

CURRICULUM VITAE

NAME : DR SHIV DATT KUMAR

PRESENT POSITION : Professor
Department of Mathematics
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DATE OF BIRTH : 10th August, 1965

FATHER'S NAME : Shiv Mohan Tripathi

EDUCATIONAL QUALIFICATION :

Examination	Board/University	Year	Division	Remarks
M.A.(Maths)	Allahabad University	1988	First	IInd Position in Alld. Univ.
Post M.Sc.(Maths)	Harish-Chandra Research Institute, Allahabad	1993		
NET(National Eligibility Test)	UGC-CSIR	June 1993		
Ph.D.	Harish-Chandra Research Institute (Alld. University)	2003		Sub.-Commutative Algebra

RESEARCH INTERESTS : Commutative Algebra, Algebraic Geometry, Operation Research.

RESEARCH AWARDS/FELLOWSHIPS RECEIVED

- Mathematics Research Fellowship at the **Abdus Salam, International Centre For Theoretical Physics, Trieste, Italy** from May 18 to July 17, 2009.
- Mathematics Research Fellowship at the **Abdus Salam, International Centre For Theoretical Physics, Trieste, Italy** from May 18 to June 17, 2008.
- Visiting Scientist at the **Johann Radon Institute for Computational and Applied Mathematics(RICAM), Linz, Austria** from May 15, 2006 to June 15, 2006.
- Mathematics Research Fellowship at the **Abdus Salam, International Centre For Theoretical Physics, Trieste, Italy** from June 1, 2004 to September 2, 2004.
- Junior and Senior Research Fellowships at **Harish-Chandra Research Institute, Jhansi, Allahabad** in Commutative Algebra from 14th August, 1992 to 9th May, 1996.

MEMBER OF EDITORIAL BOARD OF THE JOURNALS

1. International Journal of Engineering and Applied Sciences since January 2013.
2. American Journal of Applied Mathematics and Statistics, since 2013 (SCIEP).

REVIEWER OF INTERNATIONAL JOURNALS AND BOOKS:

1. Mathematical Reviews/MathSciNet, American Mathematical Society, USA (Reviewer number: 098594).
2. International Journal of Engineering, science & Technology(IJEST)
3. Turkish Journal of Mathematics, published from Ankara, Turkey.
4. International Journal of Information Technology & Decision Making.
5. "Higher Engineering Mathematics" of Pearson Education Publication, New Delhi

OTHER AWARDS AND HONOURS:

1. Edushine 2014 : Honoured by the United Group of Institutions for distinguished services in the academic world on June 07, 2014 at United Campus Allahabad.
2. Invited as a Judge in the Chhattisgarh Young Scientists Congress 2013 held at Govt Nagarjuna P.G. College of Science, Raipur during Feb 28- March 01, 2013.
3. Edushine 2012 : Honoured by the United Group of Institutions for distinguished services in the academic world on May 25, 2012 at United Campus Allahabad.
4. Received Best Teacher Award in Government P. G. College, Ramanagar (Nainital) Uttrakhand in 2004.

RESEARCH PUBLICATIONS:

IN INTERNATIONAL REFREED SCI JOURNALS

1. Rees algebra over an ideal in t-rings, **Journal of Pure and Applied Algebra, Elsevier Publication, SCI Journal**, 2014 (with Jyoti Singh), DOI: 10.1016/j.jpaa.2014.04.032
2. Reductions in Rees algebra of modules, **Algebras and Representation Theory**, Volume 17, No. 2, April, 2014 **Springer Publication, SCI Journal**, (with Priti Singh) DOI 10.1007/s10468-014-9471-1. ISSN 1386-923X
3. Finite Majid algebras over the Klein group, **Communications in Algebra, Taylor and Francis Publication, SCI Journal**, 2014 (with Mamta Balodi & Hua-Lin Huang), (ID: 828739 DOI:10.1080/00927872.2013.828739).
4. On the Involutivity of the Characteristic Variety, **Communications in Algebra, Taylor and Francis Publication, SCI Journal**, 42, Issue 8 (2014), 3607-3618., (with Jyoti Singh), (ID: 790393 DOI:10.1080/00927872.2013.790393).
5. Completion of unimodular row to an invertible matrix, **Mitteilungen Klosterneuburg Journal**, 64 (3) 2014, **SCI Journal**, (with Raja Sridharan and Ratnesh Kumar Mishra).
6. On the number of generators of a projective module, Proc. Indian Acad. Sci. (Math. Sci.), (**Springer Publication**), **SCI Journal**, Vol. 123, No. 4, November 2013, pp. 469 - 478. DOI 10.1007/s12044-013-0147-2 (with Sumit Kumar Upadhyay and Raja Sridharan)
7. Group graded associated ideals with flat base change of rings and short exact sequences, **Proceedings Mathematical Sciences, (Springer Publication), SCI Journal**, Indian Acad. Sci., Vol. 121, No. 2, February 2011, pages 111–120 (with Srinivas Behara).

8. Uniqueness of graded primary decomposition of modules graded over finitely generated Abelian groups, **Communications in Algebra, Taylor and Francis Publication, SCI Journal**, Vol 39 (7), 2011, pages 2607-2614 (with Srinivas Behara).
9. Primary decomposition over rings graded by finite Abelian groups, **Journal of Algebra, Elsevier Publication, SCI Journal**, 318(2), 2007, 553-561 (with Markus Perling).
10. Sections of zero dimensional ideals over a Noetherian ring, **Archiv der Mathematik, Birkhauser Verlag Basel, Switzerland Publication, SCI Journal**, 89, 2007, 124-130.
11. A note on a graded ring analogue of Quillen's theorem, **Expositiones Mathematicae, Elsevier Publication, SCI Journal**, Vol 22, 2004, 29-30.
12. Lifting of generators of an ideal and Nori's Homotopy Conjecture, **Indian Journal of Pure and Applied Mathematics (Springer Publication), SCI Journal**, Indian National Science Academy Publication, Vol 34 (11), 2003, 1599-1610 (with Ramji Lal).
13. Some results on generators of an ideal, **Journal of Pure and Applied Algebra, Elsevier Publication, SCI Journal**, Vol. 169 (1), 2002, 29-32 (with Satya Mandal).
14. Surface modification of Semiconductor Photo-electrode for improved Solar Cell performance, **Solar Energy Materials and Solar Cells, Elsevier Publication, SCI Journal**, Volume 91, Issue 18, 2007, 1663-1668 (with M. Tripathi and K. Pandey).

IN INTERNATIONAL REFREED JOURNALS

15. Lifting of generators of ideals to Laurent polynomial ring, Beitr Algebra Geom/ Contributions to Algebra and Geometry (**Springer Publication**), March 2013, Volume 54, Issue 1, pages 147-153, ISSN 0138-4821 (with Ratnesh Kumar Mishra) DOI: 10.1007/s13366-012-0102-x.
16. Existence of a unique group of finite order, the Mathematics Student, Vol 81, Nos. 1-4, 2012, pages 215-218 (ISSN: 0025-5742), (with Sumit Kumar Upadhyay) **IMS publication**.
17. On projective modules and computation of dimension of a module over Laurent polynomial ring, ISRN Algebra (**Hindawi Publication, USA**), Volume 2011, Article ID 926165, 12 pages, doi:10.5402/2012/926165 (with Ratnesh Mishra and Srinivas Behara).
18. A note on joint reduction of an ideal over local ring, **International Mathematical Forum**, Vol 7, No. 4 (2012), 183-188 (with Priti Singh).
19. An approach for multiobjective linear plus linear fractional programming problem, International electronic journal of pure and applied mathematics Volume 2, No. 3 (2010) (with Pitam Singh & R. K. Singh).
20. Fuzzy Method for Multiobjective Linear Plus Linear Fractional Programming Problem, **International Mathematical Forum**, Vol 5 (No. 60) 2010, 2971 - 2983 (with Pitam Singh & R. K. Singh).
21. Fuzzy efficient and Pareto - Optimal Solution for Multiobjective Linear Fractional Programming Problems, International Journal of Mathematics in Operational Research, 2013 (with Pitam Singh & R.K. Singh), in press.

22. On a variant of Bertini's theorem and generator of ideals of a polynomial ring with monic polynomials, **International Journal of Algebra**, Vol 3, 2009, no. 17, 863 - 872 (with Priti Singh).
23. Some Important Notions of Grobner Basis and Buchberger's Algorithm, **RICAM, website of Grobner basis**, Linz, Austria, 2006.
http://www.ricam.oeaw.ac.at/Groebner-Bases-Bibliography/gbbib_files/publication_1194.
24. Analogue of Eakin Sathaye theorem over Rees Algebra, UNESCO & International Atomic Energy Agency, ICTP, IC/049/2009.

PAPER SUBMITTED IN SCI JOURNALS :

25. "Mathematical Counterpart of Heisenberg Uncertainty Principle" (with Jyoti Singh).
26. "Topological analogue of completable unimodular rows" (with Sumit Kumar Upadhyay and Raja Sridharan).
27. "Diamond lemma for group graded quasi-algebras" (with Mamta Balodi and Hua-Lin Huang)

(b) IN INTERNATIONAL CONFERENCES :

1. "On the number of generators of projective modules", International Conference on Computer Algebra CoCoA- 2013 at the Institute of Mathematics, University of Osnabrueck, **Germany**. during June 10-14, 2013 (Poster Presentation with Sumit Kumar Upadhyay, Raja Sridharan).
2. The Rees algebra of a module and ideal module over a noetherian local ring, International Conference on "Computational Mathematics, Computational Geometry and Statistics", **Singapore**, during Jan 30-31, 2012 (with Priti Singh).
3. Lifting of generators of an ideal over Laurent polynomial ring, **International Congress of Mathematicians**, 2010, Hyderabad, August 19-27, 2010 (with Ratnesh Kumar Mishra).
4. Fuzzy Efficient and Pareto - Optimal Solution For Multiobjective Linear Plus Linear Fractional Programming Problem, International Conference on Computer and Communication (ICCCT-2010) (IEEE Conference) September 17-19, 2010, MNNIT, Allahabad (with Pitam Singh & R.K. Singh)
5. Analogue of Eakin Sathaye Theorem over Rees Algebra, **International Congress of Mathematicians**, 2010, Hyderabad, August 19-27, 2010 (with Priti Singh).
6. Sections of Zero Dimensional Ideals over a Noetherian Ring at the CIMPA-UNESCO- Spain School during August 14-21, 2006, Universidad Complutense de Madrid, Madrid, Spain.
7. Homotopy of Sections of Ideals over a Noetherian ring , School and Conference on Algebraic K-Theory and its Applications (May 14 - June 1, 2007), Abdus Salam, International Centre For Theoretical Physics, Trieste, Italy.
8. "Projective Modules and completion of an unimodular row to an elementary matrix" 74th Annual Indian Mathematical Society Conference at Allahabad University, Allahabad, during December 27 - 30, 2008.

(c) IN NATIONAL CONFERENCES :

1. "On the Number of Generators of Projective Modules" (with Sumit Kumar Upadhyay and Raja Sridharan) in the National Conference of Ramanujan Mathematical Society at Shiv Nadar University, New Delhi, during October 20-22, 2011.
2. "Projective modules and completion of a unimodular row to an elementary matrix" Indian Mathematical Society Conference at Allahabad University, Allahabad, during December 27-30, 2008.
3. "Some Remarks on Grobner basis" in the national conference on "Material Science in the service of society " at the CMP Degree College, Allahabad University, Allahabad during February 5-6, 2008. In this conference also worked as Joint Secretary.
4. "Lifting of generators of zero dimensional ideals over Noetherian rings" ACADEMICA at M.B. Govt. P. G. College, Haldwani, Nainital during March 11-12, 2005.
5. "On Generators of Ideals over a Noetherian Ring", Recent Trends in Mathematics, Aligarh Muslim University, March 24 - 26, 2001.

RESEARCH PROJECTS:

1. National Board of Higher Mathematics sanctioned a research project entitled "Study of Rees Algebra, graded rings in module theoretic setup and its applications" of Rs 707850/- for three years.
2. DST (Department of Science and Technology), Govt of India, sanctioned a research project "Graded modules over rings graded by finitely generated Abelian groups" in 2010 of Rs 10,04,640/- for three years.

Ph.D. GUIDANCE EXPERIENCE : I have guided the following students for Ph. D. Degree in MNNIT, Allahabad.

S.N.	Name	Status	Topic
1	Srinivas Behara	Awarded in 2011	A study on rings graded over finitely generated Abelian groups
2	Pitam Singh	Awarded in 2012	A study on fuzzy multiobjective fractional programming problems and their applications Co-Supervisor Prof R.K. Singh, EED
3	Ratnesh Kumar Mishra	Awarded in July, 2013	Study of Projective Modules, Generators of Ideals and Modules
4	Priti Singh	Awarded in January, 2014	A study on Rees Algebras of ideals, modules and its reductions.
5	Mamta Balodi	submitted in May, 2014	Classification of finite dim pointed Majid algebras (Co-supervisor Prof Hua Lin-Huang, Shandong University, Jinan, China)
6	Sumit K. Upadhyay	submitted in April, 2014	A study on unimodular rows and its topological analogue
7	Jyoti Singh	Submitted in June, 2014	A study on Characteristic Varieties of Filtered Modules and Rees Algebra of t -rings

M.Sc. Thesis Supervision: The following students have submitted M.Sc. project thesis at MNNIT, Allahabad under my supervision.

Name	Session	Topic
Priyanka Singh	2009-10	An Effective implementation of Braid Group
Atul Srivastav	2010-11	Topology
Ankur Shukla	2011-12	Commutative Algebra
Rangoli Goyal	2012-13	Classification and Representation Theory of Finite Groups

FOREIGN COUNTRY VISITED FOR ACADEMIC PURPOSE:

Country visited	Year	Place
Italy	2004, 2006, 2008, 2009	ICTP Trieste
Iran	2005	Institute for Advanced Studies In Basic Sciences, Zanjan
Spain	2005	Universidad Complutense de Madrid
Austria	2006	RICAM, Linz
Turkey	2008	Istambul
Vietnam	2011	Institute of Mathematics, Hanoi
Bulgaria	2012	Sofia
Germany	2013	University of Osnabrueck

MEMBER OF PROFESSIONAL ACADEMIC BODIES :

1. Member of Indian Mathematical Society since 2010 (Membership No.- K-10-179).
2. Member of Ramanujan Mathematical Society since September 2011 (Membership No.- RMS0749).

TEACHING EXPERIENCE :

Position Held	Institution	From	To	Nature of Job
Professor	Motilal Nehru National Institute of Technology, Allahabad	Sept 28, 2012	Continue	Teaching and Research
Associate Professor	Motilal Nehru National Institute of Technology, Allahabad	June 20, 2008	Sept 27, 2012	Teaching and Research
Assistant Professor (Reader)	Motilal Nehru National Institute of Technology, Allahabad	June 20, 2005	June 19, 2008	Teaching and Research
Senior Lecturer	Govt. P. G. College, Ramnagar(Nainital)	May 19, 2003	June 19, 2005	Teaching and Research
Lecturer(Maths)	Govt. P. G. College, Ramnagar(Nainital)	Dec 29, 1998	May 18, 2003	Teaching and Research
Lecturer(Maths)	Allahabad Degree College, Allahabad University, Allahabad	Nov 03, 1997	Dec 28, 1998	Teaching and Research
Lecturer(Maths)	Ewing Christian College, Allahabad University, Allahabad	Sept 2, 1996	May 28, 1997	Teaching and Research
Lecturer(Maths)	Nagaland University, Medziphema, Nagaland	May 9, 1996	Sep 1, 1996	Teaching and Research
PGT(Maths)	Army School, Srinagar(J and K)	Oct 15, 1990	Aug 9, 1992	Teaching

Conference/Workshop organized :

1. Organizing Secretary of National Instructional Workshop on Cryptology(NIWC-2014) during June 5-9, 2014 at MNNIT, Allahabad.
2. Chairman of the National Workshop "Optimization Techniques and their applications" (NWOTA-2013) during June 5-11, 2013 (seven days) at MNNIT, Allahabad.

3. Convenor and Chairman of the National Conference “Advances in Mathematical Sciences” during October 5-7, 2012 (three days) at MNNIT, Allahabad.
4. Chairman and Coordinator of the Workshop on Course Curriculum development of M.Sc. (Mathematics and Scientific Computing) and B. Tech. Mathematics Courses on March 24, 2012.
5. Joint Secretary of the National Conference at C M P Degree College, Allahabad in September 2009.
6. Convenor of Workshop on Course Curriculum development of M.Sc. (Mathematics and Scientific Computing) in April, 2007.

COURSES TAUGHT:

- **Under Graduate Level:** Mathematics I, II, III, Algebra, Linear Algebra, Calculus, Real Analysis, Complex Analysis, Numerical Analysis, Discrete Mathematics.
- **Post Graduate Level:** Algebra, Computational Algebraic Geometry, Topology, Operations Research, Algebraic Number Theory, Optimization, Fuzzy Theory, Weblet Theory, Mathematical Modeling, Discrete Mathematics and Functional Analysis.

INVITED TALKS/SEMINARS GIVEN OUTSIDE THE PERMANENT INSTITUTE:

1. Gave an invited talk on ” Algebraic Foundations of Cryptography: Finite Fields” National Instructional Workshop on Cryptology (NIWC-2014) during June 5-9, 2014 at MNNIT, Allahabad.
2. Invited talks (four lectures) on ”Nilpotent groups and field extensions“ at Nagarjuna Govt. P.G. College of Science, Raipur(Chhattisgarh) during August 28-29, 2013.
3. Gave a talk on ”Game Theory” in the National Workshop on “Optimization Techniques and their applications” (NWOTA-2013) during June 5-11, 2013 at MNNIT, Allahabad.
4. Invited talk on ”Applications of Mathematics and Cryptography” as a resource person in a training programme/workshop of HRD Ministry, Hindi Shabdawali Ayog, at Karm Kshetra P.G. College, Etawa on February 27, 2013.
5. Gave an invited talk on ”The coisotropic variety of Weyl algebra” in the national conference on ”Recent Advances in Mathematics”, at Rani Durgavati University, Jabalpur January 14, 2013.
6. Invited talks on ”Projective modules and unimodular rows” in the national conference on ” Analysis and its applications”, at National Institute of Technology, Srinagar (J&K) during November 19-20, 2012.
7. Two invited talks on ”Boundary value problems over an Integro-Differential Algebra” and ”Cryptosystem based on platform group of amalgamated free products of braid group and Thompson group” in an International conference on ”Application of Computer Algebra”, at Sofia, Bulgaria during June 25-28, 2012.
8. Invited talk on ”Braid group and Thomson group based Cryptosystem” in an International conference on ”Group Theory and Lie Theory”, at Harish-Chandra Research Institute, Allahabad during March 19-21, 2012.
9. Delivered an invited talk on ”Cryptosystem based on braid group and Thomson group” in a National workshop on ”Recent trends in Graph Theory and Cryptography”, at Govt VYT PG Autonomous College, Durg (Chhattisgarh) on October 13, 2011.

10. Invited talk on "Applications of Mathematics and Cryptography" as a resource person in a training programme/workshop of HRD Ministry, Hindi Shabdawali Ayog, at Janata Degree College, Bakewar, Etawa on September 30, 2011.
11. Invited talks (seven lectures) as a resource person in a DST workshop (UGTPM) in IIT, Patna during May 15-20, 2011.
12. Gave invited talk as a resource person on "Cryptography and Importance of Mathematics" in a national workshop of HRD Ministry, Hindi Shabdawali Ayog, on March 03, 2011 at Vivekanand P.G. College, Dibiyapur, Oraiya.
13. Invited talk on "Braid and transversal based crypto system" in the CIMPA-Vietnam school on "Braids in Algebra, Topology and Geometry" at the **Institute of Mathematics, Hanoi, Vietnam** during January 17-28, 2011.
14. Two invited talks as a resource person in the UGC Sponsored National Workshop on "Emerging Areas of applications of Mathematics" in B.C.S. Government P.G. College, Dhamtari, Chhatisgarh during October 27 -28, 2010 one on "Representations of finite groups" and another on "Finite field extensions and Galois theory".
15. Presented research paper "Analogue of Eakin Sathaye Theorem over Rees Algebra" in the International Congress of Mathematicians, Hyderabad, during August 19-27, 2010.
16. "Projective Modules and completion of an unimodular row to an elementary matrix", Indian Mathematical Society Conference at Allahabad University, Allahabad, during December 27-30, 2008.
17. A talk on "Homotopy of Sections of Ideals over a Noetherian ring" in the School and Conference on Algebraic K-Theory and its Applications (May 14 - June 1, 2007) at the **Abdus Salam, International Centre For Theoretical Physics, Trieste, Italy**.
18. Invited talk on the "Sections of zero dimensional ideals over a Noetherian ring" at the **CIMPA-UNESCO- Spain** School from on 14-21 August, 2006 at Universidad Complutense de Madrid, **Madrid, Spain**.
19. Talk on the topic "Projective modules and generators of an ideal over Noetherian rings" at Allahabad University in Feb, 2005.
20. Gave a seminar on the topic "Sections of projective modules and a question of Nori" at the **The Abdus Salam, International Centre For Theoretical Physics, Trieste, Italy** on 27th August, 2004.
21. Invited talk on the topic "Projective generation of ideals" at the national seminar organized by Jammu Mathematical Society and Dept. of Mathematics, Jammu University from 20-22 February, 2004.
22. A talk on the topic "Generators of ideals" at the University of Allahabad in June, 2001.
23. Presented a paper entitled "Lifting of generators of ideals over a Noetherian ring" presented in the national level conference at Aligarh Muslim University in March, 2001.
24. Talk on the topic "Homotopy sections of projective modules over a Laurent polynomial ring" at Harish Chandra Research Institute, Allahabad in June, 2000.

25. Seminar on the topic of “Set theoretic complete intersection ideals” at Harish Chandra Research Institute(Old MRI), Allahabad in 1995.

ORIENTATION PROGRAM / REFRESHER COURSE ATTENDED:

- Participated in a Faculty Orientation programme conducted by MNNIT, Allahabad under TIQUIP-II during January 12-13, 2013.
- Participated in the National level U.G.C. sponsored **Refresher Course in Mathematics** from 20th January, 2005 to 9th February, 2005 in the Academic Staff College, Allahabad University, Allahabad.
- Participated in the National level U.G.C. sponsored **Orientation program** from 27 September, 2001 to 25 October, 2001 in the Academic Staff College, Allahabad University, Allahabad.
- Participated in the National level U.G.C. sponsored **Refresher Course in Mathematics** from 27th February, 2001 to 30th March, 2001 in the Academic Staff College, Aligarh Muslim University, Aligarh.

EXPERIENCE OF ACADEMIC ADMINISTRATION :

1. **Head**, Department of Mathematics, Motilal Nehru National Institute of Technology, Allahabad from September 01, 2011 to August 31, 2013.
2. **Warden-Incharge - C.V. Raman Hostel**, Motilal Nehru National Institute of Technology, Allahabad from July, 2010 to January, 2012.
3. **Warden-Incharge - R.N. Tagore Hostel**, Motilal Nehru National Institute of Technology, Allahabad from November, 2010 to January, 2012.
4. **Coordinator**, M.Sc.(Mathematics and Scientific Computing) program, Motilal Nehru National Institute of Technology, Allahabad from July, 2010 to continue.
5. **President, Student Activity Centre (officiating)**, Motilal Nehru National Institute of Technology, Allahabad from March 22, 2010 to April 29, 2010.
6. **Convenor**, Departmental Under Graduate Committee (DUGC) in the Department of Mathematics, Motilal Nehru National Institute of Technology, Allahabad from June, 2008 to August, 2010.
7. **Coordinator**, Athletics and Gymnastic Activities, Students Activity Centre, Motilal Nehru National Institute of Technology, Allahabad from July, 2008 to August, 2010.
8. **Convenor**, Departmental Post Graduate Committee(DPGC) in the Department of Mathematics, Motilal Nehru National Institute of Technology, Allahabad from June, 2005 to June, 2008.
9. **Hostel Warden** in the Govt. Post Graduate College, Ramnagar (Nainital), Uttarakhand (India) from September, 2004 to June, 2005.
10. **N.C.C. Officer (ANO)** in the Govt. Post Graduate College, Ramnagar (Nainital), Uttarakhand (India) from March, 1999 to May, 2004.
11. **Assistant Hostel Warden** in the Govt. Post Graduate College, Ramnagar (Nainital), Uttarakhand (India) from March, 1999 to August, 2004.

12. **Proctor (Science faculty)** in the Govt. Post Graduate College, Ramnagar (Nainital), Uttrakhand (India) from March, 1999 to August, 2004.
13. **Dean (Science faculty)** in the Govt. Post Graduate College, Ramnagar (Nainital), Uttrakhand (India) from August, 2000 to May, 2004.

COMPUTER COURSE :

- One year **Diploma in Computer Application ("O" Level)** from Electronics Services and Training Centre, Kania, Ramnagar (Nainital).

SEMINARS / CONFERENCES ATTENDED: INTERNATIONAL LEVEL

1. Participated and made poster presentation on research paper "On the number of generators of projective modules" in the "International Conference on Computer Algebra CoCoA- 2013" at the **Institute of Mathematics, University of Osnabrueck, Germany**", during June 10-14, 2013.
2. Participated and gave two invited talks on "Boundary value problems over an Integro-Differential Algebra" and "Cryptosystem based on platform group of amalgamated free products of braid group and Thompson group" in an International conference on "Application of Computer Algebra", at Sofia, Bulgaria during June 25-28, 2012.
3. Participated and gave an invited talk on "Braid group and Thomson group based Cryptosystem" in an International conference on "Group Theory and Lie Theory", at Harish-Chandra Research Institute, Allahabad during March 19-21, 2012.
4. Participated in the International Conference on "Commutative Algebra and Algebraic Geometry ("CAAG-2012") at the **University of Pondicherry, Pondicherry** during March 5-9, 2012.
5. Participated and gave an invited talk on "Braid and transversal based crypto system" in the CIMPA-Vietnam school on "Braids in Algebra, Topology and Geometry" at the **Institute of Mathematics, Hanoi, Vietnam** during January 17-28, 2011.
6. International Conference on Computer and Communication (ICCCT-2010) (IEEE Conference), September 17-19, 2010, at MNNIT, Allahabad .
7. Participated in the International Conference "**International Congress of Mathematicians**", Hyderabad, August 19-27, 2010 and presented paper entitled "Analogue of Eakin Sathaye Theorem over Rees Algebra".
8. Participated in the "Summer School and advanced workshop on trends and developments in Linear Algebra" during June 22-July 10, 2009 at the **Abdus Salam, International Centre For Theoretical Physics, Trieste, Italy**.
9. Participated in the School and workshop on "Integrable systems and Scientific Computing" during June 15-20, 2009 at the **Abdus Salam, International Centre For Theoretical Physics, Trieste, Italy**.
10. Participated in the Indian Mathematical Society Conference at Allahabad University, Allahabad, during December 27-30, 2008 and presented a paper entitled "Projective Modules and completion of an unimodular row to an elementary matrix".

11. Participated in the School and Conference on Differential Geometry (June 2 - June 20, 2008) at the **Abdus Salam, International Centre For Theoretical Physics, Trieste, Italy**.
12. Participated in the, School and Conference on Algebraic K-Theory and its Applications (May 14 - June 01, 2007) at the **Abdus Salam, International Centre For Theoretical Physics, Trieste, Italy** and presented research paper "Homotopy of Sections of Ideals over a Noetherian ring".
13. Participated and gave an invited talk on the research paper on "Sections of zero dimensional ideals over a Noetherian ring" at the **CIMPA-UNESCO- Spain** School from on 14-21 August, 2006 at Universidad Complutense de Madrid, Madrid, Spain.
14. Participated in the " Special Semester on Groebner Basis and related methods" from May 15, 2006 to June 15, 2006 at **Johann Radon Institute for Computational and Applied Mathematics(RICAM), Linz, Austria**.
15. Participated in "CIMPA-UNESCO-IRAN School on Groebner bases and its Application" during 9-22 July, 2005 at the **Institute for Advanced Studies In Basic Sciences, Zanjan, IRAN**.
16. Participated in "Advanced School and Conference on Non-Commutative Geometry" from 9-27 August, 2004 at the **The Abdus Salam, International Centre For Theoretical Physics, Trieste, Italy**.
17. Participated in the international school on "Commutative Algebra interaction with Algebraic Geometry and combinatorics" from 2nd June to 11th June, 2004 at the **The Abdus Salam, International Centre For Theoretical Physics, Trieste, Italy**.
18. Participated in the International workshop on "Computational Algebraic Geometry" during 8 - 13 Dec., 2003 at H.R.I., Allahabad jointly organized by Bhaskaracharya Pratisthan, Pune and H.R.I., Allahabad.
19. Participated in the International Conference and Instructional School on "Homological Methods in Commutative Algebra" to 27th Nov. to 16th Dec., 2000 at HBCSE (TIFR), Mumbai.
20. Participated in the "International symposium on rings, modules and groups with homological techniques and their applications" at I.T., B.H.U. Varanasi during 18 - 21 Dec., 1995.

NATIONAL LEVEL

21. Participated in a Instructional workshop on " Schur Multiplier and related topics" during March 01-08, 2014 at Harish Chandra Research Institute, Allahabad
22. Participated in workshop on " Quality Initiatives in Technical & Higher Educational Institutions", (In Compliance with NBA & NAAC Accreditation) during February 11-13, 2014 at Engineering Staff College of India, Gachi Bowli, Hyderabad.
23. Participated in the workshop on "Finite field, Galois Theory & Cryptography", at IIIT, Allahabad and NASI, Allahabad during June 25-27, 2013.
24. Participated and delivered an invited talk on "Projective modules and unimodular rows" in the national conference on " Analysis and its applications", at National Institute of Technology, Srinagar (J&K) during November 19-20, 2012.

25. Participated and presented research paper “On the Number of Generators of Projective Modules” in the National Conference of Ramanujan Mathematical Society at Shiv Nadar University, New Delhi, during October 20-22, 2012.
26. Participated and presented research paper “On the Number of Generators of Projective Modules” in the National Conference of Ramanujan Mathematical Society at Shiv Nadar University, New Delhi, during October 20-22, 2012.
27. Participated in the Conference of Ramanujan Mathematical Society at Allahabad University, Allahabad, during October 2-5, 2011.
28. Participated and gave invited talks (7 lectures) as a resource person in a DST workshop (UGTPM) in IIT, Patna during May 15-20, 2011.
29. Participated in the national seminar during 20-22 February, 2004 at Jammu University and delivered an invited talk on the topic “Projective generation of ideals”
30. Participated in the National workshop on “Computational Algebraic Geometry’ during 2 - 11th Jan., 2003. in H.R.I., Allahabad.
31. Participated in the National level “Instructional School on Linear Algebra” during Dec 3-15, 2001. in Harish- Chandra Research Institute, Jhansi, Allahabad.
32. Participated in the National level Conference on “ Recent trends in mathematics” during March 24-26, 2001 and presented paper entitled “Lifting of generators of an ideal” in Aligarh Muslim University, Aligarh.
33. Participated in the National Conference on “Commutative Algebra and and Algebraic Geometry’ during Feb 1-3, 1999 in HRI (Old Mehta Research Institute), Jhansi, Allahabad.
34. Participated in the Seminars on “Infinite Permutation Groups” in I.I.T., Guwahati during August 6-15, 1996.
35. Visited Institute of Mathematical Sciences, Chennai, TIFR, Mumbai and H.R.I., Allahabad several times.
36. Participated in I.S.I. winter and summer schools on non-commutative Harmonic Analysis at I.S.I., New Delhi, and I.I.Sc., Bangalore respectively.

SUMMARY OF SOME RESEARCH WORK :

1. Some Results On Generators Of An Ideal, **Journal of Pure and Applied Algebra, Elsevier Publication**, Vol. 169 (1), 2002, 29-32 (with Satya Mandal).

Let I be an ideal of the Laurent polynomial ring $A[T, T^{-1}]$ containing a doubly monic polynomial. Let P be a projective A -module of rank $r \geq \dim(A[T, T^{-1}]/I) + 2$ and suppose that $S : P \rightarrow I(1)$ and $\phi : P[T, T^{-1}] \rightarrow I/I^2$ are surjective homomorphisms such that $\phi(1) \equiv S \pmod{(T-1, I(1)^2)}$. Then there is a surjective homomorphism $\psi : P[T, T^{-1}] \rightarrow I$ such that $\psi(1) = S$ and ψ lifts ϕ .

2. **Indian Journal of Pure and Applied Mathematics (Springer Publication)**, Indian National Science Academy Publication, Vol 34 (11), 2003, 1599-1610 (with Ramji Lal)

Suppose A is a commutative Noetherian ring and I is an ideal in the polynomial algebra $A[T]$ containing a monic polynomial. Suppose also that $\mu(I/I^2) = r \geq \dim(A[T]/I) + 2$. Assume that $I(0)$ is generated by r elements, say, a_1, \dots, a_r .

- (a) Can we find a set of generators f_1, \dots, f_r of I such that $f_i(0) = a_i$, for all $i = 1, \dots, r$?
- (b) Can we find a set of generators of I in which one and hence all the generators are monic?

We settle the problem 1 in affirmative. The problem 2, in general, has negative answer. We have given examples to show this. However in certain cases result is true and interesting. In some cases answer is complete and in some cases answer is partial. We have answered the question in the following cases:

- (a) A is semi local Noetherian ring and $I(0)/I(0)^2$ is a free module over $A/I(0)$ with $I(0) \subseteq \text{Rad}(A)$.
- (b) A is local Cohen Macaulay ring and $I(0)$ is a local complete intersection ideal of A .
- (c) I is a zero dimensional ideal.
- (d) I is a local complete intersection ideal of height $r = \dim(A[T])$.
- (e) $\mu(I/I^2) = 1$ and A is an integral domain.
- (f) $I(0) = I(0)^2$.

In some cases the Laurent polynomial analogue are also proved.

3. (**Expositiones Mathematicae, Elsevier Publication**, Vol. 22, 2004. 29-30)

We have extended the famous theorem of Quillen to the graded ring.

Let $S = \bigoplus_{i=0}^{\infty} S_i$ be a graded ring and let M be a finitely presentable S -module, which is a locally extended, for all $\mathcal{M} \in \text{Max}(S_0)$. Then M is a globally extended.

4. Primary decomposition over rings graded by finite Abelian groups (with Markus Perling) (**Journal of Algebra, Elsevier Publication**, 318(2), 2007, 553-561.)

Let R be a Noetherian ring which is graded by a finite Abelian group G . In general, for G -graded R -modules there do not exist primary decompositions which are graded themselves. This is quite different from the case of gradings by torsion free group, for which graded primary decompositions always exists.

In this paper we introduced G -primary decompositions as a natural analogue to primary decomposition for G -graded R -modules. We show the existence of G -primary decomposition and give a few characterizations analogously to Bourbaki's treatment for torsion free groups.

5. Uniqueness of graded primary decomposition of modules graded over finitely generated Abelian groups, **Communications in Algebra, Taylor and Francis Publication, SCI Journal**, Vol 39 (7), 2011, pages 2607-2614 (with Srinivas Behara).

In this paper we have introduced G -graded primary sub-modules, G -graded P -primary submodules and established the uniqueness of group graded primary decomposition. We have also given a new proof on existence of G - primary decomposition.

We proved the following main result:

Let A be a commutative Noetherian ring which is graded by a finitely generated Abelian group G and M be a finitely generated G -graded A -module. Suppose $0 = \bigcap_{i \in \mathcal{I}} N_i$ is a reduced G -primary decomposition of 0 in M , where N_i being G -primary. Then $Ass^G(M) = \{P_i : i \in \mathcal{I}\}$.

6. (**International Journal of Algebra, 2009**) : We have given different versions of Bertini's theorems and proved following a variant of theorem of Bertini (with Priti Singh)
7. Let A be a finitely generated K algebra with K characteristic 0, algebraically closed field. Assume A reduced and $dim(A) \geq 2$. Let $f, g \in A$ with that $ht(f, h) \geq 2$. Then for all but a finite number of $\lambda \in K$, $A/(f + \lambda h)$ is reduced.

We used this theorem to prove the following :

8. Suppose A is a semilocal regular reduced affine algebra over an algebraically closed field of characteristic zero such that every maximal ideal in $A[T]$ is complete intersection, with $dim(A) = n > 0$. Suppose I is an ideal of $A[T]$, with $height(I) = n + 1$. Assume co-normal module I/I^2 is generated by $n + 1$ elements over $A[T]/I$. Then we can find a minimal set of generators of I with a monic polynomial.
9. **Proceedings Mathematical Sciences, (Springer Publication)**, Indian Academy of Sciences, Vol. 121, No. 2, February 2011, pages 111–120,

Title: Group graded associated ideals with flat base change of rings and short exact sequences (with Srinivas Behara).

In this paper we presented behaviour of G -associated ideals and strong Krull G -associated ideals with at base change of rings and behaviour of G - associated ideals with short exact sequences over rings graded by finitely generated Abelian group G .

10. **Proceedings Mathematical Sciences, (Springer Publication)**, Indian Academy of Sciences, 2013

Title: On the number of generators of a projective module (with Sumit Kumar Upadhyay and Raja Sridharan)

In this article we give a bound on the number of generators of a finitely generated projective module of constant rank over a commutative Noetherian ring in terms of the rank of module and the dimension of ring. Under certain conditions we provide an improvement to the Forster - Swan bound in case of finitely generated projective modules of rank n over an affine algebra over a finite field or an algebraically closed field.

11. Reduction in Rees algebra of modules, **Algebras and Representation Theory, Springer Publication**,, 2014 (with Priti Singh)

In this paper we give an application of Zariski open sets associated with the reduction of a module and generalize a Eakin-Sathaye theorem for the reduction for modules.

12. Title: Mathematical Counterpart of Heisenberg Uncertainty Principle, with Jyoti Singh

In this paper, we prove that the characteristic ideal of a module over the Weyl algebra with Bernstein and order filtrations is closed under the Poisson bracket. This result can be viewed as a mathematical counterpart of Heisenberg uncertainty principle. It also provides a relation between D -modules and symplectic geometry.

13. Title : On Topological Analogue of Unimodular rows, with Sumit Kumar Upadhyay and Raja Sridharan

In this paper we show how commutative algebra is connected to topology. We give underlying topological idea of some results on completable unimodular rows.