



Faculty Details proforma for DU Web-site


Title	Dr.	First Name	Amita	Last Name	Chandra	Photograph
Designation	Professor					
Address	Department of Physics and Astrophysics North Campus, University of Delhi Delhi-110 007, INDIA					
Phone No. Office	91-11-27667155					
Email	achandra@physics.du.ac.in amitach1@yahoo.com					
Educational Qualifications						
Degree	Institution			Year		
Ph.D.	Banaras Hindu University			1993		
PG	Banaras Hindu University			1989		
UG	Banaras Hindu University			1986		
Career Profile						
<p>Oct. 1999-Dec. 2004: Lecturer at the Panjab University, Chandigarh</p> <p>Dec. 2004-Dec. 2007: Reader at the University of Delhi</p> <p>Dec. 2007-Dec. 2010: Associate Professor at the University of Delhi</p> <p>Dec. 2010-till date : Professor at the University of Delhi</p>						
Administrative Assignments :						
<p>In the Department:</p> <p>Member (Dec. 2004 onwards): Executive Committee, Departmental Research Committee, TPSC/Visitor's Programme Committee, P.G. Committee of Courses, Library Committee, Time-</p>						

Table Committee, Exam Committees (M.Sc. & Entrance exams), Workshop Committee, Disciplinary Action Committee and Anti-ragging Committee.

Secretary, Departmental Council (March 2006- February 2007)

Areas of Interest / Specialization

Broad field of specialization: Materials Science, Solid State Ionics

Research Interests:

- (i) **Mixed ion+electron conductors:**
Polymer-crystal composites
Polymer-polymer composites
Polymer electrolyte composites
- (ii) **Ion track based electronic devices:** New family of electronic devices using the TEMPOS (Tunable Electronic Materials with Pores in Oxide on Silicon) structures
- (iii) **Chaos in electrochemical systems:** Ion selective devices
- (iv) **Fractals in polymers:** Growth and characterization of large size fractals
- (v) **EMI shielding materials:** Polymer composites for electromagnetic interference shielding
- (vi) **Organic-inorganic hybrid electrolytes:** Hybrid polymer electrolytes for energy devices

Teaching Experience (Subjects/Courses Taught)

1999-2004 (at Panjab University): **THEORY-** (1) Electronics (M.Sc. Previous and Final)
(2) Solid State Physics
(3) Physics of Materials

LAB COURSES- B.Sc., M.Sc. and B. Tech. labs

2004-2019 (at Delhi University): **THEORY- M.Sc. Physics**

- (1) Atomic and Molecular Physics (Core)
- (2) Electronics (Core), M.Sc. Prev.
- (3) Physics at Nanoscale II (Special), M.Sc. Final
- (4) Electronics II (Special), M.Sc. Final

M.Tech.: Nanoscience and Nanotechnology

- (1) Solid State Chemistry/Solid State Physics
- (2) Basic Electronics

LAB COURSES -(1) M.Sc. Previous (Solid State, core lab)
(2) M.Sc. Previous (Electronics, core lab)
(3) M.Sc. Final (Solid State, special lab)

M.Tech.: Nanoscience and Nanotechnology

- (1) Physics Lab

- 1. *Supervision of awarded Doctoral Thesis:* **Eight + one submitted**
- 2. *Supervision of Doctoral Thesis, under progress:* **Three**

Publications Profile

- 1. *Research papers published in Refereed/Peer Reviewed Journals (2010-July 2019)*
 - 1. Ion conducting polymer-silica hybrid ionogels obtained via non-aqueous sol-gel route
Shilpa Khurana and Amita Chandra
Solid State Ionics 340 (2019) 115027
 - 2. Synergistic effect of conducting and insulating fillers in polymer nanocomposite films for attenuation of X-band
Manoj Kumar Vyas and Amita Chandra
Journal of Materials Science 54 (2019) 1304-1325
 - 3. Ionic switch using nano-channels in polymeric membrane
Sangeeta Negi and Amita Chandra
Ionics 25 (2019)1123–1130
 - 4. Role of organic/inorganic salts and nanofillers in polymer nanocomposites: Enhanced conduction, rheological and thermal properties
Manoj Kumar Vyas and Amita Chandra
Journal of Materials Science 53 (2018) 4987–5003

5. Ionic Liquid based Organic-Inorganic Hybrid Electrolytes: Impact of in-situ obtained and dispersed Silica
Shilpa Khurana and Amita Chandra
Journal of Polymer Science, Part B: Polymer Physics 56 (2018) 207–218
6. Organic-inorganic hybrid electrolytes by in-situ dispersion of silica nanospheres in polymer matrix
Sujeet Kumar Chaurasia and Amita Chandra
Solid State Ionics 307 (2017) 35-43
7. Ion-electron conducting polymer composites: Promising electromagnetic interference shielding material
Manoj Kumar Vyas and Amita Chandra
ACS Applied Materials and Interfaces 8 (2016) 18450–18461
8. Tunable EMI shielding effectiveness using new exotic carbon: Polymer composites
Monika Mishra, Avanish Pratap Singh, Vinay Gupta, Amita Chandra, S.K. Dhawan
Journal of Alloys and Compounds 688 (2016) 399-403
9. Probing the engineered sandwich network of vertically aligned carbon nanotube–reduced graphene oxide composites for high performance electromagnetic interference shielding applications
Avanish Pratap Singh, Monika Mishra, Daniel P. Hashim, T.N. Narayanan, Myung Gwan Hahm, Pawan Kumar, Jaya Dwivedi, Garima Kedawat, Ankit Gupta, Bhanu Pratap Singh, Amita Chandra, Robert Vajtai, S.K. Dhawan, Pulickel M. Ajayan and, Bipin Kumar Gupta
Carbon, 85 (2015) 79-88
10. Electric field driven fractal growth dynamics in polymeric medium
Anit Dawar and Amita Chandra
Physics Letters A, 378 (2014) 2951–2958
11. Transition metal oxides in etched ion tracks: Surface morphological studies
Sangeeta Rawat and Amita Chandra
Nuclear Instruments and Methods in Physics Research, B 322 (2014) 41–47
12. Incapsulation of γ -Fe₂O₃ decorated reduced graphene oxide in polyaniline core-shell tubes as an exceptional tracker for electromagnetic environmental pollution
Avanish Pratap Singh, Monika Mishra, Pradeep Sambyal, Bipin Kumar Gupta, Bhanu Pratap Singh, Amita Chandra and S. K. Dhawan
Journal of Materials Chemistry A 2 (2014) 3581
13. Polymer electrolyte nanocomposites with transition metal oxides' nanoparticles
Puja Diwan & Amita Chandra
Journal of Polymer Research 20 (2013) 324

14. Conductivity modification in polymer electrolyte–crown ether complexes
Puja Diwan, Sebastain Dollinger, Klaus Raetzke and Amita Chandra
Solid State Ionics 247–248 (2013) 71–75
15. Multiwalled carbon nanotube/cement composites with exceptional electromagnetic interference shielding properties
Avanish Pratap Singh, Bipin Kumar Gupta, Monika Mishra, Govind, Amita Chandra, R.B. Mathur, S.K. Dhawan
Carbon 56 (2013) 86-96
16. Fractal forming species and hierarchical growth in polymer electrolyte composites: Raman mapping and role of seed particles
Anit Dawar and Amita Chandra
Communications in Nonlinear Science and Numerical Simulation 18 (2013) 959–972
17. Electric field driven fractal growth in polymer electrolyte composites: Experimental evidence of theoretical simulations
Anit Dawar and Amita Chandra
Physics Letters A 376 (2012) 3604–3608
18. Percolation threshold and conductivity of polymer electrolyte composites: Effect of dispersoid particle size
Puja Diwan and Amita Chandra
Polymer Composites 33 (2012) 1750–1754
19. Chaotic motion of ions in polymer gel electrolytes: First Observations
Amita Chandra, Sangeeta Rawat, Barnamala Saha and Awadhesh Prasad
Solid State Ionics 225 (2012) 751–754
15. A new concept for bioalcohol control
D.Fink, S. Cruz, G. Munoz, L. Alfonta and Amita Chandra
Proc. Natl. Acad. Sci. (India) 82(1) (2012) 71-77
16. Phenolic resin-based composite sheets filled with mixtures of reduced graphene oxide, γ - Fe_2O_3 and carbon fibers for excellent electromagnetic interference shielding in the X-band
Avanish Pratap Singh, Parveen Garg, Firoz Alam, Kuldeep Singh, R.B. Mathur, R.P. Tandon, Amita Chandra and S.K. Dhawan
Carbon 50 (2012) 3868–3875
17. Polymer electrolyte-graphene composites: Conductivity peaks and reasons thereof
Puja Diwan, Stephan Harms, Klaus Raetzke and Amita Chandra
Solid State Ionics 217 (2012) 13–18

18. Chaotic behavior of ion exchange phenomena in polymer gel electrolytes through irradiated polymeric membrane
Sangeeta Rawat, Barnamala Saha, Awadhesh Prasad and Amita Chandra
Physics Letters A 376 (2012) 1915–1918
19. Graphene oxide/ferrofluid/cement composites for electromagnetic interference shielding application
Avanish Pratap Singh, Monika Mishra, Amita Chandra and S. K. Dhawan
Nanotechnology 22 (2011) 465701
20. I-V behavior of transition metal oxides' nanoparticles confined in ion tracks
Sangeeta Rawat and Amita Chandra
Journal of Nanoparticle Research, 13 (2011) 5265
21. Microwave absorption properties of NiCoFe₂O₄-graphite embedded poly(o-phenetidine) nanocomposites
Anil Ohlan, Kuldeep Singh, Namita Gandhi, Amita Chandra and S. K. Dhawan
AIP ADVANCES 1 (2011) 032157
22. Conduction mechanism in polyaniline-flyash composite material for shielding against electromagnetic radiation in X-band & Ku band
Avanish Pratap Singh, Anoop Kumar S., Amita Chandra and S. K. Dhawan
AIP ADVANCES 1 (2011) 022147
23. In situ production of CuS particles in polymer electrolyte matrix for mixed ion+electron conduction
Manoj Kumar & Amita Chandra
Ionics 16 (2010) 849
24. Study of ferrofluids in confined geometry
Sangeeta Rawat, Dietmar Fink, Amita Chandra
Journal of Colloid and Interface Science, 350 (2010) 51
25. Conducting swift heavy ion track networks
D. Fink, A. Kiv, D. Fuks, A. Saad, J. Vacík, V. Hnatowicz and A. Chandra
Radiation Effects & Defects in Solids: Incorporating Plasma Science & Plasma Technology, 165 (2010) 227
26. Study of surface morphology of ferrofluid deposited etched ion tracks in dielectric layers
Sangeeta Rawat and Amita Chandra
Radiation Measurements, 45 (2010) 844

27. Microwave absorption behavior of core-shell structured poly (3,4-ethylenedioxy thiophene)-barium ferrite nanocomposites

Anil Ohlan, Kuldeep Singh, Amita Chandra and Sundeep K. Dhawan

ACS Applied Materials and Interfaces, 2 (2010) 927

Research papers published in Refereed/Peer Reviewed Conferences (2010- July 2019)

1. Ion track based novel nanostructures: A step towards magnetic nanosensor
Amita Chandra and Sangeeta Rawat
in **NATO Science for Peace and Security Series B: Physics and Biophysics** eds. Yuri Shunin and Arnold Kiv, (Springer 2012), pp. 281-289
2. Electroactive polymers as obtained by insertion of electrolytes into polymeric tracks.
D. Fink, G. Munoz H., S.A. Cruz, L. Alfonta, Y. Mandabi, J. Vacik, V. Hnatowicz and A. Chandra
in **Electroactive Polymers: Materials and Devices, Vol. IV** eds. S.A. Hashmi et al. (Macmillan 2012, New Delhi) p3
3. Electrical and magnetic properties of polymer electrolyte (PEO:NH₄I) nanocomposites containing transition metal oxides' nanoparticles.
Puja Diwan_& Amita Chandra
in **Electroactive Polymers: Materials and Devices, Vol. V** eds. S.A. Hashmi et al. (Allied Publishers Pvt. Ltd. 2015, New Delhi) p82
4. Fractal growth dynamics in polymer electrolyte composites: Bias-free and electric-field driven aggregation.
Anit Dawar and Amita Chandra
in **Electroactive Polymers: Materials and Devices, Vol. V** eds. S.A. Hashmi et al. (Allied Publishers Pvt. Ltd. 2015, New Delhi) p97

1. Other publications (Edited works, etc.):

1. Khare, N., Hashmi, S.A., Chandra, A. and Chandra, A. Eds. 2007. *Electroactive Polymers: Materials and Devices, Vol. I*: Allied Publishers Pvt. Ltd.
2. Hashmi, S.A., Chandra, A. and Chandra, A. Eds. 2007. *Electroactive Polymers: Materials and Devices, Vol. II*: Allied Publishers Pvt. Ltd.
3. Hashmi, S.A., Chandra, A. and Chandra, A. Eds. 2009. *Electroactive Polymers: Materials and Devices, Vol. III*: Macmillan, New Delhi
4. Hashmi, S.A., Chandra, A., Singh, R. K. and Chandra, A. Eds. 2012. *Electroactive*

Polymers: Materials and Devices, Vol. IV: Macmillan, New Delhi

5. Hashmi, S.A., Chandra, A., Singh, R. K. and Chandra, A. Eds. 2015. Electroactive Polymers: Materials and Devices, Vol. V: Allied Publishers Pvt. Ltd.

Conference Organization/ Presentations

1. *Organization of Conferences (2010-July 2019)*

1. Fourth International Conference on Electroactive Polymers: Materials and Devices held at Suraj Kund from November 21-26, 2010. (*Co-Chairperson*)
2. Fifth International Conference on Electroactive Polymers: Materials and Devices held at Varanasi from November 4-9, 2012. (*Co-Chairperson*)
3. Seventh International Conference on Electroactive Polymers: Materials and Devices held at Udaipur from February 3-8, 2019. (*Co-Chairperson*)

2. *Participation as Paper/Poster Presenter (2010-July 2019)*

1. Plenary speaker at the Workshop on Macromolecules II held at the Universiti Teknologi Mara, Shah Alam, MALAYSIA, Dec 14-16, 2010.
2. Key Speaker, NATO Advanced Research Workshop on Nanodevices and Nanomaterials for Ecological Security, Riga, LATVIA, June 20-23, 2011.
3. Invited Talk, 18th International Conference on Solid State Ionics held at Warsaw, POLAND, July 3-8 (2011).
4. Invited Talk, Ninth National Conference on Solid State Ionics (NCSSI-9) held at Noida, INDIA, Dec15-17 (2011).
5. Invited Talk, India Singapore joint Physics symposium (ISJPS 2012) held at IIT Delhi, INDIA, Feb. 20-22 (2012).
6. Invited Talk, Tenth National Conference on Solid State Ionics (NCSSI-10) held at IIT Kharagpur, INDIA, Dec.21-24 (2013).
7. Invited Talk, Eleventh National Conference on Solid State Ionics (NCSSI-11) held at Tezpur University, INDIA, Dec.21-23 (2015).
8. Invited Talk, XVth International Symposium on Polymer Electrolytes held at Uppsala, SWEDEN, August15-19 (2016).
9. Keynote Talk, 15th Asian Conference on Solid State Ionics held at Patna, INDIA, November 27-30, (2016).
10. Invited Talk, 6th International Conference on Electroactive Ceramics and Polymers (ICEP-2017) held at IIT Kharagpur, INDIA, February 20th-22nd, 2017.
11. Invited Talk, Australian-Indian workshop for Women in Energy Research held at Deakin University, AUSTRALIA, November 6-10, 2017.

12. Invited Talk, Faculty Development Program on “Polymer Analysis and Applications: Current Scenario” held at Delhi Technological University, INDIA, June 4-8, 2018.
13. Invited Talk at 63rd DAE SSP Symposium held at Guru Jambheshwar University, Hisar, INDIA, December 18-22, 2018.
14. Talks at 7th International Conference on Electroactive Polymers (ICEP-2019) held at Udaipur, INDIA, February 3-8, (2019).

Research Projects (Major Grants/Research Collaboration)

Research Projects (Completed & ongoing)

1. Ion conducting polymers and gels
(July 2002-Jan 2004)
(Principal Investigator)
Funded by Third World Academy of Sciences (TWAS), Trieste, Italy
2. Conductivity modification in polymer electrolytes by dispersal of ceramic and semiconductor (μm and nm) particles
(July 2002-March 2005)
(Principal Investigator)
Funded by Council of Scientific and Industrial Research, India
3. Chemical, optical, thermal and electrical studies of swift heavy ions modified conducting polymers
(February 2002-January 2005)
(Co-Investigator)
Funded by University Grants Commission-NSC, India
4. Polymer composites with mixed ion + electron conduction for device applications
(April 2007- September 2010)
(Principal Investigator)
Funded by University Grants Commission, India
5. Novel Si-based nano electronic devices in confined geometry
(15 September 2007-14 September 2010)
(Principal Investigator)
Funded by Council of Scientific and Industrial Research, India

6. Investigation of magnetic, optical and electrical properties of nanomaterials: Synthesis, characterization and applications
(August 2009-August 2012)
(Co-Investigator)
Funded by Department of Science and Technology, India
7. Polymer composites for energy devices: Structure-property relationship
(1st June 2017-31st May 2020)
Funded by Alexander von Humboldt Foundation, Germany
(Research Group Linkage Programme)

Scientific Collaborators (past & present)

1. Dr. D. Fink
(Formerly at Helmholtz Centre for Materials and Energy, Berlin, Germany)
Physics Department, Universidad Autónoma Metropolitana-Iztapalapa,
Apartado Postal 55534, 09340, México, D.F., México
2. Prof. Dr. Klaus Raetzke
Technical Faculty of the University of Kiel
Institute for Materials Science
Kaiserstr. 2, D - 24143 Kiel, Germany
3. Prof. Dr. Claudia Schmidt
Department of Chemistry, University of Paderborn
Warburger Strasse 100, 33098 Paderborn, Germany

Awards, distinctions and other responsibilities

- (i) **Member**, Managing Committee, Jubilee Hall, University of Delhi, 8/5/2019 - 7/5/2021.
- (ii) **Member**, Managing Committee, North Eastern Students House for Women, University of Delhi, 8/5/2019 - 7/5/2021.
- (iii) **Member**, University Research Council, Manav Rachna University, 5/4/2019 - 4/4/2021.
- (iv) **Member**, Governing Body, Durgabai Deshmukh College of Special Education, University of Delhi, 4/12/2018 - 3/12/2019.
- (v) **VC Nominee to DRC**, Department of Operational Research, University of Delhi, 26/10/2018 - 25/10/2020.
- (vi) **UGC Nominee-Advisory Committee SAP (DSA-II, 01/4/2015-31/3/2020)**, Department of Physics, Mohanlal Sukhadia University, Udaipur.
- (vii) **Member, Selection Committee** (2009-2012), (2013-15) & (2016-2017), Alexander von Humboldt Foundation, Germany, International Climate Protection Fellowships.
- (viii) **Member, Board of Studies**, School of Vocational Studies and Applied Sciences, Gautam Buddha University. Greater Noida.
- (ix) **DAAD Research Ambassador** (2014 onwards).
- (x) **Humboldt Ambassador Scientist** (2006-2009) and (2009-2012).
- (xi) **Nominated** by INSA under the International Exchange Programme to visit the Czech Republic (2011).
- (xii) **Recorder**, Materials Science Section, Indian Science Congress Association, 2006-2007 & 2007-2008.
- (xiii) **Member National Academy of Sciences, India (M.N.A.Sc.)**.
- (xiv) **Guest Scientist** at the Max-Planck-Institute for Solid State Research, Stuttgart, GERMANY from May 1999 to July 1999, May 2001 to June 2001; Hahn Meitner Institute, Berlin, GERMANY, from May 2003 to June 2003, mid-May 2004 to mid-June 2004, mid-June 2005 to mid-July 2005, May 2006 to June 2006, May 2007 to June 2007, May 2008 to June 2008, May 2009 to June 2009 (Kiel), May 2010 to June 2010 (Kiel), May 2011 to June 2011 (Kiel) & June 2013 (Freiburg).
- (xv) **Alexander von Humboldt Postdoctoral Research Fellow** (1996-97) at the Max-Planck-Institute for Solid State Research, Stuttgart, GERMANY.
- (xvi) **Best Poster Award** at the 10th International Conference on Solid State Ionics held at Singapore (1995).
- (xvii) **Young Scientist Award** (1992) for best paper presentation at the Third Asian Conference on Solid State Ionics.
- (xviii) **Resource Person** in Asian Training Workshops on Solid State Ionics held in 1992 and 1998.
- (xix) **Invited lectures** at the Delft Technical University, (Netherlands); University of Exeter, (England); University of Aberdeen, (Scotland); University of Münster, (Germany) and

University of Zürich, (Switzerland).

(xx) **Invited lectures** at National and International conferences.

(xxi) **Judge**, International Panel of Judges to select the Best Posters at the International Conference on Solid State Ionics held at Cairns, Australia, July 8-13, 2001, and 2nd International Conference on Functional Materials and Devices (ICFMD-2008) held in Kuala Lumpur, Malaysia, June 16-19, 2008.

(xxii) **Session-Chairperson** at National and International Conferences.

(xxiii) Elected as **Member of Sectional Committee of Materials Science** for 2004-2005 and 2005-2006 of the Indian Science Congress Association.

(xxiv) **Resource Person** at Refresher Courses in Physics held at the University of Delhi and JNU.

Association With Professional Bodies

1. *Reviewing:* **Reviewer for several international Journals**

2. *Memberships :* **Life Member**, Indian Science Congress Association
Life Member, Indian Solid State Ionics Society
Life Member, Indian Physics Association
Life Member, Materials Research Society of India