Chennai Mathematical Institute

Annual Report

April 2016–March 2017

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1 Preface

I am happy to report that the academic program at CMI continues to attract very good students. Our faculty and research scholars continue to excel in research and our BSc and MSc programs graduate some some of finest minds in the mathematical sciences in the country. A large proportion of our students go onto graduate studies. The institutions where our students have gone include Berkeley, Caltech, Chicago, Harvard, MIT, NYU, Princeton, Penn, Yale in USA, ENS Paris, ENS Cachan, Univ Paris-Sud and Univ Bordeaux in France, the Max Planck Institutes and Humboldt University in Germany and the Harish-Chandra Research Institute, IITs, IMSc, ISI and TIFR in India.

ABout 15 CMI graduates have returned or about to return to India after completing their PhDs to take up academic positions at institutions like CMI, IMSc, ISI Kolkata, IIT Bombay, IIT Kanpur, TIFR, IISER Mohali, IISER Pune, IISER Kolkata, IISER Bhopal, IISc as well as in research labs such as Microsoft Research. Another dozen have faculty or postdoctoral research positions at academic and research institutions across the world.

Students with CMI Ph D's have taken up academic positions at IIT Bombay, IIT Guwahati and IIM Indore. CMI graduates have also moved into areas such as financial mathematics and analytics, both in India and abroad. The places where they have found placements include IBM, TCS R&D, Veritas, Barclays, Goldman Sachs, HSBC, ICICI, Mu Sigma and some startups. It is the students who have been trained in CMI that are responsible for the tremendous goodwill that CMI enjoys across the spectrum and have helped us create brand equity around brand CMI.

Chennai Mathematical Institute has exchange programmes with leading French institutions such as the Ecole Normale Superieure in Paris and Cachan as well as the Ecole Polytechnique. CMI is one of three non-European partners in the Erasmus Mundus Master Programme ALGANT (ALgebra Geometry And Number Theory), funded by the European Union. The ALGANT programme allows students to pursue Masters and Doctorate degrees across the institutions participating in the programme.

Few years ago we had launched a program, MSc Applications of Mathematics and we are learning each year and keep transforming the same. We do hope that this program becomes attractive to students who wish to explore options other than academic research and also of interest to the Industry. In January 2017, the French National Centre for Scientific Research, CNRS, established a joint international research lab in Computer Science involving CMI and IMSc in India and ENS Paris-Saclay and University of Bordeaux in France. This lab is headquartered in CMI and is the first such CNRS lab in Computer Science based in India. It recognizes two decades of active research collaborations and exchange visits between the two sides in this area.

A society named Algolabs has been created to promote interaction between CMI and the industry. The activities of Algolabs include joint projects in areas such as analytics and mathematical modelling, as well as part-time training programmes for the industry. This society is doing very well on all fronts and hope to grow to be a major center for academia

- industry collaboration in mathematical sciences.

Academically, the last year was active. Apart from regular courses and lectures by visitors including several lectures in the Wednesday colloquium series, we organised several workshops and conferences. In April 2016, we had organised a Chennai Theory day (computer science) for students and faculty members living in Chennai. In August 2016, a meeting in celebration of Prof G Rajasekaran's 80th birthday was held where several leading physicists from India participated and lectured. In December 2016, CMI organised FSTTCS 2016- the annual national conference on Theoretical Computer Science. December 2016, CMI also organised a workshop on Statistical Methods in Finance 2016. In addition CMI also organised 5th Workshop on Automata, Concurrency and Timed Systems during January–February 2017, a Workshop on Seshadri Constants during January–February 2017.

The following Endowment Lectures were held at CMI during the last year.

- V. Arvind, Director, Institute of Mathematical Sciences, Chennai, delivered the K. Madhava Sarma Memorial Distinguished Lecture on "Noncommutative arithmetic circuits: lower bounds and polynomial identity testing" (November 2016).
- Satya N. Majumdar, Directeur de recherche, CNRS, Laboratoire de Physique Theorique et Modeles Statistique, Universite Paris-Sud, France, delivered the K. Lakshmanan Memorial Distinguished Lecture on "KPZ story" (January 2017).
- Gadadhar Misra, IISc, Bangalore, delivered the R.K. Rubugunday Distinguished Lecture on "The Grothendieck inequality" (January 2017).

Rajeeva L Karandikar
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    Professor, Chennai Mathematical Institute, Chennai

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    Distinguished Professor, Chennai Mathematical Institute

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    Director-Emeritus, Chennai Mathematical Institute, Chennai

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    Professor, Chennai Mathematical Institute, Chennai

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    Professor, Chennai Mathematical Institute, Chennai

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7 Faculty Profiles

Rajeeva L. Karandikar

Rajeeva L. Karandikar received his B.Sc. from Indore University, Indore (1976), M.Stat. form Indian Statistical Institute, Kolkata (1978) and Ph.D. from Indian Statistical Institute, Kolkata (1981).

He has been an Associate Professor at the Indian Statistical Institute, Delhi (1984-89), a Professor at the Indian Statistical Institute, Delhi (1989-2006), a Professsor-in-Charge at the Indian Statistical Institute, Delhi (2000-2002), Head, Delhi Center at the Indian Statistical Institute, Delhi (2000) and (2004-2006) and an Executive Vice-President at Cranes Software International Limited.

He received the Shanti Swarup Bhatnagar Award in 1999. He has been awarded the P C Mahalanobis Gold medal by the Prime Minister at the Indian National Science Congress in February 2014. He is a fellow of the Indian Academcy of Sciences and the Indian National Science Academy.

His research interests are: Probability theory and Stochatic Processes, Applications of Statistics and Cryptography.

Madhavan Mukund

Madhavan Mukund received his B.Tech. (Computer Science and Engineering) from the Indian Institute of Technology, Bombay (1986) and his Ph.D. (Computer Science) from Aarhus University, Aarhus, Denmark (1992).

He is a member of the Executive Council and President of the Indian Association for Research in Computing Science (IARCS), as well as a member of the ACM India Council.

His research interests include models for concurrent and distributed systems, formal verification and distributed algorithms.

C.S. Seshadri

C.S. Seshadri received his B.A. Hons. (Mathematics) degree from Madras University (1953) and his Ph.D. from TIFR/Bombay University (1958).

He was at the School of Mathematics, Tata Institute of Fundamental Research, Bombay from 1953 to 1984 starting as a Research Scholar and rising to a Senior Professor. He was then a Senior Professor at the Institute of Mathematical Sciences, Madras (1984–89).

He has been a Visiting Professor at the University of Paris, France; Harvard University, Cambridge, U.S.A.; Institute for Advanced Study, Princeton, U.S.A.; University of California at Los Angeles, Los Angeles, U.S.A.; Brandeis University, U.S.A.; University of Bonn, Bonn,

Germany; Kyoto University, Kyoto, Japan.

He has given invited talks at many international conferences including the International Congress of Mathematicians, Nice, France, 1970.

He has received the Shanti Swarup Bhatnagar Award (1972) and the Srinivasa Ramanujan Medal of Indian National Science Academy (INSA). He was awarded the D.Sc. Degree (Honoris Causa) of Banaras Hindu University, Varanasi (1985). He has been awarded the Shanti Swarup Bhatnagar Medal (1995) of INSA and Srinivasa Ramanujan Birth Centenary Award (1995-96) of Indian Science Congress Association (ISCA). He has received G.M. Modi Science Award (1995), The Trieste Science Prize of the Academy of Sciences for the Developing World in (2006) and H.K. Firodia Award for Excellence in Science & Technology, Pune (2008).
He has also been awarded Padma Bhushan by the President of India (2009).

He is a Fellow of the Indian Academy of Sciences, Indian National Science Academy and a Fellow of the Royal Society. He has been appointed National Research Professor of the Ministry of Human Resource Development Government of India in 2006.

His research interests are: Algebraic Geometry and Algebraic Groups.

T.R. Ramadas

T.R. Ramadas received his M.Sc. in Physics from the Indian Institute of Technology, Kanpur (1977) and Ph.D. in Mathematics from TIFR/University of Bombay (1982).

He has been a Professor at the School of Mathematics, TIFR till June 2002, a Professor at the University of Montpellier, France (2000-03), a Research Scientist at ICTP (2003-10) and Head, Mathematics Group, ICTP (2010-13).

He has received the Shanti Swarup Bhatnagar Award for Mathematical Sciences (1998). He is a Fellow of the Indian Academy of Sciences.

His research interests are: Differential and Algebraic Geometry.

V. Balaji

V. Balaji received his B.A. Hons. (Mathematics) from University of Delhi (1982), his M.A. (Mathematics) from University of Delhi (1984), his Ph.D. from University of Madras (1991).

He has been an NBHM Post-doctoral Fellow at the Chennai Mathematical Institute (1989–92).

He received the Shanti Swarup Bhatnagar Award in 2006 and is a Fellow of the Indian Academy of Sciences.

His research interest is Algebraic Geometry.

Samir Datta

Samir Datta received his B.Tech. (Computer Science and Engineering) from the Indian Institute of Technology, Kanpur (1995), M.S. from Rutgers University (1997) and Ph.D. from Rutgers University (2004).

He has been a Network Architect at Tellium Inc. (2000-03) and a Post Doctoral Fellow at WINLAB, Rutgers University (2004-05).

His research interests are Complexity Theory, Wireless and High Speed Networking.

K. Narayan

K. Narayan received his B.Tech. (Engineering Physics) from the Indian Institute of Technology Bombay, Mumbai (1997), M.S. (Physics) from the Cornell University, U.S.A. (1999) and Ph.D. (Physics) from the Cornell University, U.S.A. (2002).

He has been a Research Assistant at the Cornell University, U.S.A. (1998-2001), a Research Assistant at the Cornell University, U.S.A. (2001-02), a Postdoctoral Research Fellow at the Duke University, U.S.A. (2002-04) and a Postdoctoral Research (Visiting) Fellow at the Tata Institute of Fundamental Research, Mumbai (2004-07).

His research interests are String theory and cosmology, Stringy geometry and D-brane gauge theories.

K. Narayan Kumar

K. Narayan Kumar received his M.Sc. (Tech.) in Computer Science from Birla Institute of Technology and Science, Pilani (1990). He received his Ph.D. from the TIFR/University of Bombay (1997).

His research interests include Logic, Automata theory and Concurrency.

Pramathanath Sastry

Pramathanath Sastry received his B.Sc. (Hons) in Mathematics from University of Delhi, New Delhi (1982), M.Stat. from the Indian Statistical Institute, New Delhi (1984) and Ph.D. (Mathematics) from Purdue University, U.S.A. (1990).

He has been a Teaching Assistant, a Research Assistant at Purdue University, U.S.A. (1984-1990), a Visiting Assistant Professor at University of Missouri, U.S.A. (1990-1991), a Visiting Fellow at the Tata Institute of Fundamental Research, Mumbai (1991-1992), a Fellow at SPIC Science Foundation (1992-1995), a Reader at SPIC Science Foundation (1995-1996), a Reader at Harish-Chandra Research Institute, Allahabad (1996-1999), a Reader F at Harish-Chandra Research Institute, Allahabad (1999-2001), a Visiting Assistant Professor at Purdue

University, U.S.A. (1999-2001), an Asst. Assoc. Professor (Term) at the University of Toronto, Canada (2001-2006), CLA at McMaster University, Canada (2006) and an Assistant Professor at East Carolina University, U.S.A. (2007-2009).

His research interest is Algebraic Geometry.

S. Senthamarai Kannan

S. Senthamarai Kannan received his B.Sc. from HKRH College, Uthama Palayam (1985–88), M.Sc. from the Madurai Kamaraj University (1988–90) and Ph.D. from the Chennai Mathematical Institute, (1992–98). He has been a Post-doctoral Fellow at the International Centre for Theoretical Physics (1999–2000).

His research interests are Representation Theory and Algebraic Geometry.

Shiva Shankar

Shiva Shankar received his B.Tech. (Electrical Engineering) from the Indian Institute of Technology, Delhi (1978) and his Ph.D. from SUNY, Stony Brook (1983).

He has been an Assistant Professor, at the Department of Applied Mathematics, SUNY, Stony Brook (1983–84), a Visiting Fellow at the School of Mathematics, Tata Institute of Fundamental Research, Bangalore (1984–88), an Associate Professor at the Department of Electrical Engineering, Indian Institute of Technology, Bombay (1988–2000).

Visiting Positions include Institute of Mathematical Sciences, Chennai, and at Mathematics Institute, University of Groningen.

His research interests are Partial Differential Equations, Mechanics and Control Theory.

V.V. Sreedhar

V.V. Sreedhar received his B.Sc. from Andhra University, Visakhapatnam, M.Sc. (Physics) from the Indian Institute of Technology, Madras and received his Ph.D. (Physics) from Saha Institute of Nuclear Physics, Jadavpur University, Calcutta.

He has been an Assistant Professor in the Department of Physics at the Indian Institute of Technology, Kanpur, a Post-doctoral researcher at the School of Theoretical Physics, Dublin Institute of Advanced Studies, Dublin, Ireland and a Post-doctoral researcher at the Institute for Theoretical Physics, Uppsala University, Uppsala, Sweden.

His visiting positions include stints at the S. N. Bose National Centre for Basic Sciences, Kolkata, Raman Research Institute, Bangalore, Universities of Rochester, New York and Cincinnati, Ohio, U.S.A. and the High Energy Research Organization (KEK), Tsukuba, Japan.

His research interests are Quantum Entanglement, Classical and Quantum Field Theory and Fluid Dynamics.

K.V. Subrahmanyam

K.V. Subrahmanyam received his B.Tech. (Computer Science and Engineering) degree from the Indian Institute of Technology, Bombay (1986) and M.S. from Vanderbilt University, U.S.A. in 1987. He received his Ph.D. from the TIFR/University of Bombay in December, 1995.

His research interests are Circuit Complexity, Algebraic methods in Complexity theory.

K.G. Arun

K.G. Arun received his B.Sc. (Physics) from Calicut University, Calicut (1998), M.Sc. (Physics) from Cochin University of Science and Technology (2001) and Ph.D. (Physics) from Raman Research Institute, Bangalore.

He has been a Postdoctoral Research Associate, Washington University in St Louis and VESF Fellow, LAL Orsay & IAP, Paris (2009-2010).

His research interests are Gravitational Wave Astrophysics, Modelling compact binaries, High energy Astrophysics and Cosmology, Tests of General Relativity and Alternative theories of gravity.

Sourav Chakraborty

Sourav Chakraborty received his B.Sc. from Chennai Mathematical Institute (2003), M.S. from University of Chicago (2005) and Ph.D. from University of Chicago (2008).

He has been a Post-doctoral researcher at Technion, Israel (2008-2009) and a Post-doctoral researcher at CWI, Amsterdam (2009-10).

His research interests are Complexity and Algorithms

Clare D' Cruz

Clare D' Cruz received her M.Sc. (Mathematics) from the Indian Institute of Technology, Bombay (1991) and her Ph.D. (Mathematics) from the Indian Institute of Technology, Bombay (1996).

She has been a Post-Doctoral Fellow at the Tata Institute of Fundamental Research, Mumbai (1996–98) and a Visiting Scholar at the Northeastern University, Boston, U.S.A. (1997–98).

Her research interest is Commutative algebra.

Govind S. Krishnaswami

Govind S. Krishnaswami received his B.Sc. (Physics), B.A. (Mathematics) from University of Rochester,U.S.A. (1999), M.A. (Physics), from University of Rochester, U.S.A. (2001) and Ph.D. (Physics) from University of Rochester, U.S.A. (2004).

He has been a Marie Curie Fellow, Spinoza Institute & Institute for Theoretical Physics, Utrecht University, The Netherlands.

His research interests are Quantum Field Theory, Hydrodynamics and Mathematical Physics

Upendra Kulkarni

Upendra Kulkarni received his B.Tech. (Computer Science and Engineering) from the Indian Institute of Technology Bombay, Mumbai (1992) and Ph.D. (Mathematics) from Brandeis University, U.S.A. (1998).

He has been a Visiting Assistant Professor at the University of Massachusetts Amherst (1998-2000), an Assistant Professor at the Truman State University (2000-05), An Associate Professor at the Truman State University (2005), a Visiting Scientist at the Indian Statistical Institute, Bangalore (2005-06) and a Visiting Fellow at the Tata Institute of Fundamental Research, Bangalore (2006-07).

His research interests are Representations of algebraic groups over the integers and in characteristic p, Algebraic aspects of Lie representation theory including Lie algebras, quantum groups and related combinatorics and in solving elementary challenging problems.

Manoj Kummini

Manoj Kummini has received his B.Tech. (Electronics and Communication Engineering) from the University of Calicut (1999), M.E. (Telecommunication Engineering) from the Indian Institute of Science, Bangalore (2002), M.A. (Mathematics) from the University of Kansas, Lawrence (2005) and Ph.D. from University of Kansas, Lawrence (2008).

He has been a Software Engineer at Sasken Communication Technologies, Bangalore (19992000), a Senior Design Engineer (2003) & Design Engineer (2002-2003) at Texas Instruments India, Bangalore, Graduate Teaching Assistant, University of Kansas, Lawrence, KS, U.S.A. (2003-2008), Research Assistant Professor, Purdue University, West Lafayette, IN, U.S.A. (2008-2011) and a Post-doctoral Fellow at Mathematical Sciences Research Institute, Berkeley, CA, U.S.A. (2012).

His research interest is commutative algebra.

Partha Mukhopadhyay

Partha Mukhopadhyay received his B.E. (Electronics & Telecommunication Engineering) from Jadavpur University, Kolkata (2000), M.Tech. (Computer Science) from the Indian Statistical Institute, Kolkata (2002) and Ph.D. from the Institute of Mathematical Sciences, Chennai (2009).

He has been a Software Engineer at Motorola India Electronics Ltd., Bangalore (2002-2003), a Research Associate at the Indian Statistical Institute, Kolkata (2003-2004) and a Postdoctoral Fellow at Technion, Israel (2009-2010).

His research interests are Complexity Theory and Additive Combinatorics.

Dishant M. Pancholi

Dishant M. Pancholi received his B.Sc. from M.S. University of Baroda, Vadodara (1996), M.Sc. from M.S. University of Baroda, Vadodara (1998) and Ph.D. from Tata Institute of Fundamental Research, Mumbai (2006).

He has been a Visiting Fellow at TIFR Centre, Bangalore (2006-07) and a Post doctoral Fellow at the International Centre for Theoretical Physics, Trieste, Italy (2008-10).

His research interests are Contact and symplectic topology.

Purusottam Rath

Purusottam Rath received his Ph.D. (Mathematics) from Harish Chandra Research Institute, Allahabad (2006).

He has been a Visiting Fellow at the Institute of Mathematical Sciences, Chennai (2006–2007) and a Coleman Research Fellow at Queen's University, Canada (2007–2008).

His research interests are Combinatorial Number Theory, Diophantine Approximation and Transcendental nature of special values of L-functions.

R. Srinivasan

R. Srinivasan received his Ph.D. degree in Mathematics from the Indian Statistical Institute and the Institute of Mathematical Sciences (1998).

He has been a Visiting Fellow at the Harish-Chandra Research Institute, Allahabad (1998-2000), a Post Doctoral Fellow at the Indian Statistical Institute (2000-01), a Post Doctoral Fellow at Universite d'Orleans, France (2001-02), a Visiting Scientist at the Indian Statistical Institute (2002-03), a Visiting Fellow at ICTP, Trieste, Italy (2003) and a JSPS Post Doctoral Fellow at University of Tokyo, Japan (2003-2005).

His research interests are Operator Algebras and Operator Theory.

M. Sundari

M. Sundari received her M.Sc. (Mathematics) from the University of Hyderabad, Hyderabad (1988), M.Phil. (Mathematics) from the University of Hyderabad, Hyderabad (1990) and Ph.D. (Mathematics) from the Indian Statistical Institute, Bangalore (1996).

She has been a Visiting Mathematician at the International Center for Theoretical Physics, Trieste, Italy (1996), a Research Associate at the University of New South Wales, Sydney, Australia (1996-97), an Assistant Professor in the Effat College, Jeddah, Saudi Arabia (2000-01), a Faculty member at the ICFAI Institute of Science and Technology, Hyderabad (2003-04) and an Assistant Professor at the Indian Institute of Technology Roorkee, Roorkee (2004-06).

Her research interests are Representation theory of Lie groups, Uncertainty Principles in Harmonic Analysis, Wiener-Tauberian theorems.

S.P. Suresh

S.P. Suresh received his M.C.A. from R.E.C. Trichy (1996), his M.Sc. (by Research) from Anna University (1999), and his Ph.D. from the Institute of Mathematical Sciences (2003).

His research interests are Logic in Computer Science, Reasoning about Security protocols and Classical Indian Epistemology.

Aiswarya Cyriac

Aiswarya Cyriac received her B.Tech. in Computer Science and Engineering from National Institute of Technology (2008), First year of Masters from Institute of Mathematical Sciences, Chennai (2009), Second year of Masters from Master Parisien de Recherche en Informatique (MPRI), Ecole Normale Superieure de Cachan, France (2010) and Ph.D. in Computer Science from Laboratoire Spécification et Vérification, Ecole Normale Superieure de Cachan, France (2014).

She has been a Teaching Assistant at ENS, Cachan (2010-13), a Lecturer and a Postdoctoral Researcher at Uppsala University (2014-15).

Her research interests are: Lossy channel systems with data, Gossip beyond channel bounds and Under-approximate analysis of data-centric data-base systems.

Sourish Das

Sourish Das received his B.Sc. (Statistics) from St. Xavier's College, Calcutta (2001), M.Sc. (Statistics) from Calcutta University, Calcutta (2003) and Ph.D. (Statistics) from the University of Connecticut, U.S.A. (2008).

He has been a Postdoctoral Fellow at the Statistical and Applied Mathematical Science Institute (aka SAMSI) (2008-10), A Postdoctoral Associate at Duke University (2008-10)

and a Scientist - Analytics at SAS Research & Development, India (2010-13).

His research interests are: Biostatistics, Financial Statistics, Functional Data Analysis and Bayesian Statistics.

Priyavrat Deshpande

Priyavrat Deshpande received his B.Sc. in Mathematics from Pune University, Pune (2000), M.Sc. in Mathematics from Pune University, Pune (2002), M.Sc. in Mathematiacs from the University of Western Ontario (2007) and Ph.D. in Mathematics from the University of Western Ontario, Canada (2011).

Priyavrat Deshpande has been a Junior Research Fellow at Computational Mathematics Lab, Pune (2002-04), a Visiting Lecturer at Institute of Management and Career Courses, Pune (2005), a Lecturer at S.P. College, Pune (2004-06), a Graduate Teaching Assistant at University of Western Ontario, Canada (2006-11), a Lecturer in Mathematics at University of Western Ontario, Canada (2011), a Visiting Research Scholar at Northeastern University, Boston, USA (2011-12) anda Visiting Fellow at the Chennai Mathematical Institute (2012-15).

His research interest are: Topology, Combinatorics and Algebra.

Krishna Hanumanthu

Krishna Hanumanthu received his B.Sc. (Mathematics) from the Chennai Mathematical Institute (2001), M.Sc. (Mathematics) from the Chennai Mathematical Institute (2003) and Ph.D. (Mathematics) from the University of Missouri (2008).

His research interests are Algebraic Geometry and Commutative Algebra.

Alok Laddha

Alok Laddha received his B.Sc. in Physics from University of Mumbai (1998), M.Sc. in Physics from Indian Institute of Technology (2000) and Ph.D. in Theoretical Physics from Institute of Mathematical Sciences (2008).

He has been a Teaching Assistant at University of Utah, USA (200-03), a Research Fellow at Institute of Mathematical Sciences , Chennai (2004-08), a Postdoctoral Fellow at Raman Research Institute, Bangaloru (2008-10), a Postdoctoral Fellow at Institute of Gravitation and Cosmos, Pensylvania State University (2010-12), and a Ramanujan Fellow at the Chennai Mathematical Institute, Chennai (2012-14).

His research interest is: Loop Quantum Gravity.

Sukhendu Mehrotra

Sukhendu Mehrotra received his B.Sc. (Hons) in Mathematics from Delhi University (1998), M.S. in Mathematics from the University of Delaware (2000) and Ph.D. in Mathematics from the University of Pennsylvania (2005).

He has been a Visiting Assistant Professor at the University of Massachusetts Amherst (2005–2009) and Van Vleck Visiting Assistant Professor at the University of Wisconsin Madison (2009–2012).

His research interests are algebraic geometry and homological algebra—more specifically, derived categories, Bridgeland stability conditions and moduli problems, and string theory.

Prajakta Nimbhorkar

Prajakta Nimbhorkar received her B.E. (Computer Science and Engineering) from Government College of Engineering, Aurangabad (2003), M.Tech. (Information Technology) from Indian Institute of Technology, Bombay (2005) and Ph.D. from The Institute of Mathematical Sciences, Chennai (2010).

Her research interests are Complexity and Algorithms.

M. Praveen

M. Praveen received his B.E. in Electronics and Communication Engineering from R.V. College of Engineering, Bangalore University, Bangalore (2001), M.Sc. in Theoretical Computer Science from the Institute of Mathematical Sciences, Homi Bhabha National Institute, Chennai (2008) and Ph.D. in Theoretical Computer Science from the Institute of Mathematical Sciences, Homi Bhabha National Institute, Chennai (2011).

He has been a Software Engineer at Mindtree Consulting Pvt. Ltd., Bangalore (2002-06), a Research Intern at Microsoft Research, Bangalroe (2011), ERCIM Postdoctoral Researcher at Inria Saclay - Ile de France (2012) and a Postdoctoral Researcher at Laboratoire Bordelais de Recherche en Informatique, France (2013-14).

His research interests are: Computational complexity of modelling and verifying concurrent infinite state systems, logic and parameterized complexity.

Geevarghese Philip

Geevarghese Philip received his B.Sc. in Physics from St. Berchmans' College, Chenganassery, Kerala (1998), MCA from Regional Engineering College, Kozhikode, Kerala (2001), M.Sc. in Theoretical Computer Science from Institute of Mathematical Sciences, Chennai (2008) and Ph.D. in Theoretical Computer Science from Institute of Mathematical Sciences, Chennai (2011).

He has been Senior Application Developer - Oracle Apps at Oracle India Pvt. Ltd., Ban-

galore, (2002-06), and a Postdoctoral researcher at Max Planck Institute for Informatics, Saarbruecken, Germany (2011-2015).

His research interest is: Parametrized Algorithms and Complexity.

Vijay Ravikumar

Vijay Ravikumar received his BA in Mathematics from Amherst College, Amherst MA (2006), Ph.D. in Mathematics from Rutgers University, New Brunswick NJ (2013).

He has been a Graduate Coordinator for the DIMACS REU program (2007-08), a Teaching Assistant at Rutgers University (2007-13), a Postdoctoral Fellow at TIFR, Mumbai (2013-14) and a Postdoctoral Fellow at CMI, Chennai (2015-16).

His research interests are: Quantitative methods for improving sustainability and Bioinformatics and population genetics.

B. Srivathsan

B. Srivathsan received his B.Tech. and M.Tech. (Dual Degree Programme) in Computer Science and Engineering from the Indian Institute of Technology (2009) and Ph.D. in Computer Science from LaBRI, Université Bordeaux 1 (2012).

He has been a Postdoctoral Researcher at RWTH-Aachen (2012-13).

His research interests are: Theoretical foundations of formal verification and Formal langualge theory.

S. Sundar

S. Sundar received his B.Sc. (Mathematics) from Manonmanian Sundaranar University (2005), M.Sc. (Mathematics) from the Homi Bhabha National Institute (2007) and Ph.D. (Mathematics) from the Homi Bhabha National Institute (2010).

He has been a Post-doctoral researcher at the University of Caen, France (2010–2011) and Visiting Scientist at the Indian Statistical Institute, Delhi (2011–2012).

His research interest is operator algebras—in particular, noncommutative geometry, K-theory, inverse semigroups and their C^*-algebras.

8 Achievements

- CMI accredited with A grade by NAAC, May 2016.
- Madhavan Mukund elected President of ACM India Council (2016-2018), July 2016.
- CNRS LIA Informel upgraded to joint international unit (UMI) RELAX with CMI and IMSc as Indian partners from 2017.

9 Research Activities

Mathematics

In Mathematics research was carried out in the following topics: the transcendental nature of sums arising from the non-trivial zeros of the Riemann zeta function, generalizing some basic results of Deligne and Serre in the theory of representations of algebraic groups, moduli space of vector bundles over integral nodal curves, finding equivariant k-theory pieri formulas for isotropic grassmannians, computing the Seshadri constants on surfaces with Picard number one, automorphism groups of non-reduced BSDH variety, Gaussian states, fast Gaussian process regression, fractional Brownian motion, applications of the Dirichilet process prior for portfolio risk analysis, symmetric Jordan basis of q-analog of Boolean algebra and its representation theoretic significance, partition identities associated with various standard modules for affine Lie algebras, finding Euclidean number rings, problems in higher number fields, an analogue of Benedick's theorem for Weyl transform, on a method of minimum distance estimation using probability generating functions for discrete time and discrete state space Markov Chains and W-algebras, studying the non-vanishing of periodic L functions L(f,1) where f is an odd integer valued function and has odd square-free period, studying the p-adic analogue for the same when f is an even function, on "Brill-Noether loci" over surfaces, on higher jet ampleness and N_p - property (also called p-th syzygy property) of theta divisor on the de-singularisation of the compactified jacobians $J^d(X_k)$ of a nodal curve X_k with k nodes as singularities over algebraically closed fields, problems related to connections and semistability of vector bundles on hyperelliptic varieties, investigating the branching rule for the tower of algebras, when the algebras are the Schur-Weyl dual of the rook monoid, trying to compute an explicit formula of $\lambda K/F := W(IndK/F(1K), \psi)$ function, where K/F is a wildly ramified quadratic extension of a non-archimedean local field F of characteristic 0 and ψ is a nontrivial additive character of F, on resolving a technical conjecture concerning the preservation of the rigidity of hyperholomorphic sheaves along generic twistor deformations with Markman and Verbitsky, on sesquilinear algebra structure on Schur algebras, relation between functor categories and sesquilinear algebras, combinatorial digram categories and their representations on F-rationality of Rees algebras, some properties of syzygies, on Capital Asset Pricing Model, developing the theory of multi-parameter E_0-semigroups, on the problem of reconstructing E_0^P-semigroup from a product system, automorphism groups of Compact Quantum Groups, Quantum group actions on Free Araki Woods factors, studying full automorphism group of a smooth Schubert variety and of a Bott-Samelson-Hansen variety, studying the GIT quotient of a Bott-Samelson-Hansen variety by a maximal torus, on Seshadri constants, positivity of linear systems on algebraic surfaces, symbolic powers of ideals of points in the projective plane, on constructing discrete Morse function on moduli space of planar polygons, linear independence of Artin L-values, on problems related to the set-theoretic complete intersection and symbolic powers of ideals.

Computer Science

In Computer Science research was carried out in the following topics: Hardness of testing the existence of sparse affine shifts of polynomials, establishing that bounded tree width arithmetic circuits are not any more powerful than arithmetic formulas, logical aspects of security protocols, power of the intruder in the Dolev-Yao model extended with communicable certification, information flow and connections to the Russian cards problem, 2-variable logics on countable linear orderings, factorizations for orbit-finite nominal monoids, trichotomy theorems for model-checking mu-calclus formulas, lower bounds for majority logics, decidability and complexity of a model of LTL with linear constraints over rationals, optimizations to liveness checking of timed automata, efficient test generation for expressive decision tables, distributed probabilistic systems, boundedness in counter systems, parallel complexity of k-disjoint paths on planar graphs, transcendence and algebric independence of some classes of irrational numbers, dynamic complexity, counting many-to-one matchings in rank-maximal and popular matching settings, maintaining latest information in systems with unbounded channels, multi-parametric verification of distributed algorithms, MSCs with broadcasts, finding fast practical fixed-parameter-tractable (FPT) algorithm for the Feedback Vertex Set (FVS) problem, learning bounded degree tree using separator queries, randomized polynomial-time identity testing for non-commutative circuits, quantitative analysis of recursive programs, and verification of infinite behaviours via graph decompositions.

Physics

Research in theoretical physics was carried out in the following topics: A new deformation of the Bernoulli polynomials using the Tsallis exponential function, Complete integrability of Non linear Schrodinger model, Bethe ansatz and integrability, Yang- Baxter equation and Quantum inverse scattering, studying aspects of hydrodynamics, in particular diffusion and viscosity for a certain class of non-relativistic fluids and their gravity duals (which exhibit hyperscaling violation), on giving a geometric formulation to our proposed equations regularising neutral fluid flows and magnetohydrodynamics, on 2-fluid regularized Plasma equations, entanglement in ghost systems (CFTs and quantum ghost-spin systems), studying the shear diffusion constant in hyperscaling violating Lifshitz theories, study of the measurability of spin-induced quadrupole moment and its implications for testing the nature of compact binaries using gravitational wave observations, on a geometric formulation of fluid dynamics and its regularization on a curved Riemannian manifold, Two-fluid plasma theory, its Hamiltonian-Poisson bracket formulation and its regularisation, Aspects of integrable systems and three body problem.

10 Publications

Journal Articles

Mathematics

J1 Krishna Hanumanthu: *Positivity of line bundles on general blow ups of* $\mathbb{P}^2$, J. Algebra 461 (2016), 65-86, 1 September 2016.

J2 B.V. Rao and R.L. Karandikar: *Second Fundamental Theorem of Asset Pricing*, to appear in Communications on Stochastic Analysis.

J3 Ronno Das and Priyavrat Deshpande: *Coxeter transformation groups and reflection arrangements in smooth manifolds*, Journal of Homotopy and Related Structures, 11(3), 571–597.

J4 Priyavrat Deshpande: *On arrangements of pseudohyperplanes*, Proc of the Indian Academy of Sciences, 126 (2016), no. 3, 399–420.

J5 B.N. Chary, S.S. Kannan: *Rigidity of Bott-Samelson-Demazure-Hansen variety for* $PSp(2n, C)$, to Appear in the Journal of Lie Theory.

J6 Shraddha Srivastava, Upendra Kulkarni and K.V. Subrahmanyam: *Relating tensor structures on representations of general linear and symmetric groups*, to appear in the Journal of Transformation Groups.

J7 Priyavrat Deshpande: *Arrangements of spheres and projective spaces*, Rocky Mountain Journal of Mathematics, 46(5), 2016, pp.1447-1487

J8 Kartik Chandrasekhar and Priyavrat Deshpande: *Face enumeration for line arrangements in a 2-torus*, to appear in the Indian Journal of Pure and Applied Mathematics.

J9 Krishna Hanumanthu and S. Senthamarai Kannan: *Syzygies of some GIT quotients*, J. Ramanujan Math. Soc. 31 (2016), no. 4, 419-430.

J10 Krishna Hanumanthu: *Seshadri constants on surfaces with Picard number 1*, Manuscripta Math. 153 (2017), no. 3-4, 535-543.

J11 Krishna Hanumanthu: *Positivity of line bundles on special blow ups of* $\mathbb{P}^2$, to Appear in the Journal of Pure and Applied Algebra.

J12 Krishna Hanumanthu and Alapan Mukhopadhyay: *Multi-point Seshadri constants on ruled surfaces*, to appear in Proc. Amer. Math. Soc.

J13 V. Lakshmibai, Vijay Ravikuma and William Slofstra: *The cotangent bundle of a cominuscule Grassmannian*, Michigan Math. J. Volume 65, Issue 4 (2016), 749-759.

J14 Oliver T. Margetts and R. Srinivasan: *Non-cocycle-conjugate E_0-semigroups on Factors*, to appear in Publications of Research Institute of Mathematical Sciences, Kyoto.

J15 Oliver T. Margetts and R. Srinivasan: *Cohomology for spatial super-product systems*, to appear in Kyoto Journal of Mathematics.

J16 Shraddha Srivastava, Upendra Kulkarni and K.V. Subrahmanyam: *Relating tensor structures of the general linear group and the symmetric group*, to appear in Transformation Groups.

J17 Sourish Das, Aritra Haldar and Dipak K Dey: *Portfolio Risk Analysis: A Bayesian Approach*, to appear in Methodology and Computing in Applied Probability.

J18 Rajeeva L. Karandikar: *Remarks on Stochastic Integral*, to appear in the Indian Journal.

J19 Abhishek T Bharadwaj: *Fatou's Lemma and Integrality Criteria in Number Fields*, The Mathematics Student(ISSN 0025-5742).

J20 Sukhendu Mehrotra and I. Biswas: *Automorphisms of the generalized quot schemes*, Advances in Theoretical and Mathematical Physics.

J21 Narasimha Chary and S. Senthamarai Kannan: *Rigidity of Bott-Samelson-Demazure-Hansen variety for $PSp(2n, \mathbb{C})$*, J. Lie Theory 27 (2017), no.2, 435-468.

J22 Indranil Biswas, S. Senthamarai Kannan and D.S. Nagaraj: *The full automorphism group of $\overline{T}$*, to appear in C. R. Acad. Sci. Paris, Ser. I.

J23 Raja Sridharan, R Sridharan and M.D.Srinivas: *Narayana's generalisation of Matra-vrtta-prastara and the generalised Virahanka-Fibonacci representaitn of numbers*, Indian Jour Hist Science, 50.2, 2015, 227-244.

J24 V. Balaji, Pierre Deligne and A.J. Parameswaran: *Complete Reducibility in Characteristic p*, to appear in EPIGA Journal.

J25 Krishanu Dan and Sarbeswar Pal: *Semistability of certain bundles on second symmetric power of a curve.*, J. Geom. Phys. 103 (2016), 37–42.

J26 Eyal Markman and Sukhendu Mehrotra *Hilbert schemes of K3 surfaces are dense in moduli.*, Math. Nachr. 290 (2017), no. 5–6, 876-884

Computer Science

J27 Suryajith Chillara and Partha Mukhopadhyay:: *On the limits of depth reduction at depth three over fixed finite fields*, to appear in Information and Computation.

J28 B. Srivathsan, F. Herbreteau and I. Walukiewicz: *Better abstractions for timed automata*, to appear in Information and Computation.

J29 K.V. Subrahmanyam, Gabor Ivanyos and Young Qiao: *Non-Commutative Edmond's problem and matrix semi-invariants*, to appear in the Journal of Computational Complexity.

J30 Fahad Panolan, Geevarghese Philip and Saket Saurabh: *On the parameterized complexity of b-chromatic number*, Journal of Computer and System Sciences 84: 120-131.

J31 Stefan Kratsch, Geevarghese Philip, Saurabh Ray: *Point Line Cover: The Easy Kernel is Essentially Tight*, ACM Transactions on Algorithms 12(3): 40:1-40:16 (2016)

Physics

J32 G.S. Krishnaswami and S Sachdev: *Algebra and geometry of Hamilton's quaternions*, Resonance: Journal of Science Education, June 2016. arXiv:1606.03315.

J33 Chandra Kant Mishra, Aditya Kela, K.G. Arun and Guillaume Faye: *Ready-to-use post-Newtonian gravitational waveforms for binary black holes with non-precessing spins: An update*, Phys. Rev. D 93, 084054 (2016).

J34 K.G.Arun: *Tests of general relativity with GW150914*, LIGO scientific Collaboration and Virgo Collaboration, Phys. Rev. Lett. 116, 221101 (2016).

J35 K.G. Arun: *Properties of the Binary Black Hole Merger GW150914*, LIGO scientific Collaboration and Virgo Collaboration, Phys. Rev. Lett. 116, 241102 (2016).

J36 K.G. Arun: *GW151226: Observation of Gravitational Waves from a 22-Solar-Mass Binary Black Hole Coalescence*, LIGO scientific Collaboration and Virgo Collaboration, Phys. Rev. Lett. 116, 241103 (2016).

J37 K.G. Arun and and Chandra Kant Mishra: *Gravitational-wave phasing for low-eccentricity inspiralling compact binaries to 3PN order*, Blake Moore, Marc Favata, Phys. Rev. D 93, 124061 (2016).

J38 Kedar S. Kolekar, Debangshu Mukherjee and K. Narayan: *Hyperscaling violation and the shear diffusion constant*, Phys. Lett. B (2016), arXiv:1604.05092 [hep-th].

J39 K. Narayan: *On dS4 extremal surfaces and entanglement entropy in some ghost CFTs*, arXiv:1602.06505 [hep-th], Phys.Rev. D94 (2016) no.4, 046001.

J40 T.R. Govindarajan: *Algebraic formulation of quantum theory, particle identity and entanglement*, International Journal of Quantum Information Vol. 14, No. 6 (2016) 1640026.

J41 G.S. Krishnaswami and H. Senapati: *Curvature and geodesic instabilities in a geometrical approach to the planar three-body problem*, J. Math. Phys. 57, 102901 (2016). (Featured article).

J42 T. R. Govindarajan and J. M. Munoz-Casta neda: *Modelling quantum black hole*, Modern Phys Letts, 31,(2016)165-210.

J43 Poonam Chandra, G. C. Anupama, K. G. Arun, Shabnam Iyyani, Kuntal Misra, D. Narasimha, Alak Ray, L. Resmi, Subhashis Roy and Firoza Sutaria: *Explosive and Radio-Selected Transients: Transient Astronomy with Square Kilometre Array and its Precursors*, Journal of Astrophysics and Astronomy, 37, 30 (2016).

J44 K.G. Arun: *Binary Black Hole Mergers in the first Advanced LIGO Observing Run*, LSC and Virgo collaboration, Phys. Rev. X 6, 041015 (2016).

J45 K.G. Arun: *Upper Limits on the Rates of Binary Neutron Star and Neutron Star-Black Hole Mergers from Advanced LIGO First Observing Run*, LSC and Virgo Collaborations, Astrophys. J, 832, L21 (2016).

J46 M.Balamurugan and R.Chakrabarti: *Squeezed Schrodinger kitten states of a qubitoscillator system: Generation and quantum properties in the phase space*, B.Virgin Jenisha, Physica A473(2017)428444.

J47 A. Laddha and A. Sen: *Sub-subleading Soft Graviton Theorem in Generic Theories of Quantum Gravity*, Accepted for publication in JHEP.

J48 M. Campiglia and A. Laddha, *Sub-subleading soft gravitons and large diffeomorphisms*, JHEP 1701, 036 (2017)

J49 M. Campiglia and A. Laddha, *Sub-subleading soft gravitons: New symmetries of quantum gravity*, Phys. Lett. B 764, 218 (2017)

J50 M. Campiglia and A. Laddha, *Subleading soft photons and large gauge transformations*, JHEP 1611, 012 (2016)

Humanities

J51 Malathi Velamuri, Damien Eldridge and Ilke Onur: *The Impact of Private Hospital Insurance on the Utilization of Hospital Care in Australia*, Applied Economics, 49(1) (2017): pp.78-95.

J52 Malathi Velamuri and Ilke Onur: *A Life-Course Perspective on Gender Differences in Cognitive Functioning in India*, Journal of Human Capital (Univ. of Chicago Press), 10(4), 2016, pp.520-563.

Conference Papers

Mathematics

C1 Ananya Lahiri and D. Kundu: *On parameter estimation of two-dimensional polynomial phase signal model*, Statistica Sinica, (to appear).

C2 Raja Sridharan, R Sridharan and M.D. Srinivas: *Developments in Tala-Prastara afterr Sangitaratnakara of Sarngadeva*, Paper Presented at the AMS-INdia Symposium, Varanasi, to appear in Ganitabharati.

Computer Science

C3 Parosh Aziz Abdulla, C. Aiswarya, Mohamed Faouzi Atig, Marco Montali and Othmane Rezine: *Recency-Bounded Verification of Dynamic Database-Driven Systems*, in the proceedings of The Principles of Database Systems (PODS) symposium 2016, San Francisco, USA.

C4 Mohamed Faouzi Atig, K. Narayan Kumar, Prakash Saivasan: *Acceleration in Multi-PushDown Systems*, TACAS 2016: Springer LNCS Vol 9656, pages 698-714.

C5 Mohamed Faouzi Atig, Dmitry Chistikov, Piotr Hofman, K. Narayan Kumar, Prakash Saivasan and Georg Zetzsche: *Complexity of regular abstractions of one-counter languages*, in Proceedings of the 31st Annual Symposium on Logic in Computer Science (LICS 2016), New York, July 2016.

C6 Amaldev Manuel and A.V. Sreejith: *Two-variable logic on countable linear orderings*, Proceedings of the 41st International Symposium on Mathematical Foundations of Computer Science (MFCS), LIPIcs 58, Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik 2016

C7 B. Srivathsan and M. Praveen: *Nesting Depth of Operators in Graph Database Queries: Expressiveness Vs. Evaluation Complexity*, Proceedings of the 43rd International Colloquium on Automata, Languages and Programming (ICALP 2016).

C8 B. Srivathsan, F. Herbreteau, T.T. Tran and I. Walukiewicz: *Why liveness for timed automata is hard, and what we can do about it*, in the Proceedings of FSTTCS 2017, LIPIcs, Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik 2016.

C9 Nikhil Balaji, Samir Datta, Raghav Kulkarni and Supartha Podder: *Graph Properties in Node-Query Setting: Effect of Breaking Symmetry*, Proceedings of the 41st International Symposium on Mathematical Foundations of Computer Science (MFCS), LIPIcs 58, Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik 2016

C10 Samir Datta, Raghav Kulkarni and Anish Mukherjee: *Space-efficient Approximation Scheme for Maximum Matching in Sparse Graphs*, Proceedings of the 41st International Symposium on Mathematical Foundations of Computer Science (MFCS), LIPIcs 58, Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik 2016

C11 Parosh Aziz Abdulla, C. Aiswarya and Mohamed Faouzi Atig: *Data Communicating Processes with Unreliable Channels*, in the proceedings of Logic in Computer Science (LICS),2016.

C12 Partha Mukhopadhyay: *Depth-4 Identity Testing and Noether's Normalization Lemma*, CSR 2016, Springer LNCS, 2016.

C13 Ratul Saha, Madhavan Mukund and Jagadeesh Chandra Bose R P: *Time-bounded Statistical Analysis of Resource-constrained Business Processes with Distributed Probabilistic Systems*, in Proceedings of SETTA 2016, Beijing, Nov 2016, Springer LNCS 9948 (2016), 297-314.

C14 Gábor Ivanyos, Youming Qiao and K V Subrahmanyam: *Constructive non-commutative rank computation in deterministic polynomial time over fields of arbitrary characteristic*, in the Proceedings of the Innovations in Theoretical Computer Science conference held in January 2017, Simon's Institute, University of California, Berkley, USA.

C15 Varunkumar Jayapaul: *Improved bounds for poset sorting in the forbidden-comparison regime*, accepted at CALDAM 2017.

C16 Varunkumar Jayapaul: *Elusiveness of finding degrees*, Accepted at CALDAM 2017.

C17 B. Srivathsan, F. Herbreteau, T.T. Tran and I. Walukiewicz: *Why liveness for timed automata is hard, and what we can do about it*, FSTTCS 2016.

C18 V. Arvind, Pushkar S Joglekar, Partha Mukhopadhyay, S. Raja: *Randomized Polynomial Time Identity Testing for Noncommutative Circuits*, to appear in the 49 Annual ACM Symposium on the Theory of Computing (STOC'17).

C19 R. Ramanujam, Vaishnavi Sundararajan and S.P. Suresh: *Existential Assertions for Voting*, accepted for publication at Voting 2017.

C20 M. F. Atig, A. Bouajjani, K. Narayan Kumar and P. Saivasan: *Parity games on bounded phase multi-pushdown systems*, to appear in the Proceedings of NETYS 2017.

C21 K.V. Subrahmanyam and Muthuvel Murugan: *Invariant representations of images for better learning*, Proceedings of the European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning, 2017, pages 59-64.

Preprints

Mathematics

P1 Debajyoti Nandi: Partition identities arising from the level 4 standard modules for A2(2).

P2 Purusottam Rath, S. Gun and M. R. Murty: Transcendental sums related to the zeros of zeta functions.

P3 V. Balaji and A.J. Parameswaran: On a theorem of Deligne and the etale slice theorem.

P4 Krishanu Dan and Suratno Basu: Stability of Secant Bundles on Second Symmetric Power of Curves, http://arxiv.org/abs/1604.00752

P5 S.S. Kannan, K. Paramasamy, S.K. Pattanayak, Shyamashree Upadhyay: Torus quotients of Richardson varieties.

P6 K.V. Subrahmanyam, Upendra Kulkarni and Shraddha Srivastava: Relating tensor structures on representations of general linear and symmetric groups,

P7 Priyavrat Deshpande: A note on cohmology of the complement of certain hypersurface arrangements.

P8 Krishna Hanumanthu: Seshadri constants on surfaces with Picard number 1.

P9 Krishna Hanumanthu: Positivity of line bundles on special blow ups of $\mathbb{P}^2$

P10 Dipankar Ghosh: Some criteria for regular and Gorenstein local rings via syzygy modules.

P11 S. Sundar and S.P. Murugan: E_0 semigroups and Product systems.

P12 R. Srinivasan and Ollie T Margeths: Cohomology for spatial super-product systems.

P13 Clare D'cruz and Shreedevi: Cohen-Macaulayness and Gorensteinness of Symbolic Blowup algebras of certain monomial curves, submitted to Journal.

P14 Krishna Hanumanthu and Alapan Mukhopadhyay: Multi-point Seshadri constants on ruled surfaces.

P15 I. Biswas, S. S. Kannan, D. S. Nagaraj: Full automorphism group of $\overline{T}$.

P16 Arpan Kabiraj: A non-cancellation lemma for Goldman bracket.

P17 Dipankar Ghosh and Tony J. Puthenpurakal: Vanishing of (co)homology over deformation of Cohen-Macaulay local rings of minimal multiplicity.

P18 Shraddha Srivastava: A short and new proof of the classical Schur-Weyl duality.

P19 Shraddha Srivastava: Sesquiunital sesquialgebra structure of the centralizer algebras arising from the finite groups.

P20 M. Subramani and K. Srinivas: Non-Wieferich primes in number fields and abc conjecture (Submitted).

P21 Sourish Das, Ananya Lahiri and Purba Das: Understanding Arctic Sea Ice Melting using Functional Data Analysis.

P22 Sourish Das, Aritra Halder and Dipak Dey: Portfolio Analysis with modified Dirichlet Process Prior.

P23 M. Subramani, M. Ram Murty and K. Srinivas: A family of Euclidean real quadratic fields.

P24 Sukhendu Mehrotra, E. Markman and M. Verbitsky: Rigid hyperholomorphic sheaves remain rigid along generic twistor deformations.

P25 Ananya Lahiri: Asymptotic properties of the volatility estimator of mixed fractional Brownian motion driven model, Arxiv link: https://arxiv.org/abs/1611.08543.

P26 Senthamarai Kannan and J.F. Thomsen: GIT quotient of a Bott-Samelson-Demazure-Hansen variety by a maximal torus.

P27 V. Balaji: Principal bundles on singular curves.

P28 Priyavrat Deshpande and Nachiketa Adhikari: Discrete Morse theory for moduli space of planar polygons.

P29 Krishanu Dan and Sarbeswar Pal: Non-emptiness of Brill-Noether Loci over very general quintic hypersurface. (https://arxiv.org/abs/1702.05893)

P30 Kuldeep Saha: On Contact Embedding and Immersion.

P31 Sazzad Ali Biswas: Lamprecht-Tate Formula.
https://arxiv.org/pdf/1702.04286.pdf.

P32 Dipankar Ghosh and Manoj Kummini: Characterizations of Cohen-Macaulay local rings via free summands of certain syzygy modules.

P33 Kunal Mukherjee and Issan Patri: Automorphisms of Compact Quantum Groups.

P34 Alexandru Chirvasitu and Issan Patri: Topological Automorphism groups for Compact Quantum Groups-

P35 Teodor Banica and Issan Patri. 3-Maximal torus theory for compact quantum groups

Computer Science

P36 Suryajith Chillara, Mrinal Kumar, Ramprasad Saptharishi and V Vinay: The Chasm at Depth Four, and Tensor Rank : Old results, new insights.
http://eccc.hpi-web.de/report/2016/096/

P37 R Ramanujam, Vaishnavi Sundararajan, S P Suresh: Dolev-Yao model with assertions: intruder capabilities.

P38 Ratul Saha, Madhavan Mukund, and R. P. Jagadeesh Chandra Bose: Time-bounded Statistical Analysis of Resource-constrained Business Processes with Distributed Probabilistic Systems.

P39 Partha Mukhopadhyay, V. Arvind and Raja S. Randomized Polynomial Time Identity Testing for Noncommutative Circuits (ECCC Report: 2016/089).

P40 K.V. Subrahmanyam, Gabor Ivanyos and Young Qiao: Construction non-commutative rank is in deterministic polynomial time.

P41 Vikraman Arvind, Pushkar Joglekar, Partha Mukhopadhyay and S Raja: Identity Testing for +ve Regular Non-commutative Arithmetic Circuits.
https://arxiv.org/abs/1611.07235.

P42 C. Aiswarya, Paul Gastin and Prakash Saivasan: Nested Words for Order-2 Pushdown Systems.

Physics

P43 G S Krishnaswami and H Senapati: Geodesic instabilities and completeness in the planar three-body problem, arXiv:1606.05091

P44 T.R. Govindarajan and J. M. Munoz-Castaneda: quantum theory on manifolds with singular potentials, arXive: 1606.02079.

P45 K.G. Arun: Binary Black Hole Mergers in the first Advanced LIGO Observing Run, LIGO scientific Collaboration and Virgo Collaboration, arXiv:1606.04856.

P46 Kedar S. Kolekar, Debangshu Mukherjee and K. Narayan: Hyperscaling violation and the shear diffusion constant, arXiv:1604.05092

P47 Dileep P. Jatkar and K. Narayan: Entangled spins and ghost-spins, arXiv:1608.08351 [hep-th].

P48 R. Parthasarathy and J. Pasupathy: Evolution From Classical to Quantum Theory.

P49 R.Parthasarathy, K.S.Viswanathan and A.DeBeneditis: Classical Defocussing of geodesics from higher dimensions, gr-qc/1702.05231.

P50 Govind S. Krishnaswami, Sonakshi Sachdev, Anantanarayanan Thyagaraja: Conservative regularization of compressible flow and ideal magnetohydrodynamics, arXiv:1510.01606 (Significantly extended version of earlier paper).

P51 Kedar Kolekar, Debangshu Mukherjee and K. Narayan: Notes on hyperscaling violating Lifshitz and shear diffusion, arXiv:1612.05950 [hep-th].

P52 M. Balamurugan, R. Chakrabarti and R. Jagannathan: An extension of the Bernoulli polynomials inspired by the Tsallis statistics, arXiv:1612.07496[math-ph].

P53 M. Balamurugan, R. Chakrabarti and B. Virgin Jenisha: Deconstruction and differentiation of squeezed kitten states in a qubit-oscillator system, arXiv:1610.05117.

P54 G.S. Krishnaswami and H. Senapati: An introduction to the classical three-body problem: From periodic solutions to instabilities and chaos,

P55 N. V. Krishnendu, K. G. Arun and C. K Mishra: Testing the binary black hole nature of a compact binary coalescence, arxiv: 1701.06318.

P56 A. Laddha and Prahar Mitra: Asymptotic Symmetries and Subleading Soft Photon Theorem in Effective Field Theories [arxiv : 1709.03850].

Ph.D. Thesis

T1 B. Narasimha Chary: Torus quotients and Automorphism group of a Bott-Samelson variety (April 2016).

T2 Prakash Saivasan: Analysis of Automata-theoretic Models of Concurrent Recursive Programs (May 2016).

T3 Nikhil Balaji: Succinct Numbers, Skew Circuits and Bounded Treewidth Graphs: Algorithms and Complexity (July 2016).

T4 Suratno Basu: On a relative Mumford-Newstead Theorem (July 2016).

11 The National Undergraduate Programme

In 1998, CMI initiated an National Undergraduate Programme in the Mathematical Sciences in collaboration with Madhya Pradesh Bhoj Open University with a 3 year course in Mathematics and Computer Science, leading to a B.Sc. Honours degree. In 2001, this programme was extended to the postgraduate level with separate 2 year courses leading to M.Sc. degrees in Mathematics and Computer Science. The scope of the undergraduate programme was expanded in 2003 to incorporate a 3 year course leading to a B.Sc. Honours degree in Physics. CMI commenced a two year course leading to an M.Sc. degree in Applications of Mathematics in 2010.

From 2012, the B.Sc. Physics programme has been restructured as a B.Sc. programme in Mathematics and Physics. There is a common admission to the B.Sc. programmes in Mathematics and Computer Science and Mathematics and Physics and all students do the same courses in the first semester. Students choose their stream at the end of the first semester.

The undergraduate and postgraduate teaching programmes at CMI are both run in cooperation with the Institute of Mathematical Sciences (IMSc), Chennai. These programmes tap the teaching talent available at the elite research institutes of the country, which are normally outside the university system. Students are thus exposed to lectures by active researchers who bring a very different perspective to the teaching.

B.Sc. (Hons.) Mathematics and Computer Science

In 2016, the nineteenth batch of students was admitted to the undergraduate programme. At the end of the first semester, 28 opted for B.Sc. in Mathematics and Computer Science. The second year B.Sc. class has 32 students in Mathematics and Computer Science and the third year B.Sc. class has 23 students. Out of the 20 students of the 2013 batch who took their degrees at the convocation in July 2016, several have been placed in very prestigious institutions.

- Abhishek De
  MSc Computer Science, Chennai Mathematical Institute
- Akash Kumar
  MSc Computer Science, Chennai Mathematical Institute
- Anirban Majumdar
  MSc Computer Science, Chennai Mathematical Institute
- Chayan Kumar Banerjee
  MSc Applications of Mathematics, Chennai Mathematical Institute

- Debraj Chakraborty
  MSc Computer Science, Chennai Mathematical Institute
- Deshmukh Yash Uday
  MSc Mathematics, Chennai Mathematical Institute
- Mohit Upmanyu
  Integrated PhD Mathematics, Tata Institute of Fundamental Research, Mumbai
- Patel Nisarg Rameshbhai
  MSc Computer Science, Chennai Mathematical Institute
- Pranjal Dutta
  MSc Computer Science, Chennai Mathematical Institute
- Purba Das
  MSc Applications of Mathematics, Chennai Mathematical Institute
- R Goutham
  PhD Computer Science, University of Chicago, Illinois, USA
- R Siddarth
  MSc Applications of Mathematics, Chennai Mathematical Institute
- Sanath Kumar Krishnamurthy
  MSc Computer Science, Chennai Mathematical Institute
- Subham Bhakta
  MSc Mathematics, Chennai Mathematical Institute
- Suman Sadhukhan
  MSc Computer Science, Chennai Mathematical Institute
- Uma Girish
  MSc Computer Science, Chennai Mathematical Institute
- Varun Ramanathan
  MSc Computer Science, Chennai Mathematical Institute
- Rebhu Johymalyo Josh
  Ernst & Young, Bengaluru
- Ramya Dutta
  PhD student in Mathematics, TIFR Centre for Applicable Mathematics, Bangalore
- Toorupu Chanakya Reddy
  MSc. Economics, Indian Institute of Technology, Roorkee

B.Sc. (Hons.) Mathematics and Physics

Of the 29 students admitted to the undergraduate programme in 2016, 1 student opted for B.Sc. in Mathematics and Physics as the end of the first semester. The second year class has 9 students. The third year class has 4 students. Out of the 7 students of the 2013 batch who took their degrees at the convocation in July 2016, several have been placed in very prestigious institutions.

- Chirantan Chowdhury
  MSc, Mathematics, ALGANT (University of Duisburg-Essen, Germany and Milan, Italy)
- Chivukula Sai Krishna Deep
- Krishnendu Ray
  Pre-PhD Physics, Chennai Mathematical Institute
- Neetal Neel
  MSc Mathematics, Chennai Mathematical Institute
- Pranav V Chakravarthy
  MSc Mathematics, University of Western Ontario, Canada
- Sankhadip Chakraborty
  PhD Mathematics, Instituto Nacional de Matemtica Pura e Aplicada, Rio de Janeiro
- Soumyadip Sahu
  MSc Mathematics, Chennai Mathematical Institute

M.Sc. Mathematics

In 2016, 6 students have joined the programme. There are 7 students in the second year of the programme. 15 students who joined the programme in 2014 have completed the programme successfully.

- Aman Barot
  PhD Statistics, University of North Carolina at Chapel Hill, USA
- Arpan Pal
  PhD Mathmatics, Indian Statistical Institute, Bangalore
- Arpit Kansal
- Dharm Veer
  PhD Mathematics, Chennai Mathematical Institute

- Dwaipayan Mazumder
- Gautam Aishwarya
  PhD Mathematics, University of Delaware, USA
- Kunjakanan Nath
  PhD Mathematics, University of Montreal, Canada
- Navaneeth C C
  PhD Mathematics, University of Missouri, Columbia, USA
- Prayagdeep Parija
  Phd Mathematics, University of Wisconsin, Milwaukee, USA
- Sannidhi A S
- Shreejit Bandyopadhyay
  PhD Mathematics, Pennsylvania State University, USA
- Soumendra Ganguly
- Subham Roy
- Deepak K D

M.Sc. Computer Science

In 2016, 16 students have joined the programme. There are 21 students in the second year of the programme. 15 students who joined the programme in 2014 have completed the programme successfully.

- Arindam Biswas
  PhD Computer Science, Institute of Mathematical Sciences
- Ashutosh Kumar
  PhD Computer Science and Automation, IISc Bangalore
- Bineet Kumar Ghosh
  Oracle, Bengaluru
- Kamal Nayan Goyal
  LOCUS, Bengaluru
- Miheer Dewaskar
  PhD Statistics and Operations Research, University of North Carolina at Chapel Hill

- Preetish Bajpai
  Ernst & Young LLP, Bengaluru
- Prabal Banerjee
  PhD Cryptology and Security Research Unit, ISI Kolkata
- Pranav Ashok
  PhD Computer Science, Technical University of Munich, Germany
- Rajit Datta
  PhD Computer Science, Chennai Mathematical Institute
- Ramit Das
  PhD Computer Science, Institute of Mathematical Sciences, Chennai
- Srijita Kundu
  PhD Centre for Quantum Technologies, National University of Singapore
- Sushrut Karmalkar
  PhD Computer Science, The University of Texas, USA
- Venkatesh G S
- Vivek K
- Arjun Arul
  PhD Computer Science, Chennai Mathematical Institute

M.Sc. Applications of Mathematics

In 2016, 12 students have joined the programme. There are 4 students in the second year of the program. 10 students who joined the programme in 2014 have completed the programme successfully.

- Arghya Ghosh
- Aritra Halder
  PhD Statistics, University of Connecticut, USA
- Asmita Ghoshal
  Credit Suisse, Mumbai
- Chiranjit Dutta
  Cogitaas, Mumbai
- Prantik Biswas

- Srawan Kumar Bishnoi
  PhD student, IFMR, Chennai
- Sayan Mukherjee
  PhD Computer Science, Chennai Mathematical Institute
- Swati Gupta
  Credit Suisse, Mumbai
- Mouktik Chattopadhyay
- Radharaman Roy

Convocation

The 14th Annual Convocation of CMI was held on 25 July 2016. Degrees were awarded to 76 successful candidates at various levels. Of these, 27 were B.Sc. candidates, 44 were M.Sc. candidates and 5 were a Ph.D. candidates. Prof. H.S. Mani, Adjunct Professor, CMI (Former Director, Harish-Chandra Research Institute, Allahabad) delivered the convocation address. Mr. Narayana Murthy, Founder, Infosys Ltd. was the Chief Guest.

For the B.Sc. programmes, the CMI Gold Medal of Excellence was awarded to Uma Girish in Mathematics and Computer Science and Soumyadip Sahu in Mathematics and Physics for their outstanding performance at the undergraduate level. For the M.Sc. programmes, the CMI Gold Medal of Excellence was awarded to Aman Barot in Mathematics and Miheer Ulhas Dewaskar in Computer Science.

12 Activities of the Undergraduate Students

Informatics Olympiad

CMI faculty coordinate the training and selection of students to represent India at the International Olympiad in Informatics through the Indian Association for Research in Computer Science (IARCS). CMI hosts the official IARCS website. From September 2004, a monthly online programming competition has been conducted by the CMI faculty via the IARCS website.

Deeparaj Bhat

- Attended Summer Camp Vijyoshi in December 2016 at IISc, Bangalore.

Aalok Thakkar

- Speaker at TEDxMITS, Kochi, in July 2017. Topic: How Theory transformed Carnatic Music.
- Speaker at TEDxIIESTShibpur, Kolkata in October 2017. Topic: Why do we debate?

Aditya Hendre

- Participated in Google Summer of Code 2016 and successfully completed a project titled "Fineract: Implement integration for Unified Payments Interface," with the Apache Software Foundation. Wrote open source software code as part of the program.

Interaction with graduate students from Ecole Normale Supérieure

Chennai Mathematical Institute has an agreement with the Ecole Normale Supérieure in Paris, France, one of the leading institutions in the world for teaching and research in Mathematics. This agreement provides for regular exchange visits by academic members of CMI and ENS, Paris. This includes, in particular, exchanges of visits by undergraduate students between the two institutions.

Every year, the top three students passing out from the B.Sc. Mathematics programme spend 8 weeks at the ENS, where they work on research projects with the ENS faculty. In May–June 2016, Deshmukh Yash Uday visited the ENS.

The annual visitors from the ENS arrived in two groups: two for the period January–February and two for the period March–April. Apolline Louvet visited CMI during February–March, 2017.

Interaction with graduate students from Ecole Polytechnique

Chennai Mathematical Institute has an agreement with the Ecole Polytechnique in Paris, France, one of the leading institutions in the world for teaching and research in Physics.

Every year, the top three students passing out from the B.Sc. Mathematics programme spend 8 weeks at the ENS, where they work on research projects with the ENS faculty. In May–July 2016, Soumyadip Sahu visited the ENS.

13 Undergraduate/Graduate Courses

August – November 2016

Algebraic Automata Theory	:	Amaldev M
Algebraic Geometry I	:	Krishanu Dan
Advanced Graph Theory	:	Samir Datta/Sourav Chakraborty
Algebra I	:	Clare D'Cruz
Algebra III	:	Krishna Hanumanthu
Algebra IV	:	Upendra Kulkarni
Design & Analysis of Algorithms	:	Prajakta Nimbhorkar
Analysis I	:	S Sundar
Analysis III	:	M Sundari
Analysis	:	Alladi Sitaram
Algebraic Number Theory	:	Purusottam Rath
Advanced QFT	:	R Parthasarathy
Algebraic Topology II	:	Shiva Shankar
Calculus	:	Dishant Pancholi
Commutative Algebra	:	Seshadri Chintapalli
Classical Mechanics	:	K G Arun
Classical Mechanics I	:	K Narayan
Complexity II	:	Partha Mukhopadhyay
Colloquium	:	Speaker
Combinatorics I	:	P Deshpande
Concurrent Programming	:	Madhavan Mukund
Derived Categories in Alg Geometry	:	Pramathanath Sastry
Data Mining & Machine Learning	:	K V Subrahmanyam
Economics	:	Malathi Velamuri
Econometrics I	:	V Swaminathan
Electrodynamics	:	R Chakraborti
English	:	Usha Mahadevan
Enviroment Course	:	Speaker/Movie
Graduate Algebra I	:	S Senthamarai Kannan
Graduate Analysis I	:	R Srinivasan
General English	:	Usha Mahadvan
Games on Graphs	:	B Srivathsan

Graduate Topology I	:	Manoj Kummini
Indian Art in Context	:	T M Krishna et al
K-Theory of Operator Algebras	:	Sundar Sobers
Laboratory 1	:	K G M Nair
Logic, Automata & Games	:	Praveen M
Linear Algebraic Groups	:	V Balaji
Mathematical Logic	:	Sriram Nambiar
Intro to Manifolds	:	Vijay Ravikumar
Mathematical Finance	:	Sreejata Banerjee
Mathematical Physics	:	T R Govindarajan
Measure Theoretic Probability	:	B V Rao
Multivariate Statistical Analysis	:	J V Deshpnde
Optimization	:	T Parthasarathy
p-adic Analysis	:	Sazzad Ali Biswas
Proofs and Types	:	S P Suresh
Probability and Statistics	:	Sourish Das
Parameterized & Exact Algorithms	:	Philip Geevarghese
Intro to Programming (Haskell)	:	S P Suresh
Intro to Programming (Python)	:	Narayan Kumar
Quantum Mechanics I	:	H S Mani
Quantum Mechanics	:	G Rajasekaran
Regression & Classification	:	T Krishnan
Statistical Mechanics	:	V V Sreedhar
Software Verification Using SMT Solvers	:	M Srivas
Theoretical Foundations of CS	:	Sourav/Philip/Praveen
Topics in Geometry	:	T R Ramadas
Theory Project	:	Alok/Narayan/VV Sreedhar
Extra Lecture	:	Alladi Sitaram
Theory of Computation	:	Aiswarya Cyriac
Thermal Physics	:	Govind Krishnaswami

January - April 2017

Algebraic Automata Theory	:	Narayan Kumar
Advanced Algorithms	:	Prajakta Nimbhokar
Advanced Functional Analysis	:	R Srinivasan
Algebraic Geometry Problem Seminar	:	Pramath/Manoj/Krishna
Algebra II	:	S Senthamarai Kannan
Design & Analysis of Algorithms	:	K Narayan Kumar
Analysis II	:	S Sundar
Advanced Programming	:	Samir Datta
Adv Regression & Classification	:	T Krishnan
Bayesian Data Analysis	:	Sourish Das
Basic Homologial Algebra	:	Dipankar Ghosh
Complex Analysis	:	T R Ramadas
Complex Algebraic Surfaces	:	Krishna Hanumanthu
Classical Mechanics II	:	T R Govindarajan
Commutative Algebra II	:	Clare D'Cruz
Continuum Mechanics & Nonlinear Dynamics	:	H S Mani
Commutative Algebra Seminar	:	Manoj Kummini
Concurrency Theory	:	Madhavan Mukund
Complex Analysis	:	Pramathanath Sastry
Complexity Theory	:	Partha Mukhopadhyay
Critical Phenomenon and Renormalization Group	:	K Narayan
Introduction to Cryptography	:	Rajeeva L Karandikar
Automata/Verification Seminar	:	Coordinator
Development Economics	:	Malathi Velamuri
Differential Equations	:	Dishant Pancholi
Discrete Mathematics	:	Philip Geevarghese
Phy Elective 2	:	V V Sreedhar
Electrodynamics I	:	R Jagannathan
Environment Course	:	Speaker/Movie
Ergodic Theory and Entropy	:	Issan Patri
Finance	:	Sreejata Banerjee
Implementation of FP Languages	:	Madhavan Mukund/S P Suresh
Financial Risk Management	:	Sourish Das
Graduate Algebra II	:	Manoj Kummini
Graduate Analysis II	:	M Sundari
Game Theory	:	T Parthasarathy
Games on Graphs 2	:	B Srivathsan
General Relativity	:	Alok Laddha
Graduate Topology II	:	Priyavrat Deshpande
Laboratory	:	K G M Nair

Logic, Automata and Games	:	Aiswarya/Praveen
Linear Algebra	:	Kavita Sutar
Mathematical Logic	:	Sriram Nambiar
Model Checking and Systems Verification	:	M Srivas/B Srivathsan
Optimization	:	K V Subrahmanyam
Optics	:	R Chakraborti
Programming Language Concepts	:	M Praveen/S P Suresh
Probability Theory	:	B V Rao
Probability & Statistics II	:	J V Deshpande
Group Theory and Physics	:	Govind Krishnaswami
Quantitative Automata Theory	:	Aiswarya Cyriac
Quantum Field Theory	:	G Rajasekaran
Quantum Mechanics II	:	H S Mani
QFT of Spin Zero Particles	:	Alok Laddha
Riemmanian Geometry	:	Arpan Kabiraj
Symplectic Geometry	:	Sushmita Venugopal
Simulation Methods	:	Ananya Lahiri
Special Topics in QFT	:	R Parthasarathy
Introduction to String Theory	:	K Narayan
Topics in Algebra	:	Upendra Kulkarni
The Art of Short Fiction	:	Usha Mahadevan
Topics in Commutative Algebra	:	Parangama Sarkar
Topics in Geometry	:	T R Ramadas
Lectures on Rational Singularities	:	R V Gurjar
Topology	:	Purusottam Rath
Time Series Analysis/Econometrics II	:	V Swaminathan

14 Workshops/Schools/Conferences

Chennai Theory Day

The following talks were presented at the Chennai Theory Day organized at CMI in April 2017.

- Nitin Saurabh:
  Complete and intermediate polynomials in algebraic complexity theory
- Anuj Tawari:
  Sums of read-once formulas: How many summands suffice?
- S. Raja:
  Noncommutative Valiant's Classes: structure and complete problems
- Prafullakumar P Tale:
  Harmonious Coloring
- Pankaj Pundit:
  On Minimum Average Stretch Spanning Trees in Grid Graphs
- M. Jagadish:
  Tree reconstruction using separator queries
- Arnaud Sangnier:
  Parameterized reachability in networks with many identical processes
- Amaldev Manuel:
  Factorisations over orbit-finite nominal monoids
- Sreejith A V:
  Limited set quantifiers over countable Linear orderings
- William Moses Jr.:
  Balanced allocation: Patience is not a virtue
- S. Kolay:
  Subexponential algorithms for rectilinear Steiner tree and arborescence
- Diptapriyo Majumdar:
  Polynomial kernel for vertex cover parameterized by small degree modulators
- Pradeesha Ashok:
  Parameterized complexity of red blue set cover for lines

- Gaurav Rattan:
  On the limitations of color-refinement and linear-programming approaches to graph isomorphism

- Krishnamoorthy Dinesh:
  Characterization and lower bounds for branching program size using projective dimension

- Ramya Chandrasekar:
  Limitations of sum of products of read-once polynomials

- Sagnik Sen:
  Colouring oriented graphs

- Muthuvel Murugan:
  Learning rotations from images

- Rajiv Sambasivan:
  Fast Gaussian process regression for big data

Lecture Programme for School Students

The Chennai Mathematical Institute (CMI) organised a lecture programme for students of class XI and XII in the areas of Mathematics, Computer Science and Physics, in association with National Academy of Sciences, Allahabad in July 2016. The following lectures were delivered during this program.

- Alok Laddha, CMI: *Einstein, Gauss, Gravity and all that*

- R. Ramamnujam, IMSc: *Games for the Internet*

- Vijay Ravikumar, CMI: *Pascal's triangle evened out*

- Sourish Das, CMI: *Applications of Mathematics in Climate Change*

- G. Krishnamoorthy, Anna University: *Chemistry In Biology*

- Meena Mahajan, IMSc: *Searching with errors*

Meeting in honour of Prof G Rajasekaran

A meeting was organized to honor Prof G Rajasekaran on his 80th birthday and the following is the list of lectures held as part of this meeting.

- D. P. Roy:
  Basic Constituents of Matter and Their Interactions
- R. P. Malik:
  Higher p-Form Gauge Theories Strings: BRST Approach
- M. Sivakumar:
  Higher Spin theories: From Dirac to Vasiliev
- J. Maharana:
  High Energy Scattering in Higher Dimensions
- G. Krishnaswami:
  Higgs mechanism and the Added Mass E ect
- J. Samuel:
  Wick Rotation in the Tangent Space
- R. Rajaraman:
  The S-Matrix Formulation of Statistical Mechanics and Issues of Elementarity
- G. Rajasekaran:
  My Inward Bound Journey (or) How I got Enlightenment
- Sudarshan Ananth:
  Relating the forces of Nature
- Amitava Raychaudhuri:
  A4 as a symmetry for neutrino mass models
- Vivek Datar:
  Some novel physics at INO and a possible cryogenic Indium detector for solar neutrinos
- R. Adhikari:
  Leptogenesis in supersymmetric models
- Saurabh Gupta:
  A natural explanation for large neutrino mixing
- M. K. Parida:
  Sterile Neutrino Assisted Non-canonical Seesaw Mechanisms
- Ravindran:
  Infrared structure of Gauge theory

FSTTCS 2016

The 36th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science was held at Chennai Mathematical Institute, Chennai during December 2016. The conference featured invited talks by Tevfik Bultan (University of California, Santa Barbara), Fedor V. Fomin (University of Bergen), Holger Hermanns (Saarland University), Aleksander Madry (Massachusetts Institute of Technology), Mooly Sagiv (Tel Aviv University) and Mikkel Thorup (University of Copenhagen). There were also 44 contributed talks. As part of the conference two workshops were held: Rangoli of Algorithms and Algorithmic Verification of Real-Time Systems.

Statistical Methods in Finance 2016

The second conference and workshop on Statistical Methods in Finance was jointly hosted by Chennai Mathematical Institute (CMI) and the Indian Statistical Institute, Chennai and held at CMI, Chennai. The plenary speakers at this conference were: Prof Rama Cont, Imperial College, London, Prof Mrinal Ghosh, Indian Institute of Science, Bangalore and Prof Subrata Sarkar, Indira Gandhi Institute of Development Research, Mumbai. The list of invited speakers is as follows: N. Balakrishna, CUSAT, Gopal K Basak, ISI Kolkata, Kaushik Bhattacharya, TAPMI, Anirban Chakraborti, JNU, Siddhartha Chakrabarty, IIT Guwahati, Pranab Kumar Das, Centre for Studies in Social Sciences, Kolkata, Sourish Das, CMI, Anindya Goswami, IISER, Pune, Sandeep Juneja, Tata Institute of Fundamental Research, Anandamayee Majumdar , Soochow University, Diganta Mukherjee, ISI Kolkata, Pritam Ranjan, IIM, Indore, Indranil Sengupta, North Dakota State University, Rituparna Sen, ISI Chennai and Vineet Virmani, IIM Ahmedabad.

Workshop on Automata, Concurrency and Timed Systems

The fifth in a series of workshops hosted by CMI was held in Jan/Feb 2017. The previous workshps were held in CMI in February 2015, February 2011, February 2010 and January 2009. In this edition, the following talks were presented:

- C Aiswarya (CMI, Chennai):
  Recency-bounded verification of dynamic database-driven systems Slides.
- Mikolaj Bojanczyk (University of Warsaw, Poland):
  A probabilistic variant of MSO on infinite trees.
- Ahmed Bouajjani (IRIF, University of Paris Diderot, France):
  The Benefits of Duality in Verifying Concurrent Programs under TSO.
- Dmitry Chistikov (University of Oxford, UK):
  Minimal probabilistic automata and nonnegative matrix factorizations require irrational numbers.
- Constantin Enea (IRIF, University of Paris Diderot, France):
  On Verifying Causal Consistency.
- Javier Esparza (TU Munich, Germany):
  From LTL to Limit-Deterministic Automata.
- Emmanuel Filiot (Universite Libre de Bruxelles, Belgium):
  Automata, Logic and Algebra for Word Transductions.
- Blaise Genest (IRISA Rennes, France):
  Controlling a Population.
- Hugo Gimbert (LaBRI, University of Bordeaux, France):
  On the controller synthesis problem for distributed systems with causal memory.
- Stefan Goller (LSV, ENS Cachan, France):
  On long words avoiding Zimin patterns.
- Bartek Klin (University of Warsaw, Poland):
  Functional programming over sets with atoms.
- Martin Lange (University of Kassel, Germany):
  Buffered Simulation Games.
- Amaldev Manuel (CMI, Chennai):
  Cost functions defined by min automata and max automata.

- Roland Meyer (TU Kaiserslautern, Germany):
  Liveness Verification and Synthesis: New Algorithms for Recursive Programs.

- Madhavan Mukund (CMI, Chennai):
  Distributed Probabilistic Systems.

- Anca Muscholl (LaBRI, University of Bordeaux, France):
  Sound negotiations and static analysis.

- M Praveen (CMI, Chennai):
  Nesting Depth of Operators in Graph Database Queries: Expressiveness vs. Evaluation Complexity.

- Prakash Saivasan (TU Kaiserslautern, Germany):
  The complexity of regular abstractions of one-counter languages.

- Philippe Schnoebelen (LSV, ENS Cachan, France):
  Decidable fragments of the logic of subwords.

- AV Sreejith (CMI, India - currently visiting University of Warsaw, Poland):
  Extending monadic second order logic with bounded predicate.

- B Srivathsan (CMI, Chennai):
  Abstractions for timed automata.

- S P Suresh (CMI, Chennai):
  Existential Assertions in Dolev-Yao.

- Gregoire Sutre (LaBRI, University of Bordeaux, France):
  Boundedness and Coverability for Pushdown Vector Addition Systems.

Workshop on Seshadri Constants

A Workshop on Seshadri Constants was held at CMI in January/February 2017. The list of speakers and the topics covered is as follows:

- Brian Harbourne:
  Seshadri constants, Waldschmidt constants and resurgences.

- T. R. Ramadas:
  Divisors and line bundles, and maps to projective spaces, Intersection theory on surfaces, Riemann-Roch for surfaces, Nakai, Kleiman, and Seshadri criteria for ampleness.

- Krishna Hanumanthu:
  Cohomology of coherent sheaves, cohomology of line bundles on projective space. Seshadri constants, Waldschmit constants. Bounds on Seshadri constants.

- D. S. Nagaraj:
  Riemann-Roch for curves, blow-ups of surfaces.

- Manoj Kummini:
  Serre duality.

- M. S. Narasimhan:
  Birational Geometry.

CMI Arts Initiative

The objective of the CMI Arts Initiative is to provide a space for students, professionals and anybody else keenly interested in the humanities and arts to interact and learn from experts in these areas. The CMI Arts Initiative is coordinated by Profs K. Srilata (IIT Madras), K.V. Subrahmanyam, and Madhavan Mukund.

As part of this initiative, the eminent musician T M Krishna conducted a semsester long course at CMI on *Indian Art in Context* between August and November of 2016. The course included lectures by by T.M. Krishna, Gita Jayaraj, Dr A. Mangai, S. Nandagopal, and Baradwaj Rangan.

- T.M. Krishna, one of India's foremost musicians, is also an author, public speaker and columnist. He focused on Classical (Karnatik) music and Bharatanatyam.
- Gita Jayaraj wrote her M.Phil dissertation on Kerala's ritual performative form, Theyyam. She freelances as an editor and writer. She has served as the administrative head at a college of journalism. She discussed ritual art forms, and in particular Theyyam.
- Dr. A. Mangai is an academic, activist and artist. She teaches English in a city college and is a director, playwright and actor in Tamil. She gave lecture on subaltern art forms, beginning the discussion with Tappattam.
- S. Nandagopal is a senior and celebrated painter, metal worker and ceramist -turned-sculptor based out of the Cholamandalam artists village. He focused on the Madras Movement of Art and his own work.
- Baradwaj Rangan, is one of India's leading and award-winning Cinema critics. He is an author and Associate Editor at The Hindu. He covered Cinema.

Concerts/Perfomances at CMI

- Prof. M.V.N. Murthy (Veena) accompanied by Ravi Shankar R. (tabla) gave a Hindustani Instrumental Concert on 19th April 2016.
- Pandit Arun Kashalkar accompanied by Vishal Moghe and Mukul Kulkarni (vocal support), Praveen Karkare (Tabla) and Vyasmurti Katti (Harmonium) gave a Hindustani Vocal concert at CMI on the 25th of August 2016.

Weekend programmes

CMI invites distinguished professionals and academicians from the arts and humanites to give a series of lectures and performances of about 15-20 hours, spread over two or three weekends, on a topic of their choice. Two such events were organized.

- Anne Tannam: 'Harnessing Creativity' Workshop in October 2016.
- Sue Butler: Poetry Writing Workshop in November 2016.

Writers in residence

CMI is proud to host a writers' residency programme in cooperation with Sangam House. Under this programme, CMI supports two international writers each year for a residency of 4–6 weeks. International writers for the year 2016-17 were:

- **Carlos Eduardo de Magalhaes, Brazil:** Carlos Eduardo de Megalhaes is a Brazilian novelist and short story writer. He runs a small, independent publishing house. His novels include Super-homen, neo-homen, Carol e Os Invisis (Superman, no-man, Carol and the Invisibles, 2015), Trova (2013), Cama de pregos (2009), Pitanga (2008) and Dora (2005), among others. Carlos co-wrote the screenplay Corpos Celestes, which won the 1st Edition of contest of Cinema in the State of Parana, in 2014. This was filmed subsequently in 2005. Carlos is also the writer of Tres Linhas – Three lines, which is yet to be filmed. He has been writer-in-residence at Ledig House, New York and at Sangam house, Pondicherry.
- **Per Bloch, Denmark:** Per Bloch works across media and genres. In his album Mezzosphere he mixes electronic, classical and rhythmic sounds and musicians. His recent album, Kokoro, consists of eight love songs in eight languages. He is currently working on a new novel which will follow up on his debut novel, Ti, tyve, tredive (Ten, twenty, Thirty) from 2013.

Endowment Lectures at CMI

- V. Arvind, Director, Institute of Mathematical Sciences, Chennai, delivered the K. Madhava Sarma Memorial Distinguished Lecture. His talk was titled *Noncommutative arithmetic circuits: lower bounds and polynomial identity testing.*

- Satya N. Majumdar, Directeur de recherche, CNRS, Laboratoire de Physique Theorique et Modeles Statistique, Universite Paris-Sud, France, delivered the K. Lakshmanan Memorial Distinguished Lecture. This talk was titled *KPZ story.*

- Gadadhar Misra, IISc, Bangalore, delivered the R.K. Rubugunday Distinguished Lecture. His talk ws titled *The Grothendieck inequality*

15 Conferences, Visits and External Lectures

Madhavan Mukund

- Gave keynote talk, on "It's All About Programming, Stupid!" at LaTiCE 2016, Fourth International Conference on Learning and Teaching in Computing and Engineering, IIT Bombay, Mumbai, India, in April 2016.
- Visited IRIF, University of Paris Denis-Diderot in June 2016 to collaborate with Ahmed Bouajjani on CNRS-CEFIPRA project AVeCSo (Automatic Verification of Concurrent Software).
- NPTEL MOOC on Design and Analysis of Algorithms (Jul-Sep 2016)
- NPTEL MOOC on Programming Data Structures and Algorithms in Python (Jul-Sep 2016)
- Attended the Formal Methods Update Meeting 2016, Government Engineering College, Idukki, Kerala, in July 2016.
- Delivered a talk, "Computer Science: A Rambling Tour", at 2 day workshop on Computational Thinking, SSN College of Engineering, Chennai, in August 2016.
- Participated in the Curriculum Workshop for CSPathShala, an ACM India initiative for teaching computer science in schools, CMI, in August 2016.
- Delivered two lectures at a workshop on "Design and Analysis of Efficient Algorithms and Its Applications", at SRM University, Chennai, in August 2016.
- Delivered a talk, "Concurrent programming: old problems, new challenges", at Amrita School of Engineering, Amritapuri, Kerala, in August 2016.
- Delivered a talk, "Automata, logic and verifying computer programs", at Thiagarajar College of Engineering, Madurai, in August 2016.
- Participated in the ACM India session on Digital India at VLDB 2016, Delhi, in September 2016.
- Delivered an extramural talk, "Correctness in a Connected World", at VIT, Vellore, in September 2016.
- Delivered a keynote talk on the role of mathematics in computer science, in the ACM-W Celebration Event, at Goa University, Goa, in September 2016.
- Participated in ACM Compute at DA-IICT, Gandhinagar, in October 2016.

- Participated in CS Pathshala workshop at Ahmedabad University, in October 2016 and delivered a keynote talk on "Computer Science in School".
- Participated in ACM India iSIGCSE Curriculum Workshop at IIT Gandhinagar, in October 2016.
- Participated in ACM India Deep Tech Summit organized as part of NASSCOM Product Conclave at Bangalore, in October 2016.
- Attended MSR Trusted Data Collaborative Workshop at Bangalore, in November 2016.
- Participated in CS Pathshala workshop at IMSc, Chennai, in November 2016 and delivered a keynote talk on "Computer Science in School".
- Conducted a one-day workshop on algorithms and programming for school teachers from Vivekananda Vidyalaya group of schools, Chennai.
- Delivered a tutorial on "Propositional Logic" at the First Indian SAT-SMT School at TIFR, Mumbai, in December 2016.
- Participated in Grace Hopper Celebrations India at Bangalore, in December 2016.
- Co-organized and participated in 36th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2016) at CMI, in December 2016 and chaired a session.
- Participated in workshop on Algorthmic Verificaton of Real Time Systems (AVeRTS) at CMI, in December 2016.
- Participated in workshop on The Interface of Biology and Theoretical Computer Science at NCBS, Bangalore, in December 2016.
- NPTEL MOOC on Design and Analysis of Algorithms (January–March 2017).
- NPTEL MOOC on Programming Data Structures and Algorithms using Python (January–March 2017).
- NPTEL MOOC on Introduction to Haskell Programming (January–March 2017).
- Participated in ACM India CS Pathshala workshop, University of Calcutta, in January 2017 and delivered a keynote talk on "Computer Science in School".
- Participated in ACM India iSIGCSE workshop on Computer Science curriculum, in January 2017.
- Participated in ACM India Annual Event, Kolkata, in January 2017.
- Participated in Academic Research Summit organized by ACM India and Microsoft Research Bangalore, in January 2017.

- Delivered a lecture on "Computing as a Mathematical Science" at Shri Mathuradas Mohota College of Science, Nagpur, in January 2017.
- Participated in ACTS 2017, the fifth workhop on Automata, Concurrency and Timed Systems, organized at CMI, Chennai during January–February 2017 and gave a talk entitled "Distributed Probabilistic Systems".
- Participated in ACM IKDD Conference on Data Science (CoDS 2017), IIT Madras, in March 2017.
- Delivered an Institute Colloquium talk on "The Life and Times of Edsger Dijkstra" at IMSc Chennai, in March 2017.

Samir Datta

- Visited TU Dortmund in June 2016 under a DST-DAAD project on Dynamic Complexity.
- Gave an invited talk at Mysore Park Workshop on recent trends in Algorithms and Complexity entitled "Dynamic Complexity: the import of old ideas".
- Gave an invited talk on "Solving connectivity problems via basic Linear Algebra" at NMI Thematic workshop on Complexity in IIT Gandhinagar, in November 2016.

K. Narayan

- Participated in the "Simons Summer Workshop on Mathematics and Physics 2016", Simons Center for Geometry and Physics, Stony Brook University, USA, in July 2016.
- Visited TIFR string theory group and gave a talk on "Entanglement in ghost systems", during September-October 2016.
- Attended "Indian Strings Meeting ISM2016" at international string theory conference at IISER Pune, in December 2016 and gave a talk on "de Sitter extremal surfaces and entanglement in ghost systems".
- Attended "String Theory: Past and Present" (SpentaFest), Discussion Meeting around the 65th birthday of Spenta Wadia, ICTS Bangalore, in january 2017.
- Visited HRI String Theory Group, in March 2017.

K. Narayan Kumar

- Attended the ETAPS 2016 conference in Eindhoven, Netherlands.

- Visited LaBRI, Univ of Bordeaux, France, and gave a talk titled "Regular Abstractions of One-counter Languages" in May 2016.
- Visited LSV, ENS de Cachan, France, in May 2016.
- Visited Univ. Paris Diderot, France, during May-June 2016.
- Visited Uppsala University, Sweden, in June 2016.
- Gave invited lectures in the Workshop on Concurrent, Parametric and Distributed Systems at the Institute for Mathematical Sciences, NUS, Singapore on "Graph Decompositions and the Verification of Concurrent Recursive Programs".
- Gave an invited talk in the Annual meeting of IFIG Working Group 2.2 at the Institute for Mathematical Sciences, NUS, Singapore. on "Using graph decompositions to verify concurrent programs"
- Gave an invited talk at Ramkrishna Mutt Vidyamandira on "A glimpse into theoretical computer science".

Senthamarai Kannan

- Gave a talk at QGM, Aarhus, Denmark.

Shiva Shankar

- Gave a talk on *The central definition of control theory* at the Indo-French Program for Mathematics at IMSc. Chennai,

K.V. Subrahmanyam

- Visited IIT Mumbai in August 2016.
- Gave a talk on "A polynomial time algorithm for membership in the null cone of several matrices under left right action", at the International Conference of AMS-TIMC, at BHU, Varanasi, in December 2016.
- Gave a talk at the Innovations in Theoretical Computer Science conference held at University of California, Berkley, in January 2017 on "Constructive non-commutative rank computation is in deterministic polynomial time".
- Gave an invited talk at the Arithmetic Complexity Workshop held at the Institute of Mathematical Sciences, during February-March 2017 on "Invariants, compression spaces and Brascamp-Lieb inequalities".

K.G. Arun

- Visited ICTS-TIFR in April 2016.
- Gave an invited talk at IIT-Bombay, on "Decoding the binary black hole merger" in April 2016.
- Gave an invited talk at the Astronomical Society meeting, Srinagar on "Astrophysical Implications of GW150914" in May 2016.
- Gave a Public talk aimed at college students about Gravitational Wave discovery at Loyola College, Chennai.
- Gave a talk on "The Dawn of Gravitational Wave Astronomy" for college lecturers in the refresher course at B. S Adbur Rahaman University, Vandalur, Tamilnadu.
- Gave an invited colloquium talk on "Testing the binary black hole nature of a compact binary coalescence" at Penn State, in March, 2017.
- Gave a Plenary talk on "Testing Extreme Gravity using Einstein Telescope" at, Einstein Telescope Symposium, Birmingham UK, in March 2017.

Govind S. Krishnaswami:

- Gave a seminar on "Conservative regularization of compressible 3D Eulerian flows" (Part 1), at IMSc., Chennai, in April 2016.
- Gave a seminar on "Conservative regularization of compressible 3D Eulerian flows" (Part 2), at IMSc., Chennai, in April 2016.
- Gave a lectrure in the Summer Training Programme in Physics on "Topics in Quantum Mechanics" at the Dept of Nuclear Physics, University of Madras, in June 2016.
- Gave a lecture on "Topics in Linear Algebra" at Workshop on Mathematical Physics sponsored by Indian Science Academies, PSGR Krishnammal College for Women, Coimbatore, in June 2016.
- Gave three lectures for undergraduates at IISER Pune, in October 2016 on "Introduction to Fluid Mechanics".
- Gave a talk on "Regularization of ideal flow" at IISER Pune, during October 2016.
- Gave a talk on "Three body problem: a geometrical approach at the International conference on New Trends in Field Theories, during November 2016 at Banaras Hindu University, Varanasi.

- Gave 12 lectures on "Quantum Mechanics: Module 2" at the Science Academies' Refresher Course in Quantum Mechanics, at B S Abdur Rahman University, Vandalur, Chennai, during November - December 2016.
- Gave a talk on "Regularization of ideal flow" at IIT Hyderabad, in March 2017.
- Gave a talk on "Higgs mechanism and the Added Mass Effect" at IIT Hyderabad, in March 2017.

Upendra Kulkarni

- Visited ISI, Bangalore and gave a talk on "Schur-Weyl duality and a new tensor product for representations of the general linear group".

Manoj Kummini

- Gave two talks (one colloquium and one seminar) at Cochin University of Science and Technology.

Purusottam Rath

- Visited International Centre for Theoretical Physics(ICTP), Trieste, Italy, for the period May-June 2016.
- Visited the Kerala School of Mathematics for a conference on Arithmetic Geometry and L-functions in August 2016.
- Gave an invited talk in the Conference on Modular Forms, in September 2016 at IISER Bhopal.
- Gave an invited talk in the International Conference of The Indian Mathematics Consortium (TIMC) in cooperation with American Mathematical Society(AMS) held at BHU during December 2016.
- Visited Kerala School of Mathematics for lecturing in a school on Algebraic Number theory.
- Visited Harish Chandra Research nstitute, Allahabad.

M. Sundari

- Attended Indian Women in Mathematics 2016 held at University of Hyderabad during June - July 2016.

S.P. Suresh

- Visited Prof. Hans van Ditmarsch and Prof. Steve Kremer at LORIA, Nancy during June - July 2016. Gave a talk titled "Complexity of disjunction in intuitionistic logic" during the visit.
- Visited NIE, Mysuru and gave mini-course on "Programming in Haskell" in September 2016.
- Gave an introductory talk on Bitcoin for the ACM Chennai Chapter. IMSc., in September 2016.
- Gave a talk on "Theories of knowledge in classical Indian philosophy" at IIT Madras, in September 2016.

Aiswarya Cyriac

- Visited LSV, ENS Cachan, France during May - July 2016.
- Visited LIF, Aix-Marseille University, Marseille, France and gave a talk on "Formal methods for the verification of distributed algorithms" in July 2016.
- Attedned Formal Methods Update Meeting, Government Engineering College, Idukki, Kerala and gave a talk on "On recency bounded verification of dynamic database driven systems" in July 2016.
- Visited Institute of Mathematical Sciences, National University of Singapore, Singapore and gave a talk on "Nested words for order-2 pushdown systems" in September 2016.
- Visited Uppsala University, Sweden, during November-December 2016.

Sourish Das

- Visited LABRI, Bordeaux, France during June 2016 and Gave a talk on "Data Communicating Processes with Unreliable Channels".
- Visited LSV, ENS Cachan, France during May-July 2016.
- Gave a talk on "Data Communicating Processes with Unreliable Channels" in June 2016 at LSV, Cachan, France.
- Gave a talk on "Recency-Bounded Verification of Dynamic Database-Driven Systems" in June 2016 at LSV, Cachan, France.

- Gave a talk on "Formal methods for the verification of distributed algorithms" in June 2016 at GT Verif, IRIF, Paris France.
- Presented a talk at Calcutta University on Platinum Jubillee conference.
- Presented a Talk at StatFin16 at CMI.

Priyavrat Deshpande

- Gave an invited talk at IISER Pune in November 2016 on "Moduli space of planar polygons".
- Gave an inivited talk on "Complexification of pseudo-hyperplane arrangements" at the Nationcal conference on discrete mathematics held at Pune university, in February 2017.
- Gave a colloquium talk on "Moduli space of planar polygons: a topological introduction to mechanical linkages" at IITM, in March 2017.

Krishna Hanumanthu

- Lectured on Linear Algebra in "Mathematics Training and Talent Search" program (MTTS) at IIT-Madras during May-June 2016.
- Gave a talk on "Positivity of line bundles on general blow ups of projective plane" at Commutative Algebra and Algebraic Geometry (CAAG 2016) conference, IISER Mohali, in October 2016.
- Organized and lectured in "Workshop on Seshadri constants" at CMI, during January–February 2017.
- Lectured on "Diagonalization of matrices" at VIT, Chennai.

Sukhendu Mehrotra

- Gave a talk on "Derived symmetries of moduli spaces of sheaves on $K3$ surfaces" at the conference "Geometry at the Frontier" in Pucon, in November 2016.
- Gave talk on "Hyperholomorphic Sheaves and applications" at the joint meetings of the Argentinean and Chilean Mathematical Societies (SUMA) at Valparaiso, in December 2016.
- Gave a talk on "The $K3$ category associated to a symplectic variety of $K3^{[n]}$ type" at the Workshop on Algebraic Geometry in Hanga Roa, Easter Island, in December 2016.

- Gave a course on "Algebra I" at Universidad Catolica.

Prajakta Nimbhorkar

- Gave a talk in the workshop "Symmetry, Logic, Computing" at Simons Institute, Berkeley.

M. Praveen

- Visited Uppsala university in Sweden, in June 2016 as part of the Indo-Swedish project on verification of concurrent software.
- Visited University of Bordeaux in France during June-July 2016 for collaboration and also gave a talk on "Nesting Depth of Operators in Graph Database Queries: Expressiveness Vs. Evaluation Complexity" based on joint work with B. Srivathsan from CMI.
- Visited Laboratoire Bordelais de Recherche en Informatique (LaBRI) in Bordeaux, France during June-July 2016 for research colaboration.
- Gave a talk in the conference ICALP 2016, based on the paper accepted in that conference.
- Gave a talk on "Nesting Depth of Operators in Graph Database Queries: Expressiveness vs. Evaluation Complexity" in the workshop on Automata, Concurrency and Timed Systems organized in CMI during January–February 2017.

Geevarghese Philip

- Visited Max Planck Institute for Informatics, Saarbrucken, Germany during May-June 2016.
- Visited the University of Bergen, in July 2016.
- Attended Dagstuhl Seminar "Randomization in Parameterized Complexity" in January 2017, at Schloss Dagstuhl, Wadern, Germany.

Vijay Ravikumar

- Gave invited talk in University of Ottawa in April 2016, as well as attended the conference on "Equivariant generalized Schubert calculus and its applications" during April-May 2016.
- Visited Rutgers University in New Jersey in May 2016 as part of collaboration.

- Gave talk in IMSc, Chennai on "An Introduction to Schubert Polynomials" in August 2016.

B. Srivathsan

- Visited TCS Innovation Lab - TRDDC, Pune, during May-July 2016 and gave a talk on "Formal semantics for Expressive Decision Tables".
- Gave a talk at FSTTCS 2016 conference.
- Visited LaBRI, Bordeaux, France, in January 2017.
- Visited LSV, ENS Cachan, France, in January 2017.
- Gave 3 talks in January 2017 - LaBRI, LSV, CMI-ACTS workshop
- Visited TRDDC, Pune, in March 2017.

S. Sundar

- Visited Queen Mary University, London.

Krishanu Dan

- Visited IISER Trivandrum, in July 2016 and gave a talk.

Dipankar Ghosh

- Attended 12th National Conference on Commutative Algebra and Algebraic Geometry (CAAG), at IISER Mohali during October 2016.
- Attended International Conference of The Indian Mathematics Consortium (TIMC) in cooperation with American Mathematical Society (AMS) at Banaras Hindu University, Varanasi during December 2016.

Arpan Kabiraj

- Presented a paper at ICTIMC-AMS at Bhubaneshwar, in December 2016.
- Delivered a talk on "Goldman Lie algebra: Center and Geometric intersection number" in Departmental colloquium, at the Department of Mathematics, IIT Madras.

Ananya Lahiri

- Attended Workshop on Lectures in Probability and Stochastic Processes X1 at ISI, Delhi.
- Attended the Conference on Statistical Finance 2016 at CMI.

Ashish Mishra

- Participated in "Lie Theory and Representation Theory Workshop 2016" at University of Cologne, Germany.
- Participated in Workshop and discussion meeting "Group Theory and Computational Methods" at ICTS Bangalore, in November 2016.

Issan Patri

- Gave an invited talk at the conference Recent Advances in Operator Theory and Operator Algebras (OTOA) 2016 at Indian Statistical Institute, Bangalore.

Parangama Sarkar

- Delivered a talk in National conference on "Commutative Algebra and Algebraic Geometry", at IISER Mohali, in October 2016.
- Presented a paper at ICTIMC-AMS at Bhubaneshwar, in December 2016.

T.R. Govindarajan

- Gave a talk on "Edge states, Horizon states and moving boundaries, FTAG XI" at S N Bose Center.
- Visited IISER, Mohali, in October 2016 and gave a Colloquium on "Quantum blackhole".
- Visited CTP, Jamia Millia University, in October 2016 and gave a short course on "Topology, Differential geometry and quantum physics".
- Visited Max Planck Inst for Gravitation Physics, Potsdam and University of Morelia, Michocan, Mexico, in February 2017 and gave talks on "Quantum blackhole as Atom", "Algebraic quantum theory: statistics and entanglement 1" and "Algebraic quantum theory: statistics and entanglement".

- Visited City College of Newyork, CUNY, NY, USA, in March 2017 and gave a talk on "Novel edge states and horizon states".
- Visited Cochin University of S&T, in March 2017 and gave a talk on "Quantum blackhole as Atom" and "Pages from History of Maths in India".
- Visited IISER, Trivandrum, in March 2017 and gave a talk on "Quantum blackhole as Atom".

H.S. Mani

- Completed two projects in the semester January to April 2016 by students from National Institute of technology, Calicut.
- Gave a talk at I.I.T. Bhubaneswar in April 2016 on "Quantum Erasure".
- Gave lectures at matreyi College Delhi in October 2016.
- Gave lectures on Foundation of Quantum mechanics in October 2016.
- Gave refresher course at B.S.Abdur Rahaman University on Qunatum mechanics in December 2016.
- Gave refresher course on Advance Quantum Mechanics at Government College melur in December 2016.
- Gave lectures at Periyar E.V.R. Government College, Tiruchirappalli, in February 2017 on "Advances in Particle Physics".
- Gave lectures on Foundation of Quantum mechanics in February 2017.
- Gave a lecture on Science Day, in February 2017 at the Central University of Himachal Pradesh.

R. Parthasarathy

- Gave twelve lectures on "Relativistic Quantum Mechanics" for University/College teachers in a Refresher Course at Melur, Madurai, Tamilnadu, during December 2016

B.V. Rao

- Visited Rajiv Gandhi University, Itanagar, Arunachal Pradesh during May-June 2016 and attended North-East lecture programme of I.S.I, Bangalore.
- Visited IISER Mohali in June 2016 and gave lecture in Summer interaction series, lecture in Department Mathematics and lecture in Ishan Vikas, North-East programme.

- Visited IISc. Bangalore during June-July 2016. Gave Lectures in summer school 2016 of Joint Telematics Group/IEEE Information Theory.
- Visited ISI Bangalore and attended lectures in January 2017.
- Lectured on "Probability" at University college for women Osmania University, Hyderabad, in February 2017.
- Gave R Vaidyanatha Swamy Trust Lecture on "Probabilistic Modelling" at Madras University, Chennai.

M.K. Srivas

- An invited research presented at SMT/SAT Workshop, TIFR, Mumbai, in December 2016 on "Compositional Bounded Model Checking Using SMT Solvers".
- Visited Prof. Mukund Thattai, National Center for Biological Sciences, Bangalore to collaborate research work on applying SAT/SMT solvers for biological modeling.

V. Swaminathan

- Visited University of Pune, in June 2016 for research discussion and gave a talk titled "An Introduction to Weak Convergence of Probability Measures".
- Visited University of Pune, in September 2016 for research discussion.

Vipul Arora

- Visited Microsoft Research Summer Scholar on Internet of Things, in June 2016 at IISc., Bangalore.
- Attended a worskshop on Complexity Theory, organized by NMI, at IIT Gandhinagar during November 2016.
- Attendee a school on SAT and SMT solvers at TIFR Mumbai during December 2016.
- Attended FSTTCS at CMI during December 2016.
- Attended 2 National Mathematics Initiative(NMI) workshops; first on 'Perspectives in Complexity Theory and Cryptography' at IISc Bangalore, in January 2017 and second on 'Arithmetic Complexity' at IMSc Chennai, during February–March 2017.

Suryajith Chillara

- Visited Tel Aviv University hosted by Prof. Amir Shpilka in April 2016.
- Visited Chebyshev laboratory, St Petersburg state universit, in May 2016.
- Presented paper "Chasm at depth four and tensor rank: Old results, new insights" at the NMI workshop on computational complexity, held at IIT Gandhinagar during November 2016.
- Attended FSTTCS 2016, held at Chennai Mathematical Institute during December 2016.
- Visited TIFR, Mumbai, during February 2017 and was hosted by Ramprasad Saptharishi.
- Attended a workshop on arithmetic circuit complexity at IMSc, Chennai, during February-March 2017.

Abhijeet Atmaram Ghanwat

- Visited IIT Mumbai during April-June 2016.

Kedar Shrikrishna Kolekar

- Attended Indian Strings Meeting 2016, held at Indian Institute of Science Education and Research (IISER) Pune during December 2016.

Debangshu Mukherjee

- Visited IIT-Gandhinagar during June-July 2016 and attended a workshop on "Black Hole Information Paradox" conducted under the GIAN Initiative.

Sayan Mukherjee

- Attended SAT+SMT School, TIFR, Mumbai.

Shraddha Srivastava

- Gave a talk on "On the monoidal structure of the modules over the Schur algebra" in September 2016 at IMSc, Chennai.

Vaishnavi Sundararajan

- Visited Prof. Steve Kremer at LORIA, Nancy during June-July 2016 and gave a talk on "Communicating assertions in security protocols".
- Assisted Prof. S.P. Suresh in teaching an introductory course on Functional Programming in Haskell at NIE, Mysore in September 2016.

16 Other Professional Activities

Madhavan Mukund

- Member, Programme Committee of the following conferences.
  - LaTiCE 2016, Fourth International Conference on Learning and Teaching in Computing and Engineering, Mumbai, India, March 31-April 3, 2016.
  - SAC-SVT 2016, Software Verification and Testing, a track of the ACM Symposium on Applied Computing, Pisa, Italy, April 3-8, 2016.
  - NETYS 2016, 4th International Conference on Networked Systems, Rabat, Morocco, May 18-20, 2016.
  - Petri Nets 2016, 37th International Conference on Application and Theory of Petri Nets and Concurrency, Torun, Poland, June 19-24, 2016.
- Elected President, ACM India Council, 2016-2018.
- Appointed to the Advisory Board of the Anita Borg Institute (ABI) India, 2016-2018.
- Team Leader for India at the International Olympiad in Informatics 2016 (IOI-2016), Kazan, Russia, August 2016.
- Member, Programme Committee 14th International Symposium on Automated Technology for Verification and Analysis (ATVA 2016) Chiba, Japan, October 2016.
- Member, Programme Committee 36th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2016) Chennai, India, December 2016.
- Member, Programme Committee VMCAI 2017, International Conference on Verification, Model Checking, and Abstract Interpretation, Paris, France, January 2017.
- Director, UMI Research Lab in Computer Science (RELAX), Joint Research Unit of CNRS, started January 2017.

Samir Datta

- PC member for FSTTCS16.

K. Narayan

- Part of the National Organizing Committee (over August 2015 to December 2016) for the Indian Strings Meeting ISM2016 international string theory conference at IISER Pune, December 2016.

K. Narayan Kumar

- Coach at the IOI training camp in May 2015.
- PC Member of GanDalf 2016, CSR 2017.
- Member of the Program Committee of CSR 2017, Khazan, Russia, DLT 2017, Cant, Belgium, CONCUR 2017, Berlin, Germany.
- Co-chair of the Program Committee, ATVA 2017, Pune, India.

K.G. Arun

- Co-organizer of "Future of Gravitational Astronomy Workshop" at ICTS-TIFR, Bengaluru. (https://www.icts.res.in/discussion_meeting/details/35/)
- Wrote a popular article on the Gravitational Wave Discovery aimed at general science enthusiasts in Malayalam in the science magazine Sasthragathy.
- Telescope time awarded by GMRT as Co-investigator of Search for merger ejecta in short duration gamma-ray bursts, Cycle 31 of Giant Meter Wave Radio Telescope (GMRT) with L. Resmi & K. Mishra.
- Co-organizer of ICTS summer school on Gravitational Wave Astronomy (July-August 2016) with P. Ajith and Bala Iyer.
- Awarded the Indo-US Centre for the Exploration of Extreme Gravity, awarded by IUSSTF (Co-PI from Indian side).

Govind S. Krishnaswami

- Serve on the editorial board of Resonance, Journal of Science Education.
- External examiner for PhD thesis (IISER Pune).
- Referee and editorial board member of Resonance, Journal of science education.

S.P. Suresh

- Part of organizing committee for FSTTCS 2016.

Sourish Das

- Submitted a book proposal on Financial Statistics with R in Springer and waiting for their response.

- Organized second Workshop Conference on Statistical Methods in Financial Mathematics at CMI with ISI Chennai.

Geevarghese Philip

- Program Committe for the 11th International Symposium on Parameterized and Exact Computation (IPEC 2016).

Vijay Ravikumar

- Refereed a paper for Journal of Combinatorial Theory, Series A.

B. Srivathsan

- Reviewed papers for ICALP 2016, CONCUR 2016, Sadhana Journal.
- Reviewer for FOSSACS 2017 conference.

H.S. Mani

- Participated as a resource person in International Astronomy Olympiad and am also a member of the academic committee.
- Participated as a resource person for Physics Olympiad.
- Organized the 2 day out reach programme in collaboration with the Allahabad Science academy in July 2016.
- Memeber of the academic committee of Astronomical Olympiad - meeting in November 2016 at Homi Bhabha Cntre for Science Education.

17 Visitors

- Alladi Sitaram, Professor (retd.), Indian Statistical Institute, Bangalore Centre (April 2016).
- Tali Pinsky, TIFR, Mumbai. Gave a talk on "On the volumes of geodesics on surfaces" and "On the modular template and continued fractions" (April 2016).
- Yasmeen Akhtar, IISER, Pune. Gave a talk on "Covering arrays and Generalizations" (April 2016).
- P. Vanchinathan, VIT Chennai. Gave a talk on "Symmetric Key Encryption from Affine Spaces" (April 2016).
- Nitin Nitsure, TIFR, Mumbai. Gave a talk on "Harder-Narasimhan schemes and stacks" (April 2016).
- M.S. Raghunathan, NCM, IIT Bombay. Gave a talk on "A proof of Narasimhan-Seshadri theorem" (April 2016).
- Vijaylaxmi Trivedi, TIFR, Mumbai. Gave a talk on "Hilbert-Kunz Density Function and Hilbert-Kunz Multiplicity" (April 2016).
- N.D. Hari Dass, TIFR-TCIS Hyderabad. Gave a talk on "Non-GR approaches to Gravitational Radiation" (April 2016).
- J. Pasupathy, CTS Bangalore (April-May 2016).
- Jyoti Sarkar, Indiana University-Purdue University Indianapolis. Gave a talk on "Symmetric Random Walks on Tetrahedra and Octahedra" (June 2016).
- R. Rajaraman, JNU, New Delhi. Gave a talk on "Understanding the Photons" (June 2016).
- Vishwambara Makam, University of Michigan, Ann Arbour, USA. Gave a talk on "Linear matrices and their applications to semi-invariants of quivers" (June 2016).
- Ananthnarayan Hariharan, IIT Bombay. Gave a talk on "Idealizations and Connected sums" (July 2016).
- Arindam Banerjee, Purdue University, USA. Gave a talk on "Homological Algebra of Bipartite Graphs" (July 2016).
- Ronak M. Soni, TIFR, Mumbai. Gave a talk on "Entanglement in Gauge Theories" (July 2016).
- Arul Shankar, Harvard University, USA. Gave a talk on "Heuristics for the distribution of the ranks and Selmer-ranks of elliptic curves" (July 2016).

- V Suresh, Emory University, Atlanta, USA. Gave a talk on "Rost invariant over function fields of p-adic curves" (July 2016).
- Rohith Varma, TIFR, Mumbai. Gave a talk on "The global nilpotent cone and parahoric torsors" (July 2016).
- Swarnava Mukhopadhyay, University of Maryland, USA. Gave a talk on "Topology of hyperplane arrangements and invariant theory" (July 2016).
- Dvijotham Krishnamurthy, Center for Mathematics of Information, Caltech, USA. Gave a talk on "Graphical models for analysis and control of infrastructure networks" (August 2016).
- S.G. Rajeev, University of Rochester. Gave a talk on "Strong coupling limit of scalar field theory" (August 2016).
- Gopal Pandurangan, University of Houston, USA. Gave a talk on "Distributed Computation of Large-scale Graph Problems" (August 2016).
- Satish Kumar Saravanan, Lorentz Institute, Leiden University and National Institute for Subatomic Physics, The Netherlands. Gave a talk on "Spin Dynamics in General Relativity" (August 2016).
- Vaidyanathan Sivaraman, SUNY Binghamton, U.S.A. Gave a talk on "Forbidden Induced Subgraph Characterizations" (August 2016).
- Anosh Joseph DAMTP, Cambridge University, U.K. Gave a talk on "Quantum Black Holes and Gravity from the Lattice" (August 2016).
- Takeshi Ikeda, Okayama University of Science, Japan. Gave a talk on "Kempf-Laksov-Damon determinant formula in K-theory" (August 2016).
- Rahul Singh, Northeastern University, USA. Gave a talk on "Kac-Moody Algebras and Groups" and "Cotangent Bundle to the Partial Flag Variety" (August 2016).
- Shashank Kanade, University of Alberta, Canada. Gave a talk on "Tensor categories and vertex operator algebras" (August 2016).
- Supratik Chakraborty, IIT Bombay. Gave a talk on "Counterexample guided Skolem Function Synthesis from Factored Specifications" (September 2016).
- Andrzej Zuk, University of Paris VII. Gave a talk on "Random walks on random symmetric groups" (September 2016).
- Amit Hogadi, IISER Pune. Gave a talk on "Generalities on algebraic stacks" and "Construction of Keel Mori moduli space" (September 2016).

- Prakash Saivasan, Univ. of Kaiserlautern, Germany. Gave a talk on "Parametrised complexity of concurrent shared memory systems" (October 2016).
- Aprameyan Parthasarathy, University of Paderborn, Germany. Gave a talk on "Domains of holomorphy for irreducible admissible Banach representations" (October 2016).
- Sue Butler, Poet, UK (October 2016).
- S.L. Narasimhan, Freelancer. Gave a talk on "Archiving and collecting - Meaning and method; purpose and uses" (October 2016).
- Anne Tannam, Irish poet. Poetry reading (October 2016).
- Suhas BN IIT Madras. Gave a talk on "Rationality of moduli space of torsion-free sheaves over a chain-like curve" (November 2016).
- Francois Le Maitre University of Paris VII. Gave a talk on "L^1 full groups for measure-preserving transformations" (November 2016).
- A. P. Balachandran, Joel Dorman Steele Emeritus Professor, Syracuse Univ. U.S.A. Gave a series of lectures on "Algebraic Quantum Physics" (November 2016).
- Thomas Zeume, TU, Dortmund (November-December 2016).
- Nils Vortmeier, TU, Dortmund (November-December 2016).
- Rajat Mittal, IIT Kanpur. Gave a talk on "Finding quadratic non-residue over finite fields" (December 2016).
- Gilles Pisier, Texas A&M University/University of Paris VI. Gave a talk on "Lacunary series in duals of compact groups and generalizations" (December 2016).
- Rajesh Chitnis, Weizmann Institute of Science, Rehovot, Israel. Gave a talk on "A Fine-Grained Approach for Designing (Time and Space) Efficient Algorithms" (January 2017).
- Rohini Ramadas, Ann Arbor. Gave a talk on "Dynamics on the moduli space of pointed rational curves" (January 2017).
- Robert Silversmith, Ann Arbor. Gave a talk on "A mirror theorem for symmetric products of projective space" (January 2017).
- Ashwin Ravikumar, The Field Museum of Natural History, Chicago, U.S.A. Gave a talk on "Tropical Forests, the Global Climate, and You" (January 2017).
- Kuldeep Meel, Rice University, U.S.A. Gave a talk on "Constrained Counting and Sampling: Bridging the Gap between Theory and Practice" (January 2017).

- Yoshihiro Ryu, Ritsumeikan University, Japan. Gave a talk on "A category of probability spaces and a conditional expectation functor" (January 2017).
- Hira L. Koul, Michigan State University, U.S.A. Gave a talk on "Residual empirical processes" (January 2017).
- Alain Finkel, LSV (ENS Cachan), France. Gave talks on "The Erdos & Tarski Theorem (1943)" and "WBTS, the new class of WSTS without wqo" (January 2017).
- Philippe Schnoebelen, CNRS and ENS Cachan. Gave a short course on "Algorithmic Aspects of WQO Theory" (January 2017) and two talks on "Reductions between one-clock time automata & lossy channel systems" (February-March 2017).
- Loganayagam R, ICTS Bangalore. Gave a talk on "Issue in Open Effective Field Theory" (February 2017).
- Brian Harbourne, University of Nebraska, USA. Gave a talk on "Asymptotic Invariants and the Geometry of Rational Surfaces" (February 2017).
- M.S. Narasimhan, IISc., Bangalore (February 2017).
- Harikrishnan Ramani, SUNY Stony Brook, USA. Gave a talk on "Thermal resummation and phase transitions" (February 2017).
- Paul Gastin, LSV, ENS Cachan, France. Gave a short course on "Quantitative Automata Theory" (Jan–Feb 2017).
- Parosh Abdulla, Uppsala University, Sweden (December 2016).
- Ahmed Bouajjani, IRIF, Univ. of Paris-Diderot, France. Gave a short course on "Algorithmic Program Verification" (February 2017).
- M.F. Atig, Uppsala University (December 2016, February 2017).
- Koushik Ragavan, Applied Materials, Chennai. Gave a talk on "Can Machine Learning and Artificial Intelligence influence Advanced Semiconductor Nano Manufacturing Technology?" (February 2017).
- Ankit Garg, MSR, New England. Gave a talk on "Algorithmic and optimization aspects of Brascamp-Lieb inequalities" (February 2017).
- V. Lakshmibai Northeastern University, Boston, U.S.A. Gave a talk on "Levi subgroup actions on Schubert varieties, induced decompositions of their coordinate rings, sphericity and singularity consequences" (February 2017).
- TVH Prathamesh, Institute of Mathematical Sciences, Chennai. Gave a talk on "Of Legendrian Knots and First Order Theorem Provers" (February 2017).

- R.V. Gurjar, IIT-Bombay. Gave lectures on "Rational Singularities" (February-March 2017) and a talk on "Quotients of smooth affine 3-folds modulo the additive group G_a of complex numbers" (March 2017).

- Samrith Ram, HRI, Allahabad. Gave a talk on "Splitting subspaces of linear transformations over finite fields" (March 2017).

- T.E.S. Raghavan, University of Illinois at Chicago. Gave a talk on "An algorithm to compute the nucleolus of binary assignment games" (March 2017).

- Pankaj Sekhsaria, DST-Centre for Policy Research, Dept of Humanities and Social Science, IIT-Delhi. Gave a talk on "Andaman & Nicobar Islands" (March 2017).

- Jugal Verma, IIT-Bombay. Gave a talk on "Counting zeroes of Laurent polynomials in the algebraic torus" (March 2017).

- Rishi Vyas, Ben Gurion University. Gave talks on "Dualizing Complexes in the Noncommutative Arithmetic Context" and "A noncommutative Matlis-Greenlees-May equivalence" (March 2017).

- Per Bloch, Denmark (Arts Initiative Programme) (February–March 2017).

- Zelaci Hacen, Raman-Charpak Fellows 2016 (January–March 2017).

- Carlos Eduardo de Magalhaes, Brazil (Arts Initiative Programme) (January–March 2017).

- Apolline Louvet, ENS, France (February–March 2017).