

INDRANIL LAHIRI

Assistant Professor

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Work Experience

- **December, 2012 onwards: Assistant Professor**, Department of Metallurgical and Materials Engineering, Indian Institute of Technology (IIT) Roorkee, INDIA
- **September – October 2012: Research Assistant Professor**, University of North Texas, Denton, TX, USA
- **December 2011 – August 2012: Post Doctoral Researcher**, Florida International University, Miami, FL, USA
- **Spring 2008 – Fall 2011: Graduate Research Assistant**, Florida International University, Miami, FL, USA (as PhD student)
- **May 2005 – June 2007: Senior Scientist**, NFTDC, Hyderabad, India
- **May 2000 – April 2005: Scientist**, NFTDC, Hyderabad, India

Education

- **Ph.D.**, Materials Science and Engineering, Florida International University (FIU), Miami, Florida, USA, Fall 2011
- **M.Tech.** (Master of Technology), Materials & Metallurgical Engineering, Indian Institute of Technology (IIT) Kanpur, India, May 2000
- **B.E.** (Bachelor of Engineering), Metallurgical Engineering, Bengal Engineering College, Shibpur, India, June 1998

Teaching

2013 onward (in IIT Roorkee)

- **MT-201A:** Materials Science and Engineering (2nd Year Undergrad.) – Autumn 2013
- **MT-207:** Electrical and Electronic Materials (2nd Year Undergrad.) – Autumn 2015, 2016
- **MT-210:** Materials Characterization Lab.-I (2nd Year Undergrad.) – Autumn 2013
- **MT-220:** Materials Characterization Lab.-II (2nd Year Undergrad.) – Autumn 2013

- **MT-402:** Mechanical Working of Metals, MMED (4th Year Undergrad.) – Spring 2013, Spring 2014, Spring 2015
- **MT-490:** Practical Training, MMED (4th Year Undergrad.) – Spring 2013
- **NT-512:** Technology of Nanostructure Fabrication, Centre of Nanotechnology (M.Tech. and PhD) – Spring 2013, Spring 2014
- **MT-531:** Electronic Materials (M. Tech. and Ph.D. students) – Autumn 2014
- **NT-604:** Physics of Nanomaterials, Centre of Nanotechnology (M. Tech. and PhD) – Spring 2015
- **NTN-501:** Nanostructured Materials, Centre of Nanotechnology (M. Tech. and PhD) – Autumn 2015, 2016

Until 2012

- **EGN 3365:** Materials Engineering (undergraduate)- Spring 2012, FIU, USA
- **EGN 3365:** Materials Engineering (undergraduate)– Special lectures on selected topics (in the classes of Dr. W. Choi) – Fall and Spring, 2009-2011, FIU, USA
- Free tutorship (for Material Advantage chapter in Florida International University) to undergraduate students in Materials Engineering – Fall and Spring, 2009-2011, FIU, USA

Administrative Responsibilities (at IIT, Roorkee)

- Principal Investigator, Nanomaterials and Applications Lab., Metallurgical and Materials Engineering
- Officer-in-charge, Functional Nanomaterials Lab., Centre of Nanotechnology
- Officer-in-charge, Annual Reports, Metallurgical and Materials Engineering
- Officer-in-charge, Time Table, Metallurgical and Materials Engineering
- Additional Officer-in-charge, Energy Materials Lab., Metallurgical and Materials Engineering
- Additional Officer-in-charge, Metal Forming Lab., Metallurgical and Materials Engineering
- Additional Officer-in-charge, Materials Engineering Lab., Metallurgical and Materials Engineering
- Additional Officer-in-charge, Materials Testing Lab., Metallurgical and Materials Engineering
- Member, Department Academic Committee, Metallurgical and Materials Engineering
- Member, Faculty Search Committee, Metallurgical and Materials Engineering
- Member Secretary, Department Faculty Committee, Metallurgical and Materials Engineering

Research Interests

- **Carbon nanotubes**–Large-scale synthesis of carbon nanotubes on different metallic, semiconducting and insulating substrates, their electronic applications (as field electron emitter) and electrochemical application (as electrodes in batteries, super-capacitors).
- **Graphene** – Large-scale synthesis; applications for flexible, transparent field emitters and other transparent, conducting electrodes.

- **Field emission** – Application of C-nanostructures for fabrication of field emission devices, for possible application in high power microwave generators and displays.
- **Energy storage devices** – Development of new electrode materials for next-generation high-capacity Li-ion batteries and supercapacitors.
- **Materials for energy generation** – Development of new materials for energy generation systems like solar cells

Other Research Experience

- Functionally gradient materials
- Mechanical alloying, powder metallurgy
- Superplasticity, deformation processing of metals and alloys
- X-ray diffraction, line profile analysis, SEM, AFM
- Materials testing and characterization, destructive and non-destructive testing, microscopy, image analysis
- Alloy, process and product development, thermo-mechanical processing
- Processing and characterization of various non-ferrous alloys

Honours & Achievements

- ❖ Winner of **2012 ASM International Student Paper Contest** by **ASM International** (awarded during MS&T 2012, Pittsburgh, PA, USA, Oct. 7-11, 2012).
- ❖ Won **TMS Student Best Paper Contest 2011– Graduate Level – 2nd Place** (awarded during TMS 2012 Annual Meeting, Orlando, FL, Mar. 11-15, 2012).
- ❖ Awarded **Graduate Excellence in Materials Science (GEMS) Award 2011-Sapphire** by Basic Science Division, **American Ceramic Society** (awarded during MS&T 2011, Columbus, OH, USA, Oct. 16-20, 2011). (*ACerS Bulletin*, Vol. 91, No. 1, January 2012, p. 8)
- ❖ Awarded **Second prize** in **The Best Junior Researcher Award in 2011 Nanomaterials Symposium**, TMS 2011, San Diego, USA, 27 Feb -3 March, 2011.
- ❖ Awarded **“Best Doctoral Graduate”** among all departments of College of Engineering, Florida International University, in Fall 2011 Commencement, Dec. 12, 2011.
- ❖ Recipient of **Dissertation Year Fellowship**, FIU, Spring-Fall 2011.
- ❖ Recipient of **Doctoral Evidence Acquisition Fellowship**, FIU, Summer-Fall 2010.
- ❖ Selected as Student Board Member in **ASM International - Board of Trustees, 2010-11**. (<http://www.asminternational.org/content/docs/Lahiri.pdf>)
- ❖ **Travel Grants** to present in conferences:
 - *Attendee-Assistance Support* from the organizers of 2011 Nanoelectronic Devices for Defense & Security (NANO-DDS) Conference, Aug. 29- Sept. 2, 2011, Brooklyn, NY, USA

- *Student Travel Grant* from TMS – Electronic, Magnetic, & Photonic Materials Division, TMS 2011 Annual Meeting, San Diego, USA, 27 Feb -3 March, 2011
- *Student Travel Grant* from Electro Chemical Society (ECS) – Battery Division, 218th ECS Meeting, Las Vegas, USA, 10-15 October, 2010
- *Conference Travel Awards* from Student Government Association, FIU for
 - TMS 2009
 - MRS Fall 2009
 - MS&T 2011
- ❖ **5 Awards in events** organized by Material Advantage - FIU chapter
- ❖ Included in *Marquis' Who's Who in the World*, 2009.

Publications

Summary:

US Provisional Patent Applications – 2

Book Chapters – 3

Journal Articles – 33

Peer-Reviewed Conference Proceedings – 7

Conference Presentations – 57

h index – 12 (scopus.com)

i-10 index – 15 (google scholar)

Total citations – 1028 (scopus.com)

Patents

2. W. Choi, I. Lahiri, C. Kang, *High efficiency lithium ion battery anode based on 2- and 3-dimensional carbon nanotube-metal/alloy substrates*, **US Provisional Patent Appl. No. 61567979** (Filed on December 7, 2011).
1. W.B. Choi, S.J. Cho, I. Lahiri, *High efficiency lithium ion battery anode using interface-controlled binder-free carbon nanotubes grown on metal/alloy substrates*, **US Provisional Patent Appl. No. 61/222,481** (Filed on July 2, 2009).

Book Chapters

3. Indranil Lahiri, Wonbong Choi, *Field emission and graphene: An overview of current status*, In “**Graphene: Synthesis and applications**” Ed. W. Choi, J.-W. Lee, CRC Press (Boca Raton, USA), January 2012, **ISBN: 9781439861875**, pp. 263-290.

2. **Indranil Lahiri**, Wonbong Choi, *Graphene and graphene based materials in solar cell application*, In “**Graphene: Synthesis and applications**” Ed. W. Choi, J.-W. Lee, CRC Press (Boca Raton, USA), January 2012, **ISBN**: 9781439861875, pp. 291-312.
1. **Indranil Lahiri**, *Microstructural Characterization of Mechanically Alloyed Powder by X-ray Diffraction and Atomic Force Microscopy: A case study with Cu-Cr*, In “**Advances in Materials Science Research. Vol. 3**”, Ed. M.C. Wythers, Nova Science Publishers, Inc. (NY, USA), April 2011, **ISBN**: 978-1-61728-998-9, pp. 183-203.

Journals (Published/Accepted)

2016

33. Raj Kumar, R. Manoj Kumar, Debrupa Lahiri, **Indranil Lahiri**, *Thermally reduced graphene oxide film on soda lime glass as transparent conducting electrode*, **Surface and Coatings Technology**, DOI: 10.1016/j.surfcoat.2016.10.060.
32. Akshay V. Singhal, Hemant Charaya, **Indranil Lahiri**, *Noble Metal Decorated Graphene based Gas Sensors and their Fabrication: A Review*, **Critical Reviews in Solid State and Materials Sciences**, DOI: 10.1080/10408436.2016.1244656.
31. Vijayesh Kumar, Nikhil Kumar, Partha Roy, Debrupa Lahiri, **Indranil Lahiri**, *Emergence of fluorescence in boron nitride nanoflakes and its application in bioimaging*, **RSC Advances**, 2016, **6**, 48025 - 48032. **(Impact Factor: 3.840)**

2015

30. Sameer Chouksey, Anjan Sil, Debrupa Lahiri, **Indranil Lahiri**, *Atmospheric oxidation effect of silicon-carbon nanotube anode on Li-ion battery performance*, **Nanomaterials and Energy**, 4 (2), 2015, 153-158.
29. Krishna Saini, Manoj Kumar R., Debrupa Lahiri, **Indranil Lahiri**, *Quantifying Bonding Strength of CuO Nanotubes with Substrate Using Nano-Scratch Technique*. **Nanotechnology**, 26, 2015, 305701. **(Impact Factor: 3.821)**
28. Gaurav Mittal, Mamta Khaneja, Krishna Saini, **Indranil Lahiri**, *Carbon nanotube based 3-dimensional hierarchical field emitter structure*. **RSC Advances**, 5, 2015, 21487-21494. **(Impact Factor: 3.840)**

2014

27. Gaurav Mittal, **Indranil Lahiri**, *Recent progress in nanostructured next-generation field emission devices*. **Journal of Physics D: Applied Physics**, 47, 2014, 323001. **(Impact Factor: 2.528)**

2013

26. Zheng Yan[†], Lulu Ma[†], Yu Zhu[†], **Indranil Lahiri**, Myung Gwan Hahm, Zheng Liu, Shubin Yang, Changsheng Xiang, Wei Lu, Zhiwei Peng, Zhengzong Sun, Carter Kittrell, Jun Lou, Wonbong Choi,

Pulickel M. Ajayan, James M. Tour, *Three-dimensional metal-graphene-nanotube multifunctional hybrid materials*. **ACS Nano**, 7(1), 2013, 58-64. **(Impact Factor: 11.421)**

25. **Indranil Lahiri**, Wonbong Choi, *Carbon Nanostructures in Lithium Ion Batteries: Past, Present and Future*. **Critical Reviews in Solid State and Materials Sciences**, 38, 2013, 128-166. **(Impact Factor: 9.467)**
<http://www.tandfonline.com/eprint/8aBTAbfxZyYxHrn9vmEM/full>

2012

24. **Indranil Lahiri**, Joyce Wong, Zilu Zhou, Wonbong Choi, *Ultra-high current density multiwall carbon nanotube field emitter structure on three-dimensional micro-channeled copper*, **Applied Physics Letters**, 101, 2012, 063110 (5 pages). **(Impact Factor: 3.844)**
23. Chiwon Kang[#], **Indranil Lahiri**[#] ([#]equal contributors), Rangasamy Baskaran, Jun Y. Hwang, Won-Gi Kim, Yang-Kook Sun, Rajarshi Banerjee, Wonbong Choi, *Multiwall Carbon Nanotube Based Anodes on 3D Current Collector for Li-Ion Batteries*, **Journal of Power Sources**, 219, 2012, 364-370. **(Impact Factor: 4.951)**

2011

22. **Indranil Lahiri**, Seung-Min Oh, Jun Y. Hwang, Chiwon Kang, Hyeongtag Jeon, Rajarshi Banerjee, Yang-Kook Sun, Wonbong Choi, *Ultrathin alumina coated carbon nanotubes as negative electrodes for high capacity and safe Li-ion battery*, **Journal of Materials Chemistry**, 21, 2011, 13621-13626. **(Impact Factor: 5.968)**
21. **Indranil Lahiri**, Wonbong Choi, *Interface control: A modified rooting technique for enhancing field emission from multiwall carbon nanotube based bulk emitters*, **Acta Materialia**, 59, 2011, 5411-5421. **(Impact Factor: 3.755)**
20. **Indranil Lahiri**[#], Debrupa Lahiri[#] ([#]equal contributors), Sungho Jin, Arvind Agarwal, Wonbong Choi, *Carbon Nanotubes: How strong is their bond with the substrate?*, **ACS Nano**, 5(2), 2011, 780-787. **(Impact Factor: 11.421)**
Highlighted as spotlight in "Nanowerk" (<http://www.nanowerk.com/spotlight/spotid=19707.php>)
19. **Indranil Lahiri**, Ved Prakash Verma, Wonbong Choi, *An all-graphene based transparent and flexible field emission device*, **Carbon**, 49 (5), 2011, 1614-1619. **(Impact Factor: 5.378)**
18. **Indranil Lahiri**, Santanu Das, Chiwon Kang, Wonbong Choi, *Application of carbon nanostructures – Energy to electronics*, **JOM**, 63(6), 2011, 70-76. **(Impact Factor: 1.421)**
17. Santanu Das, Raghunandan Seelaboyina, Ved Verma, **Indranil Lahiri**, Jun Yeon Hwang, Rajarshi Banerjee, Wonbong Choi, *Synthesis and Characterization of Self-Organized Multilayered Graphene-Carbon Nanotube Hybrid Films*, **Journal of Materials Chemistry**, 21, 2011, 7289-7295. **(Impact Factor: 5.968)**

16. Jun Huang, Unjeong Kim, Bei Wang, **Indranil Lahiri**, Eunhong Lee, Peter C. Eklund, Wonbong Choi, *Controlled Growth of Single-walled Carbon Nanotubes for Unique Nanodevices*, **Journal of Nanoscience and Nanotechnology**, 11(1), 2011, 262-269. **(Impact Factor: 1.563)**

2010

15. **Indranil Lahiri**, Sung-Woo Oh, Jun Y. Hwang, Sungjin Cho, Yang K. Sun, Rajarshi Banerjee, Wonbong Choi, *High capacity and excellent stability of lithium ion battery anode using interface-controlled binder-free multiwall carbon nanotubes grown on copper*, **ACS Nano**, 4(6), 2010, 3440-3446. **(Impact Factor: 11.421)**
14. **Indranil Lahiri**, Raghunandan Seelaboyina, Jun Y Hwang, Raj Banerjee, Wonbong Choi, *Enhanced field emission from multi-walled carbon nanotubes grown on pure copper substrate*, **Carbon**, 48 (5), 2010, 1531-1538. **(Impact Factor: 5.378)**
13. **Indranil Lahiri**, *Prospects of oxide materials in Li-ion batteries*, **American Ceramic Society Bulletin**, 89 (6), 2010, 17-18. **(Impact Factor: 0.522)**
12. Jun Huang, Bei Wang, **Indranil Lahiri**, Awnish K. Gupta, Peter C. Eklund, Wonbong Choi, *Effect of bending on the resistivity and Raman spectrum of single-walled carbon nanotubes*, **Advanced Functional Materials**, 20, 2010, 4388-4393. **(Impact Factor: 10.179)**
11. Ved Prakash Verma, Santanu Das, **Indranil Lahiri**, Wonbong Choi, *Large-area graphene on polymer film for flexible and transparent anode in field emission device*, **Applied Physics Letters**, 96 (20), 2010, 203108(1-3). Also published in *Virtual Journal of Nanoscale Science and Technology*, Vol. 21, Issue 22, May 31, 2010. **(Impact Factor: 3.844)**
10. Raghunandan Seelaboyina, **Indranil Lahiri**, Wonbong Choi, *Carbon Nanotube Embedded Novel 3-Dimensional Alumina Microchannel Cold Cathodes for High Electron Emission*, **Nanotechnology**, 21 (14), 2010, 145206. **(Impact Factor: 3.979)**
9. Wonbong Choi, **Indranil Lahiri**, Raghunandan Seelaboyina, Yong Soo Kang, *Synthesis of graphene and its applications: a review*, **Critical Reviews in Solid State and Materials Sciences**, 35, 2010, 52-71. **(Impact Factor: 9.467)** **Most-cited article in the history of the journal**
<http://www.tandfonline.com/eprint/kBHWaJ6rC4XT855NsaVn/full>

2009

8. **Indranil Lahiri**, Sanjeev Bhargava, *Crystallite size of mechanically alloyed Cu-Cr powder – a comparison between X-ray diffraction and atomic force microscopy techniques*, **Materials Characterization**, 60 (11), 2009, 1406-1410. **(Impact Factor: 1.572)**
7. **Indranil Lahiri**, Sanjeev Bhargava, *Enhanced properties of functionally gradient Cu-Cr powder compacts*, **International Journal of Materials Research (formerly: Zeitschrift fuer Metallkunde)**, 100 (5), 2009, 723-729. **(Impact Factor: 0.830)**

6. Indranil Lahiri, S. Bhargava, *Compaction and sintering response of mechanically alloyed Cu-Cr powder*, **Powder Technology**, 189 (3), 2009, 433-438. **(Impact Factor: 2.080)**
5. I. Lahiri, S. Bhargava, *X-ray powder diffraction line profile analysis of mechanically alloyed Cu-Cr powder*, **Materials Science and Technology**, 25 (4), 2009, 520-526. **(Impact Factor: 0.772)**

2000 – 2008

4. Indranil Lahiri, K. Balasubramanian, *Application of mechano-chemical synthesis for protective coating on steel grinding media prior to ball milling of copper*, **Bulletin of Materials Science**, 30 (2), 2007, 157-161. **(Impact Factor: 0.880)**
3. Satyam Suwas, I. Lahiri, R.K. Ray, S. Bhargava, *The 8her hardness yield locus of Ti-24Al-11Nb alloy*, **Materials Letters**, 57 (21), 2003, 3251-3256. **(Impact Factor: 2.307)**
2. Indranil Lahiri, Debrupa Lahiri (Mondal), S. Bhargava, *Effect of prior β -processing on superplasticity of ($\alpha+\beta$) 8hermos mechanically treated Ti-6Al-4V alloy*, **Materials and Manufacturing Processes**, 18 (4), 2003, 621-635. **(Impact Factor: 1.058)**
1. Indranil Lahiri, S. Bhargava, *Superplasticity in titanium alloys*, **Titanium**, 5 (2), 2000, 11-21.

Peer-reviewed Symposium Proceedings (Published/Accepted)

7. Pramod Kumar, Indranil Lahiri, Anirban Mitra, *Direct graphene growth from highly ordered pyrolytic graphite using pulsed Nd: YAG laser on p-Si (100) substrate at 700 °C*, **AIP Conference Proceedings**, 1728, 2016, 020452 (1-4).
6. Wonbong Choi, Indranil Lahiri *Novel design considerations for high efficiency carbon nanotube field emitters*, **Technical Digest – 25th International Vacuum Nanoelectronics Conference, IVNC 2012**, art. No. 6316855, pp. 30-31.
5. Chiwon Kang, Indranil Lahiri, Rangasamy Baskaran, Mansoo Choi, Yang-Kook Sun, Wonbong Choi, *3D Multiwall Carbon Nanotubes (MWCNTs) for Li-Ion Battery Anode*, **TMS 2012 Proc.**, Vol. 2, 2012, 35-41.
4. Santanu Das, Indranil Lahiri, Chiwon Kang, Wonbong Choi, *Engineering Carbon Nanomaterials for Future Applications: Energy and Bio-sensor*, **Proc. SPIE 8031**, 80311K (2011), DOI: 10.1117/12.883743.
3. Indranil Lahiri, Sung-Woo Oh, Yang-Kook Sun, Wonbong Choi, *High specific capacity and excellent stability of interface-controlled MWCNT based anodes in lithium ion battery*, **MRS Symp. Proc. 2010**, Vol. 1313, mrsf10-1313-kk07-11, 60-67.
2. Ved P. Verma, Santanu Das, Indranil Lahiri, Wonbong Choi, *Large area graphene on polymer films for transparent and flexible field emission device*, **MRS Symp. Proc. 2010**, Vol. 1283, 2011, 82-88.
1. Indranil Lahiri, Raghunandan Seelaboyina, Won Bong Choi, *Field Emission Response from Multiwall Carbon Nanotubes Grown on Different Metallic Substrates*, In *Nanotubes and Related*

Nanostructures — 2009, Ed. Yoke Khin Yap (**MRS Symp. Proc.** Vol. 1204, Warrendale, PA, 2010), 1204-K18-21, 257-263.

Invited/Contributed/Poster Presentation

57. Indranil Lahiri, *Carbon nanostructures in Li-ion Battery*, **QIP short term course on Relevance of Nanotechnology to Rechargeable battery technology** 18-22 July, 2016, IIT Roorkee. (Invited)
56. Indranil Lahiri, *Carbon nanotube based anodes in Li-ion battery*, **Indo-US bilateral workshop on ``Recent Advances in Multiscale, Multiphysics Analysis of Energy Conversion in Li-ion Batteries``**, IIT Bombay, India, June 17-19, 2016. (Invited)
55. Nikhil Mohandas, Raj Kumar, Indranil Lahiri, *synthesis and field emission response of anodically reduced graphene oxide*, **4th international Conference on frontiers of nanoscience and technology- Cochin Nano**, Kochi, India, February 20-24, 2016.
54. Kavitha, Indranil Lahiri, *Graphene synthesis by thermal chemical vapour deposition using solid carbon sources*, **4th international Conference on frontiers of nanoscience and technology- Cochin Nano**, Kochi, India, February 20-24, 2016.
53. Pramod Kumar, Indranil Lahiri, Anirban Mitra, *Direct Graphene Growth From Highly Ordered Pyrolytic Graphite Using Pulsed Nd: YAG Laser On p-Si (100) Substrate at 700 °C*, **International Conference on Condensed Matter & Applied Physics (ICC-2015)**, Bikaner, India, Oct. 30-31, 2015.
52. Indranil Lahiri, *Nanostructure synthesis and applications*, Short term course on “**Nanotehnology: Basics and Applications in Chemical Engineering**”, 22-26 June, 2015, IIT Roorkee. (Invited)
51. Indranil Lahiri, *Nanotechnology and its applications*, Tripura Institute of Technology, Agartala, Feb. 22, 2015. (Invited)
50. Indranil Lahiri, *Nanostructured Carbon in Field Emission and Energy Storage*, BARC, Mumbai, Dec. 23, 2014. (Invited)
49. Vaibhav Jain, Amit Tripathi, Indranil Lahiri, *Field Emission response of CNT Emitters synthesized on different substrate*, **7th Bangalore India Nano**, Bangalore, India, Dec. 4-6, 2014.
48. Krishna Saini, Khelendra Agrawal, Debrupa Lahiri, Indranil Lahiri, *Bonding Strength of CuO NT with substrate*, **7th Bangalore India Nano**, Bangalore, India, Dec. 4-6, 2014.
47. Amit Tripathi, Vaibhav Jain, Indranil Lahiri, *Growth of vertically aligned CNTs on Cu substrate*, **7th Bangalore India Nano**, Bangalore, India, Dec. 4-6, 2014.
46. Gaurav Mital, Indranil Lahiri, *CNT based 3-dimensional structure as high current density field emitter*, **Indian Institute of Metals (IIM) Annual Technical Meeting**, Pune, India, Nov. 12-15, 2014.
45. Sameer Chouksey, Indranil Lahiri, *Si-CNT hybrid structure as Li-ion battery anode material*, **Indian Institute of Metals (IIM) Annual Technical Meeting**, Pune, India, Nov. 12-15, 2014.
44. Indranil Lahiri, *Prospect of Carbon Nanotubes in Li-ion Battery*, **TMS 2014**, San Diego, USA, Feb. 16-20, 2014.

43. Gaurav Mittal, Indranil Lahiri, *High-current-density field emitter with carbon nanotubes – an overview*, 6th **Bangalore India Nano**, Bangalore, India, Dec. 4-6, 2013.
42. Sameer Chouksey, Indranil Lahiri, *High performance Li-ion battery based on CNT-Si Core-Shell structured anode – an overview*, 6th **Bangalore India Nano**, Bangalore, India, Dec. 4-6, 2013.
41. Indranil Lahiri, *Carbon nanotube as an anode material in Li-ion battery*, **Indian Institute of Metals (IIM) Annual Technical Meeting**, Varanasi, India, Nov. 12-16, 2013. (Invited)
40. Indranil Lahiri, *Carbon nanotube based high energy-efficient applications*, Short term course on “**Essentials of Nanoscience and Nanotechnology**”, 18-22 February, 2013, IIT Roorkee. (Invited)
39. Chiwon Kang, Indranil Lahiri, Rangasamy Baskaran, Won-Gi Kim, Yang-Kook Sun, Wonbong Choi, *3 Dimensional Carbon Nanofibers for Li-Ion Battery Anode*, **MRS Fall 2012**, Boston, USA, Nov. 25-30, 2012.
38. Indranil Lahiri, Wonbong Choi, *Novel design considerations for high efficiency carbon nanotube field emitters: Interface engineering and 3-D architecture*, **MS&T 2012**, Pittsburgh, USA, 7 – 11 October, 2012.
37. Indranil Lahiri, Wonbong Choi, *High efficiency field emission and energy storage: Application of interface engineered carbon nanotube structures*, **Nano Korea 2012**, Seoul, Korea, August 16-18, 2012.
36. Indranil Lahiri, Ved Prakash Verma, Wonbong Choi, *Transparent, Flexible Field Emitter using hybrid Graphene-MWCNT structure*, **Nano Korea 2012**, Seoul, Korea, August 16-18, 2012.
35. Rangasamy Baskaran, Chiwon Kang, Indranil Lahiri, Wonbong Choi, *Ex-situ investigations on 3D MWCNT anode for Li ion battery*, **Nano Korea 2012**, Seoul, Korea, August 16-18, 2012.
34. Wonbong Choi, Indranil Lahiri, *Novel design considerations for high efficiency carbon nanotube field emitters*, **25th International Vacuum Nanoelectronics Conference 2012 (IVNC 2012)**, Jeju, Korea, July 9-13.
33. Indranil Lahiri, Wonbong Choi, *Interface engineered carbon nanotube based high efficiency electrodes for field electron emission and energy storage devices*, **11th US-Korea Workshop on Nanostructured Materials**, Dallas, USA, May 1 – 4, 2012.
32. Indranil Lahiri, Ved Prakash Verma, Wonbong Choi, *Graphene-CNT hybrid structure based Transparent and Flexible Field Emission Device*, **9th US-Korea Workshop on Nanoelectronics**, Dallas, USA, May 1 – 4, 2012.
31. Indranil Lahiri, Wonbong Choi, *Interface engineering as a tool to enhance efficiencies of carbon nanotube based devices*, **TMS 2012**, Orlando, USA, Mar.11-15, 2012.
30. Wonbong Choi, Indranil Lahiri, Santanu Das, Chiwon Kang, *Application of Carbon Nanotubes – Energy to Bioelectronic Sensor*, **TMS 2012**, Orlando, USA, Mar. 11-15, 2012.
29. Chiwon Kang, Indranil Lahiri, Rangasamy Baskaran, Mansoo Choi, Yang-Kook Sun, Wonbong Choi, *3D Multiwall Carbon Nanotubes (MWCNTs) for Li-Ion Battery Anode*, **TMS 2012**, Orlando, USA, Mar. 11-15, 2012.

28. Indranil Lahiri, Wonbong Choi, *Interface engineered carbon nanotube based high efficiency electrodes for field electron emission and energy storage devices*, **MRS Fall 2011**, Boston, USA, Nov. 28 – Dec. 2, 2011.
27. Indranil Lahiri, Santanu Das, Chiwon Kang, Wonbong Choi, *Field electron energized phase change in thin $\text{Ge}_2\text{Sb}_2\text{Te}_5$ film for memory application*, **2011 ASME-IMECE**, Denver, USA, Nov. 11 – 17, 2011.
26. Indranil Lahiri, Wonbong Choi, *Ultrathin alumina coated carbon nanotubes as anodes for high capacity Li-ion battery*, **MS&T 2011**, Columbus, USA, 16 – 20 October, 2011.
25. Indranil Lahiri, Wonbong Choi, *Interface engineered carbon nanotube-based field emission devices*, **MS&T 2011**, Columbus, USA, 16 – 20 October, 2011.
24. Chiwon Kang, Indranil Lahiri, Rangasamy Baskaran, Mansoo Choi, Yang-Kook Sun, Wonbong Choi, *An efficient Li-Ion Battery Anode Based on 3D Carbon Nanotubes Structure*, **Nano Florida 2011**, Miami, USA, Sep. 30 – Oct. 1, 2011.
23. Indranil Lahiri, Wonbong Choi, *Performance optimization of carbon nanotube-based field emission devices through interface engineering*, **Nano-Electronic Devices for Defense and Security Conference (Nano-DDS)**, Brooklyn, USA, Aug. 29 – Sept. 1, 2011.
22. Indranil Lahiri, Ved Prakash Verma, Santanu Das, Wonbong Choi, *CNT-on-graphene composite structure as transparent-flexible field emission device*, **Nano-Electronic Devices for Defense and Security Conference (Nano-DDS)**, Brooklyn, USA, Aug. 29 – Sept. 1, 2011.
21. W. Choi, I. Lahiri, S. Das, M. Choi, P. Sudhagar, Y. Sun, Y. Kang, *Carbon Nanomaterials for High Efficiency Energy Devices*, **The 18th International Conference on Composite Materials**, Jeju Island, Korea, 21-26 August, 2011.
20. Indranil Lahiri, Ved Prakash Verma, Mansoo Choi, Wonbong Choi, *A Graphene-based Hybrid Structure as Flexible, Transparent Field Emitter*, **Graphene 2011**, Bilbao, Spain, 11 – 14 April, 2011.
19. Indranil Lahiri, Ved Prakash Verma, Wonbong Choi, *Graphene-CNT hybrid structure based Transparent and Flexible Field Emission Device*, **TMS Annual Meeting 2011**, San Diego, USA, Feb. 27 – Mar 3, 2011.
18. Indranil Lahiri, Debrupa Lahiri, Sungho Jin, Arvind Agarwal, Wonbong Choi, *Carbon Nanotubes: How strong is their bond with the substrate?*, **TMS Annual Meeting 2011**, San Diego, USA, Feb. 27 – Mar 3, 2011.
17. Indranil Lahiri, Sung-Woo Oh, Yang-Kook Sun, Wonbong Choi, *MWCNT based structures as negative electrodes for high capacity lithium ion batteries*, **TMS Annual Meeting 2011**, San Diego, USA, Feb. 27 – Mar 3, 2011.
16. Santanu Das, Indranil Lahiri, Ved P. Verma, Wonbong Choi, *Graphene for Large Scale Flexible Transparent Conducting Nanoelectronics and Bio-Devices*, **BIONIUM 2010**, Miami, USA, 9 – 10 December, 2010.

15. Indranil Lahiri, Sung-Woo Oh, Yang-Kook Sun, Wonbong Choi, *High specific capacity and excellent stability of interface-controlled MWCNT based anodes in lithium ion battery*, **MRS Fall 2010**, Boston, USA, Nov. 29 – Dec. 3, 2010.
14. Ajay Kumar, Indranil Lahiri, Wonbong Choi, *The field emission from multiwall carbon nanotubes grown on copper foam*, **MRS Fall 2010**, Boston, USA, Nov. 29 – Dec. 3, 2010.
13. Ved P. Verma, Santanu Das, Indranil Lahiri, Wonbong Choi, *Large area graphene on polymer films for transparent and flexible field emission device*, **MRS Fall 2010**, Boston, USA, Nov. 29 – Dec. 3, 2010.
12. Ved P. Verma, Indranil Lahiri, Santanu Das, Mansoo Choi, Wonbong Choi, *Graphene for flexible field emission display*, **Dasan Conference: Graphene Science and Technology**, Boston, USA, Nov. 29 – Dec. 3, 2010.
11. Indranil Lahiri, Sung-Woo Oh, Yang-Kook Sun, Wonbong Choi, *High specific capacity and excellent stability of interface-controlled MWCNT based anode structures for application in lithium ion batteries*, **218th ECS Meeting**, Las Vegas, USA, 10-15 October, 2010.
10. Indranil Lahiri, Sung-Woo Oh, Yang-Kook Sun, Wonbong Choi, *Multi wall carbon nanotubes directly grown on copper current collector as anode for lithium ion batteries*, **2010 Florida Energy Systems Consortium Summit**, Orlando, USA, 28-29 September 2010.
9. Ved P. Verma, Santanu Das, Indranil Lahiri, Wonbong Choi, *Large-area Graphene on Polymer Film for Transparent and Flexible Electrode*, **2010 Florida Energy Systems Consortium Summit**, Orlando, USA, 28-29 September 2010.
8. Indranil Lahiri, Raghunandan Seelaboyina, Wonbong Choi, *Enhanced field emission from multiwall carbon nanotubes through substrate optimization and novel 3D design*, **IEEE NANO 2010-NANO KOREA 2010**, Seoul, Korea, 17-20 August, 2010.
7. Santanu Das, Raghunandan Seelaboyina, Ved P. Verma, Indranil Lahiri, Dong Hoon Song, Young Soo Kang, Wonbong Choi, *Graphene and carbon nanotube hybrid structure and its applications in flexible electronics devices*, **IEEE NANO 2010-NANO KOREA 2010**, Seoul, Korea, 17-20 August, 2010.
6. Chiwon Kang, Indranil Lahiri, Yang-Kook Sun, Wonbong Choi, *Synthesis and electrochemical characterization of carbon nanostructures for Li-ion battery anode*, **US-Korea Conference 2010**, Seattle, USA, 11-15 August, 2010.
5. Indranil Lahiri, Chiwon Kang, Wonbong Choi, *Carbon nanostructures in Li-ion batteries*, **FIU First Energy Day Workshop**, Miami, USA, 12 March, 2010.
4. Jun Huang, Bei Wang, Indranil Lahiri, Awnish K. Gupta, Peter C. Eklund, Wonbong Choi, *Controlled Growth of Single-walled Carbon Nanotubes for Unique Nanodevices*, **Nano-Korea 2009**, Seoul, Korea, 26-28 August, 2009.

3. Indranil Lahiri, Raghunandan Seelaboyina, Wonbong Choi, *Field Emission Response from Multiwall Carbon Nanotubes Grown on Different Metallic Substrates*, **MRS Fall 2009**, Boston, USA, 30 November – 4 December, 2009.
2. Indranil Lahiri, Raghunandan Seelaboyina, Wonbong Choi, *High efficiency multi-walled carbon nanotube field emitters grown on pure Cu substrate*, **TMS Annual Meeting**, San Francisco, USA, 15-19 February, 2009.
1. R. Seelaboyina, I. Lahiri, K.W. Jones, W.B. Choi, *A novel ceramic high secondary yield micro-channel plate*, **TMS Annual Meeting**, San Francisco, USA, 15-19 February, 2009.

Students Supervised

Ph.D (Completed – 0; On-going – 6)

Sl. No.	Name	Dept./Center	Admitted in	Supervisor/Co-Supervisor	Area of Research
1	Raj Kumar	Metallurgical & Materials Engineering	Autumn 2013	Supervisor	Nano-materials for solar cell application
2	Vijayesh Kumar	Center of Nanotechnology	Autumn 2013	Co- Supervisor (Dr. D. Lahiri as Supervisor)	Synthesis and application of boron nitride nanostructures
3	Pramod Kumar	Metallurgical & Materials Engineering	Autumn 2012 (joined group in Autumn 2013)	Supervisor (Dr. A. Mitra, Physics as Co-Supervisor)	Optical properties of carbon nanomaterials
4	Gurjinder Kaur	Metallurgical & Materials Engineering	Autumn 2014	Supervisor	Graphene synthesis
5	Akshay V. Singhal	Center of Nanotechnology	Autumn 2015	Supervisor	Graphene synthesis and application
6	Narasimha Vinod Pulagara	Metallurgical & Materials Engineering	Spring 2016	Supervisor	Field emission from nanostructured materials

Masters (Completed – 8; On-going – 4)

Sl. No.	Name	Dept./Center	Admitted in	Supervisor/Co-Supervisor	Area of Research	Comments
1	Gaurav Mittal	Center of Nanotechnology	Autumn 2012	Supervisor	Field emission	Graduated in June 2014
2	Sameer Chouksey	Center of Nanotechnology	Autumn 2012	Co- Supervisor (Dr. D. Lahiri as Supervisor)	Li-ion battery	Graduated in June 2014
3	Krishna Saini	Center of Nanotechnology	Autumn 2013	Supervisor	Synthesis of CuO nanostructures	Graduated in June 2015
4	Amit Tripathy	Metallurgical & Materials Engineering	Autumn 2013	Supervisor	Synthesis of patterned CNTs	Graduated in June 2015

5	Vaibhav Jain	Metallurgical & Materials Engineering	Autumn 2013	Supervisor	Field emission	Graduated in June 2015
6	Kavitha	Center of Nanotechnology	Autumn 2014	Supervisor	Graphene synthesis	Graduated in June 2016
7	Nikhil Mohandas	Metallurgical & Materials Engineering	Autumn 2014	Supervisor	RGO synthesis and applications	Graduated in June 2016
8	Mukul Srivastava	Metallurgical & Materials Engineering	Autumn 2014	Co- Supervisor (Dr. D. Lahiri as Supervisor)	Graphene based composites	Graduated in June 2016
9	Teekaram Madhukar	Center of Nanotechnology	Autumn 2015	Supervisor	Graphene-polymer composites	
10	Rakesh Kumar Meena	Metallurgical & Materials Engineering	Autumn 2015	Supervisor	Graphene-aluminium composite	
11	Jagdish Chandra Arya	Metallurgical & Materials Engineering	Autumn 2015	Supervisor	NiO-graphene hybrid	
12	Amlan Baishya	Metallurgical & Materials Engineering (IDD)	Autumn 2012	Supervisor	Adhesion energy of 1D nanostructures	

Undergraduate (Groups: Completed – 12; On-going – 4)

Sl. No.	Name	Status	Active Year of Research	Area of Research
1	Shikhar Gupta Siddharth Gupta Vipul Tiwari	4 th year, MMED (B.Tech. Major Project)	2013-14	Synthesis of Reduced Graphene Oxide
2	Swapnil Parkhe Rahul Agarwal Pratibh Vijay Sirowa	4 th year, MMED (B.Tech. Major Project)	2013-14	Developing carbon nanotube based composite materials for lithium ion battery electrodes (Co-PI: D. Lahiri)
3	Himanshu Garg Gopesh Kumar Mahendra Kumar Meena	4 th year, MMED (B.Tech. Major Project)	2013-14	Nanofillers reinforced (Cu based structural) composites for electrical application (Co-PI: D. Lahiri)
4	Shubham Gupta	3 rd year, MMED	Autumn 2013	Synthesis of graphene
5	Hemant Charaya M. Karthick Akshay V. Singhal	3 rd and 2 nd year, MMED	Autumn 2013	Synthesis and application of RGO
6	M. Karthick Apratim Khandelwal	2 nd year, MMED	Summer 2014 (Summer Undergraduate Research Assistantship)	Electrochemical exfoliation for synthesis of graphene
7	Chayan Sengar	2 nd year, MMED	Summer 2014	Cu-Cr based contact materials
8	Arvind Dasgupta Gaurav Modi K. Sudheer	4 th year, MMED (B.Tech. Major Project)	2014-15	Field emitter

9	Akshay V. Singhal Hemant Charya Siddharth Jain	4 th year, MMED (B.Tech. Major Project)	2014-15	Graphene-NP hybrid structure
10	Lakshman N. Sashidhar Ananya Shrivastava	2 nd year, MMED	Summer 2015 (Summer Undergraduate Research Assistantship)	Graphene synthesis by CVD on Ni-based substrates
11	Mahak Agarwal Aditya Mishra	4 th year, MMED (B.Tech. Major Project)	2015-16	Carbon nanotube synthesis on tungsten substrate
12	Md. Rasheed Alam Md. Amid	4 th year, MMED (B.Tech. Major Project)	2015-16	Carbon nanotube synthesis at low temperatures
13	K. N. Sashidhar Lakshman N. Chakrav	4 th year, MMED (B.Tech. Major Project)	2016-17	RGO synthesis and applications
14	Hemlata Borana Manwar Alisha Anil	4 th year, MMED (B.Tech. Major Project)	2016-17	Ni-graphene hybrid
15	Nitin Patel Prithavi Chand	4 th year, MMED (B.Tech. Major Project)	2016-17	Graphene-polymer composites
16	Shubham Gandhi Manuj Dixit	2 nd year, MMED	Summer 2016 (Summer Undergraduate Research Assistantship)	CNT growth on aluminum

Affiliation to Professional Societies

- The Minerals, Metals & Materials Society (TMS)
- ASM International
- Materials Research Society of India (MRS-I) – Life Member
- Indian Institute of Metals (IIM) – Life Member
- Biomedical Engineering Society of India – Founder Member

Other Leadership Activities

- **Faculty Advisor**, Material Advantage, IIT Roorkee chapter, since its inception in 2014.
- **Served** as “Student Board Member” in **Board of Trustees – ASM International**, 2010-11, USA.
(<http://www.asminternational.org/content/docs/Lahiri.pdf>)
- **Chair** (2009-10), Material Advantage chapter, FIU, USA.
- **Secretary** (2008-09), Material Advantage chapter, FIU, USA.
- **Led** Material Advantage chapter at FIU to win several international accolades including ASM Materials Education Foundation Grant, Fall Membership Challenge - Most Innovative Recruitment Strategy Award), World Materials Day Award and Chapter of Excellence Awards (2 times).

- **In-charge** of SEM, thermal CVD system, field emission characterization system, battery testing unit, FIU, USA.
- **In-charge** of “Materials Testing Lab.”, “Nanomaterials by mechanical alloying” group, **Principal coordinator** for “Alloy melting, processing and testing” group, **coordinator** for many sponsored projects from ISRO, BEL, BHEL, Indian Navy etc., NFTDC, Hyderabad, India.

Other Professional Activities

- ❖ **Key Reader (Member of Board of Review)** for Metallurgical and Materials Transactions E.
- ❖ **Reviewer for**
 1. Metallurgical and Materials Transactions A (Received 'Letter of Appreciation' thrice from the Editor for 'Excellent' reviews) (Publisher: ASM International and TMS)
 2. Surface and Coatings Technology (Publisher: Elsevier)
 3. Materials Science and Engineering A (Publisher: Elsevier)
 4. New Journal of Chemistry (Publisher: Royal Society of Chemistry, London)
 5. RSC Advances (Publisher: Royal Society of Chemistry, London)
 6. Journal of Physics and Chemistry of Solids (Publisher: Elsevier)
 7. Current Applied Physics (Publisher: Elsevier)
 8. Chemical Communications (Publisher: Royal Society of Chemistry, London)
 9. Journal of Materials Engineering and Performance (Publisher: ASM International)
 10. Materials Characterization (Publisher: Elsevier)
 11. Journal of Materials Processing Technology (Publisher: Elsevier)
 12. Powder Technology (Publisher: Elsevier)
 13. Nanomaterials and Energy (Publisher: ICE Publishing)
 14. Materials Letters (Publisher: Elsevier)
 15. ACS Applied Materials and Interfaces (Publisher: American Chemical Society)
 16. Journal of Alloys and Compounds (Publisher: Elsevier)
 17. MRS Symposium Proceedings (Publisher: Materials Research Society)
 18. Bulletin of Materials Science (Publisher: Springer)
 19. Journal of Electronic Materials (Publisher: Springer)
 20. Proceedings of the National Academy of Sciences, India Section A: Physical Sciences (Publisher: Springer)
 21. Philosophical Magazine Letters (Publisher: Taylor & Francis)
- ❖ **External Grant Proposal Reviewer** for Georgia National Science Foundation.
- ❖ **External Grant Proposal Reviewer** for National Research Council, Romania.
- ❖ **Proposal Reviewer** for **SERB, DST, India**
- ❖ **Book Proposal Reviewer** for Elsevier Publishing
- ❖ **Book Proposal Reviewer** for CRC Press (Taylor & Francis Group LLC)

- ❖ **Visiting researcher** in WCU Department of Energy Engineering, Hanyang University, Seoul, Korea, May-June 2009.
- ❖ **Offered** “Nanotechnology Classes” (including seminar and interesting hands-on demonstration) on recent advances in nanotechnology and its impact on community, to high school students of “Coral Park Senior High School” several times during 2009-10. **Received ‘letter of appreciation’** from Office of Intergovernmental Affairs and Community Engagement, Miami-Dade County, Florida, USA – for this community service.

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