

CURRICULUM VITAE

Mahesh Kakde

CONTACT INFORMATION	Department of Mathematics Indian Institute of Science Bangalore 560012 India	<i>Phone: Work</i> +91 (0)80 2293 2833 <i>Phone: Cell</i> +91 8088 129 817 <i>E-mail:</i> maheshkakde@iisc.ac.in
EMPLOYMENT	India Institute of Science, Bangalore King's College London King's College London University College London Princeton University	Professor Reader Lecturer Research Associate Instructor of mathematics
		08/2019 - present. 09/2015 - 07/2019. 08/2011 - 08/2015. 09/2009-07/2011. 09/2008-08/2009.
AWARDS, FELLOWSHIPS AND VISITING POSITIONS	Homi Bhabha Chair (Tata Education and Development Trust) Frontiers of Science Award, ICBS Beijing (jointly Samit Dasgupta and Kevin Ventullo) London Mathematical Society Whitehead Prize Fellow of Indian Academy of Science Infosys Prize in mathematical science Inaugural Ganit Ratna Award, PTGS, Pune International Congress of Mathematicians, St Petersburg (Invited speaker, joint with Samit Dasgupta) DST–SwarnaJayanti Fellowship Simons Visiting Professor, CRM, Montreal Visiting Researcher, Newton Institute, Cambridge Visiting position, CNRS-Université de Nice Sophia Antipolis Visiting Professor, Tata Institute of Fundamental Research, Mumbai Visiting Professor, Tata Institute of Fundamental Research, Mumbai Visiting Researcher, Tata Institute of Fundamental Research, Mumbai Visiting Researcher, POSTECH, Pohang, South Korea Newton Institute Visiting Fellowship, Cambridge Oberwolfach Leibniz Graduate Students, Oberwolfach Senior Scholar, Trinity College, Cambridge Ramanujan Studentship, Trinity College, Cambridge Visiting Student, Tata Institute of Fundamental Research, Mumbai	Oct 2023. 2023. 2023. 2023. 2022. 2022. 2022. 2022. 2022. Sept - Dec, 2020 (postponed). April, 2020 (postponed). April, 2017. 10/2015 - 12/2015. 10/2014 - 01/2015. 08/2011 and 07/2009. 08/2010 - 12/2010. 07/2009 - 12/2009. 06/2009. 10/2005 - 09/2008. 10/2004 - 09/2008. 07/2003 and 08/ 2005.
RESEARCH GRANTS	Indo-French CEFIPRA grant “Arithmetic properties of special values of automorphic L -functions” SERB MATRICS grant “Bianchi modular forms and Iwasawa theory” DST-SERB SwarnaJayanti Fellowship “Special Values of L -functions” SERB SUPRA Grant “Brumer–Stark conjecture and Hilbert’s twelfth problem” EPSRC First Grant “ p -adic automorphic forms and Iwasawa theory” DST Ramanujan Fellowship (declined) Royal Society India-UK seminars grant (declined) London Mathematical Society Conference Grant Consultant on NSF FRG Grant “Iwasawa theory and Chern classes”	2022 - 2025. 2021 - 2023. 2020 - 2025. 2020 - 2023. April 2014 - March 2016. (awarded) January 2015. January 2015 March, 2015. July, 2014 - June, 2017.
PUBLICATIONS AND PREPRINTS	(1) <i>Proof of the main conjecture of noncommutative Iwasawa theory for totally real number fields in certain cases.</i> J. Algebraic Geometry , 20 (2011) 631–683. (2) <i>From the classical to the noncommutative Iwasawa theory (for totally real number fields) in Non-abelian fundamental groups and Iwasawa theory</i> , 107–131, London Math. Soc. Lecture Note Ser., 393, Cambridge Univ. Press, Cambridge 2012.	

- (3) *Congruences between abelian p -adic zeta functions in Noncommutative main conjectures for totally real fields*, 125–158, Springer Proceedings in Mathematics and Statistics, 29, 2013.
- (4) *The main conjecture of Iwasawa theory for totally real fields*. **Invent. Math.** Sept. 2013, Vol 193 (3), 539–626.
- (5) *On Kato’s ϵ -conjecture: the $l \neq p$ case*. **Journal of London Mathematical Society**. Aug. 2014, Vol 90, No. 1, 287–308.
- (6) *Non-commutative q -expansions*. in “ p -adic aspects of modular forms”, 317–331, World Sci. Publ., 2016.
- (7) *Some congruences for non-CM elliptic curves*. in “Elliptic curves, modular forms and Iwasawa theory”, 295–309., Springer Proc. Math. Stat. 2016.
- (8) *Higher Chern classes and Iwasawa theory* (Joint with F. Bleher, T. Chinburg, R. Greenberg, G. Pappas, R. Sharifi, M. Taylor). **American Journal of Mathematics**, **142**(2), 2020 627–682.
- (9) On the Gross-Stark conjecture (joint with S. Dasgupta and K. Ventullo). **Ann. of Math.** **174**(1) (2018) 833–870.
- (10) *Unramified Chern-Simons invariants* (joint with F. Bleher, T. Chinburg, R. Greenberg, G. Pappas, M. Taylor). **New York J. Math.**, **24** (2018) 514–542.
- (11) *On a refinement of the Birch and Swinnerton-Dyer Conjecture in positive characteristic* (joint with D. Burns, W. Kim). Submitted.
<https://arxiv.org/abs/1805.03611>
- (12) *On the rank one Gross–Stark conjecture for quadratic extensions and the Deligne–Ribet q -expansion principle* (joint with S. Dasgupta). Adv Studies of Pure Math. (proceedings of Iwasawa 2017), **86**, 2020, 243–254.
- (13) *On Weil-étale cohomology and Artin L -series* (joint with D. Burns). Submitted.
https://nms.kcl.ac.uk/david.burns/web_page/bk.pdf.
- (14) *Exterior powers in Iwasawa theory* (joint with F. Bleher, T. Chinburg, R. Greenberg, R. Sharifi, M. Taylor). **Journal of the European Mathematical Society**. **24**(3), 2022, 967–1005.
- (15) *A note on the Main Conjecture over \mathbb{Q}* (joint with Z. Wojtkowiak). **Osaka J. of Math.** **58**(1), 2021 149–170.
- (16) *On the Brumer–Stark conjecture* (joint with S. Dasgupta). **Ann. of Math.** **197**(1). (2023) 289–388.
- (17) *On constant terms of Eisenstein series* (joint with S. Dasgupta). **Acta Arithmetica**, **200**. (2021) 119–147.
- (18) *Brumer–Stark Units and Explicit Class Field Theory* (joint with S. Dasgupta). Accepted for publication in **Duke Math. Journal**.
- (19) *Trivial zeros in the Iwasawa main conjecture* (joint with S. Dasgupta). Accepted for proceedings of **International Colloquium** at Tata Institute of Fundamental Research, Mumbai.
- (20) *On the Brumer–Stark conjecture and refinements* (joint with S. Dasgupta). Accepted for publication in the proceedings of **International Congress of Mathematicians (ICM)**, **2022**.
- (21) *The Residually Indistinguishable Case of Ribet’s Method for GL_2* (Joint with S Dasgupta, J Silliman, J Wang), Preprint.
- (22) *The Brumer–Stark Conjecture over \mathbb{Z}* (Joint with S Dasgupta, J Silliman, J Wang), Preprint.
- (23) *The Equivariant Tamagawa Number Conjecture* (Joint with S Dasgupta and J Silliman), Preprint.

UNIVERSITY EDUCATION	Ph.D.	University of Cambridge	07/2008.
	Pure Mathematics (Advisor - Prof. John Coates)		
	CASM (Mathematical Tripos Part 3)	University of Cambridge,	06/2005.
	Grade: 86% aggregate.		
	B.Math.(Hons.)	Indian Statistical Institute, Bangalore, India	06/2004
	Grade: 70% aggregate.		
TEACHING EXPERIENCE	Advanced Multivariable Calculus in Princeton University		Fall 2008.
	Elementary Number Theory in Princeton University		Spring 2009.
	Real Analysis in Princeton University		Spring 2009.
	Elliptic Curves in University College London		2010.
	A short course on Kato's Euler Systems in POSTECH		10/2010 - 12/2010.
	Elliptic Curves in University College London		2011.
	Galois Theory in King's College London		2012 and 2015.
	Elementary Number Theory in King's College London		2012, 2013, 2014, 2015 and 2016.
	Algebraic Number Theory in King's College London		2013.
	Linear Algebra in King's College London		2016, 2017, 2018.
	Class Field Theory in King's College London		2016, 2017.
	Elliptic Curves in IISc		2020.
	Algebra I in IISc		2020.
	Algebra I in IISc		2021.
	Basic Analysis in IISc		2023.
Modular Forms in IISc		2023.	
Algebraic Number Theory in IISc		2023.	
ADMINISTRATION	2012 - 2014	Programme Director for BSc/MSc Mathematics, Year 3.	
	2012 - 2014	Exchange Student Tutor and Erasmus Coordinator.	
	2014 and 2015	Organiser of London Number Theory Seminars.	
	2014 - 2019	Management team of London School of Geometry and Number Theory.	
	2015	Organiser of Iwasawa 2015 meeting in King's College London.	
	2018	Organiser of UK-Japan Winter School in King's College London.	
	2022 - present	Department Curriculum Committee convenor.	
STUDENTS	Yasin Zaehring (graduated)		
	Vishal Solanki (graduated)		
	Kwok-Wing Tsoi (jointly with D. Burns) (graduated)		
	Matthew Honnor (graduated)		
	Rieshikesh Ghatage (current)		
	Lalit Thuwal (current)		
	Ashutosh Jangle (current)		
SELECTED TALKS AND CONFERENCE INVITATIONS	• Iwasawa 2008, Irsee, Germany		29/06/2008 - 4/07/2008.
	• 'Pan Asia Number Theory conference' in POSTECH, Pohang, South Korea		08/01/2009 - 13/01/2009.
	• 'Algebraische Zahlentheorie' in Oberwolfach, Germany		21/06/2009 - 27/06/2009.

- ‘Non-commutative algebra and Iwasawa theory’ in Edinburgh, UK 28/09/2009 - 02/10/2009.
- ‘Final workshop on non-abelian fundamental groups in arithmetic geometry’ in Newton Institute, Cambridge, UK 14/12/2009 - 18/12/2009.
- ‘London-Paris number theory seminar’ at King’s College London, UK 02/06/2010.
- ‘Modular/Geometric Iwasawa theory and p-adic L-functions’ in UCLA, Los Angeles, USA 14/06/2010- 20/06/2010.
- ICM satellite conference on ‘Galois Representations in Arithmetic and Geometry’ at Goa, India 10/08/2010 - 13/08/2010.
- ‘Pan Asia Number theory conference’ in RIMS, Kyoto 13/09/2010 - 17/09/2010.
- ‘Galois-theoretic Arithmetic Geometry’ in IIAS, Kyoto 19/10/2010 - 24/10/2010.
- ‘Recent Developments in Galois Module Structure Theory’ in CIRM, Marseille-Luminy, France. 21/03/2011 - 25/03/2011.
- ‘Workshop on Galois Representations and Automorphic Forms’ in IAS, Princeton. 21/03/2011 - 25/03/2011.
- ‘Instructional Workshop On The Noncommutative Main Conjectures’ in Muenster, Germany 26/04/2011 - 30/04/2011.
- ‘4th Pan Asia Number Theory Conference’ in IISER Pune, India 23/07/2012 - 27/07/2012.
- Journées Arithmétiques in Grenoble, France 01/07/2013-05/07/2013.
- Elliptic curves, modular forms and Iwasawa theory (conference in honour of the 70th birthday of John Coates), Cambridge, 25/03/2015-27/03/2015.
- New directions in Iwasawa theory, Banff, Canada, 26/06/2016-01/07/2016.
- Iwasawa 2017 (to commemorate Iwasawa’s birth centenary), Tokyo, Japan, 24/07/2017-28/07/2017.
- ‘Algebraische Zahlentheorie’ in Oberwolfach, Germany 25/06/2018-29/06/2018.
- ‘Algebraic Arithmetic Geometry’ in Poznan, Poland (in honour of G. Banaszak’s 60th birthday) 26/8/2018-01/09/2018.
- ‘New direction in the theory of complex multiplication’ at Joint Mathematics Meetings in Baltimore, USA 16/01/2019-19/01/2019.
- ‘Advances in Iwasawa theory’ at AMS meeting in Hawaii, USA 22/03/2019-24/03/2019.
- ‘Pan Asian Number Theory’ conference in Kyoto, Japan 06/12/2021-10/12/2021.
- Number Theory Section at ICM (held online) 06/07/2022 - 14/07/2022.
- JNT Biennial Conference in Cetraro, Italy 18/07/2022 - 22/07/2023.
- Algebraische Zahlentheorie in Oberwolfach, Germany 25/06/2023 - 01/07/2023.
- International Congress of Basic Science in Beijing, China 16/07/2023 - 28/07/2023.
- Iwasawa 2023 (in memory of John Coates) in Cambridge UK 17/07/2023 - 21/07/2023.

SERVICE

2008- present

Inventiones Math., Referee for Annales de l’ENS, LMS Publications, CUP Publications, Commentarii Mathematici Helvetici, Math. Annalen, Algebra Number Theory, Advances in Mathematics, Cambridge Philosophical Society, Crelle etc. Reviewer for ‘Mathematical Reviews’.