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Professor Shanta Laishram
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Curriculum Vitae

Objective

To pursue a career in an Institute or University or Organisational setting that will allow me to practice the skills I have begun to develop for research and for teaching Mathematics and use it to my fullest level. And to also encourage and mentor young minds to think logically and possibly take up mathematics.

Career

- Professor of Mathematics, Indian Statistical Institute, New Delhi, India since December 2020.
- Associate Professor of Mathematics, Indian Statistical Institute, New Delhi, India from December 2015 to November 2020.
- Assistant Professor of Mathematics, Indian Statistical Institute, New Delhi, India from July 2010 to November 2015.
- Academic Visitor, ETH Zurich during May-June 2010.
- Assistant Professor of Mathematics, Indian Institute of Science Education and Research, Bhopal, India December 2009 to May 2010.
- Academic Visitor, Tata Institute of Fundamental Research, Mumbai, September-November, 2009.
- Post-Doctoral Fellow at Department of Pure Mathematics, University of Waterloo, Canada from August, 2007 to August 2009.
- Academic Visitor, Max-Planck Institute for Mathematics, Bonn, Germany from August-October, 2008.

Research Interests

Diophantine Equations, Binary Recurrence Sequences, Sum of digits, Irreducibility of Polynomials and Inverse Galois Problem, Transcendental Number Theory and Diophantine Approximation, Prime Numbers and Cryptography, particularly, the number theoretic aspects of Cryptography.

Education

- Ph.D. Mathematics, 2007, School of Mathematics, Tata Institute of Fundamental Research(TIFR), Mumbai, India
  Dissertation: *Refinements, Extensions and Generalisations of a Theorem of Sylvester on the prime factors of a product of consecutive integers*
  Advisor: Professor T. N. Shorey.
  online at http://www.isid.ac.in/∼shanta/PhDThesis.pdf.
- M.Sc. (by Research) Mathematics, 2004, TIFR/University of Mumbai, Mumbai, India
  Dissertation: *Topics in Diophantine equations*
  Advisor: Professor T. N. Shorey.
  online at http://www.isid.ac.in/∼shanta/MScThesis.pdf.
- B.Sc.(Mathematics Hons'), 2001, DM College of Science, Manipur University, Imphal, India.

Awards, Scholarships and Educational fellowships

- Recipient of INSA Bilateral Exchange Program 2015(with Hungary)
- Erasmus Mundus Scholar, University of Bordeaux, France 2013.
- *Microsoft Young Faculty Award 2010-11*, Microsoft Research India and Indian Statistical Institute.
- *Harish Chandra Memorial Award 2008* for the best Ph.D. Thesis in Mathematics at TIFR Mumbai.
- *Kanwal Rekhi Career Scholarship* holder during Ph.D program at TIFR, Mumbai.
- *Rajiv Gandhi Science Talent Research Fellow-1999*, JNCASR, Bangalore, India.

List of Publications

Published or Accepted papers

§1 M. Chintamani, **S. Laishram** and P. Paul, *On a Problem in Additive Number Theory*, Jour. Ramanujan Math. Society, accepted for publication.

§2 **S. Laishram**, *On members of Lucas sequences which are either products of factorials or product of middle binomial coefficients and Catalan numbers*, Res. Number Theory 7, **29** (2021), https://doi.org/10.1007/s40993-021-00257-x.

§3 **S. Laishram**, F. Luca and M. Sias, *On members of Lucas sequences which are products of Catalan numbers*, Int. Jour. of Number Theory, **17** (2021). 1487–1515; https://doi.org/10.1142/S1793042121

§4 **S. Laishram**, D. López-Aguayo, C. Pomerance and T. Thongjunthug, *Progress towards a nonintegrality conjecture*, European Jour. of Math., **6** (2020), 1496-1504.

§5 **S. Laishram**, F. Luca and M. Sias, *On members of Lucas sequences which are products of factorials*, Monats. Math., **193** (2020), 329–359.

§6 **S. Laishram**, S. Nair and T. N. Shorey, *Irreducibility of extensions of Laguerre Polynomials*, Func. Approx., **62** (2020), 143–164.

§7 **S. Laishram**, S. Nair and T. N. Shorey, *On the Galois group of Generalised Laguerre polynomials II*, Hardy Ramanujan Journal, **42**, (2019), 26–30.

§8 **S. Laishram**, S. S. Ngairangbam and R. S. Moirangthem, *Yet another generalization of Sylvester's Theorem and its application*, Publ. Math. Debrecen, **95** (2019), 1–17.

§9 P. K. Dey and **S. Laishram**, *Powerful numbers in product of consecutive integer values of a polynomial*, Publ. Math. Debrecen, **94** (2019), 319–336.

§10 P. Das, **S. Laishram** and N. Saradha, *Cubes in products of terms from an arithmetic progression*, Acta Arith., **184** (2018), no. 2, 117–126.

§11 P. Das, **S. Laishram** and N. Saradha, *Variations of Erdős- Selfridge superelliptic curves and their rational points*, Mathematika, **64** (2018), 380–386.

§12 A. Jindal, **S. Laishram** and R. Sarma, *Irreducibility and Galois Groups of Generalized Laguerre Polynomials* $L_n^{(-1-n-r)}(x)$, J. Number Theory, **183** (2018), 388–406.

§13 J-M Deshouillers, L. Habsieger, **S. Laishram** and B. Landreau, *Sums of the digits in bases* 2 *and* 3, "Number Theory - Diophantine problems, Uniform Distribution and Applications -Festschrift in Honour of Robert F. Tichy's 60th Birthday", Ed. C. Elsholtz and P. Grabner, (2017), 211–217.

§14 L. Hajdu, **S. Laishram** and M. Szikszai, *Perfect powers in products of terms of elliptic divisibility sequences*, Bull. Aust. Math. Soc., **94**(2016), no. 3, 395–404.

§15 **S. Laishram** and T. N. Shorey, *Irreducibility of generalized Hermite-Laguerre polynomials III*, Journal of Number Theory, **164** (2016), 303–322.

§16 L. Hajdu, **S. Laishram** and S. Tengely, *Power values of sums of products of consecutive integers*, Acta Arith., **172** (2016), 333-349.

§17 **S. Laishram** and T. N. Shorey, *Perfect powers in Arithmetic Progression*, Journal of Combinatorial Number Theory, **7** (2015), no. 2, 95–110.

§18 **S. Laishram**, *Baker's Explicit abc-Conjecture and Waring's problem*, Hardy Ramanujan Journal, **38**, 2015, 49–52.

§19 **S. Laishram** and F. Luca, *Rectangles Of Nonvisible Lattice Points*, Journal of Integer Sequences, **18** (2015), Article 15.10.8.

§20 **S. Laishram**, S. Nair and T. N. Shorey, *Irreducibility of Generalized Laguerre Polynomials $L_n^{\frac{1}{2}+u}(x)$ with integer u*, Journal of Number Theory, **160** (2016), 76–107.

§21 **S. Laishram**, *On the Galois groups of generalized Laguerre Polynomials*, Hardy Ramanujan Journal, **37**, 2015, 8–12.

§22 J. Bravo, P. Das, **S. Laishram** and S. Guzman, *Powers in products of terms of Pell's and Pell-Lucas sequences*, Int. Jour. of Number Theory, **11** (2015), 1259–1274.

§23 **S. Laishram** and F. Luca, *Fibonacci numbers of the form $x^a \pm x^b \pm 1$*, Fibonnaci Quart., 52(4), 2014, 290-295.

§24 **S. Laishram** and T. N. Shorey, *Baker's Explicit abc-Conjecture and applications*, Acta Arith., **155** (2012), 419–429.

§25 **S. Laishram** and T. N. Shorey, *Irreducibility of generalised Hermite-Laguerre Polynomials*, Functiones et Approximatio, **47** (2012), 51-64.

§26 **S. Laishram** and R. Murty, *Grimm's Conjecture and smooth numbers*, Michigan Math. Journal, **61** (2012), 151-160.

§27 M. Filaseta, **S. Laishram** and N. Saradha, *Solving $n(n+d)\cdots(n+(k-1)d) = by^2$ with $P(b) \leq Ck$*, Int. Jour. of Number Theory, **8** (2012), 161–173.

§28 **S. Laishram** and T. N. Shorey, *Extensions of Schur's irreducibility results*, Indag. Math., **21** (2011), 87–105.

§29 K. Hare, **S. Laishram** and T. Stoll, *On the sum of digits of n and n^2*, Int. Jour. of Number Theory, **7** (2011), 1737–1752.

§30 K. Hare, **S. Laishram** and T. Stoll, *Stolarsky's conjecture and the sum of digits of polynomial values*, Proc. of the AMS, **1** (2011), 39-49.

§31 S.K. Khanduja **S. Laishram** and R. Khassa, *Some irreducibility results for truncated binomial expansions*, Journal of Number Theory, 131 (2011) 300-308.

§32 **S. Laishram** and T. N. Shorey, *Irreducibility of generalised Hermite-Laguerre Polynomials II*, Indag. Math., **20 (4)** (2009), 427–434.

§33 **S. Laishram**, *On a conjecture on Ramanujan primes*, Int. Jour. of Number Theory, **6** (2010), 1-5.

§34 R Balasubramanian, **S. Laishram**, T. N. Shorey and R Thangadurai, *The number of prime divisors of consecutive integers*, Jour. of Combinatorics and Number Theory, **1** (3) (2009), 65–73.

§35 **S. Laishram**, T. N. Shorey and Sz. Tengely, *Squares in products in arithmetic progression with at most one term omitted and common difference a prime power*, Acta Arith., **135** (2008), 143-158.

§36 **S. Laishram** and T. N. Shorey, *Squares in arithmetic progression with at most two terms omitted*, Acta Arith., **134** (2008), 299-316.

§37 **S. Laishram** and T. N. Shorey, *The equation* $n(n+d)\cdots(n+(k-1)d) = by^2$ *with* $\omega(d) \leq 6$ *or* $d \leq 10^{10}$, Acta Arith., **129** (2007), 249-305.

§38 N. Hirata-Kohno, **S. Laishram**, T. N. Shorey and R. Tijdeman, *An extension of a theorem of Euler*, Acta Arith., **129** (2007), 71-102.

§39 **S. Laishram** and T. N. Shorey, *Grimm's Conjecture on consecutive integers*, Int. Jour. Number Theory, **2** (2006), 207-211.

§40 **S. Laishram** and T. N. Shorey, *The greatest prime divisor of a product of terms in an arithmetic progression*, Indag. Math., **17(3)** (2006), 425-436.

§41 **S. Laishram** and T. N. Shorey, *Greatest prime factor of a product of consecutive integers*, Acta Arith., **120** (2005), 299-306.

§42 **S. Laishram**, *An estimate for the length of an arithmetic progression the product of whose terms is almost square*, Pub. Math. Debrecen, **68** (2006), 451-475.

§43 **S. Laishram** and T. N. Shorey, *Number of prime divisors in a product of terms of an arithmetic progression*, Indag. Math., **15(4)** (2004), 505-521.

§44 **S. Laishram** and T. N. Shorey, *Number of prime divisors in a product of consecutive integers*, Acta Arith. **113** (2004), 327-341.

Submitted Papers, Preprints

§1 **S. Laishram**,*A conjecture on greatest prime factor and squares in arithmetic progression*, a preprint.

§2 P. Das, **S. Laishram**, N. Saradha, D. Sharma, *Explicit rational solutions to the Variants of Erdős- Selfridge superelliptic curves*, submitted.

§3 A. Jindal and **S. Laishram**, *Families of Laguerre polynomials with Galois groups as alternating groups*, submitted.

Some Solutions

- American Mathematical Monthly(AMM) Problem #10893.
- (with Ritumoni Sarma) Mathematics Magazine Problem #1626.

Teaching (Last 5 Years)

Regular Courses

- PhD Maths Semester course on *Algebra I*, ISI New Delhi, December 2020 to March 2021.
- PhD Maths Semester course on *Algebra II*, ISI New Delhi, January to April 2020.
- PhD Maths Semester course on *Algebra I*, ISI New Delhi, July to November 2019.
- PhD Maths Semester course on *Algebra II*, ISI New Delhi, January to April 2019.

- PhD Maths Semester course on *Algebra I*, ISI New Delhi, July to November 2018.
- PhD Maths Semester course on *Algebra II*, ISI New Delhi, January to April 2017.
- MSQE Semester course on *Real Analysis*, ISI New Delhi, July to November 2016.

Lecture Courses at Schools and Workshops

- Lectures in Number Theory(3 Hrs), Instructional Workshop on Cryptology, Manipur Technical University, Imphal, 7-8 October 2019
- Lectures on Number Theory(8 Hrs), Teacher's Enrichment Workshop (TEW) on Real Analysis, Linear Algebra and Number Theory, Manipur University, 1–6 October 2019
- Lectures on Group Theory(7.5 Hrs), AFS I, University of Hyderabad, 20-25 May 2019.
- Lectures on Ring Theory and Applications to Number Theory(8 Hrs), Teacher's Enrichment Workshop (TEW) on Algebra & its applications, Shivaji College (University of Delhi), 6–11 May 2019
- IMO Training Camp (6 Hrs), HBCSE TIFR Mumbai, 26-29 April 2019.
- EGMO Training Camp (5 Hrs), Bhaskaracharya Pratisthan, 12-17 January 2019.
- Number Theory Course at MTTS (12 Hrs), IIT Guwahati, 11-23 June 2018.
- IMO Training Camp (6 Hrs), HBCSE TIFR Mumbai, 18 April to 16 May 2018.
- Lectures on Group Theory(7.5 Hrs), AFS I, IIT Delhi, 11-16 December 2017.
- Lectures on Field Theory and Galois Theory(7.5 Hrs), AFS III, NEHU Shillong, 30 June to 7 July 2017.
- IMO Training Camp (6 Hrs), HBCSE. TIFR Mumbai, 21-25 April 2017.
- Number Theory course (12 Hrs) at MTTS 2016 at Shiv Nadar University, Greater Noida, 30 May to 10 June 2016.
- IMO Training Camp (6 Hrs), HBCSE. TIFR Mumbai, 20-23 April 2016.

Supervised Thesis or Student Projects

- PhD Thesis of Dr Sudhir Ngairangbam, Manipur University as Co-Guide(2019)
- PhD Thesis of Dr Ankita Jindal, IIT Delhi(2019) (unofficial)
- PhD Thesis of Dr Pranabesh Das, ISI Delhi(2018)
- Guided a number of summer projects of students under *Academies' Summer Research Fellowship Programme* every year since 2014.
- Guided a number of summer and winter projects of students availing Inspire Fellowship every year since 2014.

Externally Funded Projects(last 5 years)

- SERB MATRICS Project on *Irreducibility and Galois Groups of Polynomials* (Ongoing)
- Co-PI of CEFIPRA Project No. 5401-A : *Sums of integers Fourier, combinatorics, computation*(completed in 2019)
- PI of DRDO CARS Project *Implementaion of the Attacks on Elliptic Curve Discrete Log Problem* (completed in 2018).
- PI of DST Fast Project SR/FTP/MS-035/2012 on *Exponential Diophantine Equations: Resolution of some well known Diophantine equations* (completed in 2016).

Membership of Academic Bodies

- Life Member of Indian Mathematical Society, India.
- Life Member of Ramanujan Mathematical Society, India.
- Life Member of Cryptology Research Society of India.
- Life Member of Indian Science Congress Association.
- Life Member of The Indian Math Consortium.
- Life Member of Indian Society of History of Mathematics.
- Life Member of the Society for Special Functions & their Applications (SSFA),India
- Member of American Mathematical Society
- Member of European Mathematical Society

Professional Experience

- NBHM Associate Member for Mathematical Olympiad Acitivities, NBHM, DAE since June 2017.
- Organised Conferences and workshops at different levels.
- Has been a resource person at different workshops and mathematical events. Attended and lectured at many mathematics conferences in India, Asia, Europe, USA and Canada.
- Gave invited talks at many universities and institutes in India, Asia, Europe, USA and Canada.
- Refereed number theory papers for a number of International journals.
- Research Co-Guide of Mathematics, Manipur University, a Central University in India and Indian Institute of Technology, Delhi.

Administrative positions

- Associate Dean, Academics, ISI Delhi from 1 March 2021.

Computing Skills

- Proficient knowledge in Computers(Linux, Windows, Latex, MS WOrd, Excel, Powerpoint, Email, Internet etc)
- Familiar with mathematical softwares like Mathematica, Maple, Magma, Pari and Sage.

Personal Details

- Date of Birth: 01-02-1980.
- Place of Birth: Thoubal, Manipur, India.
- Hobbies: Travel and Exploring new places, Solving puzzles, Watching movies.
- Marital Status: Married to Dr Kabita Waikhom Laishram

December 2, 2021
New Delhi Shanta Laishram