

**Name**

Dr. P. K. Jain

**Designation**

Scientist "F" & Team Leader

**Qualification**

Ph.D. (Carbon-Carbon Composites), M.Phil & M.Sc

**Experience**

1988-1994     Research Scholar in National Physical Laboratory NPL, New Delhi

**Research Areas of Interest**

Synthesis, Characterization and Applications of :

1. Nanostructured Carbon Materials (Carbon Nanotubes, Graphene etc)
2. Conducting Polymers,
3. Structural Nanocomposites (Polymer & Metal matrix)
4. Nanofluids,
5. Field Emission properties of CNTs,
6. Exfoliated Graphite & its Products
7. Carbon Fiber Reinforced Composites

**List of journal publications**

1. Nitrogen incorporated highly aligned carbon nanotube arrays thin film grown from single feed stock for field emission

Balaji Padya, Dipankar Kalita, P K Jain, G. Padmanbham, M. Ravi and KS Bhat

*Journal of Nanoelectronics and Optoelectronics, Vol. 8, 1-5, 2013*

2. *Carbon Nanotubes –Graphite nanosheets / Polyaniline Conducting Polymer*

P.K. Jain, Balaji Padya, G.Venkat Ramana & G. Pdamanbahm

*Nanotech Insight, 3 (1), 21-22 (2012)*

3. Characterisation of Intermediates in the synthesis of Reduced Graphene Oxides through Sequential De-Oxygenation

A.K. Mishra, C. Srinath, P.K. Jain, Balaji Padya, M. Chopakar

*Nano-trends: A Journal of Nanotechnology and Its Applications, 14 (2), 1-9, 2013*

4. *Electron Field Emission from Substitutional Nitrogen Doped Carbon Nanotubes Arrays thin Film based Cathode*

Balaji Padya, P.K. Jain, G. Padmanabham, M. Ravi and K.S. bhat

*Nanotech Insight (Communiated)*

5. Self Organized growth of bamboo like carbon nanotubes arrays for field emission properties

Balaji Padya, Dipankar Kalita, P K Jain, G. Padmanbham, M. Ravi and KS Bhat

*Applied Nanoscience (2012) 2:253-259*

6. Wear behaviour of tungsten carbide particles reinforced copper alloy composites

B.M. Girish\*, Basawaraj and B.M. Satish & P.K. Jain

*Int. J. Microstructure and Materials Properties, Vol. 7, No. 6, 2012*

7. Tungsten carbide reinforced copper composites for thermal management applications

BM Girish, Basawaraj, BM Satish and PK Jain

*J Materials: Design and Applications 226(4) 316–321*

8. Flame synthesis of carbon nano onions using liquefied petroleum gas without catalyst

Vivek Dhand, J. Sarada Prasad, M. Venkateswara Rao, S. Bharadwaj, Y. Anjaneyulu & PK Jain

*Materials Science and Engineering C 33 (2013) 758–762*

9. Electrically conductive small-diameter carbon nanotubes/polyaniline nanofibers composite thin film”

G. Venkata Ramana, Balaji Padya, Vadali V. S. S. Srikanth, P. K. Jain

*Bulletin of Materials Science journal 2013 (Accepted).*

10. Electrically Conductive Carbon Nanopipe – Graphite nanosheet / Polyaniline Composites  
G. Venkat Ramana, Balaji Padya, Vadali VSS Srikanth, P.K. Jain\*, G. Padmanabham & G. Sundararajan,  
*Carbon, 49, pp 5239 -5245 (2011)*
11. Pool Boiling Characteristics of Multiwall Carbon Nanotube (CNT) based Nanofluids Over a Flat Plate Heater  
K. Kathravan, Ravi Kumar, Akhilesh Gupta, Ramesh Chandra & P.K. Jain  
*International Journal of Heat & Mass Transfer, 54, pp 1289–1296 (2011)*
12. An investigation into the effects of graphite particles on the damping behavior of ZA-27 alloy composite materials,  
B.M. Girish, K.R. Prakash, B.M. Satish , P.K. Jain , Phani Prabhakar,  
*Materials and Design 32 (2011) 1050–1056*
13. Thermal & Mechanical Properties of Multi-scale Carbon Nanotubes and Carbon Fibers Reinforcement in Epoxy Hybrid Nanocomposites  
P.K.Jain, Balaji Padya, P.S.Rao, KMK Chowdary, B.Aswanikumar, G. Anusha  
*Journal of Nanostructured Polymers and Nanocomposites 7/3, pp 81 -86 (2011)*
14. Thermal Properties of Multiwall Carbon Nanotubes- Graphite Nanosheets/ Epoxy Resin Nano-composites  
G. Venkat Ramana, Balaji Padya & P.K. Jain  
*IEEE Proceedings*
15. Production of hydrogen and carbon nanofibers through the decomposition of methane over activated carbon supported Pd catalysts,  
J. Sarada Prasad, Vivek Dhand, V. Himabindu, Y. Anjaneyulu, P K Jain, Balaji Padya ,  
*International Journal of Hydrogen Energy 35, 10977-10983 (2010)*
16. Synthesis of Vertically aligned CNTs Arrays by Injection method in CVD  
Balaji Padya, K.V.P. Prabhakar & P.K. Jain,  
*Journal of Nanoscience and Nanotechnology, Vol. 10, pp 4960- 4966 (2010)*
17. Purification of MWCNT synthesized by arc discharge set up  
Y. Malathi, Balaji Padya, K.V.P. Prabhakar & P.K. Jain

*Carbon Letter, Vol. 11, No. 3, pp 184-191 (2010)*

18. Mechanical Properties of MWCNT reinforced Polymer Nano-composites,  
G. Venkatramana, Balaji Padya, N. Kumar K.V.P. Prabhakar & P.K. Jain,  
*Indian Journal of Engineering and Materials Sciences, Vol. 17, pp 331- 37 (2010).*
19. Wear Behavior of Graphite Particles Reinforcement in ZA-27 Alloy Composites for Tribological Applications,  
K.R. Prakash, B.M. Girish, B.M. Satish and P.K. Jain  
*Journal of Mechanical Engineering, Vol. 1, No2 (2010)*
20. Pool Boiling Characteristics of Carbon Nanotubes based Nanofluid over a Horizontal Heater  
R. Kathiraman , R. Kumar A. Gupta, R.Chandra and P.K. Jain  
*Journal of Thermal Sciences and Engineering Applications (J. Thermal Science Engg. Applications (ASME) Vol 1 2009 pp 2200-07*
21. Estimation of Cavitation Pressure to Disperse Carbon Nanotube in Aluminum Metal Matrix Nanocomposites,  
Suneel D, Nageswara Rao D, Satyanaryana Ch & P.K. Jain,  
*Asian International Journal of Science & Technology in Production and Manufacturing Engineering (AIJSTPME) Vol 1 (1) pp-53-62 (2008)*
22. Oil Spill Management using Exfoliated Graphite,  
P.K. Jain & G. Sundararajan,  
*Quarterly Journal of DST , India TARANG, 2007 Vol. 8 pp 85-91*
23. Development of Carbon Nanotubes and polymer composites therefrom  
PK Jain, G. Sundararajan, Y.R. Mahajan, A.V. Okotrub, N.F. Yudanov and AI Romanenko  
*Carbon Science Vol. 3. No. 3 September, 2002, pp- 1-11*
24. Carbon-Carbon Composites made with Oxidised PAN (PANEX) Fibers  
T.L. Dhami, O.P. Bahl and PK. Jain  
*Carbon Vol. 33 No 11, pp 1517- 1524 (1995)*
26. Charaterisation of Carbon-Carbon Brake pads  
T.L. Dhami, O.P. Bahl and PK. Jain

*Metal and Materials Processing Vol 5. No. 3 pp 169-176 (1993)*

27. Effect of Carbon fiber type on the mechanical Performance of Carbon-carbon composites

PK. Jain, O.P. bahl & LM Manocha

*SAMPE Quarterly Vol. 23 No 3 pp 43-47 (1992)*

### **List of Patents**

- 'A Process of Producing Chemically Treated Expanded Graphite and Device having such Graphite" – OIL COMB (Patent No. :- 187654). P.K. Jain and M. Subrahmaniam

### **List of Papers in Conference Proceedings**

1. Surface modification Effect on the Thermal & Mechanical Properties of multiwalled Carbon Nanotubes /Epoxy Nanocomposites  
G. Venkat Ramana, Balaji Padya & P.K. Jain  
*IEEE Proceedings 978-1-4673-0074-2/11, 110-113, 2011*
2. Highly ordered nitrogen doped carbon nanotube novel structures of aligned carpet for enhanced field emission propertied.  
Balaji Padya, P.K. Jain, G. Padmanabham. M.Ravi, K.S. Bhat,  
  
*AIP Conf. Proceedings 1538, 196-199 (2013)*
3. Role of buffer gas pressure on the synthesis of carbon nanotubes by arc discharge method  
Manikantan Kota, Balaji Padya, G. Venkat Ramana, P.K. Jain, G. Padmanbham  
*AIP Conf Proceedings, 1538, 200-204 (2013)*
4. Thermal Properties of Multi-Walled Carbon Nanotubes –Graphite Nanosheets / Epoxy Nanocomposites  
G.Venkata Ramana, Balaji Padya, Vadali V. S. S. Srikanth and P. K. Jain  
*AIP Proceedings- 1538, 205 – 208 (2013)*
5. Synthesis of Amorphous Carbon Nanofibers Using Iron Nanoparticles as Catalysts  
Mokhtar Ali, G.VenkataRamana, BalajiPadya, Vadali V. S. S. Srikanth and P. K. Jain

*AIP Proceedings-1538, 234 (2013)*

6. Development of Carbon Nanotubes and development of their Composites  
P.K. Jain  
*National Workshop on Defence Systems Applications organized by DRDO, Laboratories, Hyderabad during 7-8 Feb. 2008.*
7. Development of Carbon Nanotubes and Its Applications  
P.K. JAIN  
*National Workshop on Nanomaterials organized by GMR institute of Technology Rajam, AP during 22 Feb, 2008*
8. Purification of Multi walled carbon nanotubes (MWCNTs) synthesized by arc discharge set up  
Y. Malathi, K.V.P. Prabhakar & P.K. Jain  
*International Conf. on Nano Science and Technology (ICONSAT-20080 held at Chennai during 27-29 Feb. 2008*
9. Synthesis of aligned carbon nanotubes arrays by CVD injection method  
Balaji Padya, K.V.P. Prabhakar & P.K. Jain  
*International Conf. on Nano Science and Technology (ICONSAT-2008 held at Chennai during 27-29 Feb. (JNN09\_059A)*
10. Dispersion & rheological aspects of MWCNT in polymer matrix  
Y. Malathi, *Rajkiran*, Balaji Padya, K.V.P. Prabhakar & P.K. Jain  
*Conf. on MEMS-NEMS Engineering at Rajam during Aug. 2008 pp.114-117*
11. Grafting of carbon nanotubes arrays on Carbon Fibers by Spray pyrolysis,  
Balaji Padya, K.V.P. Prabhakar & P.K. Jain  
*First Asian Conf. on Carbon held at New Delhi during Nov., 2009 pp-73*
12. Synthesis of nanocarbons using arc discharge under water  
K.V.P. Prabhakar, Balaji Padya & P.K. Jain,  
*First Asian Conf. on Carbon held at New Delhi 2009 pp-140*
13. Development of Carbon Nanotubes filled Copper Matrix Composites  
R. Naresh Kumar, Balaji Padya, K.V.P. Prabhakar & P.K. Jain  
*Int. Conf. on Nano-science& Techn. held at IIT, Mumbai, during Feb.10, pp 198.*
14. Development of Flexible Conductive Paper using Carbon Nanotubes for Energy Storage Applications  
M. Srikanth, Balaji Padya & P.K. Jain  
*Int. Conf. on Nanotechnology & Functional Materials (ICNTFM-12), Hyderabad*

15. A facile Method for high Yield of Graphene Nanosheets from Exfoliated Graphite  
S. Raghuram Reddy, Balaji Padya , P.K. Jain & G. Padmanabham  
*Int. Conf. on Nanotechnology & Functional Materials (ICNTFM-12), Hyderabad*
16. Influence of Nitrogen Content on microstructure and Raman spectrum of Bamboo shaped multiwall Carbon nanotubes arrays  
Balaji Pady, P.K. Jain & G. Padmanabham  
*Int. Conf. on Nanoscience and Nanotechnology (ICONSAT-2012), Hyderabad*
17. Aligned Carbon nanotubes arrays for filed Emission applications  
P.K. Jain, Balaji Padya & G. Padmanabham  
*Int. Conf. on Nanoscience and Nanotechnology (ICONSAT-2012), Hyderabad*
18. Development of Composite Polymeric Films containing Carbon Nanotubes  
P.K. Jain, A.V. Okotrub, N.F. Yudanov, A.I. Romanenko and Ph.A. Pruss  
*International Workshop on Fullerenes and Its Atomic Clusters (AWFAC-2001) held at St. Petersburg, Russia on July, 2-6, 2001, pp 121.*
19. Development of Carbon Nanotubes and Polymer Composites therefrom  
P.K. Jain, G. Sunadarajan, Y.R. Mahajan, A.V. Okotrub, N.F. Yudanov, and A.I. Romanenko  
*National Conference on Carbon 2001 held at Vallabh Vidya Nagar, Gujarat, on 19-20 October, 2001, pp 249 - 255*
20. Synthesis of Multiwall Carbon Nanotubes based Polymer Composites  
P.K. Jain, G. Sundararajan, Y.R. Mahajan, A.V. Okotrub, NF. Yudanov and A.I. Romanenko,  
*13<sup>th</sup> Annual General Meeting of MRSI held at Hyderabad on Feb.7-9, 2002*
21. Carbon Nanotubes and their Field Emission Properties  
P.K. Jain, Y.R. Mahajan and G. Sundararajan  
*National Conference on "Smart materials in Defence Systems"organized by DMRL, Hyderabad during Sept. 2002 pp 45-48*
22. Field Emission properties of Multiwall carbon Nanotube and Composites Films  
P.K. Jain, Y.R. Mahajan, Sundararajan, A.V. Okotrub, and A.V. Guselinikov  
*National Conference on CARBON- 2003 held at DMSRDE, Kanpur, (2003) pp 440-446*
23. Frequency Depended cold emission Properties of arc produced multiwall carbon Nanotubes – polymer composites  
P.K. Jain, G. Sundararajan, A.V. Okotrub, A.V. Guselinikov, VV Belvin and L.G. Bulusheva  
*International Conference on Carbon Materials for Energy Applications -CARBON- 2004 held at NPL, New Delhi (2004) pp 85-91*

24. Carbon – From Coal to Carbon Nanotubes

P.K. Jain

*Seminar on “Science for Society” organized by IICT, Hyderabad during Feb. 2007 pp -5*

25. Effect of Buffer Gas Pressure on the development of Carbon Nanotubes.

K.V.P. Prabhakar, P.K. Jain & R. Sundaresan

*Carbon –2006 National Conf. On Carbon held at Bhopal during 11-12 Nov. 2006, pp 140-144*

26. Development of Carbon nanotubes through arc discharge set up.

P.K. Jain, K.V.P Prabhakar & R. Sundaresan

*Carbon –2006 National Conf. On Carbon held at Bhopal during 11-12 Nov. 2006, pp 121*

27. High Temperature Synthesis of Carbon Nanotubes In Arc – Discharge Process

P.K. Jain, K.V.P Prabhakar & R. Sundaresan

*Fifth ISAMPE National Conf. on Composites – INCCOM-5” held at HYDERABAD during 24-25 November, 2006, pp – 612 -617.*

28. Development of Carbon Nanotubes and development of their Composites

P.K. Jain

*National Workshop on Defence Systems Applications organized by DRDO, Laboratories, Hyderabad during 7-8 Feb. 2008.*

29. Development of Carbon Nanotubes and Its Applications

P.K. Jain

*National Workshop on Nanomaterials organized by GMR institute of Technology Rajam, AP during 22 Feb, 2008*

30. Purification of Multi walled carbon nanotubes (MWCNTs) synthesized by arc discharge set up

Y. Malathi, K.V.P. Prabhakar & P.K. Jain

*International Conf. on Nano Science and Technology (ICONSAT-20080 held at Chennai during 27-29 Feb. 2008*

31. Synthesis of aligned carbon nanotubes arrays by CVD injection method

Balaji Padya, K.V.P. Prabhakar & P.K. Jain



*International Conf. on Nano Science and Technology (ICONSAT-20080 held at Chennai during 27-29 Feb. 2008*

32. Exfoliated Graphite Material with Reinforcement for Automobile Applications  
P.K. Jain, M. Subrahmaniam & G. Sundararajan  
*Indo-Japan Seminar on "Manufacturing Science of Advanced Composite Materials & on Advanced Manufacturing Processing" at IIT, Kharagpur & Gangtok Sikkim during 20-25 Feb.2000, pp 35 - 38*
33. Automobile Gaskets from Expanded Graphite  
P.K. Jain, M. Subrahmaniam & G. Sundararajan  
*National Conference on Carbon-99 at New Delhi During 25-26 November 1999, pp 257*
34. Effect of Reinforcement and Process parameters on the Performance of Graphite Gasket Sheet  
P.K. Jain, Vipin Jain, M. Sudhakar, A Ganga Bhavani and G. Sundararajan  
CARBON-2004 - International Conference on Carbon Materials for Energy Applications, held at NPL, New Delhi (2004) pp 289 – 297
35. Carbon-carbon composites with different PAN and Pitch based carbon fibers  
L.M. Manocha, O.P. Bahl and P.K. Jain  
Indo-Japanese Workshop on Pitch and Pitch Based Products, pp 143, 1989, New Delhi
36. Fiber/Matrix interactions in carbon fiber reinforced composites  
L.M. Manocha, O.P. Bahl and P.K. Jain  
Int. Conf. POLYMER – 91, held at Pune, pp 943, 1991.
37. Thermal conductivity measurements Carbon-Carbon composites  
P.K. Jain & O.P. Bahl  
CARBON-92, Int. Conf. Carbon, held in Essen, Germany, 1992.
38. Thermal properties of Carbon-Carbon composites  
P.K. Jain & O.P. Bahl  
21<sup>st</sup> Biannual Conf. On CARBON held in New York, USA, 1993.
39. Mechanical properties of carbon-carbon composites made with PANOX fiber  
O.P. Bahl, TL. Dhami & P.K. Jain  
21<sup>st</sup> Biannual Conf. On CARBON held in New York, USA, 1993
40. Development of Carbon-Carbon Composites – An Overview  
O.P. Bahl, TL. Dhami & P.K. Jain  
Int. Conf. On Carbon In AUSTRAILA, 1993
41. Micro-structural studies on Carbon-Carbon Composites Brake Pad Material

- O.P. Bahl, T.L. Dhami & P.K. Jain  
Int. Conf.. ISAMPE held at Bangalore, pp IV- 20-29, 1993
42. Mechanical performance of carbon fiber reinforced composites  
P.K. Jain & O.P. Bahl  
Conf. On Newer Forms of Carbon held at Bangalore, pp 142, 1992
43. Development of PANOX (Oxidised PAN) fiber reinforced Composites  
T.L. Dhami, O.P.Bahl & P.K. Jain  
Conf. On Newer Forms of Carbon held at Bangalore, pp 142, 1992
44. Role of calcined petroleum Coke as filler in the Development of Carbon-Carbon composites  
T.L. Dhami, O.P.Bahl R.K. Seth & P.K. Jain  
5<sup>th</sup> AGM of MRSI at Hyderabad, 1994.
45. Characterization of Brake Pad Materials  
T.L. Dhami, O.P.Bahl & P.K. Jain  
Int. Conf. On Carbon at Bhopal, 1994
46. Carbon fiber reinforced Carbon Composites at N.P.L  
O.P.Bahl, T.L. Dhami & P.K. Jain  
Symposium on Advanced Composites & Structures, Hyderabad, pp 141, 1994.

### **Affiliation to Professional Societies**

Life Member of following Societies

- a. Indian Carbon Society (Joint Secretary)
- b. Aeronautical Society of India (AeSI)
- c. Materials Society of India (MRSI)
- d. Indian Society of Advanced Materials and Process Engineering's (ISAMPE)

### **Awards and honors**

1. Awarded BD BNGUR AWARD 2009, for Significant Contribution in the area of Carbon/Carbon Composites and Carbon Nano-composites by Indian Carbon Society, New Delhi during Nov., 2009.

2. Awarded BOYSCAST FELLOWSHIP-2001 of Government of India (DST) to work on Advanced Materials (Carbon Nanotubes) for a period of six months (March 2001 to September 2001) at Institute of Inorganic Chemistry, Novosibirsk, Russia.
3. "Certificate of merit" for the presentation of the paper in International Conference POLYMER-91 in N.C.L, Pune during January 91.
4. "Certificate of merit" from Agra University, Agra in M.Sc. (Physics) during 1987.

**Contact information**

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