

THE SIXTH INTERNATIONAL CONFERENCE ON UNIFORM DISTRIBUTION THEORY (UDT 2018)

CIRM, LUMINY, MARSEILLES, FRANCE,
OCTOBER 1–5, 2018

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ABSTRACT. This volume contains papers originally presented or inspired by the Sixth International Conference on Uniform Distribution Theory, which was held at CIRM in Luminy, Marseilles, France, October 1–5, 2016.

Preface

This conference is a direct continuation of the 1st International Conference in Marseilles, CIRM, France, January 21–25, 2008; the 2nd International Conference in Strobl am Wolfgangsee, Austria, July 5–9, 2010; the 3rd International Conference on Uniform Distribution Theory (UDT2012) which was held in Smolenice, Slovakia, June 25–29, 2012; the 4th International Conference on Uniform Distribution Theory (UDT 2014) Ostravice, Czech Republic, June 30–July 4, 2014, and the 5th International Conference (UDT 2016), Sopron, Hungary, 5–8, July, 2016. The latest, the 6th International Conference on Uniform Distribution Theory, was held at CIRM in Luminy, Marseilles, France, October 1–5, 2018.

The International Conference on “Uniform Distribution Theory” UDT is a biennial event which is important for the community it serves, and takes place in different places throughout Europe. The field has many disparate centres primarily in Europe, and the UDT conferences are a source of stimulation,

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inspiration and sense of community to its participants. The meeting invited active researchers to present their work in the field.

The meeting aimed at presenting the most recent developments in the Theory of Uniform Distribution, covering several areas in Number Theory and Ergodic Theory; in particular the topics included all theoretical and computational aspects of combinatorial, diophantine and probabilistic Number Theory. Several sessions were devoted to continued fractions, both unidimensional and multidimensional.

Scientific Committee

Shigeki Akiyama (University of Tsukuba)

Arturas Dubickas (University of Vilnius)

Christian Mauduit (Aix-Marseille Université)

Radhakrishnan Nair (University of Liverpool)

Oto Strauch (President UDT - Slovak Academy of Sciences)

Jean-Louis Verger-Gaugry (CNRS / Université Savoie Mont Blanc)

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Oleg Karpenkov (University of Liverpool)

Radhakrishnan Nair (University of Liverpool)

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Sponsors and Partners

Université Savoie Mont Blanc,

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Foundation Compositio Mathematica,

GDRSTN for the Theory of Numbers.

Scientific Aspects

There were 47 talks with many interactions in social settings like meals and coffee breaks, due to the very special atmosphere at the CIRM. There were 71 participants, of which 27 % were women, including 15 nationalities, of which the largest representations were from France, Russia, Austria, The United Kingdom and Hungary. We noticed the emergence of Turkey as a significant new contributor to the field.

Five of the talks were captured on video professionally by CIRM and are now available on the conference website. The first talk that was saved on video was

that of Imre Kátai, who discussed Open Problems in the Theory of Uniform Distribution. The four others were devoted to probabilistic and asymptotic issues, to Sums of Digits of Prime Numbers and Squares (J. Rivat), Quasi-Random Graphs (A. Sárközy), Geometry of the Dynamics of $SL(2, \mathbb{Z})$, with regard to Continued Fractions (A. Veselov), and to the notion of “Cross-Combined” Measures of Binary Lattices generalizing the notion of auto-correlation (K. Gyarmati).

Several sessions were devoted to non-integer bases, diophantine approximation, ergodic aspects of various sequences, on discrepancy, on densities and on auto-correlations, all of which found an attentive audience. The sessions on continued fractions naturally found their place in the programme at different thematic moments, related to their geometric or dynamic aspects.

The field was represented by all ages from young scientists, by emeritus scientists and by established scientists in mid-career. Three generations exchanged ideas confirming the vitality of this series of UDT conferences.

The website of the conference, containing the booklet, the five videos, the abstracts, the list of participants, the list of speakers and the timetable are available at

<http://conferences.cirm-math.fr/1860.html>.

The booklet lists 48 speakers. One of the talks was presented by two speakers.

Organisational Aspects

The accommodation was managed entirely by CIRM, most notably by O. Barbaroux and M. Milton, in close cooperation with L. Bastide in the Mathematics Department of the University (LAMA) Savoie Mont Blanc. The management of the lecture rooms and video equipment was carried out by the team at CIRM, allowing for the broadcasting of the videos of the talks, on YouTube. The coordination between the CIRM registration and payment of fees was managed using the AZUR-COLLOQUE software. This was implemented by the LAMA team and the CNRS Grenoble Alpes (Mmes E. Moralès and J. Guély) using password access.

The future of UDT meetings

17 of the 46 Members of the Editors of the UDT journal were present at the conference. They decided the next UDT meeting would be in Linz, Austria between 6–10 July 2020, hosted by Johannes Kepler University and RICAM of the Austrian Academy of Sciences. The two organisers will be F. Pillihammer and A. Winterhoff.

Celebrating colleagues

The present special issue of the UDT Journal is devoted to the 2018 UDT, meeting dedicated to the 60th birthday of Radhakrishnan Nair, and also to celebrate the scientific life and achievement of Professor Oto Strauch and Vladamir Balaz of the Slovak Academy of Sciences.

The future of the Uniform Distribution Theory Journal

The UDT Journal has existed since 2006. It has, by many measures, been a successful academic journal – valued by the community it serves, and containing many interesting papers. In a sense this is a by product of the independent spirit with which it was founded. For a long time this worked to its advantage and drew to it a large community of mathematicians. Today however the environment has changed, and the journal is entering a period of transition.

Most academics now live in a performance culture, with attendant implications for funding. For this reason, to develop further the journal needs to be taken up by a reviewing journal and acquire an impact factor. To do this it will have to make the changes necessary. The way forward is now in discussion and will be one of the pressing concerns of the current Editorial Board and the Managing Editors.

Speakers

- [1] CHRISTOPH AISTLEITNER (Technical University Graz)
- *Pair correlations and equidistribution.*
- [2] ISKANDER ALIEV (Cardiff University)
- *On distances to lattice points in knapsack polyhedra.*
- [3] MOHAMMED AMIN AMRI (Université Mohammed Premier, ACSA Laboratory, Oujda)
- *Uniform distribution of modular signs.*
- [4] MARIIA AVDEEVA (Institute of Applied Mathematics, Khabarovsk Division)
- *Basic properties of three-dimensional continued fractions.*
- [5] ISTVÁN BERKES (University of Graz)
- *Random walks on the circle and diophantine approximation.*

- [6] ANNE BERTRAND-MATHIS (Université de Poitiers)
- *Expansions in negative base, distribution modulo one and fractales de Rauzy.*
- [7] DMITRIY BILYK (University of Minnesota)
- *Discrepancy and energy optimization on the sphere.*
- [8] JOHN BLACKMAN (University of Durham)
- *Integer multiplication of continued fractions via geometric methods.*
- [9] ALEXANDER BUFETOV (CNRS / Aix-Marseille Université)
- *A spectral cocycle for substitution dynamical systems.*
- [10] MICHAEL DRMOTA (Technical University Vienna)
- *The sum-of-digits function, primes and Uniform Distribution modulo 1.*
- [11] ARTŪRAS DUBICKAS (Vilnius University)
- *On the distance to the nearest square-free polynomial.*
- [12] BUKET EREN (University of Galatasaray)
- *On the Markov equation and outer automorphism of $PGL(2, \mathbb{Z})$.*
- [13] MIKHAIL GABDULLIN (Moscow State University)
- *On the stochasticity parameter of quadratic residues.*
- [14] DMITRY GAYFULIN (IITP of RAS)
- *Minkowski question-mark function: fixed points and the derivative.*
- [15] OLEG N. GERMAN (Moscow State University)
- *Multidimensional continued fractions and diophantine exponents of lattices.*
- [16] RITA GIULIANO (University of Pisa)
- *Rényi α -dimension of random variables with generalized Cantor distribution and Hausdorff dimension of generalized Cantor sets.*
- [17] GEORGES GREKOS (Université Jean-Monnet)
- *Sets with fairly distributed sumsets.*
- [18] SIGRID GREPSTAD (Johannes Kepler University, Linz)
- *Asymptotic behaviour of the Sudler product of sines and a conjecture of Lubinsky.*
- [19] KATALIN GYARMATI (Eötvös Loránd University, Budapest)
- *On the cross-combined measure of families of binary lattices and sequences.*

- [20] ANDREI ILLARIONOV (Institute of Applied Mathematics, Khabarovsk Division)
- *Statistical properties of Klein polyhedra.*
- [21] ALEXANDER KALMYNIN (National Research University, HSE)
- *Large values of short character sums.*
- [22] LISA KALTENBÖCK (Johannes Kepler University Linz)
- *On bounded remainder sets and strongly non-bounded remainder sets for sequences $(\{a_n\alpha\})_{n\geq 1}$.*
- [23] IMRE KÁTAI (Eötvös Loránd University)
- *Uniform distribution mod 1, results and open problems.*
- [24] JAKUB KONIECZNY (Hebrew University of Jerusalem)
- *Automatic and q -multiplicative sequences through the lens of higher order Fourier analysis.*
- [25] VSEVOLOD LEV (The University of Haifa at Oranim)
- *Uncertainty in finite affine planes.*
- [26] BRUNO MARTIN (University Littoral Côte d'Opale, Calais)
- *Multifractal analysis of the Brjuno function.*
- [27] CHRISTINE McMEEKIN (Cornell University)
- *A density of ramified primes.*
- [28] LÁSZLÓ MÉRAI (Johannes Kepler University Linz)
- *Distribution of short subsequences of the inversive generator.*
- [29] MARIIA MONINA (Institute of Applied Mathematics, Khabarovsk Division)
- *Basic properties of three-dimensional continued fractions.*
- [30] CLEMENS MÜLLNER (Université Claude Bernard Lyon 1)
- *The Rudin-Shapiro sequence and similar sequences are normal along squares.*
- [31] ATTILA PETHŐ (University of Debrecen)
- *Variations on a theme of K. Mahler.*
- [32] FRIEDRICH PILlichSHAMMER (Johannes Kepler University, Linz)
- *Tractability properties of the weighted star discrepancy.*
- [33] ISABEL PIRSIC (Johannes Kepler University, Linz)
- *An extension of the digital method based on b -adic integers.*
- [34] IGOR PRITSKER (Oklahoma State University)
- *Uniform distribution for zeros of random polynomials.*

- [35] OLIVIER RAMARÉ (CNRS / Aix-Marseille Université)
- *Discrepancy estimates for generalized polynomials.*
- [36] JOËL RIVAT (Aix-Marseille Université)
- *On the digits of primes and squares.*
- [37] ANDRÁS SÁRKÖZY (Eötvös Loránd University, Budapest)
- *Quasi-random graphs and pseudo-random binary sequences.*
- [38] IAN SHORT (Open University, Milton Keynes)
- *The Farey graph, continued fractions and SL_2 -tilings.*
- [39] YURI SHTEINIKOV (Steklov Mathematical Institute and SRISA)
- *On exponential sums and equations over multiplicative subgroups in finite field.*
- [40] LUKAS SPIEGELHOFFER (Technical University Vienna)
- *The level of distribution of the Thue-Morse sequence.*
- [41] THOMAS STOLL (University of Lorraine, Nancy)
- *The sum of digits in two different bases.*
- [42] CATHY SWAENEPOL (Aix-Marseille Université)
- *Digital questions in finite fields.*
- [43] JÖRG THUSWALDNER (Montanuniversität Leoben)
- *Discrepancy bounds for β -adic Halton sequences.*
- [44] ROBERT TICHY (Technical University Graz)
- *Normality and Randomness.*
- [45] ALEXEY USTINOV (Russian Academy of Sciences, Khabarovsk)
- *An elementary approach to Somos-4 sequences.*
- [46] ALEXANDER VESELOV (Loughborough University)
- *Growth and Geometry in $SL_2(\mathbb{Z})$ dynamics.*
- [47] ARNE WINTERHOF (Austrian Acad. of Sciences)
- *On the maximum order complexity of subsequences of the Thue-Morse and Rudin-Shapiro sequence along squares.*
- [48] AGAMEMNON ZAFEIROPOULOS (Technical University of Graz)
- *Metric discrepancy with respect to fractal measures.*



FIGURE 1. The participants of The Sixth International Conference on Uniform Distribution Theory (UDT2018), CIRM, Luminy, Marseilles, France, October 1–5, 2018.

Participants

1. CHRISTOPH AISLEITNER, Graz University of Technology.
2. SHIGEKI AKIYAMA, University of Tsukuba.
3. ISKANDER ALIEV, Cardiff University.
4. BASMA AMMOUS, Faculté des Sciences, Université de Sfax.
5. MOHAMMED AMIN AMRI, Université Mohammed Premier.
6. PIERRE ARNOUX, Aix-Marseille Université.
7. MARIIA AVDEEVA, Institute of Applied Mathematics, Khabarovsk Division.
8. MICHEL BALAZARD, CNRS / Aix-Marseille Université.
9. LOBNA BEN MAHFOUDH, Faculté des Sciences, Université de Sfax.
10. ISTVAN BERKES, Graz University of Technology.

THE SIXTH INTERNATIONAL CONFERENCE ON UNIFORM DISTRIBUTION THEORY

11. ANNE BERTRAND MATHIS, Université de Poitiers.
12. SALMA BEYAOU, Faculté des Sciences, Université de Sfax.
13. DMITRIY BILYK, University of Minnesota.
14. JOHN BLACKMAN, University of Durham.
15. ALEXANDER BUFETOV, CNRS / Aix-Marseille Université.
16. JULIEN CASSAIGNE, CNRS / Aix-Marseille Université.
17. MICHAEL DRMOTA, Technical University Vienna.
18. ARTŪRAS DUBICKAS, Vilnius University
19. BUKET EREN, University of Galatasaray
20. SÉBASTIEN FERENCZI, CNRS I2M Marseille.
21. ANNA FRID, Aix-Marseille Université.
22. MIKHAIL GABDULLIN, Moscow State University.
23. DMITRY GAYFULIN, IITP of RAS.
24. OLEG GERMAN, Moscow State University.
25. RITA GIULIANO, University of Pisa.
26. GEORGES GREKOS, Université Jean-Monnet, Saint Etienne.
27. SIGRID GREPSTAD, Johannes Kepler University, Linz.
28. KATALIN GYARMATI, Eötvös Loránd University, Budapest.
29. LAURENT HABSIEGER, CNRS Institut Camille Jordan, Lyon 1.
30. MOHAMED HBAIB, Université de Sfax.
31. ANDREI ILLARIONOV, Institute of Applied Mathematics, Khabarovsk Division.
32. ALEXANDER KALMYNIN, National Research University, HSE.
33. LISA KALTENBÖCK, Johannes Kepler University Linz.
34. OLEG KARPENKO, University of Liverpool.
35. IMRE KÁTAI, Eötvös Loránd University, Budapest.
36. JAKUB KONIECZNY, Hebrew University of Jerusalem.
37. MICHEL LAURANT, CNRS / Aix-Marseille Université.
38. VSEVOLOD LEV, The University of Haifa at Oranim.
39. ANTOINE MARNAT, University of York.
40. BRUNO MARTIN, Université Littoral Côte d'Opale, Calais.
41. CHRISTIAN MAUDUIT, Aix-Marseille Université.
42. LÁSZLÓ MÉRAI, Johannes Kepler University Linz.
43. CLEMENS MÜLLNER, Université Claude Bernard Lyon 1.
44. CHRISTINE McMEEKIN, Cornell University.

45. MARIIA MONINA, Institute of Applied Mathematics, Khabarovsk Division.
46. RADHAKRISHNAN NAIR, University of Liverpool.
47. FLORENT NGUEMA NDONG, Université des Sciences et Techniques de Masuku.
48. ATTILA PETHŐ, University of Debrecen.
49. FRIEDRICH PILlichSHAMMER, Johannes Kepler University Linz.
50. JANOS PINTZ, Hungarian Academy of Sciences.
51. ISABEL PIRSIC, Johannes Kepler University Linz.
52. IGOR PRITSKER, Oklahoma State University.
53. OLIVIER RAMARÉ, CNRS / Aix-Marseille Université.
54. JOËL RIVAT, Aix-Marseille Université.
55. ANDRÁS SÁKÖZY, Eötvös Loránd University, Budapest.
56. IAN SHORT, Open University, Milton Keynes.
57. IURII SHTEINIKIV, Steklov Mathematical Institute and SRISA.
58. LUKAS SPIEGELHOFFER, Technical University Vienna.
59. WOLFGANG STEINER, CNRS Université Paris Diderot.
60. THOMAS STOLL, Université de Lorraine, Site de Nancy.
61. CATHY SWAENEPOL, Aix-Marseille Université.
62. JÖRG THUSWALDNER, Montanuniversität Leoben.
63. ROBERT TICHY, Technical University Graz.
64. SERGE TROUBETZKOY, Aix-Marseille Université.
65. ALEXEY USTINOV, Russian Academy of Sciences, Khabarovsk.
66. JEAN-LOUIS VERGER-GAUGRY, CNRS Université Savoie Mont Blanc.
67. ALEXANDER VESELOV, Loughborough University.
68. WALID WANNES, Faculté des Sciences, Université de Sfax.
69. ARNE WINTERHOFF, Austrian Academy of Sciences.
70. AGAMEMNON ZAFEIROPOULOS, Technical University of Graz.
71. VICTORIA ZHURAVLEVA, Moscow Institute of Physics and Technology.

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