# Dr. Sanjay Kumar Verma

Designation : Associate Professor
Subject : Physics
Area of Specialization : Solid State Physics, Materials Science
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## Summary

- Ph.D. degree in **Physics**
- Currently working on **Crystal Growth of Hybrid Materials and Characterization.**

## Workshops, Seminars, Symposia and Conferences attended

## List of Conferences/ Workshops/Seminars attended and papers presented there

1. XXXII National Seminar on Crystallography, Crystallography Research Group, Post – Graduate Department of Physics, University of Jammu, Jammu, 24 – 26th Oct. 2002.

2. XV DAE SYMPOSIUM ON HIGH ENERGY PHYSICS, Department of Physics, University of Jammu, Jammu, 11 – 15th Nov. 2002.

3. Dielectric Behaviour and Conductivity of Melt Grown $KMgF_3$ and Flux Grown $GdFeO_3$ crystal

   Banwari Lal, K.K. Bamzai, P.N. Kotru, Sanjay Verma, B.M.Wanklyn
   Fourth Asian Meeting on Ferroelectrics (AMF - 4), IISC, Bangalore, 12 - 15th December, 2003, Abstract # A-144, pp. 115 (Poster Paper Presentation)

**4.** ONE – DAY NUCLEAR SCIENCE CENTRE ACQUAINTANCE PROGRAMME, Crystal Growth and Materials Research Group**, Department of Physics & Electronics, University of Jammu, Jammu, 21st May, 2004**

**5.** Growth and Characterization of Some Rare Earth Tartrates and Molybdates
**Sanjay Verma,** Sanjay Pandita, Rakesh Koul, Vinay Hangloo, P.R. Dhar, K.K. Bamzai, P.N. Kotru

**National Conference on Advanced Materials and Technology**, 24 - 26th September 2004, **DAV College, Amritsar**, pp. 43. (Oral Presentation)

**6.** Dielectric Characteristics of Gel Grown Yttrium Tartrate Crystals
**Sanjay Verma**, Ravender Tickoo, K.K. Bamzai, P.N. Kotru

**National Seminar on Ferroelectrics & Dielectrics – 13 (NSFD – XIII), Department of Physics & Astrophysics, University of Delhi, Delhi**, 23 – 25th November 2004,Abstract # PC 17, pp. 121. (Poster Paper Presentation)

**7.** 1st J&K State Science Congress, **University of Jammu, Jammu, 7 – 9th Feb 2005**

**8.** Studies on the Dielectric Properties of Some Rare Earth Tartrates and Heptamolybdate Crystals
**Sanjay Verma**, Ravender Tickoo, Sanjay Pandita, Vinay Hangloo, Rakesh Koul, K.K. Bamzai, P.N. Kotru
**Third National Conference on Thermophysical Properties (3rd NCTP), University of Goa, Goa,** Jan. 19-20, 2005, Abstract # D – 10 (P), pp. 95.

**9.** Dielectric properties and ac conductivity investigations of flux grown $CdTiO_3$ Crystals
Vineeta Gupta, **Sanjay Verma**, K.K. Bamzai, P.N. Kotru, B.M. Wanklyn
**4th National Symposium and Conference on Solid State Chemistry and Allied Areas, Department of Chemistry, Goa University, Goa**, 403206, India, Dec. 1 - 3, 2005, Abstract # P14, pp. 39. (Poster Paper Presentation)

**10.** International Workshop on Crystal Growth & Characterization of Advanced Materials, **Crystal Growth Centre, Anna University, Chennai, INDIA**, 9 – 13 Jan. 2006

**11.** Growth and Dielectric Studies on Gel Grown Samarium Tartrate (SmT) Crystals
**Sanjay Verma**, Balwinder Kaur, Ravender Tickoo, P.N. Kotru, K.K. Bamzai

*National Conference on Advances in Technologically Important Crystals (NC- ATIC), Department of Physics and Astrophysics, University of Delhi, Delhi**, Oct.12- 14, 2006, Abstract # 30, pp. 129.***

**12.** Dielectric Anisotropy of Flux Grown Gadolinium Vanadate Single Crystals
Nidhi, Balwinder Kaur, **Sanjay Verma**, P.N. Kotru, B.M. Wanklyn, K.K. Bamzai
**National Conference on Advances in Technologically Important Crystals (NC- ATIC), Department of Physics and Astrophysics, University of Delhi, Delhi**, Oct. 12- 14, 2006, Abstract # 130, pp. 672. (Poster Paper Presentation)

**13.** Mechanical Behaviour of Samarium Aluminate Crystals by Vicker's Hardness Tester
Vishal Singh, Balwinder Kaur, Vineeta Gupta, **Sanjay Kumar**, P.N. Kotru, B.M.Wanklyn, K.K. Bamzai
**International Symposium for Research Scholars in Metallurgy, Materials Science and Engineering, (ISRS-06), Indian Institute of Technology**, Dec. 18-20, 2006, pp. 128.

**14.** Comparison of Dielectric Studies Yttrium Tartrate Crystals Grown in Silica and Agar Gel
Sanjay Kumar, Balwinder Kaur, K.K. Bamzai
**National Seminar on Ferroelectrics & Dielectrics – 14 (NSFD – XIV),**
**Indian Institute of Technology, Kharagpur**, Dec. 18-21, 2006, (Oral Presentation)

**15.** Studies on Samarium Tartrate Crystals with Change in Temperature
**Sanjay Kumar**, Balwinder Kaur, Vishal Singh, K.K.Bamzai
**2nd National Conference on Condensed Matter and Material Physics, University of Rajasthan, Jaipur**, Feb. 1-3, 2007, Abstract # G 10. (Poster Paper Presentation)

16. Use of Diffraction Methods in Condensed Matter, **Department of Physics & Electronics, University of Jammu & UGC – DAE Consortium for Scientific Research, Mumbai Centre, held at University of Jammu, Jammu,** 7 – 9 Mar. 2007

17. Dielectric and Ferroelectric Studies on Single Crystals of Rare Earth Tartrate Compounds, K.K. Bamzai, **Sanjay Kumar**, B. Kaur and Shivani Suri, **National Seminar on Electroceramics, GVM Girls College, Sonepat**, 5 – 6 Nov. 2007, Abstract # CP – 26. (Poster Paper Presentation and received second prize)

18. SEM and Morphological Studies of Yttrium Tartrate Crystals Grown by silica Gel method K.K. Bamzai, **Sanjay Kumar**, B. Kaur, G. Kaur **National Conference on electron microscopy and allied fields & XXIX Annual Meeting of EMSI, Electron Microscope Society of India & University of Delhi, Delhi, India,** 26 – 28 Nov. 2007, Abstract on Page No. 77 – 78. (Poster Paper Presentation)

19. Correlation of dielectric results with thermal studies on gel grown Yttrium Tartrate Trihydrate (YTT) single crystals K.K. Bamzai, **Sanjay Kumar**, Shivani Suri **National Seminar on Ferroelectrics & Dielectrics (NSFD – 15), Thapar University, Patiala, India,** 6 – 8, Nov.2008**,** Abstract # MMA – 04 pp. 47. (Poster Paper Presentation)

20. **NAAC Sponsored Two Day Seminar on "Quality Enhancement in Higher Education: A National Challenge" Govt. S.P.M.R College of Commerce, Jammu, 5 – 6 Feb., 2010.**

21. **2D interwoven Metal-Organic Framework in Tetrachloromercurate(II) based hybrid material** Bikram Singh, Atul Thakur, Mukesh Kumar, Ajit Kumar, **Sanjay K. Verma** Dinesh Jasrotia , **National conference on Mechanics of Advanced Materials, Shoolini University, Himachal Pradesh, India,** Abstract # 10, PP 16**.**

22. **Single Crystal Growth of Hg(II), Cd(II) and Zn(II) based inorganic-organic hybrid materials** Ajit Kumar, **Sanjay K. Verma** and Dinesh Jasrotia, **National Conference on Recent Advances in Materials Science and Technology, MLV Govt. College, Bhilwara, Rajasthan, India, 22-23 Dec., 2014**.

24. **Single Crystal Growth and Energy Band Calculation of $[ZnCl_4]^-$ $[C6H7NCH_3]^+$** **Sanjay K. Verma** and Ravinder Tickoo, **National Symposium on interdisciplinary sciences – II, 2015, G.G.M. Science College, Jammu, India, 27-28 Feb., 2015,** Abstract # 36, PP 10**.**

25. **Growth, Characterization and Dielectric measurements of mixed Yttrium Samarium Heptamolybdate crystals** Rakesh Koul, **Sanjay Verma**, Monita Bhat, K K Bamzai, **National Conference on Microscopy and Advances in Material Sciences (NCMAMS-2015) University of Jammu, Jammu**, 2-4 March 2015 Abstract # PDFM-69, PP 109**.**

26. **Single crystal growth, XRD, UV vis., SEM, Raman Spectra and Strain Tensor studies of**

**$[ZnCl_4]^-$ based Inorganic Organic hybrid materials**,
Ajit Kumar, **Sanjay K. Verma,** Mukesh Kumar, Dinesh Jasrotia, **10th JK science congress, Jammu University, Jammu,** 14 – 16 March, 2015, Abstract # Phy - 006, PP 132**.**

**27. Physicochemical analysis of $[ZnCl_4]^-$ $[R]^+$ inorganic-organic hybrid materials: Growth-Structure-Property correlations.**
Dinesh Jasrotia, Ajit Kumar, **Sanjay K. Verma, Indo-Italian International Conference, University of Delhi, Delhi, India,** 1-2 July, 2015.

**28. "Route to physical homogeneous synthesis of N-H...Cl bonded Hg(II), Cd(II) and Zn(II) based inorganic-organic hybrid materials"**
Ajit Kumar, **Sanjay K. Verma**, Mukesh Kumar, P.A. Alvi and Dinesh Jasrotia,
**1st International conference on Research and Innovations in Science and Technology**, Yogananda College of Engineering and Technology, Jammu 20-21st Nov., 2015 PP 1-5.

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## Research Publications

**1.** Dielectric, Ferroelectric and Thermal Studies of Gel Grown Yttrium Tartrate crystals
**SANJAY KUMAR**, B. KAUR, P.N. KOTRU, K.K. BAMZAI
Ferroelectrics 332 (2006) 167 – 185. (U.K)

**2.** Dielectric and Ferroelectric Studies on Gel Grown Samarium Tartrate (SmT) crystals
SANJAY KUMAR, B. KAUR, P.N. KOTRU, K.K. BAMZAI
Ferroelectrics 350(2007) 5 – 21 (U.K)

**3.** Studies on Kinetics and Mechanism of thermal decomposition of Yttrium Tartrate Trihydrate Crystals
K.K. BAMZAI, **SANJAY KUMAR**
Mat. Chem. & Phys.107 (2008) 200 – 207 (Switzerland)

**4** 2D Interwoven Metal-Organic Framework in Tetrachloromercurate(II) based Hybrid Material
Mukesh Kumar, **Sanjay K. Verma**, Bikram Singh, Atul Thakur, Ajit Kumar and Dinesh Jasrotia**,** *Chem. Sci. Trans.,* 2015, 4(2) 629-637.
(India)

**5** Single Crystal Growth, X-Ray Structure Analysis, Optical Band Gap, Raman Spectra, strain tensor and photoluminescence properties in $[HgCl4]^-[R]^+$ and $[ZnCl4]^-[R]^+$ (R=2-Amino-5-Chloropyridine) Hybrid Materials
Ajit Kumar, Mukesh Kumar, **Sanjay K. Verma**, P.A. Alvi, Dinesh Jasrotia
J Fundam Appl Sci. 7(3), 2015, 422 - 435 (Algeria)

6. Single Crystal Growth, Structural, Morphological & Raman Tensor studies of $[ZnCl_4]^-$ $[C_5H_8N_2Cl]^+$ Hybrid Material
Ajit Kumar, **Sanjay K. Verma**, P.A. Alvi and Dinesh Jasrotia
AIP Conf. Proc. 1675, 020041-1-020041-4; doi: 10.1063/1.4929199 (USA)

7. Bikram Singh, Atul Thakur, Mukesh Kumar, **Sanjay K. Verma** and Dinesh Jasrotia**,**
"Structural and Optical Properties of Inorganic-Organic Hybrid Material of Acetanilide Tetrachloromercurate(II)"
**Journal of Materials Science: Materials in Electronics, (2017) DOI: 10.1007/s10854-017-6758-0 (U.K.)**

8. Ajit Kumar, **Sanjay K. Verma**, P.A. Alvi and Dinesh Jasrotia
"Nano-spatial parameters from 3D to 2D lattice dimensionality by organic variant in

$[ZnCl4]^{-}$ $[R]^{+}$ hybrid materials: Structure, architecture-lattice dimensionality, microscopy, optical Eg and PL correlations"
*AIP Proc.* ***1724****, 020004 (2016); doi: 10.1063/1.4945124* **[U.S.]**

## Research Projects (Minor / Major Project)

**Research Project:**

UGC – Major Research **Project** No. 42-777 of 2013 amounting Rs 9, 46,000/- on "Crystal Engineering and Characterization of $MX_4^{-}$ $[R^{+}]$ inorganic-organic hybrid materials"

## Academic Qualifications

| Examination Passed | Board/ University | Subjects | Year | Division / Grade / Merit |
|---|---|---|---|---|
| SSC | JKBSE | Maths, Eng, Social Sciences Drawing and Science | 1983 | IInd |
| Higher Secondary | JKBSE | Physics, Chemistry, Maths, English | 1985 | 1st |
| Bachelor's Degree(s) | University of Jammu | Physics, Chemistry, Maths, English | 1987 | 1st |
| Master's Degree(s) (M.A/M.Sc.) | University of Jammu | Physics | 1990 | 1st |
| NET/SLET | | | | |
| Other Diploma / Certificates etc. | University of Jammu<br>University of Jammu<br>University of Jammu | 1. P.G. Diploma in Applied Electronics.<br>2. P.G. Diploma in Computer Applications.<br>3. B.Ed. | 1988<br>1991<br>1997 | 1st<br>1st<br>1st |

## Research Experience

| Research Stage | Title of Work /Thesis | University where the work was carried out | Year |
|---|---|---|---|
| M. Phil or equivalent | | | |
| Ph.D. | Studies on Growth and some properties of Dielectric Materials viz., Yttrium and Samarium Tart-rates | University of Jammu | 2002-2007 |

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|---|---|---|---|
| D.Sc/D.Litt. | | | |
| Training (Please specify) | | | |

## Teaching Experience

| Courses Taught | Name of the University/ College/Institution | Duration |
|---|---|---|
| iv) U.G.<br>(B.A./B.Sc. etc.)<br>(B.A./B.Sc. etc. Hons.) | J&K Govt. Higher Education Department (GDC Udhampur, GDC Kathua, GGM Science College, Jammu, Govt. Coll. Engineering and Technology, Jammu. | 20 Years |
| v) P.G.<br>(M.A./M.Sc.,etc.) | | |
| vii) Any other( e.g Women Study, Skill Development , Add on courses, Coaching (JUET, CET) etc) | | |

## Extension Work / Community Service