 06-07, 1997

48. Electrical Conductivity and Thermo-electric Power in a-$Se_{80-x}Ga_{20}Te_x$ Thin Films
International Conference on the Physics of Disordered Materials, Department of Physics, University of Rajasthan, Jaipur, Jan. 27 - 29, 1997

47. Participated in National Symposium on Physics of semiconductors Nanostructures, Department of Physics, IIT, New Delhi, Dec. 23-25, 1996.

46. Optical Properties of a-$Se_{80-x}Ga_{20}Te_x$ Thin Films

III International Conference and Intensive Tutorial Course on Semiconductor Materials & Technology, Department of Electronic Sciences, South Campus, University of Delhi, Delhi, Dec. 19-21, 1996.

45. Participated in International Workshop on Recent Developments in Condensed Matter Physics and Nuclear Sciences, Rajshahi University, Rajshahi, Bangladesh (Oct. 28 - Nov. 01, 1996)

44. International Seminar on Current Developments in Disordered Materials, Kurukshetra University, Kurukshetra, Jan. 22-24, 1996

43. Participated in Regional Workshop on Low Dimensional Semiconductor Structures, South Campus, University of Delhi, Delhi, Dec. 18-20, 1995

42. Electrical Transport Properties of a-$Se_{80-x}Ga_{20}Sb_x$ Thin Films.
VIth International Workshop on Physics of Semiconductor Devices, NPL, New Delhi, Dec. 11-16, 1995

41. Participated in Third School on Synchrotron Radiation in Science & Technology, John Fuggle Memorial, I.C.T.P., Trieste, Italy, Oct. 30 - Dec. 01, 1995.

40. Participated in Indo-Italian Workshop on Synchrotron Radiation Applications, IIT, New Delhi, Feb. 17- 19, 1995

39. Electrical Transport Properties of thin films of a-$Se_{80-x}Ga_{20}Bi_x$.
National Seminar on Disordered Materials, University of Rajasthan, Jaipur, Oct. 24-26, 1994

38. Participated in One Day Seminar on Advances in Thin Films, IIT, New Delhi, Feb. 19, 1994

37. Participated in Workshop on Engineering of Electronic Materials and Surfaces and Interfaces, Nuclear Science Centre, New Delhi, Jan. 24, 1994

36. Participated in fifth International Workshop on Physics of Semiconductor Devices on Applications of Modified Spreading Resistance Technique to Technique to Profile GaAs Epitaxial Layers, Solid State Physics Laboratory, Lucknow Road, Delhi, Dec. 14 -20, 1994

35. Participated in One Day Meet on Recent Developments in Porous Silicon held at Solid State Physics Laboratory, Delhi, Sept. 04, 1993

34. Effect of Indium impurities on the electrical properties of the thin films of a-$Ga_{30}Se_{70}$
2nd International Conference and Intensive Tutorial Course on Semiconductor Materials, University of Delhi, Delhi, Dec. 14-19, 1992

33. X-ray K-absorption edge studies of amorphous semiconductors
International Workshop on Surface EXAFS, University of Rajasthan, Jaipur, Aug. 18-20, 1992

32. Participated in Group Monitoring Workshop on Superconductivity Projects funded by UGC, S.V. University of Tirupati, Aug. 18-20, 1992

31. Effect of Silver on the X-ray K-absorption edge of glassy $Ga_{30}Se_{70}$

IV National Seminar on X-ray Spectroscopy, Devi Ahilya University, Indore, Jan. 09-11, 1992

30. Electrical Studies in glassy semiconducting $Ga_{30}Se_{70}$ binary alloy
VI International Workshop on Physics of Semiconductor Devices, Organized by CEERI, Pilani, IIT, Delhi, SSPL, Delhi, Dec. 02-06, 1992

29. Electrical and Structural Studies in Glassy Semiconducting GaSe Binary Alloy
International Workshop on Solid State Devices, University of Karachi, Pakistan, Aug. 17-21, 1991

28. Participated in the National Seminar on Advances in Physics of Materials, Department of Physics, Jamia Millia Islamia, New Delhi, Feb. 25-26, 1991

27. Participation in the National Congress on Ultrasonics, National Physical Laboratory, New Delhi, Dec. 17-20, 1990

26. Participated in V Group Monitoring on DST Funded Projects for Young Scientist (NEHU, Shilong, Aug. 27-28, 1992)

25. K-absorption edge studies in Glassy Semiconducting Ge-Se-In system
VIII International Workshop on Physics of Materials, Barkatullah University, Bhopal, Jan. 22 - Feb. 03, 1990

24. Participated in Research Workshop in Condensed Matter, Atomic and Molecular Physics, I.C.T.P., Trieste, Italy, Aug. 20 - Sept. 27, 1989

23. Participated in Indo-Soviet Symposium on Crystal Growth, National Physical Laboratory, New Delhi, Oct. 17-22, 1989

22. Participated in International Conference and Intensive Tutorial Course on Semiconductor Materials, University of Delhi, Delhi, Dec. 08-16, 1989

21. Participated in Thirteenth International Nathiagali Summer College on Physics and Contemporary Needs, Nathiagali, Pakistan, June 16 - July 07, 1988

20. Participated in International Workshop on Physics of Materials, Jamia Millia Islamia, New Delhi, Nov. 23 - Dec. 05, 1987

19. Participated in International Workshop on Interaction between Physics and Architecture in Environment Conscious Design, I.C.T.P., Trieste, Italy, Sept. 21-25, 1987

18. Participated in International Workshop on Economics Modeling, Planning and Management of Energy, I.C.T.P., Trieste, Italy, Sept. 14-25, 1987

17. Participated in International Workshop on Materials Science and the Physics of Non-conventional Energy Sources, I.C.T.P., Trieste, Italy, Aug. 31 - Sept. 18, 1987

16. Participated in International Workshop on Surface and Interface of Metals and Semiconductors, Department of Physics, Poona University, Pune, Aug. 03-14, 1987

15. Participated in the Workshop on Interaction between CAT and M.P. Universities for Collaborative Research Programs, Department of Physics, Bhopal University, Bhopal, March 29-30, 1986

14. Chemical Shift of X-ray absorption edges and its role in Characterization of Materials
National Seminar on Spectroscopy, Jamia Millia Islamia, New Delhi, Sept. 1985

13. Number of Electrons Participating in Plasma Oscillations by Chemical Shift of X-ray Absorption Edges
Symposium on EXAFS and allied Phenomena, MVM, Bhopal, July 19-21, 1985

12. Electronegativity and Chemical Shift of X-ray Absorption Edges
Symposium on EXAFS and allied Phenomena, MVM, Bhopal, July 19-21, 1985

11. Estimation of Composition of Compounds by chemical shifts of X-ray Absorption edge
XVI National Seminar on Crystallography, University of Delhi, Delhi, Aug. 02-04, 1985

10. Calculation of Electronegativity in Different Valence States by Fermi Energy
Indian Science Congress, Lucknow, Jan. 03-07, 1985

9. Chemical Shifts of the X-ray absorption edges of Ternary Compounds
Int. Conf on X-ray and Atomic Inner Shell Processes in Atoms, Molecules and Solids, Kapl Marx Universitat, Leipzing, GDR, Aug. 20-25, 1984

8. Molecular Weight by Chemical Shifts of X-ray Absorption Data
XV National Seminar on Crystallography, IIT, Bangalore, April 17-19, 1984

7. Electronegativity of atoms and ions
Indian Science Congress, Tirupati, Jan. 03-07, 1983

6. Chemical Shift of the X-ray absorption edges of Transition Elements
Indian Science Congress, Tirupati, Jan. 03-07, 1983.

5. Calculation of density of Compounds by Fermi Energy Method
XIV Nat. Seminar on Crystallography, IIT, Kharagpur, Dec. 20-23, 1982

4. Valence Shell Potential Model for the change in the binding energy of the core electrons due chemical environment
Fourth National Workshop on Atomic and Molecular Physics, Jadavpur, Dec. 13-18, 1982

3. Effect of Chemical Combination on X-ray Absorption Edges
International Conference on X-ray and Atomic Inner Shell Physics, University of Oregon, USA, Aug. 08-15, 1982

2. Shift in binding energy of the inner electrons due to chemical combination
Third National Workshop on Atomic and Molecular Physics, March 09-14, 1981, Roorkee, C56, p.132

1. Electron-electron interaction in the X-ray emission spectra

Third National Workshop on Atomic and Molecular Physics, March 09-14, 1981, Roorkee, C56, p.30

Appendix "I

(a) Synthesis and characterization of Multiwall carbon nanotubes

Carbon nanotubes are composed of graphene sheets rolled into seamless hollow cylinders with diameters ranging from 1 nm to about 50 nm. Several methods have been used to produce single-walled as well as multi-walled nanotubes. Nanotubes exhibit unique physical and chemical properties as being a quasi one-dimensional material. Due to extreme properties, nanotubes are under investigation towards several applications, including electron field emitters, probes of scanning-type microscopes, hydrogen storage materials, electrode materials of secondary batteries and capacitors. Among these proposed applications, field emission electron sources would be industrially the most promising and are nearly within reach of practical use.

Field emission involves the extraction of electrons from a solid by tunneling through the surface potential barrier. The emitted current depends directly on the local electric field at the emitting surface and on its work function. Field emission is important in several areas of industry, including lighting and displays. Extremely high field can be obtained on a sharp tip of very thin needle, because electric fields concentrate at the sharp points. The carbon nanotubes possess high aspect ratio, a sharp tip, high chemical stability and high mechanical strength, which make it a good candidate for field emitters.

Carbon nanotubes have been prepared by a low-pressure chemical vapour deposition method. The Iron-Palladium (Fe-Pd) catalyst was deposited on Si by using thermal evaporation. The reactive gas mixture was C_2H_2/H_2 with a flow rate of 50/50 sccm. The chamber pressure and temperature were maintained at 10 torr and 800^oC respectively. The growth time was varied from five minutes to one hour. Specially designed set-up is used to measure the field emission properties of carbon nanotubes.

Fig. 1 (a,b)shows the SEM images of Multiwall carbon nanotubes.

To confirm the graphitic structure of carbon nanotubes, we have also performed Raman spectroscopy. Raman spectra of carbon nanotubes are shown in fig. 2. The sharp peaks of D and G-band are located approximately 1345 cm^{-1} and 1580 cm^{-1}, respectively.

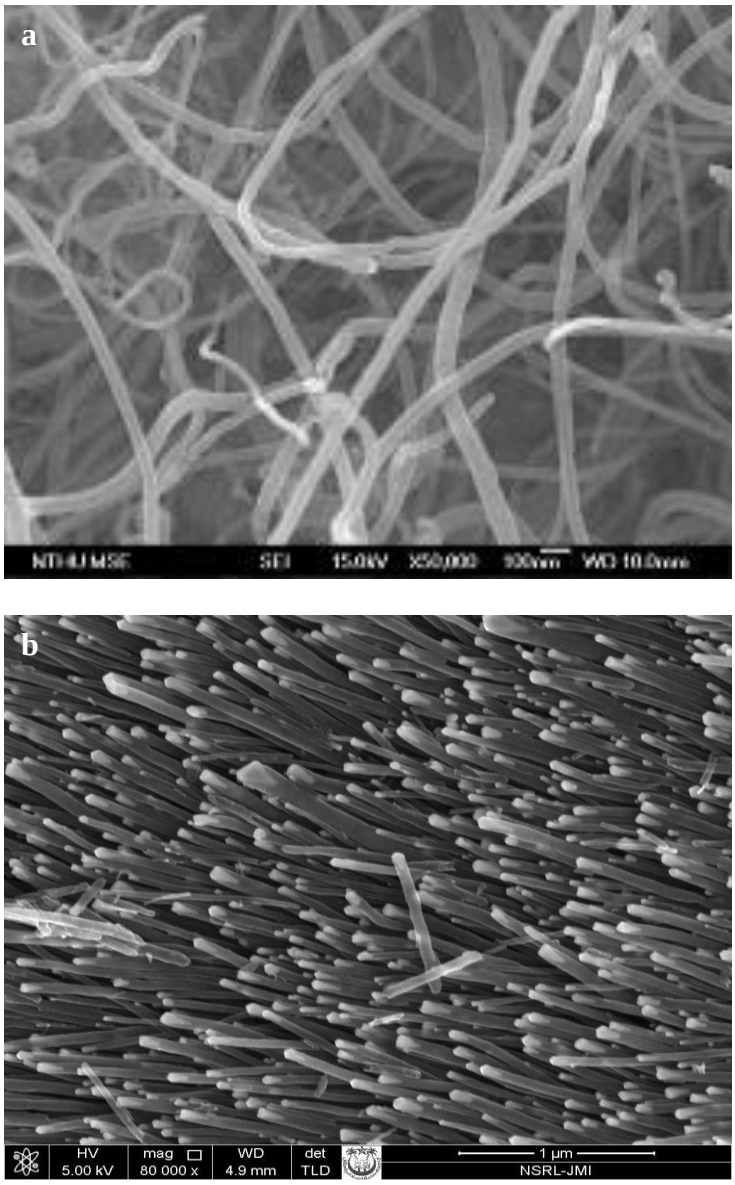

Fig. 1(a,b) Multiwall carbon nanotubes

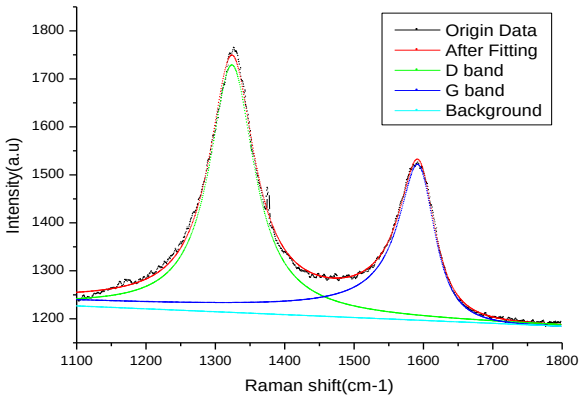

Fig. 2 Raman spectra

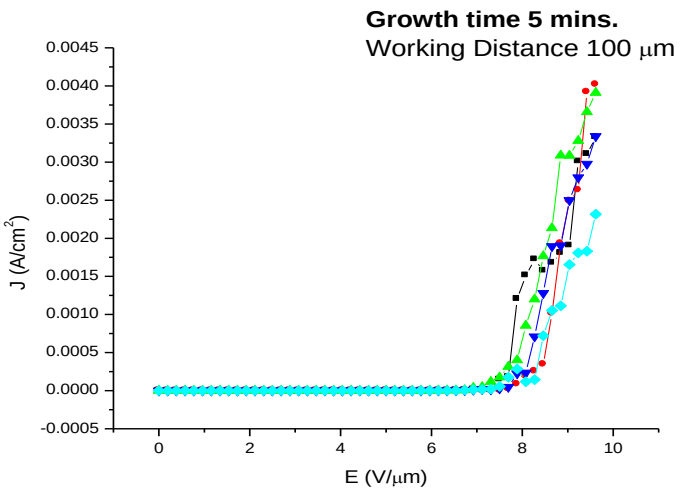

Fig. 3 J-E curves of carbon nanotubes which show that the carbon nanotubes are good field emitters.

(b) Synthesis and characterization of Single wall carbon nanotubes

Recently we have taken up a major project entitled "Growth of Single Wall Carbon Nanotubes for semiconducting applications" funded by Department of Information Technology, New Delhi.

The aim of the project is to synthesize and characterize single wall carbon nanotube (SWNTs) using Plasma Enhanced Chemical Vapor Deposition (PECVD) technique and to study their characteristics for semiconducing applications. Recently, we have installed PECVD (Black Magic 2" System, from M/S AIXTRON, UK) for the growth of SWCNTs. We have grown SWCNTs ranging from 1 nm to 3 nm using Iron as a catalyst. The work is in progress. The some of the grown SWNTS are shown here. We will also study the transport properties of as grown single wall carbon nanotubes. The I-V characteristics of single wall carbon nanotubes will be studied for various device applications. We are interested to study the I-V measurements of these as grown SWNTs for device applications. The transport properties of as grown single wall carbon nanotubes (SWNTs) will also be studied. These nanotubes will also be studied for sensor applications. Effect of atmospheric pollutants on the I-V measurements will also be a part of proposed project for sensor applications.

PECVD CNT Growth System with Enclosure Exhaust, JMI

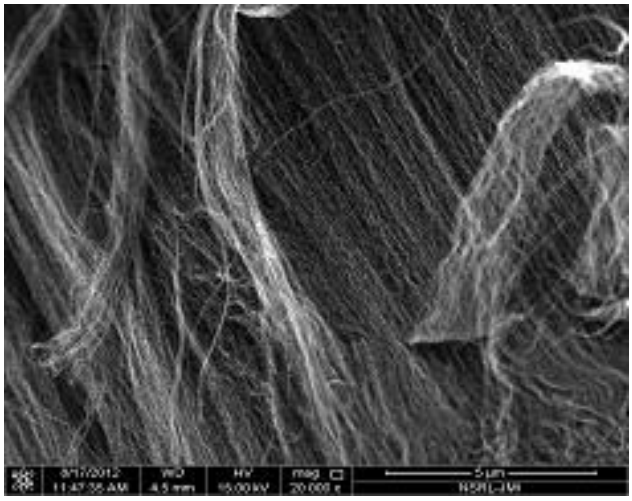

Fig. 4 Single wall carbon nanotubes