CURICULUM VITAE

NAME : Bajpai Parmendra Kumar

Short Biography

P.K. Bajpai, male, material scientist, Doctorate from physics department, North-Eastern Hill University in 1988. He worked for North Eastern Hill University 1988-1996 and Guru Ghasidas University, 1996-till date. Since 1996, he became the Head of Pure & Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur, India and served as Dean Sciences and physical Sciences. Now he has published more than 217 papers and edited two books published by AIP, USA and Anamaya Publications, New Delhi and received more than 10 awards for his contributions to the Science. He is a Fellow of International Academy of Physical Sciences; Full Member of American Nano Society and executive editor of Chhattisgarh j. Science & Technology. He is also the regional Editor of Int. J. Research published From Maxwell Publications. He is reviewer of many reputed international journals. Prof. Bajpai delivered more than 50 lectures in various International/ National conferences including more than a dozen key note addresses and chaired technical sessions in seminars. He has supervised 10 Ph.D. and 24 M.Phil dissertations. He has organized 24 Conferences and one International conference and has provided academic leadership by establishing Department of Pure & Applied Physics, Institute of Technology at Guru Ghasidas Vishwavidyalaya and is currently developing a 3 MV particle Accelerator based Interdisciplinary Research Centre with the financial support from DAE and UGC(approx. 40 crores).

Present Position : **Professor & Head**
Department of Pure & Applied Physics
Dean-School of Physical Science
Officer of Special Duty
Guru Ghasidas Vishwavidyalaya
(A Central University)
Bilaspur (C.G.) India 495 009

Date of Birth : Born on 02-05-1963 at Jhansi, (U. P.) India.

Other Information :
Sex : Male
Marital Status : Married
Nationality : Indian
Language Known : Hindi, English, French

Communication Address

Permanent
372/35 civil lines, Jhansi – 284001 (U. P.)
Ph.: 91-510-2330301

Correspondence
Department of pure and applied physics
Guru Ghasidas University, Bilaspur
Chhattisgarh - 495 009

E-mail- bajpai_pk@yahoo.com
Ph.: 91-7752-260249 (R) ; 91-7752-260007 (O)
Mobile- 94241-54024; Fax: 07752-260148

Residence
D-0, Staff Colony, G. G. University Campus, Bilaspur
Chattisgarh-495 009.

Visits Abroad:

1. Japan, (Yokohama & Tokyo) as INSA-COASTED Visiting fellow 1992
2. Thailand (Bankok) 1992
3. Italy (ICTP)
4. Myanmar (As Govt of India representative under tripartite agreement for developing research in Yangon University 2005-06 & 2006-07)
5. USA, Texas (North Texas University & Puerto-Rico University) 2008.
6. Invited to China for 1st World Nano Conference (2011).
7. Invited to South Korea for ICEC, 2011.
8. Beijing Technology University, Beijing and WCAM-2012 in June 2012

Academic Qualifications:

1988	**Ph.D.** Department of Physics, North-Eastern Hill University, Shillong. **(Worked at IIT Kanpur, Under UGC project)**
1985	**Pre-Ph.D. (Equivalent to M.Phil)** Department of Physics, North-Eastern Hill University, Shillong **(Grade - A).**
1983	**M.Sc**, Bundelkhand University, Jhansi (U.P.) Division- I (64.4%).
1981	**B.Sc**., Bundelkhand University, Jhansi (U.P.) Division- II (58 %).
1979	**Intermediate,** U.P. Board, Allahabad Division-I (68.8 %)
1977	**High School,** U.P. Board, Allahabad Division-I (71.2%) Merit of UP Board

Teaching Experience : 26 years after Ph.D.

Research Publications : **217**- Original contributions in Journals/ conferences
In International/ National Journals-**101**

Symposium / Conference Proceedings-**116**

Edited Books : **02**

Other Contributions
Member of the selection committee for Professors, Associate professors and Assistant Professors in various Universities of Maharashtra, Orissa, Uttar Pradesh and Chhattisgarh.

Member of Board of Studies, Research Degree Committee and SAP advisory Committee in various Universities (Jaipur, Udaypur, Bundelkhand, Mizoram and Assam University)

Ph.D. examiner for more than 30 Universities including Calcutta, Jadavpur, NEHU, Delhi, Punjab University, Himanchal Pradesh, Andhra University, Rani Durgavati, APS Rewa, Allahabad University, etc.

Major Contributions in Establishment of Research & Development Institutes/Facilities:

- **Actively established Institute of Bio-physics & Self Organizing System at NEHU, setup by UGC.**
- **Established various sophisticated instruments at RSIC, NEHU.**
- **Established Institute of Technology, G.G. University in the initial Phase as its first In-charge Director**
- **Established Department of Pure & Applied Physics almost from the beginning as Head and developed Materials Science Facilities as Coordinator FIST from DST.**
- **Established Nodal Computer Centre in Guru Ghasidas University as its Coordinator.**
- **Established Instrumentation Maintenance Facility at Guru Ghasidas University.**

Research Supervision : **Ph.D.** Completed - **Ten**

Registered (Working for Ph.D.) : 07

M.Phil Completed - 24

M.Sc.(Project):- More than 125

One semester project on experimental/ theoretical problems; dissertation evaluated by external experts.

MCA - **One**

Research projects Undertaken

Completed as Principal Investigator	-	04
Completed as Co-Investigator	-	02
Sanctioned & Undergoing	-	05
Under Consideration (Submitted)	-	03

Details of Research Projects Implemented

1. Spectroscopic Investigations of the functional mechanism of Ribosome inactivating protein-Gelonin.
   Council of Scientific & Industrial Research, New Delhi, 1991-95.

2. Vibrational & Dielectric studies of microscopic mechanism of structural phase transitions and role of dopants in some ferroelectric crystals.
   Department of Science & Technology, New Delhi, 1997-2000.

3. Co-investigator of DST project on Lichen eradication from temples of southern India" with Dr. Ajay Singh, National Institute of Conservation of Cultural Property" Lucknow as Principal Investigator.
   1994-96.

4. Effect of doping and irradiation on the structural, dielectric and pyroelectric properties of some ferroelectric materials for IR imaging.
   UFUP Project, Nuclear Science Centre, New Delhi.
   2003-2007.

5. Investigation of ferroelectric relaxor properties of M(A1/3B2/3)O3 (M= Pb, Ba, Sr; A= divalent ions; B=Nb) type materials and their solid solutions.
   UGC MRP, New Delhi, March 2005 - 2008.

6.

7. Rexalor behavior and dielectric relaxation in Bismuth Sodium niobate based nonlead relaxors: Solid solutions with preovskite, columbite and tungsten bronze phases
   UGC Major Research Project (2012)

8. Special Assistance Program (SAP) DRS-I from UGC (Coordinator) -2012-2017

9. FIST, DST 2005-2010) , Coordinator

10. FIST, DST (2012-2017) , Coordinator

11. 10.00 Crore grant from DAE under BRNS proposal for the Establishment of 3 MV Particle Accelerator Based Interdisciplinary Centre in the Department of Pure & Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur (Principle Investigator)

12. Coordinator, Sophisticated Analytical Instruments Facility (SAIF) being established under DST support in the University.

SPECIFIC TRAINING OBTAINED:

- **SERC Fellow at Cultivation of Science with Prof. D. Charkravorty, 1994**
- **INSA-COASTED Fellow at Yakohama, Japan 1992**
- **SERC One month School on Lasers, Dharwad**
- **PDF at IIT, Kanpur**

P.G./ M.PHIL LEVEL COURSES TAUGHT

- Advanced Quantum Mechanics I & II
- Signal analysis & System design
- Laser Spectroscopy
- Group theory & Molecular Physics
- Solid State Physics/ Condensed Matter Physics
- Molecular Biophysics
- Bio-spectroscopy
- Bio-instrumentation
- Quantum chemistry
- Numerical analysis & computer applications
- Physics of semi conducting Devices
- Atomic & Molecular Physics
- Fiber Optics & Optical Communication
- Bio-statistics
- Java for web applications.
- Material Science

Experimental Techniques (Trained & Used)

- FT-IR and Laser Raman Spectroscopy
- X-ray diffraction, SEM & TEM, EDAX
- Dielectric measurement techniques
- Impedance Spectroscopy
- Isolation and characterization techniques for proteins
- Single photon detection (PIAS) from in vivo systems
- Resonance Raman spectroscopy
- Nuclear Magnetic Resonance
- Swift Heavy ion beam irradiation
- Network analyzer (dielectric measurements at microwave)
- Atomic Force Microscopy
- Electronic Spectroscopy
- Single Crystal growth using slow evaporation & Melt
- X-ray crystallography
- Photolithography
- Low and high temperature electrical conductivity under gas environments

- Differential Scanning calorimetery
- Thin films through Vacuum evaporation, Sol-Gel, Dip Coating and PLD
- Synthesis of nano structures through various chemical routes.
- IBA Analysis Techniques (RBS, PIXE)
- Computational / simulation tools such as Material Studio, Gaussian, VASP, ZSimpwin, SRIM

SOFTWARE TRAINING

Experience in software development using C, C++, FORTRAN. Using software packages like P-spice, Mathematica, Cache-4/ Hyperchem for molecular design ArgusLab molecular orbital calculation using semi-empirical, ab-initio, density functional and molecular mechanics energy calculation, geometry optimization of Large organic molecules using quantum calculation methods like CNDO, MNDO, ZINDO, PM3, AM1, etc. MatLab for DSP work, multivariate analysis, correlation coefficient, ZSimpwin , POWD, Origin, etc.

CURRENT RESEARCH COLLABORATIONS

Central Glass & Ceramic Research Institute, Kolkata (Dr. Amar Nath Sen, Senior Sensor Hub)

Inter University Accelerator Centre, New Delhi
(With Dr. Kanjilal on SHI irradiation under UFUP project)

Bose Institute, Kolkata
(With Dr. T.P. Sinha on semiconductor sensors based on stanates ceramics)

Variable Energy Cyclotron centre, Kolkata (Dr. S.K. Bandhopadhyay)

Disha Institute of Management & technology, Raipur (Dr. Verma)

Member of the Professional Bodies

New York Academy of Science- Fellow

Fellow of American Nano Society

Indian Association of Physics Teachers
Life Member

Indian Science Congress-Member

Ferroelectrics & Dielectric society of India
- Member National Advisory Committee

International Academy of Physical Sciences- Life Member & Secretary (from 2004)

National Laser Society- Life Member

Material research Society of India- Life Member

Honors and Awards

Felicitated in NSFD-XVII at ITER, Bhuvaneshwar for significant contribution in the field of ferroelectric & Dielectrics (Dec. 17, 2012)

Fellow of American Nano Society (Full Member)

Fellow of International Academy of Physical Sciences

Regional Editor- International Journal of Applied Sciences, Engineering & Technology
Published by Maxwell Science Publications.

Executive Editor- Chhattisgarh J. Science & technology) A Joint publication of GGV and CCOST)
Editor- Focus- University NEWS

Indian Expert for Research Assistance to Myanmar, Selected by MHRD through EDCIL under the tripartite agreement between Govt. of India, Govt. of Myanmar.

INSA-Costed Visiting Fellowship (1992).

SERC visiting fellowship (1995-96).

Included in "**Marquais World who is who**" 15th, 16th & 17th Edition.

Member , Board of Directors for research, ABI, USA.

Ph.D. Thesis was selected as one of the six best research work in solid state physics at National Level in 1987 (Invited for presentation in DAE, BARC, Mumbai).

National Merit Scholarship (1977-83)
Department of Secondary Education, Govt. of Uttar Pradesh

S.N. Satyamurtiy awards Lecture (1993), BARC, Mumbai.

Chairman, Technical Sessions in number of International /National Conferences

Delivered Keynote address in a number of Conferences

Member , Jury for Young Scientist award in IAPS,
2001-02, 2002-03, 2003-2004.

General Secretary" Indo-German Friendship Association", Shillong Chapter (1991-93).
Certificate from Rotary Club, Shillong for special services for science.

Reviewer of a number of International Journals including :
1. Material Science & Engineering B- Elsevier
2. Indian J. of Material Science & Engg.
3. J. International Academy of Physical Sc.
4. Physica B
5. Mat. Chem. & Physics.

6. Powder Technology

Current Research Interests:

- Development of Nanostructures on Ferroelectric surfaces using SHI irradiation
- Modeling dye-protein interactions for environmental effect of plastics mocrofibres
- Development of charge compensated electronic ceramic materials for sensors.
- Development of new Lead and Non-Lead based Relexer Ferroelectrics for MLC's.
- Microscopic Mechanism of Structural Phase Transition in ferroelectric single crystals.
- Material characterization for pyrroelectric detector, D-Ram & communicational devices.
- System analysis and filter design.

Member/ Positions in Statutory Bodies of various Universities:

1. Member of Academic Council, NEHU, Shillong.
2. Chairman, Board of Studies in Physics & Electronics, GG University
3. Member, Planning & Evaluation Board,
4. Governor Nominee in J.N. University for Science & Technology, Raipur
5. Member, Central Board of Studies of Physics in M.P. & Chattisgarh.
6. Selected as Expert in Quantum Electronics to assist R & D in Myanmar under the Tripartite agreement between Govt. of India and Govt. of Myanmar
7. Founder Director, Institute of Technology, GG University, Bilaspur.
8. In-charge- Planning & Development, G.G. University, Bilaspur.
9. External Expert for Research Committee in Physics, Bundelkhand University, Jhansi.
10. UGC expert for SAP program in Department of Physics, Udaipur University, Rajasthan.
11. UGC expert for SAP program in Department of Physics, Central University, Mizoram.
12. Campus Coordinator and representative for United States International Programs.

Contribution to the University Administration (Last Five Years):

Officer on Special Duty- Guru Ghasidas Vishwavidyalaya

Worked as

- **Convener,** IX plan Draft preparation of the University & Evaluation report of VIII plan.
- **Chairman**, Steering Committee, University Examinations 2002-2003.
  (Responsible for University examinations 2003-2004 including central valuation).
  Chairman, Central Purchase Committee, Guru Ghasidas University, 2007 onwards
  Chairman, Draft Committee, For drafting all statues, ordinances, regulations and rules of the Guru Ghasidas Central University.

- Member of Central Flying Squad, 2001, 2002, 2003, 2004, 2005, 2006, 2007
- **Coordinator,** Steering committee for NAAC accreditation, Guru Ghasidas University.
- **Coordinator,** Nodal Computer Centre, G.G. University (from 2001, Centre is providing training to PG students of five to six departments).
- Member, Proctorial Board, G.G. University
- Formulated a number of developmental proposals for the university including

The establishing USIC,

Academic Staff College,

National Law Institute,

UGC-ERNET

Assessment report for Central University Status to GGU.

- Coordinated the activity of project cell
- Coordinator, ERNET-UGC scheme
- Chairman, Committee for Internet
- Chairman, UFM Committee
- Member, College Complaint Redresser Committee

DEVELOPMENT OF ACADEMIC CURRICULLA:

As chairman, Board of Studies in Physics & Electronics

M.Sc. (Phys) Prev & Final- Annual stream

M.Sc. (Phys) I-IVth Semester - UTD

M.Sc. (Electronics) I-IV sem - UTD

B.Sc. (Electronics) Ist/ 2nd/ / IIIrd Year

5 Years integrated UG/PG Program in Physics and Electronics
M.Phil Program in Physics

As member of central board of studies, M.P. Universities/ CG Universities

B.Sc. (Physics) All three years

Vocational Courses

Still photography

Optical Instrumentation

Diploma in Instrumentation & computer Applications

Seminars / Conferences Organized

1. National Symposium on Advanced Electronic Materials & Information Technology (NSAEM-

2003)
Convener, April 18-20, 2003. Sponsored by CCOST, UGC & SECL.

2. **Coordinator**, NSC Acquaintance Program, July 26, 2003.
Sponsored by Nuclear Science Centre, New Delhi.

3. **Co-Coordinator**, 12th M.P. Young Science Congress, Held at GGU, Bilaspur.

4. **Co-coordinator**, 2nd conference of International Academy of physical Sciences, Held at GGU, Bilaspur

5. **Coordinator**, Regional workshop on mission identification, Organized jointly by Gramodaya University, Chitrakoot and GG University.

6. Chairman, Local Organising Committee, National Convention of IAPT.

7. Member, Organising Committee, DAE Symposium 2000.

8. Member, Organising Committee, CMDAYS 2000.

13. Organised two "one month certificate course in Computer applications" successfully respectively to University/ college teachers & University/ Bank Employees.
14. National Conference on Advances in Electronic Materials & Devices, **Chairman**, Organising Committee, Department of Physics, G.G. University, Bilaspur, March 5-6, 2006.
15. National Conference on Advances in Electronic Materials & Devices, **Chairman**, Organising Committee, Department of Physics, G.G. University, Bilaspur, March 25-26, 2007.
16. Seminar on Excellence in Higher Education: Emerging Issues and Challenges in context of Chattisgarh, Oct. 5, 2005
Coordinator
17. Workshop on "Laboratory Maintenance & Electronic Instrumentation", Feb 26-March,3, 2007, Coordinator.
18. **Organizing Secretary**- Silver Jubilee International Conference" X^{th} Conference of International Academy of Physical Sciences entitled 'Interdisciplinary Approaches in Physical sciences-Growing Trends and Recent Advances", Jan. 12-14, 2008.

19. **Convener**- 6^{th} Chhattisgarh Young scientist congress ' organized by Guru Ghasidas university, Bilaspur, Feb.28-March 1, 2008.

20. **Chairman,** 3^{rd} National Conference on " Advances in Electronic Materials and Devices-AEMD-07, Organized by Department of Pure & Applied Physics, Guru Ghasidas University, Bilaspur, March 25-26, 2007.

21. **Coordinator,** Workshop on "Enhancing quality in Higher Education: Role of Leadership and Ethics, 26^{th} July, 2006 (inaugurated by H.E. the governor of Chhattisgarh, Sri K.M. Seth**.**

22. **Convener,** One week program under the national program of 'Appreciating Physics in everyday life, July, 8-16, 2007.

23. **Coordinator**, Workshop on Laboratory maintenance & Electronic Instrumentation, Organized by Instrumentation Maintenance centre, Department of Pure & applied Physics, Guru Ghasidas University, Bilaspur in technical collaboration with USIC, Mumbai University, Feb.26 – March 3, 2007.

24. **Convener**, Workshop on Research methodology in Sciences and Identification of thrust areas, Oct. 2007. Organized by Department of Pure & Applied Physics, Guru Ghasidas University, Bilaspur.

25. **Convener,** National Workshop on Low Energy Accelerators and Their Applications to Research and Industry, March 12-13, 2010 Organized by Department of Pure & Applied Physics, Guru Ghasidas University, Bilaspur.

26. Convener, XVI-National Seminar on Ferroelectrics & Dielectrics, Dec. 2-4, 2010, Department of Pure & Applied Physics, G.G. Vishwavidyalaya, Bilaspur

Represented the University at important forums

1. Represented the University on behalf of Vice-chancellor in the state level committee for regularization of daily basis employees in the University at Department of Higher education, Ministry of education, Govt. of Chhattisgarh, Raipur.

2. Attended the meeting of Hindi Granth Academy on behalf of Vice-chancellor, Guru Ghasidas University, Bilaspur.

3. Member of the committee constituted by DSIR, New Delhi for inspecting the R & D facility of BALCO, Korba, and Chhattisgarh for recognition of BALCO as DSIR recognized R & D laboratory.

4. Represented Vice-chancellor in "Program on Educational Leadership for Vie-chancellors" as Vice-chancellor's representative, Nov. 24-27, 2008, organized by Administrative Staff College of India, Hyderabad.

1. **Editor of "Focus**" – University News Letter (Published four issues during the period including the special Silver Jubilee issue).

2. **Chief Advisor**- Silver Jubilee Souvenir published on the occasion of Silver Jubilee of the University.

3. **Coordinator-** Apex Committee for Commemorating Silver Jubilee of the University. (Played pivotal role in organizing 21 conferences, National Lecture series and other programs during the silver Jubilee year).

4. **Executive Editor** of " Chhattisgarh Journal of Science & Technology" jointly published by Chhattisgarh Council of Science & Technology and Guru Ghasidas University, Bilaspur.

5. **Member of the Advisory Board** for National Conference on "Horizons of Electrolytic, Electronic and Photonic Material Physics" organized by Sri Shankaracharya College of Engineering, Bhilai, Oct. 26-27, 2007.

6. **Member of the Local Organizing Committee** of "International Conference on Advances in Nanotechnology" ICANET-2008, organized by MATS University, Raipur, Nov. 06-08, 2008.

7. **Member of the National Advisory Board** for "National Seminar on Ferroelectric and Dielectrics-NSFD-XV" organized by Thapar Institute of Technology, Patiala, Nov. 6-8, 2008.

8. Nominated as **IUAC Expert Member** in the selection committee for Research scholars in the Universities under UFR scheme of IUAC, New Delhi, 2008.

9. Nominated as expert for the selection of Faulty at Sri Shankaracharya Institute of Professional Management & Technology, Raipur.

10. Appointed as expert for the selection of Professors, Readers and lecturers in Physics in Dr. B.A.Ambedkar University, Aurangabad, Maharashtra.

11. Appointed as expert for the selection of Professors, Readers and lecturers in Physics in Bundelkhand University, Jhansi, Uttar Pradesh.

Important Assignments in the University

1. Nominated as member of the Monitoring Committee for the quality of B.Ed colleges under G.G. University, Bilaspur

2. **Convener** of the Committee appointed for the regularization of daily basis employees working in the University from last ten years (As per the state government circular).

3. Invited as faculty for "Short Term course on Recent Trends in Material science" Organized by Department of physics, National Institute of Technology, Raipur, Dec.27-31, 2008.

4. **Member of the Advisory Board** for National Conference on "Recent Advances in Nanoscience and nanotechnology" organized by, Condensed Matter Physics Research laboratory/ Department of applied Physics, Sri Shankaracharya College of Engineering, Bhilai, Jan. 12-13, 2009.

5. **Chairman, Purchase Committee,** Guru Ghasidas University, Bilaspur.

6. **Chairman, Equivalence Committee** for deciding the equivalence **of various examinations conducted** by Universities/boards.

7. **Convener** of the committee for deciding the serious diseases for reimbursement of medical bills of employees, officers and teachers of the University.

8. **Convener** of the Equivalence committee for deciding the equivalence of incomplete courses passed from autonomous colleges.

9. Represented Vice-chancellor in "Program on Educational Leadership for Vice-chancellors" as Vice-chancellor's representative, Nov. 24-27, 2008, organized by Administrative Staff College of India, Hyderabad.

10. **Member of the Committee** for the sanctioning of unassigned Grant to teachers to participate in conferences/ seminars, etc.

11. Invited to Deliver an Invited Talk in the "XXXth National Conference on Electron Microcopy and Allied fields, EMSINC-2009, being organized by Department of Physics, Bundelkhand University, Jhansi, Jan. 17-19, 2009.

12. **Member of the committee** for reviewing the courses offered under Distance Mode of the University.

13. **Represented the Vice-chancellor** in "Vice-Chancellor's meeting of new Central Universities" held at Sagar University for chalking out the programs for academics in new central universities.

14. Member of the committee for drafting common ordinances for new central universities.

15. Represented the Vice-Chancellor for Central University Budget meeting held at UGC.

RESEARCH WORK HIGHLIGHTS:

Development of Nano-particles and nano structures:

From last couple of years, our group is actively engaged in identifying and understanding the processes involved in the formation of nano-structures on polar surfaces especially those on ferroelectric crystalline surfaces. We have successfully demonstrated that polar cleavage surfaces of TGS when doped with suitable dopant and irradiated with swift heavy ion beams show regular nano structures that can be controlled by adjusting the doping concentration and ion beam fluence. The regular arrays of nano size domains are shown on various TGS crystals using atomic force microscopy. Theoretical models based on the emergence of internal electric field in the bulk crystal leading to piezoelectric forces due to the motion of the domain walls is shown to be responsible for such structures.

We are also developing semiconductor nano-particles using soft chemical routes that are cheaper and easier and successfully developed nano-particles of ZnO2, SnO2 and their solid solutions. These as synthesized nano systems are characterized using structural, optical and electrical techniques.

STRUCTURAL PHASE TRANSITIONS IN FERROELECTRICS

For last 20 years, we have been involved in investigating the mechanism of SPT's in various ferroelectric single crystals viz. Ammonium sulphate family, Potassium di-hydrogen phosphate family and Tri-glycine sulphate family. We have established a new kind of ferroelectric phase transition named as molecular distortion type in these crystals using Polarized Laser Raman, FT-IR, and XRD techniques. Single crystal. I have worked in the Laser Raman Laboratory of Professor H.D. Bist at IIT Kanpur, maintained and was Incharge of Laser Raman laboratory at North-Eastern Hill University, Shillong during the absence of professor A.L. Verma and established, IR, Mass spectrometer, UV-VIS, NMR and other facilities at RSIC, Shillong during its establishment through DST as a faculty member In-charge of these facilities. I have also worked at Jadavpur University, Professor D. Chakravorty laboratory as SERC fellow for three months and at Yokohama, Japan as INSA-Coasted fellow. Presently, we are working on the SWIFT heavy ion induced effects on single crystals of TGS using NSC facility and recently observed some interesting non-equilibrium states in crystals leading to low frequency dielectric dispersion. We are also exploring the high temperature phase transition in mixed KDP-ADP crystals using dielectric and FT-IR techniques.

We have been growing a number of ferroelectric single crystals all through our studies and developed a number of PG level experiments using these crystals.

STRUCTURAL CHANGES IN AZO-DYES AND DYE-PROTEIN INTERACTION:

We have investigated a number of aryl azo dyes that are important in our food chain and probe their molecular structure through resonance Raman, FT-IR and electronic spectroscopy. The tautomeric equilibrium of these chromophores were deduced and their molecular structural changes were correlated with there binding capacity with various protein such albumin. Gelonin, etc. The work has special significance especially as the new form of contamination is recently being detected from plastic materials

that are considered non-degradable that lead to coloring agent in our food chain through marine food produce and their binding with HAS may lead to serious metabolic disorders.

DEVELOPMENT AND CHARACTERIZATION OF ELECTRONIC CERAMIC MATERIALS.

From last seven to eight years, we have also studied a number of ceramic materials for their sensor properties, relaxor behaviour and thin film characteristics for application in communication industries, computer storage device materials and multilayer capacitor. These include, the preparation of new types of sensor material that are stanate based, BST-BZT films for RAM devices and new lead based relaxors such as PBN. Recently, ***we have discovered a new relaxor material (PBN) that is already accepted for publication in J. Applied Physics (One of the top among five most cited journals in applied Physics.***

BIO-PTOTON EMISSION AS A PROBE FOR BIOLOGICAL STRUCTURE:

In the institute of Self-Organization Systems & Biophysics, we established the first single photon detector (PIAS, Hamamatsu) to characterize the ultraweak photon emission from various plant tissues and investigated its properties. We have shown that the emitted photons have information about the organizational structure of biological organism and could be characterized as a probe for probing the bi-state of the system. A new technique using the emission of ultra weak photons emission has been developed by us for the eradication of lichens from historical monuments and studied their use in the application of biocides in agricultural crops.

Delivered more than 50 invited talks in several Universities and Institutions of National Importance (10 abroad)

List of Research Publications
of
Dr. P. K. Bajpai

1. Phase transition and Temperature dependence of the Molecular distortion of SO_4^{-2} modes in Ammonium sulphate.
Y.S.Jain, **P.K. Bajpai**, R. Bhattarjee & D. Chowdhury.
J.Phys.C: Solid State Physics,**19**, 3789 (1986). (I.F. = 2.546)

2. Phenomenological theory of phase transition in improper ferroelectrics Ammonium Sulphate.
P.K. Bajpai, P. N. Ram, Y. S. Jain,
J.Phys.C: Solid State Physics**, 20**, 5577 (1987) (I.F. = 2.546)

3. Structural phase transition in Ammonium sulphate: Dynamics of Deuterated Ammonium ions and Heat of Transition
P.K. Bajpai, Y. S. Jain,
J.Phys.C: Solid State Physics, **20**, 387 (1987). (I.F. = 2.546)

4. Phenomenological theory of phase transition in improper ferroelectric ammonium sulphate.
P.K. Bajpai, P. N. Ram, Y. S. Jain,
Phase transition **69**, 56 (1987) (I.F. = 1.006)

5. Structural phase transition in improper ferroelectric ammonium sulphate.
P.K. Bajpai.
Proc. S.S.P.S. **30A**, 238-247 (1987)

6. Ferroelectric phase transition in (NH4)2BeF4: possibility of molecular distortion type transition.
P.K. Bajpai.
Physica Status Solidi (b) **159**b, 101(1989). (I.F. = 1.316)

7. Infrared and Raman studies of distortive structural phase transition.
Y. S. Jain and **P.K. Bajpai**
Vibrational Spectra and Structure **17B**, 17-35 (1989). (Edt. J.R. Durig)

8. Temperature dependence of line width of SO4-2 modes in Raman spectra of ammonium sulphate.
Y. S. Jain, **P.K. Bajpai** &H. D. ist.
J. Raman Spectrose. **21**, 327 (1990). (I.F.-3.09)

9. Pseudo-spin phonon coupling and Raman spectra of SO_4^{-2} modes in ammonium sulphate.
P.K. Bajpai, Y. S. Jain
Advances in statistical physics of liquids & solids edits K. N. Pathak & S. Prakash, Wiley Eastern Publications, New Delhi.

10. Ultra weak photon emission from seeds: A signal of biological order.
R. P. Bajpai, **P.K. Bajpai** & D.Roy.
J. Bioluminescence & Chemiluminescence's, **6**,227,(1991). (I.F. 1.731)

11. A new techanics for investigating the effect of biocides in Lichens.
R. P. Bajpai, **P.K. Bajpai** & G. P. Sinha
International.J. Biodeterioration & Biodegradation **30**, 1-8 (1992) (I.F. 2.07)

12. Biophotonic emission as a positional probe of organizational structure.
P.K. Bajpai. and R. P. Bajpai
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13. Light induced Biophotonic emission from plant tissues.

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39. Digital filter design using MATLAB
Varsha Sao, Nivedita Singh, Swati Biswas & P.K. Bajpai
NSAEM-2003, G. G. University, Bilaspur, PP-22, 18-20, April, 2003.

40. Dielectric dispersion doped TGS crystals
D.K. Shah, **P.K. Bajpai** & Ravi Kumar
NSAEM-2003, G. G. University, Bilaspur, PP-23, 18-20, April, 2003.

42. Synthesis and spectroscopic characterization of some A2BO4 systems.
Usha Soni**, P.K. Bajpai** & R.N.P. Chowdhury
NSAEM-2003, G. G. University, Bilaspur, 18-20, April, 2003.

43. A study of network strategies and role of physical layer in building corporate network
R.N. Patra & **P.K. Bajpai**
NSAEM-2003, G. G. University, Bilaspur, PP-26, 18-20, April, 2003.

44. Preparation, structural and dielectric studies on yttrium doped stanates
Kuldeep Ratre, Mukul Pastor, D.D. Gupta & **P.K. Bajpai**
NSAEM-2003, G. G. University, Bilaspur, 18-20, April, 2003.

45. Preparation, structural characterization and dielectric studies of Sm3+ and Y3+ doped SrSnO3
Mukul Pastor, Kuldeep ratre, **P.K. Bajpai** and T.P. Sinha
CMDAYS2003, Jadavpur University, Kolkata 27-29 Aug. 2003.

46. Molecular orientational studies of glycine mode in TGS
P.K. Bajpai
CMDAYS-2003, Jadavpur University, Kolkata 27-29 Aug. 2003.

47. Investigation of dielectric behaviour of valine doped TGS crystals: effect of doping on mean field parameters.
P.K. Bajpai, N.K. Chandan & Deepak Shah
4th Asian Meeting on Ferroelectricity (AMF-4), December 12-15, 2003. Indian Institute of Science, Bangalore.

48. Study of yttirium and samarium substituted stanates: New materials for semiconductor sensor

applications.
Mukul Pastor, Kuldeep ratre, **P.K. Bajpai**, & R.N.P. Chaudhury
4th Asian Meeting on Ferroelectricity (AMF-4), December 12-15, 2003. Indian Institute of Science, Bangalore.

49. Raman and FT-IR Investigation on some ABWO4 type mixed alkali tungustates.
Usha Soni, **P.K. Bajpai**, & R.N.P. Chaudhury
4th Asian Meeting on Ferroelectricity (AMF-4), December 12-15, 2003. Indian Institute of Science, Bangalore.

50. Structural characterization and electrical properties of some Pb(A1/3Nb2/3)O3 ceramics.
Mukul Pastor, **P.K. Bajpai**, & R.N.P. Chaudhury
4th Asian Meeting on Ferroelectricity (AMF-4), December 12-15, 2003. Indian Institute of Science, Bangalore.

51. SHI irradiation induced changes in the frequency dependent dielectric response in TGS.
P.K. Bajpai, Deepak Shah & Ravi Kumar
National Seminar on Recent Trends in Material science.
March 29-30, 2004, Bhagalpur University, Bihar.

52. Development of Pyro electric materials for IR imaging : Effect of doping and swift heavy ion beam irradiation on TGS crystals
P.K. Bajpai (Invited Talk)
National Seminar on Solar Terrestrial Physics Nov. 30- Dec. 01, 2004

53. Developing Nano structures on polar surfaces using swift heavy ion beams
P.K. Bajpai (Invited Talk)
National Conference on Physics of Nano Structured functional material. Department 0of Physics, Bhilai Institute of Technology, 16-17 MARCH, 2007.

54. Nanostructured materials, synthesis, characterization and applications-a Review
P.K. Bajpai, S.N. Jajodia .
National Conference on Physics of Nano Structured functional material. Department 0of Physics, Bhilai Institute of Technology, 16-17 MARCH, 2007.

55. Nano science & Nano technology : Present status and Future directions.
National Seminar on Technology for Sustainable Development – Perspective & Strategies.
P.K. Bajpai (Invited Talk)
6-7 January,2007. Institute of Technology ,Guru Ghasidas University, Bilaspur.

56. Study of the effect of Swift Heavy Ion Induced Modification in the Optical, Structural and Ferroelectric Properties of some Ferroelectric Properties Crystals
Work Shop On Functional Oxide Materials 26-26Sep., 2006
Inter University Accelerator Center, New Delhi

57. Investigation of dielectric behaviour of valine doped TGS crystals: Effect of doping on the mean field parameters
P.K. Bajpai & Deepak K. Shah,
National Conference on Advances in Electronic Materials & Devices, March 5-6, 2006, G.G. University, Bilaspur.

58. Swift heavy ion beam induced modification on the dielectric behaviour of pure & doped TGS crystals.
P.K. Bajpai, Deepak K,. Shah & Ravi Kumar
Indo-German Workshop on Synthesis and modification of nanostructured materials by energetic ion beams Feb. 20-24, 2005, Jointly organized by NSC, New Delhi and Universitat Stuttgart.

59. Microstructural, dielectric and electrical study of mixed phase of Pb(Ca1/3Nb2/3)O3.
Mukul Pastor, P.K. Bajpai and R.N.P. Chowdhury
National Conference on Advances in Electronic Materials & Devices, March 5-6, 2006, G.G. University, Bilaspur.

60. Synthesis, characterization and dielectric study of some samarium doped strontium statnates
Mukul Pastor, Kuldeep Ratre & P.K. Bajpai
National Conference on Advances in Electronic Materials & Devices, March 5-6, 2006, G.G. University, Bilaspur.

61. Studies of Pure and Mn doped BST and BZT bulk ceramics for DRAM applications
P.K. Bajpai and C.R.K. Mohan
National Conference on Advances in Electronic Materials & Devices, March 5-6, 2006, G.G. University, Bilaspur.

62. Synthesis, Characterization and electrical impedance study of mixed phase of Pb(Sr1/3Nb2/3)O3.
Mukul Pastor, P.K. Bajpai and R.N.P. Chowdhury
National Conference on Advances in Electronic Materials & Devices, March 5-6, 2006, G.G. University, Bilaspur.

63. X-ray structure analysis of Rb3H(SO4)2 single crystals: Nature of H-bonds
T.M. Win, K.L. Thwe, P. Kaung, N. Gautham, P.K. Bajpai
National Conference on Advances in Electronic Materials & Devices,PP. 54, March 5-6, 2006, G.G. University, Bilaspur.

64. X-ray structural investigation onf (NH4)3H(SO4)2 single crystals: Nature of H-bonds
T.M. Win, K.L. Thwe, P. Kaung, N. Gautham, P.K. Bajpai
National Conference on Advances in Electronic Materials & Devices,PP. 54, March 5-6, 2006, G.G. University, Bilaspur.

65. X-ray diffraction structure analysis of (RbxNH41-x)3H(SO4)2 single crystals: Nature of H-bonds
T.M. Win, K.L. Thwe, P. Kaung, N. Gautham, P.K. Bajpai
National Conference on Advances in Electronic Materials & Devices,PP. 54, March 5-6, 2006, G.G. University, Bilaspur.

66. Study for optimization of different physical links implemented in most corporate networks: Acase study
R.N. Patra & P.K. Bajpai
National Conference on Advances in Electronic Materials & Devices,PP. 54, March 5-6, 2006, G.G. University, Bilaspur.

67. Emerging threats for corporate security networks
R.N. Patra and P.K. Bajpai
National Conference on Advances in Electronic Materials & Devices,PP. 54, March 5-6, 2006, G.G. University, Bilaspur.

68. Effect of Swift heavy ion beam irradiation on the dielectric response of pure and cobalt doped TGS crystals.
P.K. Bajpai, C.R.K. Mohan, Deepak Shah & Ravi Kumar
National Seminar on ferroelectrics & Dielectrics-XIV, Dec. 18-22, 2006, IIT Kharagpur

69. Preparation, phase morphology and electrical characterization of BaxSr1-xTiO3 (x=0.75, 0.80, 0.85, 0.90) bulk ceramics.
C.R.K. Mohan and P. K. Bajpai
National Seminar on ferroelectrics & Dielectrics-XIV, Dec. 18-22, 2006, IIT Kharagpur

70. SHI irradiation induced nano scale surface micro reliefs in the polar (010) cleavage of pure and doped TGS crystals.
P.K. Bajpai, Deepak Shah & Ravi Kumar
National Seminar on ferroelectrics & Dielectrics-XIV, Dec. 18-22, 2006, IIT Kharagpur

71. Preparation, structural and dielectric study of some samarium doped strontium statnates
Kuldeep Ratre and P.K. Bajpai
National Seminar on ferroelectrics & Dielectrics-XIV, Dec. 18-22, 2006, IIT Kharagpur

72. Swift heavy ion beam as a tool to engineer material properties in ferroelectrics
P.K. Bajpai (Invited Talk)
National Seminar on ferroelectrics & Dielectrics-XIV, Dec. 18-22, 2006, IIT Kharagpur

73. Synthesis Characterization and electrical study of $Pb(Cd_{1/3}Nb_{2/3})O_3$ Relaxor .
Mukul Pastor, P.K. Bajpai and R.N.P. Chowdhury
National Conference on Advances in Electronic Materials & Devices, March2 5-26, 2007, G.G. University, Bilaspur

74. Synthesis and electrical Characterization of in Situ Polymerized polyvaniline / PVA hydrogel composites
A. Sudheer, P.K.bajpai and P. Pradeep
National Conference on Advances in Electronic Materials & Devices, March2 5-26, 2007, G.G. University, Bilaspur

75. Synthesis Characterization and dielectric studies of $MgNb_2O_6$ powder in columbite like phase.'
K.N. Singh**,** Namita Brahme and P.K. Bajpai
National Conference on Advances in Electronic Materials & Devices, March2 5-26, 2007, G.G. University, Bilaspur

76. Synthesis Characterization and dielectric studies of $BaNb_2O_6$ powder in columbite like phase.'
K.N. Singh**,** P.K. Bajpai
National Conference on Advances in Electronic Materials & Devices, March2 5-26, 2007, G.G. University, Bilaspur

77. Preparation , Phase Morphology and electrical characterization of $BaZr_xTi_{1-x}O_3$ bulk ceramics (X= .05,0.1&0.15)
C.R.K. Mohan and P. K. Bajpai
National Conference on Advances in Electronic Materials & Devices, March2 5-26, 2007, G.G. University, Bilaspur

78. Dielectric relaxation in SHI irradiated doped TGS crystal : Domain wall relaxation
P.K. Bajpai, Deepak Shah & Ravi Kumar
National Conference on Advances in Electronic Materials & Devices, March2 5-26, 2007, G.G. University, Bilaspur

79. Impedance Analysis of $Pb(Mg_{1/3}Nb_{2/3})O_3$
Mukul Pastor, P.K. Bajpai & R.N.P. Chowdhury
National Conference on Advances in Electronic Materials & Devices, March2 5-26, 2007, G.G. University, Bilaspur

80. Effect of Rare earth doping on the electrical properties of strontium satanic: semiconductor sensors
Kuldeep Ratre , Mukul Pastor & P.K. Bajpai
National Conference on Advances in Electronic Materials & Devices, March2 5-26, 2007, G.G. University, Bilaspur

81. Effect of swift heavy ion beam irradiation on the dielectric response of $Ba_x Sr_{1-x}TiO_3$ (BST) Ceramics
C.R.K. Mohan and P. K. Bajpai
National Conference on Advances in Electronic Materials & Devices, March2 5-26, 2007, G.G. University, Bilaspur.

82. Studies of Pure and Mn doped BZT bulk ceramics for DRAM applications(X= 0.05,0.1&0.15)
C.R.K.mohan, Shiv Shanker Pandey , B. Nag Bhargavi & P.K. Bajpai
National Conference on Advances in Electronic Materials & Devices, March2 5-26, 2007, G.G. University, Bilaspur.

83. Swift Heavy Ion Beam Induced Modifications in Ferroelectric Single crystals and in Ceramics
P.K. Bajpai, C.R.K. Mohan, Deepak Shah V. Shiv Kumar & Ravi Kumar
In" Annual Report of IUAC", New Delhi, 2006-07.

84. Controlled nanostructures on polar ferroelectric surfaces using swift heavy ion beam.
P.K. Bajpai, Ravi Kumar
In "International conference on advances in nano-technology", Nov. 06-08, 2008, MATS University, Raipur.

85. Swift Heavy ion beam induced modifications in $Ba_{0.75}Sr_{0.25}TiO_3$ ceramics
P.K. Bajpai and Ravi Kumar
In" 20th International conference on the Application of Accelerators in Research & Industry-CAARI-2008, Fort Worth, Texas, USA, Aug.10-15, 2008. Full length paper is published in Amer. Institute of Physics (AIP J. Conf. Proceedings).

86. Swift heavy ion modified behavior of pure and doped TGS crystals.
P.K. Bajpai
In "20th International Conference on the Application of Accelerators in Research & Industry, CAARI-2008, Fort Worth, Texas, USA, Aug. 10-15, 2008. Full length paper is published in Amer. Institute of Physics (AIP J. Conf. Proceedings).

87. Synthesis, Dielectric and Electrical characterization of SnO_2 Nano-particle prepared by Co-precipitation Method

Proceedings of the 54th DAE Solid State Physics Symposium, M.S. University, Baroda (2009)

Raman Mishra and P.K. Bajpai

88. Structural, Dielectric and Impedance Characterization of $Pb(Ba_{1/3}Nb_{2/3})O_3$
Proceedings of the 54th DAE Solid State Physics Symposium M.S. University, Baroda (2009)
Raman Mishra and P.K. Bajpai
Mukul Pastor, K.N. Singh, P.K. Bajpai , R.N. P. Chowdhury

89. Investigation of Dielectric dispersion and relaxor behavior in $BaZr_xTi_{1-x}O_3$.
P.K. Bajpai and C.R.K. Mohan
In XII Conference of International Academy of Physical Sc. 21-23 February, Allahabad University, Allahabad.

90. Synthesis, structural, dielectric and electrical impedance study of $SrNb_2O_6$ phase pure columbite material.
K.N. Singh and P.K. Bajpai
In XII Conference of International Academy of Physical Sc. 21-23 February, Allahabad University, Allahabad.

91. Investigation of Dielectric dispersion and relaxor behavior in $BaZr_xTi_{1-x}O_3$
P.K. Bajpai and C.R.K. Mohan
In: International Conference on Electro ceramics, LC373, Dec 13-17, Delhi University, (2009)

92. Recent Advances in Surface and Domain Structures of Ferroelectric Crystals Probed with Atomic Force Microscopic Probes
P.K. Bajpai
Invited talk in" National Conference of Electron Microscopic Society of India" Bundelkhand University, Jhansi, Jan17-20, 2009.

93. Synthesis, structural, dielectric and electrical impedance study of $SrNb_2O_6$ phase pure columbite material
K.N. Singh and P.K. Bajpai
In: International Conference on Electro ceramics, LC372, Dec 13-17, Delhi University, (2009)

94. Swift Heavy Ion Beam as a Tool to Control Ferroelectric Material Modification in TGS Crystals.
P.K. Bajpai, Deepak Shah, Ashok Kumar and R.S. Katiyar
In" National Conference on Condensed Matter Physics" organized by Department of Physics, NEHU, Shillong, March21-23, 2010

95. Effect of Rare-Earth Doping on the Structural, Dielectric and Impedance Properties of SrSnO3.
P.K. Bajpai, Rakes Kurre and K. Ratre
In" National Conference on Condensed Matter Physics" organized by Department of Physics, NEHU, Shillong, March21-23, 2010

96. Recent Advances in AC Impedance Technique in SOFC Research: A status Review (Invited)
P.K. Bajpai
In "National Conference on Advances in Materials and Devices for Renewable Energy Sources, Organized by Jaipur Engineering College, Jaipur, 25-27 February (2010).

97. Ion Beam Induced Modification in Ferroelectrics: Controlled Long Range Ordering and Nanostructure Formation on Polar Surfaces
P.K. Bajpai (Invited)
In **National Conference on "Recent Trends in Materials and Devices (RTMD- 2010)" Organized by** Amity Institute of Applied Sciences and Amity School of Engineering & Technology, Amity University, Amity University Campus, Noida (U.P.), 20^{th} to 22^{nd}May, 2010.

98. XRD and FTIR Investigation of $(Na_{(1-x)}K_x)_{0.5}Bi_{0.5}TiO_3$ Solid Solution
K. S. Ojha and P. K. Bajpai
In" XVI-National Seminar on Ferroelectrics & Dielectrics (NSFD-XVI)", Organized by ,
Department of Pure & applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur, India, Dec.2-4, 2010.

99. Structural, dielectric and temperature dependent Raman spectroscopic studies on swift heavy ion beam irradiated TGS crystals
P.K. Bajpai, Deepak Shah and Ravi Kumar, Ashok Kumar and R.S. Katiyar
In" XVI-National Seminar on Ferroelectrics & Dielectrics (NSFD-XVI)", Organized by ,
Department of Pure & applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur, India, Dec.2-4, 2010.

100. Dielectric and Impedance Spectroscopic studies on diffuse phase transitions in Bismuth Sodium Titanate
K. S. Ojha, K. N. Singh and P. K. Bajpai

In" XVI-National Seminar on Ferroelectrics & Dielectrics (NSFD-XVI)", Organized by , Department of Pure & applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur, India, Dec.2-4, 2010.

101. Dielectric relaxation, electrical conductivity and impedance response of $BaNb_2O_6$ synthesized by sol-gel and solid state reaction route: A comparative study
K.N. Singh, B.R. Chauhan and P.K. Bajpai
In" XVI-National Seminar on Ferroelectrics & Dielectrics (NSFD-XVI)", Organized by , Department of Pure & applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur, India, Dec.2-4, 2010.

102. Ground Based Scatterometer Measurement of Dielectric Constant of Soil for Remote Sensing Applications
Ajay Dubey, P.K. Bajpai, D. Singh, V.K. Dubey
In" XVI-National Seminar on Ferroelectrics & Dielectrics (NSFD-XVI)", Organized by , Department of Pure & applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur, India, Dec.2-4, 2010.

103. Synthesis and Dielectric study of NBT- BSN: A lead free relaxor materials
Nitin Kumar, K.N. Singh and P.K. Bajpai
In" XVI-National Seminar on Ferroelectrics & Dielectrics (NSFD-XVI)", Organized by , Department of Pure & applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur, India, Dec.2-4, 2010.

104. Vibrational Spectroscopic Studies of Some double Alakli Tungstates belonging to Orthorhombic Class at Room Temperature
Usha sharaff, P.K. Bajpai, R.N.P.Choudhary
In" XVI-National Seminar on Ferroelectrics & Dielectrics (NSFD-XVI)", Organized by , Department of Pure & applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur, India, Dec.2-4, 2010.

105. Synthesis, Characterization and Applications of olymer-Semiconductor Nanoparticle Composites: Issues and Challenges for Applications in Sensors and Energy Storage Devices
P.K. Bajpai
1st World Conference on Advanced Materials, June 2012, Beijing, China.

106. Synthesis and electrical characterization of cerium doped strontium stanate compositions for specific gas sensors
Rakesh Kurre and P.K. Bajpai
In "Current Trends in Condensed Matter Physics" Assam University, Silchar, 3 - 5 February 2011

107. DOPING INDUCED ORIENTATIONAL DYNAMICS OF IONS IN FERROELECTRIC CRYSTALS PROBED BY POLARIZED LASER RAMAN SPECTROSCOPY
P.K. Bajpai
Invited Talk in" National Conference on Electronic Materials and Applications
10^{th}-11^{th} June 2011, Jiwaji University, Gwalior, M.P.

108. ION BEAM IRRADIATION ON FERROELECTRIC MATERIALS: DIELECTRIC AND FERROELECTRIC PROPERTIES
P.K. Bajpai
Invited Talk in CONIAPS-XIII, Petroleum University, Dehradun, Sept. 2011.

109. Strategies to Development Advanced Materials
Dielectric Relaxation and Electrical Conductivity in $Pb(Ca_{1/3}Nb_{2/3})\ O_3$: A New Ferroelectric relaxor
P.K. Bajpai, Mukul Pastor and K.N. Singh

Invited Talk in" National Conference on Ultrasonics, Bundelkhand University, Jhansi (U.P.) India.

110. RECENT PROGRESS IN THE DIELECTRIC RELAXATION IN PEROVSKITE BASED FERROELECTRIC RELAXORS
P.K. Bajpai
Invited talk CONIAPS, NIT SURAT, DEC. 2011

111. Dielectric relaxation in perovskite based relaxor ferroelectrics: Current status and challenges
P.K. Bajpai (Invited Talk)
Invited Talk , NCMAT-2012 IIITM, Gwalior.

112. Material Modification Using Swift Heavy Ion Beam Irradiation: Controlling the Surface Morphology and Properties in Polar Dielectrics
P.K. Bajpai (Invited Talk)
Recent Trends in Condensed Matter Physics, Assam University, Silchar, 3-5 February, 2011

113. "Exciting Possibilities of Material's modification Using Ion Beams: irradiation, implantation and ion beam analysis using 3 MV Pelletron Accelerator based facility at GGV, Bilaspur, India"
P.K. Bajpai (Invited for presentation)
In"15th international conference of the International Academy of Physical Sciences (CONIAPS XV) Rajamangala University of Technology, Thanyaburi, Thailand December 09-13, 2012.

114. **Swift heavy ion induced material modifications in ferroelectrics: understanding molecular reorientation and strain development through temperature dependent Raman spectroscopy**
Parmendra Kumar Bajpai
(Invited for presentation in 22nd Conference on Applications of Accelerators in Industry & Research, Texas, USA (2012).

115. Study of Diffuseness and Dielectric Relaxation in solid solution of (1-x)(Bi0.5Na0.5Ti03)—x (SrNb206): Lead-Free Ceramic Material
K.N. Singh and P.K. Bajpai
In"15th international conference of the International Academy of Physical Sciences (CONIAPS XV) Rajamangala University of Technology, Thanyaburi, Thailand December 09-13, 2012.

116. Dielectric relaxation in Lead Free Ferroelectric Relaxors: Recent Advances
P.K. Bajpai (Invited Talk)
In" 17th National Seminar on Dielectrics and Ferroelectrics (XVII NSFD) 17-19 December 2012, Institute of Technical Education & Research (ITER) Bhubaneswar, Orissa.

117. Dielectric relaxation in Microwave Barium Magnesium Niobate: $Ba(Mg_{1/3}Nb_{2/3})O_3$
K.N. Singh and P.K. Bajpai
In" 17th National Seminar on Dielectrics and Ferroelectrics (XVII NSFD) 17-19 December 2012, Institute of Technical Education & Research (ITER) Bhubaneswar, Orissa.

118.

BOOKS PUBLISHED

01. Advanced in electronic Materials & Devices, Edited by P.K. Bajpai, H.S. Tewari & Amit

Khaskalam, Anamaya Publications, New Delhi.

02. Edited proceedings of XVI- National Seminar on Ferroelectrics & Dielectrics" being published by American Institute of Physics AIP Conference Proceedings, Volume 1372, Edited by P.K. Bajpai, USA