Curriculum Vitae of Dipankar Ghosh

Personal Data

Name	:	Dr. Dipankar Ghosh
Date of Birth	:	2nd April, 1989
Present Address	:	Department of Mathematics Indian Institute of Technology Kharagpur Kharagpur - 721302, West Bengal, India
Phone	:	+91-9167098463 and +91-9790739874
E-mail ID	:	dipankar@maths.iitkgp.ac.in and dipug23@gmail.com
Marital Status	:	Married
Gender	:	Male
Nationality	:	Indian

Current Affiliation

At present, I am an Assistant Professor of Mathematics at Indian Institute of Technology Kharagpur (IIT Kgp). I have joined IIT Kgp on 28th Oct, 2021. Before moving to IIT Kgp, I was an Assistant Professor at IIT Hyderabad from Feb, 2019 to Oct, 2021, and a DST-INSPIRE Faculty at Chennai Mathematical Institute (CMI) from Aug, 2016 to Jan, 2019.

Research Interest

Commutative Algebra, Combinatorial Commutative Algebra

Educational Qualifications

Degree	**School/College/Institution (Board/University)**	**Year of Passing**	**Percentage/ CPI** (Max 10)
Secondary	Gohaldanga High School (WBBSE: West Bengal Board of Secondary Education)	2004	71 %
Higher Secondary	Birsingha Bhagabati Vidyalaya (WBCHSE: West Bengal Council of Higher Secondary Education)	2006	78.70 %
B.Sc.	Midnapore College (Vidyasagar University)	2009	75.875 %
M.Sc.	Indian Institute of Technology Guwahati	2011	9.33
Ph.D.	Indian Institute of Technology Bombay	2016	NA

M.Sc. Project

Title	:	Exact Sequences of Modules
Advisor	:	Prof. Anupam Saikia, IIT Guwahati, E-mail: a.saikia@iitg.ernet.in

Doctoral Thesis

Title	:	Asymptotic Prime Divisors Related to Ext, Regularity of Powers of Ideals, and Syzygy Modules
Advisor	:	Prof. Tony J. Puthenpurakal, IIT Bombay, E-mail: tputhen@math.iitb.ac.in

Details of Achievements/Scholarships

- Teaching Excellence Award, Indian Institute of Technology Hyderabad, 2021.
- INSPIRE Faculty Award, Dept. of Science and Technology (DST), Govt. of India, 2016.
- Scholarship from National Board for Higher Mathematics (NBHM) for Ph.D, Dept. of Atomic Energy (DAE), Govt. of India, 2011 - 2016.
- Secured all India rank 5 in Graduate Aptitude Test in Engineering (GATE), 2011.
- Qualified the test for Council of Scientific and Industrial Research (CSIR) Fellowship, Govt. of India, June 2011. (Secured all India rank 30).
- Merit-cum-Means scholarship for two years, Master of Science, IIT Guwahati, 2009 - 2011.
- Secured 1st position in College, Bachelor of Science, Midnapore College, India, 2009.

Professional Experience

Duration	**Place**	**Position**
28th Oct, 2021 to present	IIT Kharagpur	Assistant Professor
1st Feb, 2019 to 27th Oct, 2021	IIT Hyderabad	Assistant Professor
1st Aug, 2016 - 30th Jan, 2019	Chennai Mathematical Institute	DST-INSPIRE Faculty

Postdoctoral Research Visits

Duration	**Place**	**Host**
3 months: Sept - Nov, 2018	University Pierre et Marie Curie, Paris	Prof. Marc Chardin
1 month: May - June, 2018	University of Genova, Italy	Prof. Aldo Conca

M.Sc Project Students Guided

(1) Titash Kumar Mahajan (2019-20)
Project Title: Three Fundamental Theorems of Hilbert about Polynomial Rings over Fields

(2) Dwipanjana Shit (2020-2021), Project Title: Homological Algebra: Ext, Tor and Dimension

Teaching Experience

Courses Taught at IIT Hyderabad (2019 - 2021) as an Instructor

B.Tech Courses:
Calculus I (MA1110), Elementary Linear Algebra (MA1140).

M.Sc and Ph.D Courses:
Groups and Rings (MA4070), Modules and Fields (MA5070), Commutative Algebra (MA6116), Combinatorial Commutative Algebra (MA6126), Homological Algebra II (MA4150), Computational Algebra on Polynomials and Ideals (MA4133).

Courses Taught at Chennai Mathematical Institute as an Instructor

Algebraic Curves, Basic Homological Algebra.

Short Courses Taught at Workshops as an Instructor

1. Rings and Fields, Summer Training Programme in Mathematics (STPM), St. Berchmans College, Kerala, India, April 15 - 17, 2021. (Total 6 hrs teaching & 6 hrs tutorial).

Courses Associated

1. **NCM Workshop** on "Commutative algebra and algebraic geometry in positive characteristics", IIT Bombay, December 10 - 22, 2018.
   Courses: Introduction to Local Cohomology modules, Homological conjectures

2. **Annual Foundation School**, University of Pune, May 26 - June 7, 2014.
   Courses: Galois Theory, Complex Analysis

3. **IIT Bombay**, 2012 - 2015.
   Courses: Calculus, Linear Algebra, Differential Equations I, Complex Analysis, Differential Equations II, Introduction to Numerical Analysis (Each for One Semester)

List of Publications

10. D. Ghosh and R. Takahashi, *Auslander-Reiten conjecture and finite injective dimension of Hom*, To appear in Kyoto J. Math., 2022, arXiv:2109.00692.

9. M. Chardin, D. Ghosh and N. Nemati, *The (ir)regularity of Tor and Ext*, Trans. Amer. Math. Soc. 375 (2022), 47–70.

8. D. Ghosh, *Some criteria for regular and Gorenstein local rings via syzygy modules*, J. Algebra Appl. **18** (2019), 15 pp.

7. D. Ghosh and T. J. Puthenpurakal, *An asymptotic bound for Castelnuovo-Mumford regularity of certain Ext modules over graded complete intersection rings*, J. Algebra **537** (2019), 278–296.

6. D. Ghosh and T. J. Puthenpurakal, *Vanishing of (co)homology over deformations of Cohen-Macaulay local rings of minimal multiplicity*, Glasgow Math. J. **61** (2019), 705–725.

5. D. Ghosh, P. Mallick and T. J. Puthenpurakal, *Asymptotic associate primes*, J. Pure Appl. Algebra **223**, (2019), 4246–4267.

4. D. Ghosh and T. J. Puthenpurakal, *A short proof of a result of Katz and West*, J. Commut. Algebra **11** (2019), 237–240.

3. D. Ghosh, A. Gupta and T. J. Puthenpurakal, *Characterizations of regular local rings via syzygy modules of the residue field*, J. Commut. Algebra **10** (2018), 327–337.

2. D. Ghosh and T. J. Puthenpurakal, *Asymptotic prime divisors over complete intersection rings*, Math. Proc. Cambridge Philos. Soc. **160** (2016), 423–436.

1. D. Ghosh, *Asymptotic linear bounds of Castelnuovo–Mumford regularity in multigraded modules*, J. Algebra **445** (2016), 103–114.

Papers under Review

- S. Dey and D. Ghosh, *Complexity and rigidity of Ulrich modules, and some applications*, arXiv:2201.00984.

- D. Ghosh and T.J. Puthenpurakal, *Integrally closed* $\mathfrak{m}$*-primary ideals have extremal resolutions*, arXiv:2208.13715.

Grants

7. Start-up Research Grant (SRG) from SERB, DST on a project entitled "Characterizations of local rings via homological dimensions of summands of syzygy modules" for 2 years, 2020 - 2022.

6. IIT Hyderabad SEED Grant on a project entitled "Asymptotic behaviour of Castelnuovo–Mumford regularity" during May 2020 - April 2022.

5. LIA Indo-French Program in Mathematics (IFPM), CNRS India, Grant for a postdoctoral visit for three months to Prof. Marc Chardin at University Pierre et Marie Curie, Paris, France, September - November, 2018.

4. INdAM, Istituto Nazionale di Alta Matematica "F. Severi", Grant for a research visit to Prof. Aldo Conca at University of Genova, Italy, 2nd May - 1st June, 2018.

3. DST-INSPIRE Grant for attending "The Prospects for Commutative Algebra", held at Osaka University, Osaka, Japan during 10–14 July, 2017.

2. National Board for Higher Mathematics (NBHM) Travel Grant for attending an international conference "Commutative Algebra and its Interactions with Algebraic Geometry" honoring Craig Huneke held at the University of Michigan, USA during 07–12 July, 2016.

1. IIT Bombay Research Scholar Grant for attending the "First International Workshop and Conference on Commutative Algebra" held at Tribhuvan University, Kathmandu, Nepal during 20–26 April, 2015.

Invited Talks

3. "Castelnuovo–Mumford regularity, and its asymptotic behaviour", IISER Bhopal Math Symposium, IISER Bhopal, 2nd March, 2021.

2. "Linear Algebra and Its Applications (Eigenvalues and Eigenvectors, and some applications)", Seminar, Lady Shri Ram College, New Delhi, 7th October, 2020.

1. "The (ir)regularity of Tor and Ext", Two talks (one introductory and one research), West Virginia University, 26th September and 3rd October, 2020.

Conference and Symposium Presentations

9. "Vanishing of (co)homology over deformations of Cohen-Macaulay local rings of minimal multiplicity", 10 minutes talk, The Prospects for Commutative Algebra, Osaka University, Osaka, Japan, 13th July, 2017.

8. "Characterizations of regular local rings via syzygy modules of the residue field", 15 minutes talk, International Conference of The Indian Mathematics Consortium (TIMC) in cooperation with American Mathematical Society (AMS), Banaras Hindu University, Varanasi, India, 16th December, 2016.

7. "Characterizations of regular local rings via syzygy modules of the residue field", 1 hour talk, 12th National Conference on Commutative Algebra and Algebraic Geometry (CAAG), Indian Institute of Science Education and Research Mohali, India, 12th October, 2016.

6. "Asymptotic prime divisors over complete intersection rings", Poster presentation, A conference honoring Craig Huneke on Commutative Algebra and its Interactions with Algebraic Geometry, University of Michigan, USA, 8th July, 2016.

5. "Asymptotic linear bounds of Castelnuovo-Mumford regularity in multigraded modules", 25 minutes talk, Workshop/Conference on Local Cohomology, St. Joseph College, Irinjalakuda, Kerala, India, 27th June, 2016.

4. "Asymptotic linear bounds of Castelnuovo-Mumford regularity in multigraded modules", Poster presentation, International School and Conference on Computer Algebra (COCOA-2016), Indian Institute of Technology Gandhinagar, India, 25th February, 2016.

3. "Asymptotic prime divisors over complete intersection rings", 30 minutes talk, Departmental Symposium on Mathematics, Indian Institute of Technology Bombay, India, 1st November, 2015.

2. "Asymptotic prime divisors over complete intersection rings", First International Workshop and Conference on Commutative Algebra, Tribhuvan University, Kathmandu, Nepal, 25th April, 2015. (*I was invited to give a talk there. But I could not deliver the talk because of earthquake.*)

1. "Asymptotic prime divisors over complete intersection rings", 25 minutes talk, National Conference on Commutative Algebra and Algebraic Geometry (CAAG - 2015), Indian Institute of Technology Guwahati, India, 9th February, 2015.

Seminar Talks

12. "Associated prime ideals, and Castelnuovo-Mumford regularity", Indian Institute of Technology Kharagpur, India, 10th October, 2020.

11. "Asymptotic prime divisors, and Castelnuovo-Mumford regularity", Indian Institute of Technology Bhubaneswar, India, 8th April, 2019.

10. "Regularity and its asymptotic behaviour", University Pierre et Marie Curie, Paris, 12th November, 2018.

9. "Castelnuovo-Mumford regularity and its asymptotic behaviour", Indian Institute of Technology Hyderabad, India, 22nd October, 2018.

8. "Linear bounds of Castelnuovo-Mumford regularity", *Algebra Seminar*, Indian Institute of Technology Kharagpur, India, 5th July, 2018.

7. "Asymptotic linear bounds of Castelnuovo-Mumford regularity", *Algebra and Geometry Seminar*, University of Genova, Italy, 16th May, 2018.

6. "On Hibi Rings", Five lectures in the *Commutative Algebra Seminar*, Chennai Mathematical Institute, India, Aug-Sept 2017.

5. "Intersection Theorems", Three lectures in the *Commutative Algebra Seminar*, Chennai Mathematical Institute, India, Jan-Apr 2017.

4. "Characterizations of regular local rings via syzygies", One lecture in the *Commutative Algebra Seminar*, Indian Institute of Technology Bombay, India, 12th January, 2016.

3. "Introduction to Ext", One lecture in the *First International Workshop and Conference on Commutative Algebra*, Tribhuvan University, Kathmandu, Nepal, 24th April, 2015.

2. "Introduction to Castelnuovo-Mumford Regularity", Two lectures in the *Commutative Algebra Seminar*, Indian Institute of Technology Bombay, India, 6th and 13th April, 2015.

1. "Spectral Sequences", Nine lectures in *Students Algebra Seminar*, Indian Institute of Technology Bombay, India, 29th August - 14th November, 2014.

Conferences/Workshops Participation

20. Workshop on "Commutative algebra and algebraic geometry in positive characteristics", Indian Institute of Technology Bombay, Mumbai, India, 10–22 December, 2018.

19. Workshop on "Combinatorial Commutative Algebra", Indian Institute of Technology Bombay, Mumbai, India, 18–23 June, 2018.

18. Instructional School on "Grobner Bases and their Applications", Indraprastha Institute of Information Technology Delhi, 11–23 December, 2017.

17. National Conference on Commutative Algebra and Algebraic Geometry (CAAG - 2017), Indian Institute of Science Education and Research (IISER) Pune, 05–08 December, 2017.

16. A conference on "The Prospects for Commutative Algebra", Osaka University, Osaka, Japan, 10–14 July, 2017.

15. Workshop on "Positive Characteristic Methods in Commutative Algebra", Indian Institute of Technology Bombay, Mumbai, India, 19–30 June, 2017.

14. International Conference of The Indian Mathematics Consortium (TIMC) in cooperation with American Mathematical Society (AMS), Banaras Hindu University, Varanasi, India, 14–17 December, 2016.

13. 12th National Conference on Commutative Algebra and Algebraic Geometry (CAAG), Indian Institute of Science Education and Research Mohali, India, 11–15 October, 2016.

12. A conference (honoring Craig Huneke) on "Commutative Algebra and its Interactions with Algebraic Geometry", University of Michigan, USA, 07–12 July, 2016.

11. Workshop/Conference on Local Cohomology, St. Joseph College, Irinjalakuda, Kerala, India, 20th June to 2nd July 2016.

10. Advanced Instructional School in Algebraic Geometry, Indian Statistical Institute Bangalore, 16th May to 4th June 2016.

9. International School and Conference on Computer Algebra (COCOA-2016), Indian Institute of Technology Gandhinagar, India, 22–26 February, 2016.

8. Advanced Instructional School in Commutative Algebra, Chennai Mathematical Institute, Chennai, India, 21st December 2015 to 1st January 2016.

7. First International Workshop and Conference on Commutative Algebra, Tribhuvan University, Kathmandu, Nepal, 20–26 April, 2015.

6. National Conference on Commutative Algebra and Algebraic Geometry (CAAG - 2015), Indian Institute of Technology Guwahati, India, 05–09 February, 2015.

5. Advanced Instructional School in Schemes and Cohomology, Kerala School of Mathematics, Kozhi-kode, Kerala, India, 01–19 December, 2014.

4. Workshop on Computational Algebraic Geometry, Indian Institute of Space Science and Technology, Trivandrum, Kerala, India, 09–13 February, 2014.

3. Advanced Instructional School on Algebraic Curves and Riemann Surfaces, Indian Institute of Science Education and Research (IISER) Pune, India, 03–22 June, 2013.

2. National Conference on Topics in Commutative Algebra, The Institute of Science, Mumbai, 24–25 January, 2013.

1. Advanced Instructional School in Commutative Algebra, Indian Institute of Technology Madras, Chennai, India, 07–26 May, 2012.

List of References

1. Prof. Tony J. Puthenpurakal, Department of Mathematics, Indian Institute of Technology Bombay, Powai, Mumbai - 400076, India.
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