
Dr. Padmakar Gangaram Chavan

Assistant Professor
Department of Physics,
School of Physical Sciences,
Kavayitri Bahinabai Chaudhari
North Maharashtra University, Jalgaon 425001
Phone: (0257) 2258474 (ext 215)
E-mail: pgchavan@KBCNMU.ac.in
Mobile No. 09689976793



PROFESSIONAL POSITION

July 2012 - present

Assistant Professor
Department of Physics,
School of Physical Sciences,
North Maharashtra University,
Jalgaon 425001

AWARDS, FELLOWSHIPS, PROFESSIONAL ACHIEVEMENTS

- 1) **2017** - Recipient of "**Research Award for Publication**" (Impact Factor: above 5 for 2016-2017) by Hon'ble Vice chancellor, KBCNMU Jalgaon on 12th Aug 2017.
- 2) **2014** - Recipient of "**Research Award for funding**" (for the fund of 40.94 Lakhs) by Hon'ble Vice chancellor, KBCNMU Jalgaon on 15th Aug 2014.
- 3) **2014** - Recipient of "**Research Award for Publication**" (Impact Factor: above 5 for 2013-2014) by Hon'ble Vice chancellor, KBCNMU Jalgaon on 15th Aug 2014.
- 4) **2012** - Recipient of "**D. S. Kothari Post-Doctorate Fellowship**" (DSKPDF), UGC.
- 5) **2011** - Recipient of "**Dr. M. R. Bhide**" prize for the paper having potential for industrialization in Raman Memorial Conference, Pune (25-26th Feb 2011).
- 6) **2010** - Recipient of "**Dr. R. K. Bhalla award**" (to be given to the "Best Research Student of Dept. of Physics, University of Pune" for the year 2010).
- 7) **2010** - "**Sakal India Foundation Loan Scholarship**" for Pursuing Ph.D.
- 8) **2008** - Award of "**Best Poster Presentation**" at "Workshop on Nanotechnology and Smart Materials", Defense Institute of Advanced Technology (DIAT), Pune, (INDIA), 11th -13th Nov2008, Pune (INDIA) on "Field emission studies on aligned CdS nanowires array".
- 9) **2006**-Received an award of "**Rajiv Gandhi National Fellowship (RGNF)**" from University

Grants commission (UGC), Govt. of India for perusing PhD in Physics.

Education Background:

Post Doc Experience: Indian Institute of Science (IISc), Bangalore under the scheme of D. S. Kothari Post Doc fellowship (bridging Fellowship), UGC.

Ph.D. (Physics): University of Pune, Pune

M.Sc. (Physics): Department of Physics, North Maharashtra University, Jalgaon

B.Sc. (Physics): A. S. C College, Chopda, North Maharashtra University, Jalgaon

TEACHING AND RELATED EXPERIENCE

July 2012 – till date Post graduate (M.Sc.) teaching experience
Subject taught: Elements of Material Science (MS 303)
 Materials synthesis methods (MS 402)

- ❖ Organising secretary of the One-Day National Workshop on "Recent trends in Material synthesis processing" March 2013.
- ❖ Coordinator of Alumni, Department of Physics, KBCNMU
- ❖ Coordinator of e-suvida, KBCNMU
- ❖ Member of University Flying Squad for Examination
- ❖ Member of Avishkar 2012
- ❖ Life member of Semiconductor Society of India (membership No. 201501666)

RESEARCH BACKGROUND

Sr. No.	Funding Agency	Amount Sanctioned Indian Rupee (Rs.)	Status	Duration (Years)
01	UGC	6,00,000 /-	Completed	2 (2013-2015)
02	North Maharashtra University (VCRMS)	70,000 /-	Completed	2 (2013-2015)
03	DST	40,94,800 /-	Completed	4 (2013-2017)
04	UGC CSR, Indore	1,35,000/-	On going	3(2018-2021)

List of Projects submitted/implemented:

Patents: Patent: "Synthesis of Titanium Dioxide nanosprings by Anodization method" (Application number 758/MUM/2014), P. G. Chavan, Girish P. Patil.
 National/International: National, Status: Submitted (26/11/2014)

Manuscript Reviewer

- ❖ Journal of Physical Chemistry
- ❖ ACS Applied Materials and Interfaces
- ❖ Chinese Physics Letters
- ❖ Journal of Optics
- ❖ Applied Surface Science

Publications

Number of paper published in Peer Reviewed International Journals and conference Publications: **40**

H-index: **13**

i10-index: **16**

National and International Collaboration:

1. **Prof. Amitava Patra** Indian Association for Cultivation of Science (IACS), Kolkatta, (INDIA).
 2. **Dr. Anuja Datta (Research Assistant Professor)** University of South Florida, Florida, Tampa, (USA).
 3. **Prof. N. S. Gajbhiye** Indian Institute of Science (IIT), Kanpur, (INDIA).
 4. **Prof. D. S. Joag (Emeritus Scientist, CSIR INDIA)** Department of Physics, University of Pune, Pune, (INDIA).
 5. **Prof. M. A. More** Department of Physics, University of Pune, Pune,
 6. **Dr. I. S. Mulla (Emeritus Scientist, CSIR INDIA)** Centre for Materials for Electronics Technology (CMET), Pune,(INDIA).
 7. **Dr. Vijaymohan K. Pillai (Scientist-H & Director)** CSIR-Central Electrochemical Research Institute (CECRI),Karaikudi - 630 006, Tamil Nadu, (INDIA).
 8. **Dr. Sashwati Sen (Scientific Officer E),** Bhaba Atomic Research Centre (BARC), Mumbai, (INDIA).
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Expertise

1. Ultra-High Vacuum (UHV)
2. Thermal evaporation technique
3. Pulse Laser Deposition
4. Solution based synthesis techniques
5. Field emission Microscopy
6. Characterization techniques

Publications:

2018:

- 1) "Anodic Stripping Voltammetry studies of Electrochemically Engineered Silver Nanoparticles over Single Polypyrrole Nanowire Device for tracing of Arsenic (III): An Environmental Perspective", Accepted in *Nanotechnology for Environmental Engineering, Springer (2018)*.
- 2) "Sulfonated chitosan encapsulated HAp@Fe₃O₄: An efficient and recyclable magnetic nanocatalyst for rapid ecofriendly synthesis of 2-amino-4-substituted-1,4-dihydrobenzo[4,5]imidazo[1,2-a]pyrimidine-3-carbonitriles", Vilas Mahire Girish Patil Amol Deore harishchandra Jirimali Padmakar Chavan , Pramod Mahulikar, Accepted in *Research on Chemical Intermediates, Springer (2018)*.
- 3) "2D porous ZnO nanosheets: One pot synthesis with low turn-on field" Prashant K. Baviskar, Girish P. Patil, Vivekanand S. Bagal, Babasaheb R. Sankapal, Padmakar G. Chavan Accepted in *Journal of Nanostructures (2018)*.
- 4) "Field electron extraction from surface modified Cd (OH)₂ nanowires" Vivekanand S. Bagal, Girish P. Patil, Chandradip Jadhav, Malvika Sharma, Sugam Shivhare, and Padmakar G. Chavan, *AIP Conference Proceedings 1942, 050032 (2018)*.

2017:

- 5) "Tapered V₂O₅ Nanofibers for Field Emission Application", Girish P Patil, Vivekanand S Bagal, Mahendra A More, DS Joag, NS Gajbhiye, KhemchandDewangan, Padmakar G Chavan, *Journal of Nanoelectronics and Optoelectronics, 12, (2017), 286*.
- 6) "Enhanced field emission properties from surface-modified 2D Cd (OH)₂ nanocoins", Vivekanand S Bagal, Girish P Patil, Amol B Deore, Prashant K Baviskar, Dhammanand J Shirale, Padmakar G Chavan, *Applied Physics A, 123, (2017), 125*.
- 7) Electrodeposition of gold nanoparticles decorated single polypyrrole nanowire for arsenic detection in potable water: a chemiresistive sensor device, RS Salunke, CK Kasar, MA Bangar, PG Chavan, DJ Shirale, *Journal of Materials Science: Materials in Electronics, Springer, 1-6, DOI: 10.1007/s10854-017-7332-5(2017)*.
- 8) TiO₂ nanotubes decorated by silver nanocubes: Extraction of high field emission current density GP Patil, VS Bagal, AB Deore, MA More, PG Chavan, *AIP Conference Proceedings 1832 (1), 050004, (2017)*.

2016:

- 9) "Vertically aligned TiO₂ nanotubes: Highly stable electrochemical supercapacitor", Shrikant S Raut, Girish P Patil, Padmakar G Chavan, Babasaheb R Sankapal, *Journal of Electroanalytical Chemistry*, 780, (2016), 197.
- 10) "Simple Way to Deposit CdO Nanowires for Field Emission Application", Vivekanand S Bagal, Girish P Patil, Prashant Baviskar, Sachin R Suryawanshi, Mahendra A More, Padmakar G Chavan, *Journal of Nanoelectronics and Optoelectronics*, 11, (2016), 484.
- 11) "Aligned 2D CuSCN nanosheets: a high performance field emitter", Babasaheb and Padmakar Girish, Prashant, Vivekanand, Ravindra, Amol, Mahendra, *RSC Advances*, 6, (2016), 71958.
- 12) "Observation of enhanced field emission properties of Au/TiO₂ nanocomposite", Padmakar G. Chavan Girish P. Patil, Vivekanand S. Bagal, Sachin R. Suryawanshi, Dattatray J. Late, Mahendra A. More, *Appl. Phys. A: Mater Sci & Proce*, 122, (2016), 1.
- 13) "Vapour-liquid-solid-assisted growth of cadmium telluride nanowires and their field emission properties", Vivekanand S Bagal, Girish P Patil, Sachin R Suryawanshi, Mahendra A More, Padmakar G Chavan, *Micro & Nano Letters*, 11, (2016), 160.
- 14) "Observation of low turn-on field emission from nanocomposites of GO/TiO₂ and RGO/TiO₂", Girish P Patil, Vivekanand S Bagal, Chetan R Mahajan, Vijay R Chaudhari, Sachin R Suryawanshi, Mahendra A More, Padmakar G Chavan, *Vacuum*, 123, (2016), 167.
- 15) "Low turn-on field and high field emission current density from Ag/TiO₂ nanocomposite", Padmakar G. Chavan Girish P. Patil, Amol B. Deore, Vivekanand S. Bagal, b, Dattatray J. Late, Mahendra A. More, *Chemical Physics Letters*, 657, (2016), 167.
- 16) "Surface modification of aligned CdO nanosheets and their enhanced field emission properties", Vivekanand S Bagal, Girish P Patil, Amol B Deore, Sachin R Suryawanshi, Dattatray J Late, Mahendra A More, Padmakar G Chavan, *RSC Advances*, 6, (2016), 41261.
- 17) "High current density and low turn-on field from aligned Cd(OH)₂ nanosheets", Vivekanand S. Bagal, Girish P. Patil, Amol B. Deore, Prashant K. Baviskar, Sachin R. Suryawanshi, Mahendra A. More, Padmakar G. Chavan, *Chemical Physics Letters*, 650, (2016), 7.

2015:

- 18) "Enhanced field emission study of SnS/TiO₂ nanocomposite", Girish P. Patil, Vivekanand S. Bagal, Sachin R. Suryawanshi, Mahendra A. More, Padmakar G. Chavan, *IEEE 978-1-4673-9357-7/15*, DOI: 10.1109/IVNC.2015.7225553(2015).

2014:

- 19) "V₂O₅ Precursor-Templated Synthesis of Textured Nanoparticles Based VN Nanofibers and their Exploration as Efficient Field Emitter" Khemchand Dewangan, Girish P. Patil, Ranjit V. Kashid, V. S. Bagal, M. A. More, D. S. Joag, N. S. Gajbhiye, Padmakar G. Chavan, *Vacuum* 109, (2014), 223.
- 20) "CdS nanowires: Ultra-long growth and enhanced field emission properties" Padmakar G. Chavan, Satish S. Badadhe, Imtiaz S. Mulla, Mahendra A. More and Dilip S. Joag, *Vacuum* 101, (2014), 38.

- 21) "Photo-enhanced field emission studies of tapered CdS nanobelts" Padmakar G. Chavan, Mahendra A. More, D. S. Joag, Satish S. Badadhe, Imtiaz S. Mulla, *IEEE*, ISBN: 978-1-4799-5306-6 DOI:10.1109/IVNC.2014.6894770(2014).
- 22) "Enhancement in the field emission behavior of graphene in N₂/O₂ high vacuum ambience" S.R. Suryawanshi, P.S. Kolhe, D. S. Gavhane, S. S. Patil, P. G. Chavan, M. A. More, D.J. Late, *IEEE* ISBN: 978-1-4799-5306-6, DOI:10.1109/IVNC.2014.6894791(2014).

2013:

- 23) "Photo-assisted field emission and current noise analysis from single submicron CdS wire" P. G. Chavan, RV Kashid, MA More, DS Joag, SS Bhadade, IS Mulla, DOI: 10.1109/IVNC.2013.6624709(2013).
- 24) "Controlled Ti Seed Layer Assisted Growth and Field Emission Properties of Pb(Zr_{0.52}Ti_{0.48})O₃ Nanowire Arrays" Anuja Datta, Devajyoti Mukherjee, Mahesh Hordagoda, Sarath Witanachchi, Pritish Mukherjee, Ranjit V. Kashid, Mahendra A. More, Dilip S. Joag, and Padmakar G. Chavan *ACS Applied Mater. & Interfaces* 5, 6261 (2013).

2012:

- 25) "Synthesis and Characterization of Self-Assembled Nanofiber-Bundles of V₂O₅: Their Electrochemical and Field Emission Properties" K. Dewangan, N. N. Sinha, Padmakar G. Chavan, Prashant K. Sharma, Avinash C. Pandey, M. A. More, D. S. Joag, N. Munichandraiah, N. S. Gajbhiye, *Nanoscale* 4, (2012), 645.
- 26) "Decoration of CdS nanoparticles on MWCNT's by simple solution chemistry" Prashant Baviskar, Padmakar Chavan, Babasaheb Sankapal, *Appl. Surf. Sci.* 258, 7536 (2012).
- 27) "Synthesis of hierarchical nanostructures of doped-CdS by microwave assisted solvothermal technique using a household microwave oven and allied field emission and photo-catalytic characteristics" M. Shinde, Padmakar Chavan, Sudhir Arbuj, Sunit Rane, Mahendra More, Suresh Gosavi, Dilip Joag, and Dinesh Amalnerkar, *J. Nano. Nanotech.* 12, (2012), 3788.
- 28) "Spectral analysis of current fluctuations in CdS nanocombs and nanowires array" Ranjit V. Kashid, Padmakar G. Chavan, Imtiaz S. Mulla, Dilip S. Joag and Mahendra A. More, *IEEE*, ISBN: 978-1-4673-0187-9, DOI: 10.1109/IVEC.2012.6262105, (2012).

2011:

- 29) "Synthesis of single crystalline CdS nanocombs and their application in photo-sensitive field emission switches" Padmakar G. Chavan, Satish S. Badadhe, Imtiaz S. Mulla, Mahendra A. More and Dilip S. Joag, *Nanoscale* 3, (2011), 1078.
- 30) "Enhanced Field Emission From SnO₂:WO_{2.72} Nanowire Heterostructure" D. R. Shinde, Padmakar G. Chavan, Shashwati Sen, Dilip S. Joag, Mahendra A. More, S. C. Gadkari, S. K. Gupta, *ACS Appl. Mater. & Interfaces* 3, (2011) 4730.

- 31) "Controlled Growth of Well-Aligned GaSNanohornlike Structures and Their Field Emission Properties" Godhuli Sinha, Subhendu K. Panda, AnujaDatta, Padmakar G. Chavan, Deodatta R. Shinde, Mahendra A. More, D. S. Joag, and Amitava Patra, *ACS Appl. Mater. Interfaces* 3, (2011), 2130.
- 32) "Photo-enhanced field emission study of TiO₂ nanotubes array" Padmakar G. Chavan, Sugat V. Shende, Dilip S. Joag, Mahendra A. More, *Ultramicroscopy* 111 (2011), 415.
- 33) "Field Emission and Photo-Enhanced Field Emission Investigations of CdS Nanowires Array" Padmakar G. Chavan, Satish S. Badadhe, Imtiaz S. Mulla, Mahendra A. More and Dilip S. Joag, *IEEE*, ISBN: 978-1-4244-8662-5, DOI 10.1109/IVEC.2011.5746893, (2011).
- 34) "Extremely stable field emission and photo-sensitive field emission from single crystalline CdS nanowires" Padmakar G. Chavan, Satish S. Badadhe, Imtiaz S. Mulla, Mahendra A. More and Dilip S. Joag, *IEEE*, ISBN: 978-1-4577-1243-2, (2011).

2010:

- 35) "High current density, low threshold field emission from functionalized carbon nanotube bucky paper" Bhalchandra A. Kakade, Vijayamohan K. Pillai, Dattatray J. Late, Padmakar G. Chavan, Farid J. Sheini, Mahendra A. More, and Dilip S. Joag, *Appl. Phys. Lett.* 97, (2010), 073102.

2009:

- 36) "Growth, Optical, and Field Emission Properties of Aligned CdS Nanowires" AnujaDatta, Padmakar G. Chavan, Farid Jamali Sheini, Mahendra A. More, Dilip S. Joag, and Amitava Patra, *Crys. Growth and Des.* 9, (2009), 4157.
- 37) "Self-catalytic growth and field-emission properties of Ga₂O₃ nanowires" Godhuli Sinha, AnujaDatta, Subhendu K. Panda, Padmakar G. Chavan, Mahendra A. More, Dilip S. Joag and Amitava Patra, *J. Phys. D: Appl. Phys.* 42, (2009), 185409.
- 38) "Field emission studies of Te nanorods grown on Si (111) substrate" Padmakar G. Chavan, Sandip S. Patil, Mahendra A. More, Shashwati Sen, Madhvi Sharma, K.P. Muthe, Umananda M. Bhatta, P.V. Satyam, Dilip S. Joag, *Vacuum* 83, (2009), 1307.
- 39) Field emission studies on aligned CdS nanowires array PG Chavan, FJ Sheini, MA More, DS Joag, A Datta, A Patra, ISBN 978-81-8372-054-0, p. 397-398; V. 54 (2009).

2008:

- 40) "Synthesis of Well-Crystalline GaS Nanobelts and Their Unique Field Emission Behavior" Subhendu K. Panda, AnujaDatta, Godhuli Sinha, and Subhadra Chaudhuri, Padmakar G. Chavan, Sandip S. Patil, Mahendra A. More, and Dilip S. Joag, *J. Phys. Chem. C* 112, (2008), 6240.

Conference Presentations (Presenter underlined)

1. "Photo-enhanced field emission study of tapered CdS nanobelts" Padmakar G. Chavan, Satish S. Badadhe, Imtiaz S. Mulla, Mahendra A. More and Dilip S. Joag, Poster presentation, International Vacuum Nanoelectronics Conference (IVNC-2014), **Engelberg (Switzerland)**, 06th-10th July 2014.

2. "CdS nanoforms: Synthesis Field emission and Photo-sensitive field emission investigations" Padmakar G. Chavan, Satish S. Badadhe, Imtiaz S. Mulla, Mahendra A. More and Dilip S. Joag, Invited talk, Aspects of Field Emission & Vacuum Microelectronics, MTRDC, **Bangalore, (INDIA)**, 17th Sept 2011.
3. "Photo-sensitive field emission studies of CdS nanoforms and nanowires array", Padmakar G. Chavan, Satish S. Badadhe, Imtiaz S. Mulla, Mahendra A. More and Dilip S. Joag, Invited talk, NAPRA Conference, Banaras Hindu University (BHU), **Varanasi (INDIA)**, 16th -18th March, 2011.
4. "Extremely stable field emission and photo-sensitive field emission from single crystalline CdS nanowires" Padmakar G. Chavan, Satish S. Badadhe, Imtiaz S. Mulla, Mahendra A. More and Dilip S. Joag, Poster presentation, International Vacuum Nanoelectronics Conference (IVNC-2011), **Wuppertal, (Germany)**, 18th-22nd July 2011.
5. "Field Emission and Photo-Enhanced Field Emission Investigations of CdS Nanowires Array" Padmakar G. Chavan, Satish S. Badadhe, Imtiaz S. Mulla, Mahendra A. More and Dilip S. Joag, Oral presentation, International Vacuum Electronics Conference (IVEC) 2011, held at IISC, **Bangalore, (INDIA)**, 21st-24th Jan 2011.
6. "Photo-enhanced field emission study of TiO₂ nanotubes array" Padmakar G. Chavan, Sugat V. Shende, Dilip S. Joag, Mahendra A. More, Oral Presentation, International Field Emission Symposium (IFES), **Sydney (Australia)**, 5th-8th July 2010.
7. International Conference on Nanoscience and Nanotechnology (ICONSAT), Indian Institute of Technology, **Mumbai (INDIA)**, Attended, 17th-20th Feb 2010.
8. "Field emission studies of aligned CdS nanorods" Padmakar G. Chavan, Anuja Datta, Farid Jamali Sheini, Mahendra A. More, Dilip S. Joag, and Amitava Patra, Poster presentation, Second International conference on frontiers in Nano Science and Nanotechnology (Cochin nano), Department of Physics, Cochin University of Science and Technology, **Cochin, Kerala, (INDIA)**, 3rd-6th Jan 2009.
9. "Field emission and photo-sensitive field emission studies of CdS nanocombs" Padmakar G. Chavan, Satish S. Badadhe, Imtiaz S. Mulla, Mahendra A. More and Dilip S. Joag, D. S. Joag, Oral Presentation, Raman memorial conference (RMC), Centre for Advanced studies in Material Science and Condensed matter physics, Department of Physics, **University of Pune, (INDIA)**, 25th-26th Feb. 2009.
10. "Field emission studies of aligned ZnO nanorods grown by V-S mechanism" Padmakar G. Chavan, Sandip S. Patil, Jai Singh, M. A. More, O. N. Shrivastava, D. S. Joag, Poster presentation, Second International Symposium on Advanced Materials and Polymers for Aerospace and Defense Applications, National Chemical Laboratory (NCL), **Pune, (INDIA)**, 8th - 12 Dec 2008.
11. "Aligned CdS nanorods: stable field emitter" Padmakar G. Chavan, Anuja Datta, Farid Jamali Sheini, Mahendra A. More, Dilip S. Joag, and Amitava Patra, Poster presentation, Workshop on Nanotechnology and smart materials, Defense Institute of Advanced Technology (DIAT), **Pune, (INDIA)**, 11th-13th Nov 2008.

12. "In-SnO₂ field emitter arrays on patterned Si substrate" A. B. Bhise, Padmakar G. Chavan, D. J. Late, M. A. More, I. S. Mulla, V. K. Pillai and D. S. Joag, Poster presentation, DAE Solid State Physics Symposium (SSPS), Department of Physics, Mysore University, **Mysore, Karnataka(INDIA)**, 27th-31 Dec 2007.
 13. "Field emission studies of a single RuO₂ doped SnO₂ micron sized wire" A. B. Bhise, Padmakar G. Chavan, D. J. Late, M. A. More, I. S. Mulla, V. K. Pillai and D. S. Joag, Poster presentation, National Conference on Devices, Intelligent Systems and Communications (MITDISC) 2007, Department of Electronics and Communication Engineering, Manipal Institute of Advanced Technology, **Manipal (INDIA)**, 7th-8th Dec 2007.
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Research Group

Vivekanand S. Bagal (Ph.D.Students):



Research Topic: *"Nano-heterostructures of Semiconducting Chalcogenides: Synthesis and Exploration of their Structural, Optical, Field Emission and Photo-Sensitive Field Emission Properties"*

1) **Girish P. Patil (Project Assistant):**



Research Topic: *"Metal Nanoparticles decoration on TiO₂ Nanotubes for Field Emission Application"*

Research Laboratory 01:

Nanomaterials synthesis Laboratory

a) Thermal Evaporation system



b) Hydrothermal System



c) Anodization deposition method



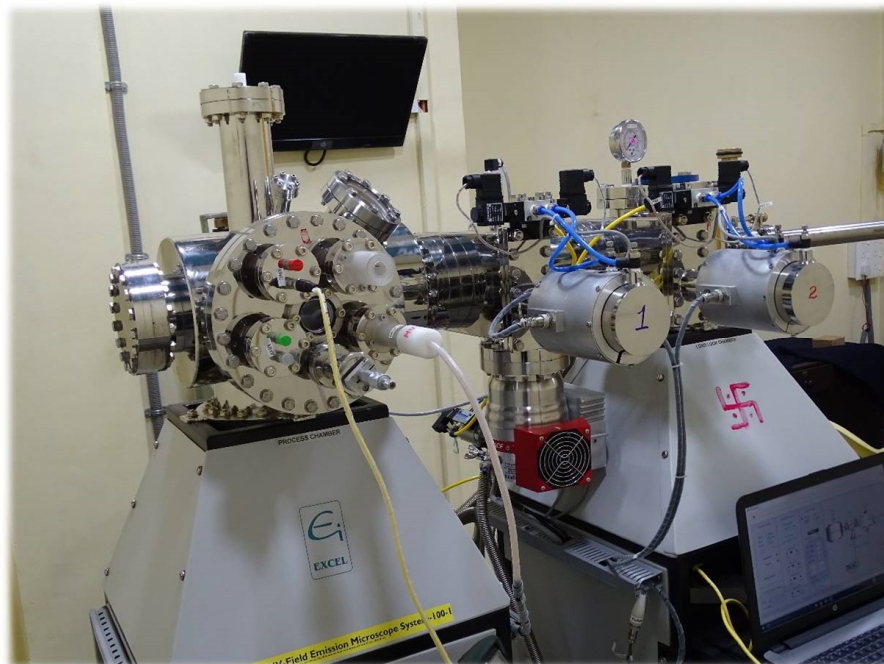
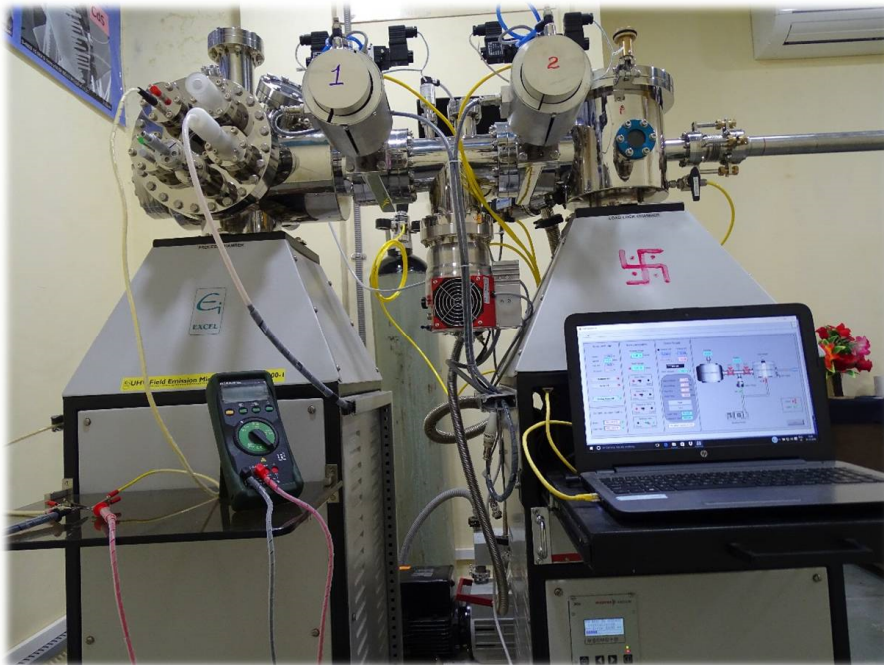
d) Glow Box



Research Laboratory 02:

Field Emission Laboratory

a) Ultra-High Vacuum Field Emission Microscope (1×10^{-8} mbar)



Future Plan:

1. Field emission studies of nano-heterostructures.
2. Patterning by e-beam lithography for field Emission studies.

