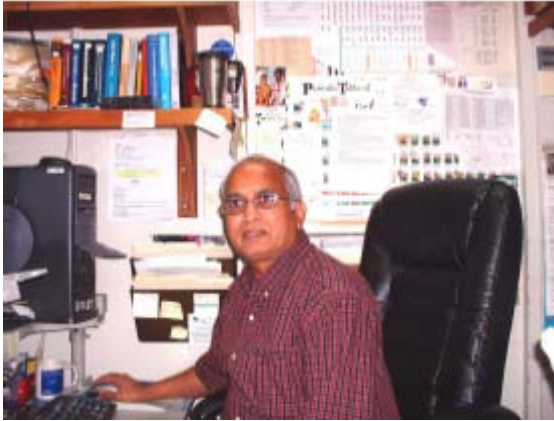


Ram S. Katiyar

Nanoscientist

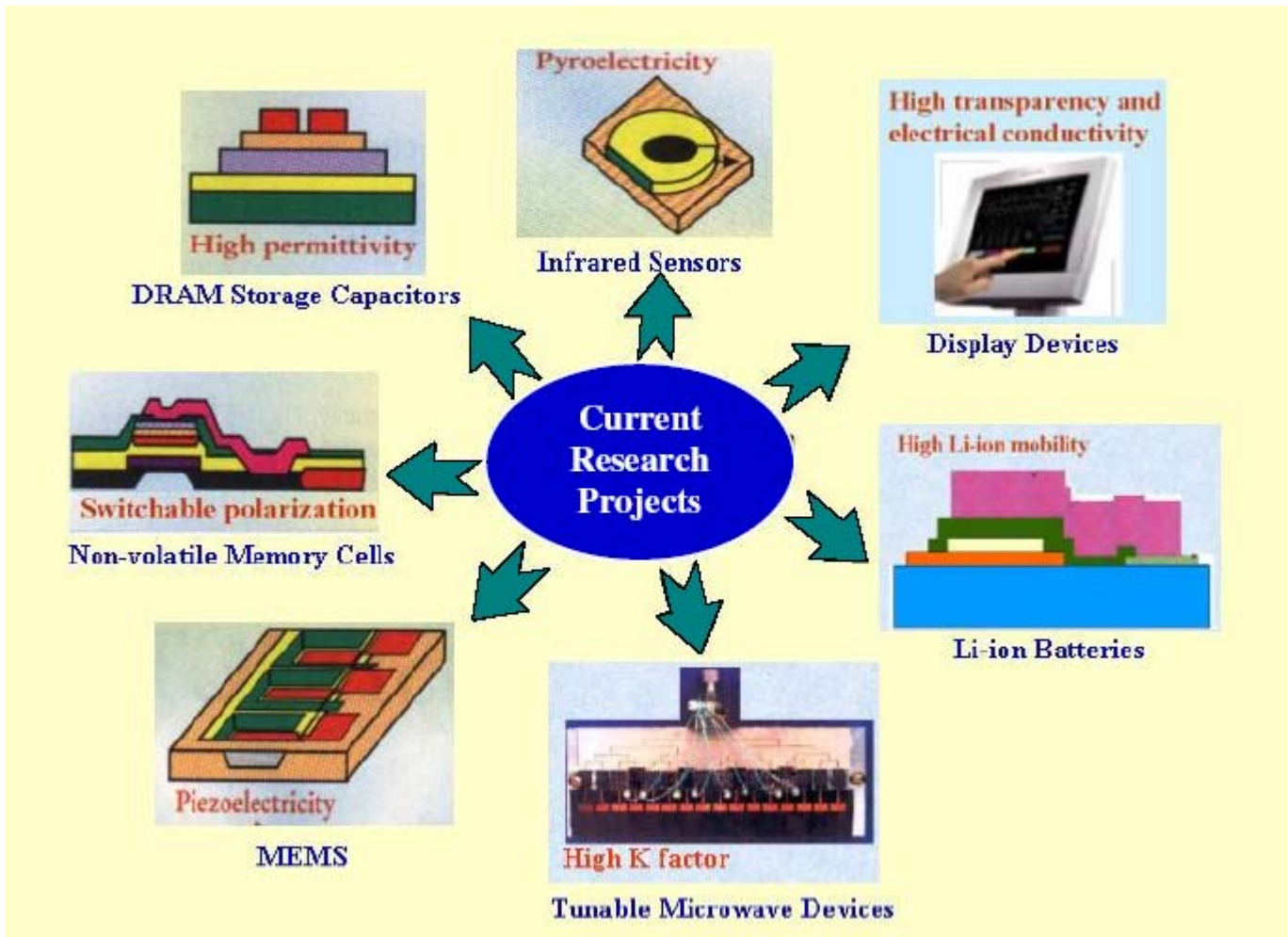
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Biography

Born in India, Katiyar obtained his Ph.D. Degree in Physics from the [Indian Institute of Science, Bangalore](#) in 1968. After completing his post-doctoral work in the area of ferroelectrics at the University of Ediburgh, he moved to the United States as an Assistant Professor of Physics at the [University of Southern California](#) in 1971. In August 1973, he joined the [University of Campinas, Brazil as an associate professor of Physics and was promoted to full professor in 1980](#). He is presently serving as a Professor of Physics at the [University of Puerto Rico, Rio Piedras Campus](#) where he has been leading [Advanced Materials Research Laboratory](#) working in the area of nanocrystalline materials and thin films for energy, memory, and sensor applications. He ingeniously exploited Raman spectroscopy and other characterization tools to understand size:structure:property relationships in various family of nano-structured materials, namely ferroelectrics, multiferroics, semiconductors, and rechargeable Li ion battery materials. His immense contributions in this field are represented by his excellent publication record (over 500, at least 150 in the last 5 years) and citation of the works in the internationally recognized journals like [Physical Review B](#), [Physical Review Letters](#), [Applied Physics Letters](#), [Journal of Applied Physics](#), and [Science](#).

Professor Katiyar's research group is presently working on six federally funded research projects including NSF-IFN Project involving fabrication and characterization of the above materials in thin film forms with potentials in energy, memory, and sensor applications. Some of these projects (and his patents) are leading into the testbed phase through collaborations with the [Argonne National Laboratory](#) and the [State University of New York, Binghamton](#).



Katiyar's current research projects.

Teams

[Cluster III: Multifunctional Nanostructures](#)

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Publications

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Grants

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Presentations

1. K. Asmar, R. S. Katiyar, M. E. Rivera-Ramos, and R. Singhal (May 2009) "High Energy Density Cathode Materials for Li Ion Rechargeable " in 215th ECS Meeting.
2. D. Abraham, M. Balasubramanian, D. S. Belen-Cordero, M. Furczon, N. Karan, R. S. Katiyar, and R. Thomas (May 2009) "Structural and Electrochemical Performance of Layered $\text{Li}(\text{Mn}_{0.5-x}\text{Cr}_{2x}\text{Ni}_{0.5-x})\text{O}_2$ Cathode Materials" in 215th ECS Meeting.
3. R. S. Katiyar, A. Kumar, R. Thomas, and M. Tomar (May 2009) "Synthesis of Carbon Treated and Untreated LiFePO_4 : A Comparative Study on the Structural, Morphological and Electrochemical Properties" in 215th ECS Meeting.
4. R. S. Katiyar, R. K. Katiyar, R. Singhal, and R. Valentin (April 2009) "High energy density cathode materials for rechargeable Li ion power batteries" in Materials Research Society Spring Meeting.
5. R. Calsada, R. S. Katiyar, R. Martínez, S. P, and R. Palai (April 2009) "Microstructure Analysis and Multiferroic Properties of

- La_{0.67}Sr_{0.33}MnO₃/Ba_{0.7}Sr_{0.3}TiO₃ Superlattices Grown on (001) MgO" in Materials Research Society Spring Meeting.
6. R. S. Katiyar, A. Kumar, R. Matínez, and D. A. Sanchez (April 2009) "Room Temperature Single Phase Multiferroics Pb{(Zr_{1/2}Ti_{1/2})_x(Fe_{1/2}Ta_{1/2})_{1-x}} Ceramics" in Materials Research Society Spring Meeting.
 7. M. Correa, R. S. Katiyar, and A. Kumar (April 2009) "Strain Effects on Relaxor Ferroelectric Properties of PbSc_{0.5}Nb_(1-x)/2Ta_x/2O₃ Thin Films and Nanoceramics" in Materials Research Society Spring Meeting.
 8. S. Dussan, R. S. Katiyar, and M. K. Singh (March 2009) "5. Phonon anomalies in multiferroic BiFeO₃ epitaxial thin films with rhombohedral (R3c) symmetry" in 17th International Symposium on Applications of Ferroelectrics (ISAF).
 9. S. Dussan, R. S. Katiyar, and M. K. Singh (March 2009) "Multiferroic Properties of Artificially Designed Perovskite-Spinel Heterostructures" in APS March Meeting.
 10. R. S. Katiyar, A. Kumar, and D. A. Sanchez (March 2009) "Single Phase Multiferroics Pb{(Zr_{1/2}Ti_{1/2})_x(Fe_{1/2}Ta_{1/2})_{1-x}} Thin Films" in APS March Meeting.
 11. R. S. Katiyar (February 2009) "Investigations on Magnetoelectric multiferroics" in Williamsburg Workshop on Fundamental Physics of ferroelectrics.
 12. R. Katiyar, R. S. Katiyar, R. Singhal, and R. Valentin (December 2008) "Electrochemical characterization of LiMn_{2-x}Cr_xO₄ cathode materials for high energy density Li Ion rechargeable batteries" in Materials Research Society Fall Meeting.
 13. S. Dussan, R. S. Katiyar, G. L. Sharma, and M. K. Singh (December 2008) "Raman scattering studies of anharmonic contribution to phonon in p type CuAlO₂ thin films" in Materials Research Society Fall Meeting.
 14. R. E. Melgarejo, R. S. Katiyar, N. M. Murari, J. J. Saavedra-Arias, and R. Thomas (December 2008) "Dielectric and magnetic properties of BiFe_{1-x}Nd_xO₃ and BiFe_{0.95}Li_{0.05}O₃," in Materials Research Society Fall Meeting.
 15. R. S. Katiyar and A. Kumar (December 2008) "Epitaxial multiferroic relaxor Pb(Fe_{2/3}W_{1/3})O₃," in Materials Research Society Fall Meeting.
 16. S. Dussan, R. S. Katiyar, and M. K. Singh (December 2008) "Growth of self-assembled CoFe₂O₄-BiFeO₃ thin films by pulsed laser deposition" in Materials Research Society Fall Meeting.
 17. R. S. Katiyar, R. K. Katiyar, A. Kumar, J. Lopez, P. Mirchandani, and I. Rivera (December 2008) "Investigation of dielectric and electrical properties of lead free relaxor Ba(Ti,Sn)O₃" in Materials Research Society Fall Meeting.
 18. R. S. Katiyar, A. Kumar, and R. Singhal (December 2008) "Magnetic behavior of Co doped ZnO nanoparticles" in 53rd Annual conference on magnetism and magnetic materials.
 19. R. Calzada, R. S. Katiyar, R. Martinez, R. Palai, and S. Pavunny (December 2008) "Magneto-electrical properties of La_{2/3}Sr_{1/3}MnO₃ /BiFeO₃ Heterostructures" in Materials Research Society (MRS), Fall Meeting .
 20. R. Calasada, R. S. Katiyar, R. Martinez, R. Palai, and S. Pavunny (December 2008) "Magnetoelectric Properties of Pulsed Laser Deposited

- Ferroelectric/Ferromagnetic Heterostructures" in Materials Research Society (MRS), Fall Meeting .
21. R. S. Katiyar, A. Kumar, and N. Ortega (December 2008) "Nanostructured thin films of $\text{Pb}(\text{Zr},\text{Ti})\text{O}_3/\text{CoFe}_2\text{O}_4$ multiferroics" in Materials Research Society Fall Meeting.
 22. S. Dussan, R. S. Katiyar, W. Prellier, and M. K. Singh (December 2008) "One-magnon light scattering and spin reorientation transition in epitaxially BiFeO_3 thin films" in Materials Research Society Fall Meeting.
 23. M. Correa, R. S. Katiyar, and A. Kumar (December 2008) "Studies on the dielectric and optical properties of epitaxial multiferroic $\text{Pb}(\text{Fe}_{0.5}\text{Nb}_{0.5})\text{O}_3$ thin films" in Materials Research Society Fall Meeting.
 24. S. Dussan-Devia, R. S. Katiyar, W. Prellier, and M. K. Singh (November 2008) "Anomalous low-temperature magnetic ordering induced magnon light scattering and spin phonon coupling in epitaxial BiFeO_3 thin films" in 53rd Annual conference on magnetism and magnetic materials.
 25. S. Dussan-Devia, R. S. Katiyar, G. L. Sharma, and M. K. Singh (November 2008) "Synthesis and characterization of Ni-doped In_2O_3 nanoparticles" in 53rd Annual conference on magnetism and magnetic materials.
 26. N. Karan, R. S. Katiyar, A. Kumar, D. Pradhan, J. Saavedra-Arias, and R. Thomas (October 2008) "Effect of annealing conditions on the structural and electrochemical behavior of $\text{Li}(\text{Mn}_{0.5-x}\text{Cr}_{2x}\text{Ni}_{0.5-x})\text{O}_2$ layered cathodes" in 214th ECS Meeting.
 27. N. Karan, R. S. Katiyar, D. Pradhan, J. Saavedra-Arias, and R. Thomas (October 2008) "Structural and electrochemical studies of solution derived $x\text{Li}_2\text{MnO}_3-(1-x)\text{Li}(\text{Mn}_{0.5}\text{Ni}_{0.5})\text{O}_2$ cathodes" in 214th ECS Meeting.
 28. Y. Ishikawa, N. Karan, R. S. Katiyar, A. Kumar, J. Saavedra-Arias, and R. Thomas (October 2008) "Structural behavior of layered cathode materials and first principles computations studies" in 214th ECS Meeting.
 29. R. S. Katiyar and R. Singhal (October 2008) "Synthesis and characterization of $\text{LiMn}_{2-x-y}\text{Co}_x\text{Ni}_y\text{O}_4$ cathode materials for high energy density Li ion rechargeable batteries" in 214th ECS Meeting.
 30. N. Karan, R. S. Katiyar, A. Kumar, J. Saavedra-Arias, R. Thomas, and M. Tomar (October 2008) "The effect of the particle size on electrochemical properties of carbon coated LiFePO_4 " in 214th ECS Meeting.
 31. N. K. Karan, R. S. Katiyar, A. Kumar, D. K. Pradhan, J. J. Saavedra-Arias, and R. Thomas (October 2008) "36. Structural and electrochemical properties of solution derived $\text{Li}(\text{Mn}_{0.475}\text{Cr}_{0.05}\text{Ni}_{0.475})\text{O}_2$ layered cathodes" in MS&T08 (Material Science and Technology 2008 Conference and Exhibition).
 32. N. K. Karan, R. S. Katiyar, D. K. Pradhan, J. J. Saavedra-Arias, and R. Thomas (October 2008) "Chemical solution deposited $\text{Ba}[(\text{Ni}_{1/2}\text{W}_{1/2})_{0.1}\text{Ti}_{0.9}]\text{O}_3$ thin films for high energy density capacitors applications" in MS&T08 (Material Science and Technology 2008 Conference and Exhibition).
 33. N. K. Karan, R. S. Katiyar, N. M. Murari, D. K. Pradhan, J. J. Saavedra-Arias, and R. Thomas (October 2008) "Effect of A-site Sr substitution on the orientation of $\text{Pb}(\text{Zr}_{0.5}\text{Ti}_{0.5})\text{O}_3$ thin films on $\text{Pt}(111)/\text{TiO}_x/\text{SiO}_2/\text{Si}$ substrates" in MS&T08 (Material Science and Technology 2008 Conference and Exhibition).

34. R. S. Katiyar, R. E. Melgarejo, N. M. Murari, and R. Thomas (October 2008) "Ferroelectric and magnetic properties of chemical solution deposited $\text{Bi}(\text{Fe}_{0.9}\text{Ti}_{0.05}\text{Co}_{0.05})\text{O}_3$ thin films" in MS&T08 (Material Science and Technology 2008 Conference and Exhibition).
35. R. S. Katiyar, N. M. Murari, and R. Thomas (October 2008) "Leakage current reduction and improved ferroelectric properties of chemical solution deposited $\text{Bi}(\text{Fe}, \text{M})\text{O}_3$ (M=Ti and Cr) thin films" in MS&T08 - Material Science and Technology 2008 Conference and Exhibition.
36. R. S. Katiyar, A. Kumar, and I. Rivera (October 2008) "Multiferroics $\text{Pb}(\text{Fe}_{0.66}\text{W}_{0.33})_{0.80}\text{Ti}_{0.20}\text{O}_3$ thin films: A room temperature relaxor ferroelectric and weak ferromagnetic" in MS&T08 (Material Science and Technology 2008 Conference and Exhibition).
37. M. Correa, R. S. Katiyar, A. Kumar, and I. Rivera (October 2008) "Multiferroics phenomenon in $\text{Pb}(\text{B}'\text{B}'')\text{O}_3$ relaxor thin films and ceramics" in MS&T08 (Material Science and Technology 2008 Conference and Exhibition).
38. R. S. Katiyar, R. Palai, J. F. Scott, and M. J. Singh (October 2008) "Phase transition in multiferroic BiFeO_3 thin films" in MS&T08 (Material Science and Technology 2008 Conference and Exhibition).
39. R. S. Katiyar, A. Kumar, and S. Lushnikov (October 2008) "Polarized Raman spectroscopy study of relaxor-ferroelectric $\text{PbSc}_{0.5}\text{Nb}_{0.5}\text{O}_3$ single crystal" in MS&T08 (Material Science and Technology 2008 Conference and Exhibition).
40. R. S. Katiyar, N. M. Murari, and R. Thomas (October 2008) "Pt/ BiFeO_3 / DyScO_3 /Si MFIS structure for FERAM application" in MS&T08 (Material Science and Technology 2008 Conference and Exhibition).
41. N. K. Karan, R. S. Katiyar, A. Kumar, D. Pradhan, J. J. Saavedra-Arias, and R. Thomas (October 2008) "Structural and electrochemical properties of $\text{LiMn}_{0.5}\text{Ni}_{0.5-x}\text{Co}_x\text{O}_2$ ($x=0.2-0.3$): A cathode material for secondary lithium-ion batteries" in MS&T08 (Material Science and Technology 2008 Conference and Exhibition).
42. R. S. Katiyar, P. Shojan, and M. Singh (October 2008) "Structural, magnetic and dielectric properties of multiferroic CuFeO_2 " in MS&T08 (Material Science and Technology 2008 Conference and Exhibition).
43. R. S. Katiyar and M. Singh (July 2008) "Phase transition studies in multiferroic BiFeO_3 thin films using Raman spectroscopy" in ICMR Summer School on Multiferroic Materials and Beyond.
44. R. S. Katiyar, A. Kumar, and N. Ortega (June 2008) "Nanostructured thin films of $\text{Pb}(\text{Zr},\text{Ti})\text{O}_3/\text{CoFe}_2\text{O}_4$ multiferroics" in 1st International Conference from Nanoparticles & Nanomaterials to Nanodevices & Nanosystem (IC4N-2008).
45. R. S. Katiyar, A. Kumar, and N. Ortega (June 2008) "2008-30 Epitaxially grown multiferroics $\text{Pb}(\text{Zr},\text{Ti})\text{O}_3/\text{CoFe}_2\text{O}_4$ layered nanostructure" in International Symposium on Integrated Ferroelectrics (ISIF).
46. R. S. Katiyar, K. Kumar, P. Mirchandani, and I. Rivera (June 2008) "Studies of magnetic and ferroelectric properties of $\text{Pb}(\text{Fe}_{0.67}\text{W}_{0.33})_{0.80}$ thin films at ambient temperature" in International Symposium on Integrated Ferroelectrics (ISIF).

47. R. S. Katiyar, A. Kumar, and I. Rivera (June 2008) "Divide line between relaxor, ferroelectric and dielectric relaxation" in International Symposium on Integrated Ferroelectrics (ISIF).
48. R. S. Katiyar, J. F. Scott, M. K. Singh, M. P. Singh, and P. Wilfred (May 2008) "Spin glass behavior in BiFeO₃ single crystal" in European Materials Research Society.
49. N. K. Karan, R. S. Katiyar, A. Kumar, J. Saavedra-Arias, M. S. Thomar, and R. Thomas (May 2008) "Carbon coated nano-crystalline LiFePO₄ cathodes for Li-ion rechargeable batteries" in 213th ECS Meeting.
50. N. K. Karan, R. S. Katiyar, D. K. Pradhan, and R. Thomas (May 2008) "Dielectric properties of nanocomposite polymer electrolytes based on Polyethylene oxide and organically modified Na montmorillonite" in 213th ECS Meeting.
51. R. S. Katiyar, S. B. Majumder, J. Saavedra, and S. Sivaprakash (May 2008) "Electrochemical and structural investigation of xLi[Li_{0.33}Mn_{0.66}]O₂(1-x)Li[Ni_{0.8}Co_{0.15}Zr_{0.05}]O₂ 1.0) composite layered oxide cathode for rechargeable lithium $0 \leq x \leq 1.0$ ion batteries" in 213th ECS Meeting.
52. N. K. Karan, R. S. Katiyar, R. Melgarejo, D. K. Pradhan, J. Saavedra-Arias, and R. Thomas (May 2008) "Metal-ferroelectric-insulator-silicon (MFIS) devices based on DyScO₃ buffer layer and Bi_{3.25}Nd_{0.75}Ti₃O₁₂ ferroelectrics" in 213th ECS Meeting.
53. N. K. Karan, R. S. Katiyar, A. Kumar, J. Saavedra-Arias, and R. Thomas (May 2008) "Structural analysis of layered Li(Ni_{0.9-x}Co_xMn_{0.1})O₂ cathode material at various stages of electrochemical process" in 213th ECS Meeting.
54. N. K. Karan, R. S. Katiyar, A. Kumar, D. K. Pradhan, J. J. Saavedra-Arias, and R. Thomas (May 2008) "Structural and electrochemical studies of chemical solution derived Li(Mn_{0.5-x}Cr_{2x}Ni_{0.5-x})O₂ layered cathodes" in 213th ECS Meeting.
55. R. S. Katiyar, G. L. Sharma, and M. K. Singh (March 2008) "Magnetic and structural properties of p type magnetic semiconductor CuAlO₂ prepared by rf sputtering" in MRS Spring meeting.
56. S. Dussan-Devia and R. S. Katiyar (March 2008) "Synthesis and characterization of Fe-doped In₂O₃ nanoparticles" in MRS Spring meeting.
57. R. S. Katiyar and R. Singhal (March 2008) "Grain size effect on the electrochemical performance of Li ion rechargeable batteries in nanocrystalline LiMn₂O₄ cathode materials" in 213th ECS Meeting.
58. R. S. Katiyar, M. K. Singh, and P. Wilfrid (March 2008) "Anomalous low temperature magnetic ordering and spin phonon coupling in BiFeO₃ thin films" in APS March Meeting.
59. N. K. Karan, R. S. Katiyar, R. Melgarejo, D. K. Pradhan, J. Saavedra-Arias, and R. Thomas (March 2008) "MIS and MFIS devices: DyScO₃ as a gate-oxide and buffer-layer" in APS March Meeting.
60. R. S. Katiyar, A. Kumar, and N. Ortega (March 2008) "Multilayer Pb(Zr,Ti)O₃/CoFe₂O₄ epitaxially thin films" in APS March Meeting.
61. N. K. Karan, R. S. Katiyar, J. F. Scott, and M. K. Singh (March 2008) "New phase transition in ceramic SrSnO₃: Raman scattering and differential thermal analysis" in APS March Meeting.

62. M. Correa, R. S. Katiyar, and A. Kumar (March 2008) "Strain induced relaxor behavior in $\text{PbSc}_{0.50}\text{Nb}_{0.25}\text{Ta}_{0.25}\text{O}_3$ thin films: A comparison with the nanoceramics" in APS March Meeting.
63. R. S. Katiyar, R. Melgarejo, N. M. Murari, and R. Thomas (March 2008) "Structural, electrical and magnetic properties of $\text{Bi}(\text{Fe}_x\text{Ti}_{1-x})\text{O}_3$ thin films prepared by chemical solution deposition" in APS March Meeting.
64. R. S. Katiyar, A. Kumar, and N. Ortega (February 2008) "3. Structural, dielectric, electrical and magnetic properties of multiferroic $\text{BaTiO}_3\text{-NiFe}_2\text{O}_4$ composite ceramic" in 17th International Symposium on Applications of Ferroelectrics (ISAF).
65. S. Dussan, R. S. Katiyar, G. L. Sharma, and M. K. Singh (February 2008) "4. Structural properties of multiferroic $\text{CuFe}_{(1-x)}\text{Al}_x\text{O}_2$ ($x=0.0\text{-}0.1$) thin films prepared by rf sputtering" in 17th International Symposium on Applications of Ferroelectrics (ISAF).
66. S. Dussan, R. S. Katiyar, G. L. Sharma, and M. K. Singh (February 2008) "6. Anomalous magnetic ordering transition and induced Raman Scattering in BiFeO_3 thin films" in 17th International Symposium on Applications of Ferroelectrics (ISAF).
67. M. Correa, R. S. Katiyar, and A. Kumar (February 2008) "Dielectric and Raman studies of La modified lead scandium niobate ceramics" in 17th International Symposium on Applications of Ferroelectrics (ISAF).
68. N. K. Karan, R. S. Katiyar, N. M. Murari, J. Saavedra-Arias, and R. Thomas (February 2008) "Effect of Sr substitution on tunability of $(\text{Pb}_{0.35}\text{Sr}_{0.65})(\text{Zr}_{0.5}\text{Ti}_{0.5})\text{O}_3$ " in 17th International Symposium on Applications of Ferroelectrics (ISAF).
69. R. S. Katiyar, N. M. Murari, and R. Thomas (February 2008) "Fabrication of BiFeO_3 capacitor structure with reduced leakage current" in 17th International Symposium on Applications of Ferroelectrics (ISAF).
70. J. Burgos, R. S. Katiyar, R. Singhal, and M. Tomar (February 2008) " $\text{LiMn}_{1.8}\text{Mg}_{0.2}\text{O}_4$ spinel cathode material for Li ion rechargeable batteries" in 17th International Symposium on Applications of Ferroelectrics (ISAF).
71. S. Dussan, S. Dussan, R. S. Katiyar, G. L. Sharma, and M. K. Singh (February 2008) "Magnetic and structural properties of multiferroic CuFeO_2 prepared by rf sputtering" in 17th International Symposium on Applications of Ferroelectrics (ISAF).
72. R. S. Katiyar, R. Martinez, R. Palai, S. Pavuunny, and S. Singh (February 2008) "Observation of structural Phase transition in La-doped multiferroic BiFeO_3 thin films" in International Symposium on Applied Ferroelectrics (ISAF).
73. R. S. Katiyar, R. Palai, and H. Schmid (February 2008) "Polarized Raman scattering and magnetic properties of ferroelectric single domain crystal and thin film" in International Symposium on Applied Ferroelectrics (ISAF).
74. R. S. Katiyar, R. Palai, S. P. Pavunny, and R. M. Valdes (February 2008) "Raman spectroscopy and magnetoelectric properties of laser ablated La and Cr doped BiFeO_3 " in 17th International Symposium on Applications of Ferroelectrics (ISAF).

75. R. S. Katiyar, R. Martinez, and R. Palai (February 2008) "Structural, dielectric, electrical, and ferroelectric properties of Ba_{1-x}Sr_xTiO₃ ceramics synthesized by different routes " in International Symposium on Applied Ferroelectrics (ISAF),.
76. R. S. Katiyar, R. Martinez, and R. Palai (February 2008) "Structural, dielectric, electrical, and ferroelectric properties of Ba_{1-x}Sr_xTiO₃ ceramics synthesized by different routes" in 17th International Symposium on Applications of Ferroelectrics (ISAF).
77. M. Jain, N. K. Karan, R. S. Katiyar, H. Wang, and J. Yoon (February 2008) "Tunable lead strontium titanate thin films by sol-gel technique" in 17th International Symposium on Applications of Ferroelectrics (ISAF).
78. R. S. Katiyar and M. K. Singh (February 2008) "Phase transition in BiFeO₃ thin films by using Raman spectroscopy" in Fundamental Physics of Ferroelectric 2008 workshop.