

Contact Information

address: 180 Queen's Gate, London, SW7 2AZ, UK
 webpage: <https://www.ma.imperial.ac.uk/~dcheragh/>

phone: +44(0) 207-59-48485 (office)
 email: d.cheraghi@imperial.ac.uk

Employment

10.2023–present	Reader in Pure Mathematics, Imperial College London, UK
10.2017–10.2023	Senior Lecturer in Pure Mathematics, Imperial College London, UK
05.2015–04.2020	EPSRC Early Career Fellow, Imperial College London, UK
05.2013–04.2015	Chapman Research Fellow, Imperial College London, UK
05.2011–04.2013	Leverhulme Early Career Fellow, University of Warwick, UK
01.2011–04.2011	Visiting Research Assistant, Université Paul Sabatier, Toulouse III, France
09.2009–12.2010	Marie Curie Research Fellow, University of Warwick, UK

Education

08.2004–08.2009 PhD in Mathematics, Stony Brook University, New York, USA

Research interests

- Low-dimensional analytic dynamics (small divisors, rigidity, and moduli spaces of rational functions)
- Analysis (renormalization operators on function-spaces)
- Geometric Analysis (quasi-conformal mappings and Teichmüller theory)

Awards and Honours

- Faculty of Natural Sciences award for Excellence in Teaching, Imperial College London, 2018
- Poste Rouge au CNRS, three month fellowship from CNRS, France, 2017

Fellowships and Grants

- H2020 Marie-Curie Fellowship (researcher: Disheng Xue), 225K EUR, 2019-2021.
- H2020 Marie-Curie Fellowship (researcher: Fabrizio Bianchi), 183K EUR, 2018-2020.
- London Math Society Scheme III grants, 4K GBP, October 2017.
- European Partners Fund, 5K GBP, ICL, August 2017.
- EPSRC ECF, 800K GBP, 2015 – 2020.
- London Math Society Scheme III grants, 1,669 GBP, April 2015
- Leverhulme Trust ECF; 97,602GBP, May 2011–April 2013.

Organization of international conferences, workshops, and research seminars

- LMS network meetings on Holomorphic dynamics, online meeting, 28 May 2021, 30 participants.
- [Analysis aspects of dynamics](#), Imperial College London, 16-18 May 2018, international conference, organised with V. Markovic and T. Sahsten, 60 participants.
- [Thematic program on dynamical systems](#), School of Mathematics, IPM, Tehran, Feb–May 2017, mini-courses and a conference, organised with M. Nassiri, E. Pujals, and A. Tahzibi.
- [Parameter problems in analytic dynamics](#), Imperial College London, Jun 27 - Jul 1, 2016, international conference, organised with T. Clark, 104 participants.
- [Renormalization in low-dimensional dynamics](#), University of Warwick, Dec 13-17, 2010, international conference, organised with S. van Strien and H. Bruin, 60 participants.
- [Dynamics of rational maps on the Riemann sphere](#), University of Warwick, Mar 22-24, 2010 international conference, organised with S. van Strien, 35 participants.
- [One-day function theory meeting](#), London Mathematical Society, Sept 7, 2015 conference; 42 participants.
- LMS network meetings in holomorphic dynamics, ICL, Sept 8, 2015, 25 participants.
- [Dynamics on the interface of real and complex one- dimension](#), ICL, Jan 13, 2014 one-day meeting organised with S. van Strien, 25 participants.

- An afternoon of complex dynamics, ICL, Sept 3, 2013
one-day meeting; 20 participants.
- [Pure Analysis and PDE](#), ICL, 2017-present,
weekly research seminars jointly organised within the pure analysis and PDE group.
- [London Analysis and Probability seminars](#), 2017- 2019
biweekly research seminars jointly organised with ICL, UCL, KCL, and Queen Mary.
- [Ergodic theory and dynamical systems](#), University of Warwick, 2009-2010, 2011-2012,
weekly seminars, organised with C. Kalle.

Research presentations

Invited talks at international conferences, workshops, and colloquia (last five years)

- Inaugural CNAM-Fields Nonlinear Days: Renormalization and Friends, Aug 21 - 25, Toronto, 2023.
- Around the Mandelbrot set (60th birthday of M. Shishikura), Kyoto, May 29 - June 2, 2023.
- Workshop on dynamic and birational geometry, King's College London, Mar 15-17, 2023.
- Complex Dynamics in the Tropics (60th birthday of C. Petersen), Rio de Janeiro, Nov 27 - Dec 3, 2022.
- Workshop on Holomorphic Dynamics - Parabolic Implosion, Holbaek, Denmark, 13-16 Oct, 2022.
- New Trends in Holomorphic Dynamics, Cortona, Aug 29 - Sept 2, 2022.
- Geometric complexity of Julia sets, Bedlewo, 27 Sept -1 Oct 2021.
- Advancing bridges in complex dynamics, Luminy, 20-25 Sept 2021.
- Many faces of renormalisation, Simon's center for geometry and physics, 8-12 March 2021.
- Complex dynamics, CIRM Luminy, 27-31 Jan 2020.
- Complex dynamics in the southern hemisphere, Santiago, Chile, 2-6 Jan 2020.
- Mathematics Colloquium, University of Durham, 9 Dec 2019.
- Low dimensional and complex dynamics, Bernoulli Center, Switzerland, 2-6 Dec 2019.
- Holomorphic Days, Copenhagen, Denmark, 18-19 June 2019.
- Topics in complex dynamics, Barcelona, 25-29 Mar 2019.
- Postgraduate conference in complex dynamics, London, 27 Feb - 1 Mar 2019.
- Dynamics in Valparaiso, Chile, 10-14 Dec 2018.
- La réunion finale du projet ANR LAMBDA, Toulouse, 28 May - 1 June 2018.

Invited talks at one-day research meetings and seminars (last five years)

- LMS network meeting on holomorphic dynamics, Open University, 18 Jul 2023.
- Dynamics seminar, Nice, France, 10 Jan 2023.
- Mini-course on topology of irrationally indifferent attractors, Stony Brook, 2,4 June 2021.
- Dynamical systems seminar, Amiens, 23 Mar 2021.
- Dynamical systems seminar, IMPAN, Warsaw, 23 Nov 2020.
- Dynamical systems seminar, IMJ-PRG, Paris, 20 Nov 2020.
- Arithmetic Dynamics International Online Seminar (ADIOS), 21 Oct 2020.
- LMS network meeting on holomorphic dynamics, Open University, 20 Jan 2020.
- Yorkshire and Durham Geometry Days, Durham University, 11 Dec 2019.
- Ergodic Theory and Dynamical System, University of Warwick, 5 Nov 2019.
- Ergodic Theory and Dynamical System, ETH Zurich, 29 Apr 2019.
- Analysis seminar, Cardiff University, March 2019.
- Analysis and Geometry seminar, University of Bristol, Feb 2019.
- Dynamical systems seminar, University of Sao Paulo, Nov 2018.
- Séminaire Géométrie Topologie Dynamique, Orsay, Feb 2018.
- Séminaire de Théorie Ergodique et Systèmes Dynamiques, Paris 13, Feb 2018.
- Séminaire de Systèmes Dynamiques, IMJ-PRG, Paris, Feb 2018.
- Séminaire de Théorie Ergodique, IMJ-PRG, Paris, Jan 2018.
- Séminaire de Systèmes Dynamiques, Université d'Orléans, Jan 2018.

Teaching

- Lecturer, Analysis II, 2nd year undergraduate module, Autumns of 2020, 2021, and 2022.

- Lecturer, Geometry of Curves and Surfaces, 3rd/4th year module, Winters of 2021, 2022, and 2023.
- Lecturer, Real Analysis (M2PM1), 2nd year undergraduate module, Autumn 2017.
- In charge of the analysis modules in the Curriculum Review for Undergraduate Mathematics, 2020.
- Lecturer, geometric complex analysis, 3rd/4th year course, IC, Autumn 2016.
- Lecturer, five-lectures on dynamical systems, MPE CDT, IC, Autumn 2015, and Autumn 2016.
- Lecturer, analytic number theory, 3rd/4th year course, Imperial College London, Spring 2016.
- Lecturer, one dimensional real and complex dynamics, Taught Course Centre (TCC), video broadcast to the universities of Bath, Bristol, Imperial College, Oxford, Warwick, Spring 2014.
- Lecturer, dynamical Systems, 4th year/MSc course, University of Warwick, Autumn 2011.
- Lecturer, dynamical Systems, 4th year/MSc course, University of Warwick, Autumn 2010.
- Lecturer, introduction to PDE's, (Summer 2009), Stony Brook University.
- Lecturer, Calculus C, Stony Brook University, Spring 2009.
- Lecturer, Calculus A, Stony Brook University, Spring 2008.
- Lecturer, Calculus B, Stony Brook University, Spring 2007.
- Outreach talk at the national online conference organised by [Taunton School Sixth Former](#).

Mentoring and supervision

- Selim Ghazouani, Chapman research fellow (postdoc), Aug 2021 – Aug 2022, now Asst Prof at UCL.
- Disheng Xu, Marie-Curie postdoc, Aug 2019 – Aug 2021, now Asst Prof at Peking University.
- Fabrizio Bianchi, Marie-Curie postdoc, May 2018 – Jan 2019; now Charge de Recherche CNRS.
- Alexandre De Zotti, postdoc, Nov 2016 – Nov 2019; moved to AI.
- Mohammad Pedramfar, PhD student, ICL, Jan 2016 –Jan 2020, moved to AI.
- Alexander Eliad, PhD student, ICL, Oct 2018 – Sept 2022.
- Ashwaq Kaseb, PhD student, ICL, Oct 2023 – present.
- Jocelyn Russell, PhD student, ICL, Oct 2022 – .
- Aleksandra Bozovic, PhD student, LSGNT, ICL, Oct 2022 – .
- (MSc projects) Anna Broenlund 2022-23, Parul Khanna 2021-22; Willie Lim 2018-2019; Christodoulos Savva 2016-2017; Albert Wood 2016-2017; Lin Fan 2016-2017; Thordis Thorsteins 2016-2017; William Downham 2016-2017; Timothy Westwood 2014-2015; Aleksandar Panayotov 2013-2014; Ruolan Chi 2012-2014; Stephen Luke 2012-2013; Martin Rixham 2012-2013; Mikk Tonissoo 2012-2013;
- UROP project supervision sine 2017 (S. Chen 2023, P. Tassopoulos 2022, K. Dong 2022, R. Zhang 2022, N. Faghihi 2022, T. Westwood 2020; D. Chrumka 2018, C. Fok 2018, D. Leonte 2018, E. Oravkin 2018), ICL.

Membership of professional bodies and learned societies

- Fellow of Higher Education Academy (FHEA), 2020.
- London Math Society (2017 – present), American Mathematical Society (2004 - 2016).
- EPSRC College, 2015 - present:
- UMI Unité Mixte Internationale (CNRS/Imperial joint laboratory), 2018 – present.
- Editorial board of [JIMS](#), 2018–present .

Publications and preprints:

1. *Lacunary series, resonances, and automorphisms of \mathbb{C}^2 with a round Siegel domain*
Francois Berteloot, D. Cheraghi
Kyoto J. Math. 63 (2023), no.2, 421–433.
2. *Hairy Cantor sets*
D. Cheraghi, Mohammad Pedramfar
Adv. Math. 398 (2022), Paper No. 108168, 51 pp
3. *Analytic maps of parabolic and elliptic type with trivial centralisers*
Artur Avila, D. Cheraghi, Alexander Eliad
Annales de l'Institut Henri Poincaré C, Analyse Non Linéaire, Vol 39, No 4, 2022.
4. *Arithmetic geometric model for the renormalisation of irrationally indifferent attractors*
D. Cheraghi
[arxiv:2112.14557](https://arxiv.org/abs/2112.14557)
5. *Dimension paradox of irrationally indifferent attractors*
D. Cheraghi, Fei Yang, Alexandre De Zotti
[arXiv:2003.12340](https://arxiv.org/abs/2003.12340).
6. *Typical orbits of quadratic polynomials with a neutral fixed point: Non-Brjuno type*
D. Cheraghi
Ann. Sci. 'Ecole Norm. Sup., Vol 1 (52), pp. 59-138, 2019.
7. *Statistical properties of quadratic polynomials with a neutral fixed point*
Artur Avila, D. Cheraghi
J. Eur. Math. Soc. (JEMS), Volume 20, Issue 8, pp. 2005-2062, 2018.
8. *Topology of irrationally indifferent attractors*
D. Cheraghi
[arxiv:1706.02678](https://arxiv.org/abs/1706.02678)
9. *Mathematics of Planet Earth, a primer*
J. Bröcker, B. Calderhead, D. Cheraghi, C. Cotter, D. Holm, T. Kuna, B. Pelloni, T. Shepherd, H. Weller
Advanced Textbooks in Mathematics, World Scientific, 2017.
10. *Satellite renormalization of quadratic polynomials*
D. Cheraghi, Mitsuhiro Shishikura
[arxiv:1509.07843](https://arxiv.org/abs/1509.07843), 2015.
11. *A proof of the Marmi-Moussa-Yoccoz conjecture for rotation numbers of high type*
D. Cheraghi, Arnaud Cheritat
Invent. Math. 202, no. 2, pp. 677–742, 2015.
12. *Typical orbits of quadratic polynomials with a neutral fixed point: Brjuno type*
D. Cheraghi
Commun. Math. Phys. 322, no. 3, pp. 999-1035, 2013.
13. *Combinatorial rigidity for some infinitely renormalizable unicritical polynomials*
D. Cheraghi
Conform. Geom. Dyn. 14, pp. 219-255, 2010.