



BIO-DATA of Professor Dhananjai Pandey

Date of Birth: March 24, 1952

Present Position & Address: Professor & Coordinator, School of Materials Science and Technology, Banaras Hindu University, Varanasi - 221 005.

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Academic Qualifications: M. Sc. (Physics), Ph. D. (Physics)

Current Areas of Research Interest: (a) Relaxor Ferroelectrics, (b) Phase Transitions in Doped Quantum Paraelectrics ($\text{Sr}_{1-x}\text{Ca}_x\text{TiO}_3$) (c) Ferroelectric, Antiferroelectric and Antiferrodistortive Phase Transitions, (d) Piezoelectric and Smart Ceramics (PZT, PMN-PT etc.), (e) Powder X-ray and Neutron Diffraction (f) Synthesis of Advanced Ceramics and (g) Nanomaterials (h) Restacking and Martensitic Transitions, (i) Diffuse Scattering, (j) Polytypism and Aperiodic Crystals, (k) High Tc Superconductors

Research Publications: >135

Honours and Awards: Elected Fellow of Indian National Science Academy (2004), Indian Academy of Science (2000) and Asia Pacific Academy of Materials (2001); ICSC-MRSI Annual Prize of Materials Research Society of India (2004), Materials Research Society of India Medal (MRSI-Medal) (1989), Homi Bhabha Fellowship (1985-87), Young Scientist Medal of Indian National Science Academy (1980)

Membership of Editorial Boards: Coeditor of Acta Crystallographica, Section A (1998- onwards) and Journal of Applied Crystallography (1996-2005), Materials Science Forum, (1997-2000), Phase Transitions (1989-2004), Bulletin of Materials Science (1989-92, 2005-onwards).

Membership of Important International Committees: i) Elected Member, Commission on Aperiodic Crystals of the International Union of Crystallography (1993-1996), Re-elected for the periods 1996-1999, 1999-2002; Consultant 2002-2005

ii) Elected Member, Working Group on Phase Transitions Nomenclature of the International Union of Crystallography (1999)

iii) Member, Commission on Journals of the International Union of Crystallography

iv) Member, International Program Advisory Committee of the International Conferences on Aperiodic Crystals held in Switzerland (1994), France (1997), Netherlands (2000), Brazil (2004) and Zao, Sendai (2006)

(v) Member Commission on Inorganic and Mineral Structures of the International Union of Crystallography (2005-2008).

Membership of Important National Committees:

- i) Member, Programme Advisory Committee in Condensed Matter Physics and Materials Science (PAC-CMP) of DST (1991-93, 2002-2004, 2004-2006)
- ii) Member, Research advisory Committee of CSIR in Engineering Sciences (2004-2007)
- iii) Member, Programme Advisory Committee of DST for the ILTP with Russia in Electronic Material
- iv) Member, National Committee for the International Union of Crystallography appointed by INSA (1991-94, 2003-2005)
- v) Member-Secretary, National Committee for the International Union of Crystallography appointed by INSA (1994-97)
- vi) Member, Scientific Advisory Committee of UGC-DAE Centre for Advance Research
- vii) Member of various Committees of UGC from time to time.

Supervision of Research Theses:

Ph.D. Theses Supervised	:	11 (completed)	+	4 (ongoing)
M.Tech. Theses Supervised	:	11 (completed)	+	4 (ongoing)

Research Publications of Professor Dhananjai Pandey 2000 ONWARDS

1. "Novel Features of $\text{Sr}_{1-x}\text{Ca}_x\text{TiO}_3$ Phase Diagram: Evidence for Competing Antiferroelectric and Ferroelectric Interactions"
Rajeev Ranjan, D. Pandey and N. P. Lalla,
Phys. Rev. Lett. **84** (2000) 3726-3729.
2. "Phase Transition in $(\text{Pb}_{1-x}\text{Ba}_x)\text{ZrO}_3$ Ceramics ($0 \leq x \leq 0.30$): Dielectric Studies",
B. P. Pokharel and Dhananjai Pandey,
J. Appl. Phys. **88** (2000) 5364-5373.
3. "Antiferroelectric Phase Transition in $(\text{Sr}_{1-x}\text{Ca}_x)\text{TiO}_3$ ($0.12 \leq x \leq 0.40$): I. Dielectric Studies"
R. Ranjan and D. Pandey,
J. Phys. Cond. Matter **13** (2001) 4239-4249.
4. "Antiferroelectric Phase Transition in $(\text{Sr}_{1-x}\text{Ca}_x)\text{TiO}_3$ ($0.12 \leq x \leq 0.40$):
II. X-ray Diffraction Studies"
R. Ranjan and D. Pandey,
J. Phys. Cond. Matter **13** (2001) 4251-4266.
5. "Evidence for Another Low-Temperature Phase Transition in Tetragonal $\text{Pb}(\text{Zr}_x\text{Ti}_{1-x})\text{O}_3$ ($x=0.515, 0.520$)"
Ragini, S. K. Mishra, D. Pandey, H. Lemmens, G. Van Tendeloo,
Phys. Rev. B **64** (2001) 054101-054106.
6. "High Temperature X-ray Diffraction Studies on Antiferroelectric and Ferroelectric Phase Transitions in $(\text{Pb}_{1-x}\text{Ba}_x)\text{ZrO}_3$ ($x=0.05, 0.10$)"
B. P. Pokharel and D. Pandey,
J. Appl. Phys. **90**, (2001) 2985-2994
7. "Evolution of Crystallographic Phases in $(\text{Sr}_{1-x}\text{Ca}_x)\text{TiO}_3$ with Composition (x)"
R. Ranjan, D. Pandey, W. Schuddinck, O. Richard, P. De Meulenaere, J. V. Landuyt and G. V. Tendeloo,
J. Solid State Chem. **162**, (2001) 20-28.
8. "A Raman scattering Study of the Antiferroelectric Phase Transition in $(\text{Sr}_{0.70}\text{Ca}_{0.30})\text{TiO}_3$ ",
S. K. Mishra, R. Ranjan, D. Pandey, R. Ouillon, J. P. Piuán-Lucarre, P. Ranson and Ph. Pruzan,
Phys. Rev. B **64** (2001) 092302-092304.
9. "Structure and the location of the morphotropic phase boundary region in $(1-x)$ $[\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3]-x\text{PbTiO}_3$ "
Akhilesh Kumar Singh and Dhananjai Pandey
J. Phys.: Cond. Matter **13**, (2001) L931-L936.
10. "Nomenclature of magnetic, Incommensurate, Composition-changed Morphotropic Polytype, Transient-Structural and Quasicrystalline Phases Undergoing Phase Transitions. II Report of an IUCr working group on Phase Transition Nomenclature"
J.C. Toledano, R.S. Berry, P. J. Brown, A.M. Glazer, R. Mrtseelaar, D. Pandey, J.M. Perez-Mato, R.S. Roth and S.C. Abrahams,

- Acta Cryst. A** **57** (2001) 614-626.
11. "Antiferroelectric Phase Transitions in $\text{Sr}_{1-x}\text{Ca}_x\text{TiO}_3$ ($0.12 < x < 0.43$)
D. Pandey, R. Ranjan and Sanjay K. Mishra
Frontiers in Materials Physics (special publication for the 75th year of the Indian Journal of Physics) Ed. D. Chakravarty, (2001) pp. 213-243.
 12. "Antiferrodistortive phase transition in $\text{Pb}(\text{Zr}_x\text{Ti}_{1-x})\text{O}_3$: A powder neutron diffraction study",
Rajeev Ranjan, Ragini, S. K. Mishra, and Dhananjai Pandey,
Phys. Rev. B **65** (2002) 060102-060105(R).
 13. "A Powder Neutron Diffraction Study of the Antiferroelectric Phase Transition in $\text{Sr}_{0.75}\text{Ca}_{0.25}\text{TiO}_3$ "
S. K. Mishra, R. Ranjan, D. Pandey and B. J. Kennedy,
J. Appl. Phys. **91**, (2002) 4447-4452
 14. "Antiferrodistortive phase transition in $\text{Pb}(\text{Zr}_{0.48}\text{Ti}_{0.52})\text{O}_3$: Space Group of the Lowest Temperature Monoclinic Phase"
D.M. Hatch, H.T. Stokes, Rajeev Ranjan, Ragini, S. K. Mishra, and Dhananjai Pandey
Phys. Rev. B **65**, (2002) 212101—212103.
 15. "Effect of Ba^{2+} Substitution on the stability of the Antiferroelectric and Ferroelectric Phases in $(\text{Pb}_{1-x}\text{Ba}_x)\text{ZrO}_3$: Phenomenological Theory Consideration"
Bhadra P. Pokharel and Dhananjai Pandey
Phys. Rev. B **65**, (2002) 214108-214114
 16. "Room Temperature structure of $\text{Pb}(\text{Zr}_x\text{Ti}_{1-x})\text{O}_3$ around the morphotropic phase boundary region: A Rietveld study"
Ragini, Rajeev Ranjan, S. K. Mishra, and Dhananjai Pandey,
J. Appl. Phys. **92**, (2002) 3266-3274.
 17. " A Raman scattering Study of the Phase Transitions in SrTiO_3 and in the mixed $(\text{Sr}_{1-x}\text{Ca}_x)\text{TiO}_3$ at ambient pressure from $T=300$ K down to 8 K"
R. Ouillon, J. P. Piuau-Lucarre, P. Ranson and Ph. Pruzan, S. K. Mishra, R. Ranjan, D. Pandey
J. Phys. Cond. Matter **14** (2002) 2079-2092.
 18. " The double loop hysteresis in DC dependant dielectric permittivity of SrTiO_3 "
S. Gevorgian, A. Eriksson, A. Deleniv and D. Pandey
J. Appl. Phys. **92**, (2002) 6165-6171.
 19. "Evolution of Crystallographic Phases in the System $(\text{Pb}_{1-x}\text{Ca}_x)\text{TiO}_3$: A Rietveld Study"
Amreesh Chandra and Dhananjai Pandey (2003)
J. Mater. Res., **18**, 407-414.
 20. "On the Discovery of New Low Temperature Monoclinic Phases with Cm and Cc Space Groups in $\text{Pb}(\text{Zr}_{0.52}\text{Ti}_{0.48})\text{O}_3$: An Overview"
D. Pandey and Ragini,
Z. Krist., **218**, (2003)1-7.
 21. "Evidence for M_B and M_C phases in the morphotropic phase boundary region of $(1-x)$ $[\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3]_x\text{PbTiO}_3$: A Rietveld Study"
Akhilesh Kumar Singh and Dhananjai Pandey
Phys. Rev. B. **67**, 064102 (2003) (1-12).
 22. "Confirmation of M_B type monoclinic Phase in $\text{Pb}[(\text{Mg}_{1/3}\text{Nb}_{2/3})_{0.71}\text{Ti}_{0.29}]\text{O}_3$: A Powder Neutron Diffraction Study"
Akhilesh Kumar Singh, Dhananjai Pandey and Oksana Zaharko
Phys. Rev. B. **68** (2003) 172103 (1-4).
 23. "Crystallographic Phases, Phase Transitions and Barrier Layer Formation in $(1-x)$ $[\text{Pb}(\text{Fe}_{1/2}\text{Nb}_{1/2})\text{O}_3]_x\text{PbTiO}_3$ "
Satendra Pal Singh, Akhilesh Kumar Singh, Dhananjai Pandey, H. Sharma and Om Parkash
J. Materials Res. **18** (2003) 2677-2687.
- "Recent Modifications to the Phase Diagram of $\text{Pb}(\text{Zr}_x\text{Ti}_{1-x})\text{O}_3$ Ceramics "
Dhananjai Pandey, Akhilesh Kumar Singh and Ragini
Proc. of International Symposium on Recent Advances in Inorganic Materials, Ed. D. Bahadur, S. Vitta and O. Prakash, Narosa publishing house, New Delhi, pp. (2004) 46-52.
24. "On the Discovery of two new Monoclinic Phases in the Morphotropic Phase Boundary Region of $\text{Pb}[(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3]_x\text{PbTiO}_3$ Ceramics"

- Akhilesh Kumar Singh and Dhananjai Pandey
Ferroelectrics, **326**,(2005) 91-99.
25. "Monoclinic Phases in the $\text{Pb}(\text{Zr}_x\text{Ti}_{1-x})\text{O}_3$ ceramics"
 Dhananjai Pandey, Akhilesh Kumar Singh, Rajeev Ranjan and Ragini
Ferroelectrics, **325**, (2005) 35-42.
 26. "Barrier Layer Formation and PTCR Effect in $(1-x) [\text{Pb}(\text{Fe}_{1/2}\text{Nb}_{1/2})\text{O}_3]-x\text{PbTiO}_3$ ($x = 0.13$)
 Ceramics"
 Satendra Pal Singh, Akhilesh Kumar Singh And Dhananjai Pandey
Ferroelectric,s **324**,(2005) 49-53.
 27. "Evidence for a New Non-Ferroelectric Phase Transition in $(\text{Pb}_{1-x}\text{Ca}_x)\text{TiO}_3$ Ceramics for $0.60 \leq x \leq 0.90$ "
 A. Chandra, D. Pandey, P.S.R. Krishna and M. Ramanadham
Ferroelectrics, **324**, (2005) 37-41.
 28. "Large Negative Thermal Expansion and Phase Transition in $(\text{Pb}_{1-x}\text{Ca}_x)\text{TiO}_3$ ($0.30 \leq x \leq 0.40$)
 Ceramics"
 A. Chandra, D. Pandey, M.D. Mathews and A. K. Tyagi
J. Mater. Res., **20**, (2005) 350.
 29. A Comparison of the Cc and R3c Space Groups for the Superlattice Phase of $\text{Pb}(\text{Zr}_{0.520}\text{-Ti}_{0.48})\text{O}_3$
 Rajeev Ranjan, Akhilesh Kumar Singh, Ragini and Dhananjai Pandey
Phys. Rev. B, **71**, (2005) 092101(1-4).
 31. The Various Phases of the System $\text{Sr}_{1-x}\text{Ca}_x\text{TiO}_3$: A Raman Scattering Study
 P. Ranson, R. Quillon, J. –P. Pinan-Lucarre, Ph. Pruzan, S.K. Mishra, R. Ranjan and D.
 Pandey
Journal of Raman Spectroscopy **36**, (2005) 898-911.
 32. S.K. Mishra, R. Ranjan, D. Pandey, P. Ranson, R. Ouillon, J. – P. Pinan-Lucarre, Ph.
 Pruzan,
 "A Combined X-Ray Diffraction and Raman Scattering Study of the Phase Transitions in $\text{Sr}_{1-x}\text{Ca}_x\text{TiO}_3$ ($x=0.04, 0.06$ and 0.12)"
Journal of Solid State Chemistry **178**, (2005) 2846-2857.
 33. "Resolving the controversies about the 'nearly cubic' and other phases of $\text{Sr}_{1-x}\text{Ca}_x\text{TiO}_3$ ($0 \leq x \leq 1$): I. Room temperature structures"
 S.K. Mishra, R. Ranjan, D. Pandey, H.T. Stokes
J. Phys.: Condens. Matter No. 6, 18, (2006) 1885-1898.
 34. "Resolving the controversies about the 'nearly cubic' and other phases of $\text{Sr}_{1-x}\text{Ca}_x\text{TiO}_3$ ($0 \leq x \leq 1$): II. Comparison of phase transition behaviours for $x = 0.40$
 and 0.43 "
 S.K. Mishra, R. Ranjan, D. Pandey, P. Ranson, R. Ouillon, J. – P. Pinan-Lucarre, Ph. Pruzan,
J. Phys.: Condens. Matter, **18 No. 6**, (2006) 1899-1912.
 35. "The effect of Pb^{2+} substitution on the quantum paraelectric behaviour of CaTiO_3 "
 A. Chandra, R. Ranjan, D. P. Singh, Neeraj Khare and D. Pandey
J. Phys.: Condens. Matter, **18 No. 11**, (2006) 2977-2994
 36. "Powder Neutron Diffraction Study of Phase Transitions in and a New Phase
 Diagram of $(1-x) \text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3-x\text{PbTiO}_3$ ".
 Akhilesh Kumar Singh, Dhananjai Pandey and Oksana Zaharko
Phys. Rev. B (accepted) (2006)