

CURRICULUM VITAE

CARLO SANNA

Contact information

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Positions

01/02/2020 – ongoing	Postdoctoral Researcher Politecnico di Torino Supervisor: Prof. Danilo Bazzanella
01/02/2019 – 31/01/2020	Postdoctoral Researcher Unità INdAM dell’Università di Genova Supervisor: Prof. Sandro Bettin

Abilitazione

Abilitazione Scientifica Nazionale per il ruolo di Professore di Seconda Fascia, Settore Concorsuale 01/A2 (Geometria e Algebra), valida dal 11/11/2020 al 11/11/2029.

Education

15/10/2018	PhD in Pure and Applied Mathematics , cum laude Università degli Studi di Torino, in association with Politecnico di Torino Thesis title: “ <i>Arithmetic properties of linear recurrences and other topics in Number Theory</i> ” Supervisor: Prof. Danilo Bazzanella Referees: Prof. Giuseppe Molteni, Prof. Alberto Perelli
16/07/2015	Master of Science, Mathematics , 110/110 cum laude and “menzione di merito” Università degli Studi di Torino
15/10/2013	Bachelor of Science, Mathematics , 110/110 cum laude Università degli Studi di Torino

Awards, prizes, and scholarships

2020	Award con.Sienze (€ 1.000) sponsored by “Conferenza Nazionale dei Presidenti e dei Direttori delle Strutture Universitarie di Scienze e Tecnologie”, and given to the six best PhD theses in the scientific areas CUN 01-05 (08/2018–07/2019)
2016	Award Medaglia d’Argento and prize Luciana Picco Botta (€ 2.000) sponsored by Università degli Studi di Torino, for the best master thesis in Mathematics of the academic year 2014/15
2015	PhD scholarship “Contemporary Problems in Mathematics” Ranked first over 35 candidates

Teaching experiences

2020/21	Assistant of “Linear Algebra and Geometry” (40 hours) Politecnico di Torino
2019/20	PhD course “Blockchain and Cryptoeconomy” (first part, 10 hours) Politecnico di Torino
2018/19	Assistant of “Mathematical Methods for Engineers” (40 hours) Politecnico di Torino
2018/19	Assistant of “Mathematics I” (40 hours) Corso di Laurea Triennale in Chimica e Tecnologie Chimiche, Università di Torino
2017/18	Assistant of “Mathematical Analysis I” (60 hours) Politecnico di Torino
2016/17	Assistant of “Mathematical Analysis I” (60 hours) Politecnico di Torino

Research groups and projects

2018 – ongoing	Member of CrypTO – Group of Cryptography and Number Theory Department of Mathematical Sciences “G. L. Lagrange”, Politecnico di Torino
2018 – ongoing	Member of “Gruppo Nazionale per le Strutture Algebriche, Geometriche e le loro Applicazioni” Istituto Nazionale di Alta Matematica
2017–2018	Member of the research project “Algebra e Dintorni” Department of Mathematics “G. Peano”, Università degli Studi di Torino
2017–2018	Member of the research project “Approssimazione multivariata e algoritmi efficienti con applicazioni a problemi algebrici, differenziali e integrali” Department of Mathematics “G. Peano”, Università degli Studi di Torino

Conferences

24/10/2019 – 25/10/2019	Co-organizer of “4th Number Theory Meeting – Torino” Department of Mathematics “G. Peano”, Università di Torino
15/10/2018 – 16/10/2018	Co-organizer of “3rd Number Theory Meeting – Torino” Department of Mathematics “G. Peano”, Università di Torino
26/10/2017 – 27/10/2017	Co-organizer of “2nd Number Theory Meeting – Torino” Department of Mathematical Sciences “G. L. Lagrange”, Politecnico di Torino

Talks and presentations

04/03/21 (invited)	Least common multiples of integer sequences: old and new results <i>Number Theory Online (Università di Pisa, Roma Sapienza, Parma)</i> , online
18/02/21 (invited)	Cryptanalysis of Multivariate Public Key Cryptosystems <i>Technology Innovation Institute</i> , United Arab Emirates, online
05/02/21 (invited)	Introduction to Multivariate Cryptography <i>Seminario della serie De Cifris Augustae Taurinorum</i> , online
23/09/20 (invited)	Additive and Xor differential probabilities of Chacha quarter round <i>Technology Innovation Institute</i> , United Arab Emirates, online

- 22/07/20 **On the least common multiple of random terms of binary recurrence sequences**
19th International Conference on Fibonacci Numbers and Their Applications, online
- 21/05/19 **On the number of distinct exponents in the prime factorization of an integer**
(invited) *Seminari di Algebra e Geometria Algebrica*, Università di Torino
- 12/04/19 **Approximations by signed harmonic sums and the Thue–Morse sequence**
5th mini symposium of the Roman Number Theory Association, Università Roma Tre
- 18/04/18 **Waring’s theorem for binary powers**
4th mini symposium of the Roman Number Theory Association, Università Roma Tre
- 12/04/18 **Distribution of integral values for the ratio of two linear recurrences**
(invited) *Giornata dei dottorandi di Teoria dei Numeri*, Università degli Studi di Parma
- 19/12/17 **A coprimality condition on consecutive values of polynomials**
(invited) *Giornate INdAM di Teoria dei Numeri*, Università degli Studi di Genova
- 21/09/17 **On the greatest common divisor of n and the n th Fibonacci Number**
20th International Workshop for Young Mathematicians, Jagiellonian University
- 06/07/17 **On the G.C.D. of n and the n th term of a linear recurrence**
XXXth Journées Arithmétiques, University of Caen
- 05/06/17 **On the sum of digits of the factorial**
Numeration 2017, Università degli Studi Roma Tre
- 04/11/16 **A factor of integer polynomials with minimal integrals**
1st Number Theory Meeting - Torino, Università degli Studi di Torino

Preprints

On the divisibility of the rank of appearance of a Lucas sequence

<https://arxiv.org/abs/2008.12506>

The largest entry in the inverse of a Vandermonde matrix

(with Jeffrey Shallit and Shun Zhang)

<https://arxiv.org/abs/2008.01012>

On the least common multiple of shifted powers

<https://arxiv.org/abs/2103.07967>

Accepted peer-reviewed papers

A note on the natural density of product sets

Bulletin of the London Mathematical Society

(with Sandro Bettin and Dimitris Koukoulopoulos)

<https://arxiv.org/abs/2006.13356>

Additive bases and Niven numbers

Bulletin of the Australian Mathematical Society

<https://doi.org/10.1017/S0004972721000186>

On the l.c.m. of shifted Fibonacci numbers

International Journal of Number Theory

<https://arxiv.org/abs/2007.13330>

Practical central binomial coefficients

Quaestiones Mathematicae

<https://doi.org/10.2989/16073606.2020.1775156>

Published peer-reviewed papers

- 2021 **On the least common multiple of random q -integers**
Research in Number Theory 7, 16 (2021)
<https://doi.org/10.1007/s40993-021-00242-4>
- 2021 **On the condition number of the Vandermonde matrix of the n th cyclotomic polynomial**
(with Antonio J. Di Scala and Edoardo Signorini)
Journal of Mathematical Cryptology 15, 174–178
<https://doi.org/10.1515/jmc-2020-0009>
- 2020 **Greedy approximations by signed harmonic sums and the Thue–Morse sequence**
(with Sandro Bettin and Giuseppe Molteni)
Advances in Mathematics 366, 107068
<https://doi.org/10.1016/j.aim.2020.107068>
- 2020 **On the l.c.m. of random terms of binary recurrence sequences**
Journal of Number Theory 213, 221–231
<https://doi.org/10.1016/j.jnt.2019.12.004>
- 2020 **A note on product sets of random sets**
Acta Mathematica Hungarica 162, 76–83
<https://doi.org/10.1007/s10474-019-01014-4>
- 2020 **On numbers divisible by the product of their nonzero base b digits**
Quaestiones Mathematicae 43, 1563–1571
<https://doi.org/10.2989/16073606.2019.1637956>
- 2020 **Least common multiple of polynomial sequences**
(with Danilo Bazzanella)
Rendiconti del Seminario Matematico Università e Politecnico di Torino 78, n° 1, 21–25
- 2020 **Direction sets: A generalization of ratio sets**
(with Paolo Leonetti)
Bulletin of the Australian Mathematical Society 101, 389–395
<https://doi.org/10.1017/S0004972719000959>
- 2020 **Practical numbers among the binomial coefficients**
(with Paolo Leonetti)
Journal of Number Theory 207, 145–155
<https://doi.org/10.1016/j.jnt.2019.07.005>
- 2020 **On the number of distinct exponents in the prime factorization of an integer**
Proceedings of the Indian Academy of Sciences 130, 27
<https://doi.org/10.1007/s12044-020-0556-y>
- 2020 **p -adic denseness of members of partitions of \mathbb{N} and their ratio sets**
(with Piotr Miska)
Bulletin of the Malaysian Mathematical Sciences Society 43, 1127–1133
<https://doi.org/10.1007/s40840-019-00728-6>

- 2019 **Waring's theorem for binary powers**
(with Daniel Kane and Jeffrey Shallit)
Combinatorica **39**, 1335–1350
<https://doi.org/10.1007/s00493-019-3933-3>
- 2019 **Practical numbers in Lucas sequences**
Quaestiones Mathematicae **42**, 977–983
<https://doi.org/10.2989/16073606.2018.1502697>
- 2019 **On the p -adic denseness of the quotient set of a polynomial image**
(with Piotr Miska and Nadir Murru)
Journal of Number Theory **197**, 218–227
<https://doi.org/10.1016/j.jnt.2018.08.010>
- 2019 **On numbers n with polynomial image coprime with the n th term of a linear recurrence**
(with Daniele Mastrostefano)
Bulletin of the Australian Mathematical Society **99**, 23–33
<https://doi.org/10.1017/S0004972718000606>
- 2019 **On numbers n relatively prime to the n th term of a linear recurrence**
Bulletin of the Malaysian Mathematical Sciences Society **42**, 827–833
<https://doi.org/10.1007/s40840-017-0514-8>
- 2018 **Small values of signed harmonic sums**
(with Sandro Bettin and Giuseppe Molteni)
Comptes Rendus Mathématique **356**, 1062–1074
<https://doi.org/10.1016/j.crma.2018.11.007>
- 2018 **On the greatest common divisor of n and the n th Fibonacci number**
(with Paolo Leonetti)
Rocky Mountain Journal of Mathematics **48**, 1191–1199
<https://doi.org/10.1216/RMJ-2018-48-4-1191>
- 2018 **The density of numbers n having a prescribed G.C.D. with the n th Fibonacci number**
(with Emanuele Tron)
Indagationes Mathematicae **29**, 972–980
<https://doi.org/10.1016/j.indag.2018.03.002>
- 2018 **The moments of the logarithm of a G.C.D. related to Lucas sequences**
Journal of Number Theory **191**, 305–315
<https://doi.org/10.1016/j.jnt.2018.03.012>
- 2018 **A note on primes in certain residue classes**
(with Paolo Leonetti)
International Journal of Number Theory **14**, 2219–2223
<https://doi.org/10.1142/S1793042118501336>
- 2018 **Central binomial coefficients divisible by or coprime to their indices**
International Journal of Number Theory **14**, 1135–1141
<https://doi.org/10.1142/S1793042118500707>
- 2018 **On the k -regularity of the k -adic valuation of Lucas sequences**
(with Nadir Murru)
Journal de Théorie des Nombres de Bordeaux **30**, 227–237
<https://doi.org/10.5802/jtnb.1025>

- 2017 **On the closure of the image of the generalized divisor function**
Uniform Distribution Theory **12**, 77–90
<https://doi.org/10.1515/udt-2017-0016>
- 2017 **A coprimality condition on consecutive values of polynomials**
 (with Márton Szikszai)
Bulletin of the London Mathematical Society **49**, 908–915
<https://doi.org/10.1112/blms.12078>
- 2017 **Distribution of integral values for the ratio of two linear recurrences**
Journal of Number Theory **180**, 195–207
<https://doi.org/10.1016/j.jnt.2017.04.015>
- 2017 **p -adic quotient sets**
 (with Stephan Ramon Garcia, Yu Xuan Hong, Florian Luca, Elena Pinsker, Evan Schechter, and Adam Starr)
Acta Arithmetica **179**, 163–184
<http://doi.org/10.4064/aa8579-4-2017>
- 2017 **The quotient set of k -generalised Fibonacci numbers is dense in \mathbb{Q}_p**
Bulletin of the Australian Mathematical Society **96**, 24–29
<https://doi.org/10.1017/S0004972716001118>
- 2017 **A factor of integer polynomials with minimal integrals**
Journal de Théorie des Nombres de Bordeaux **29**, 637–646
<http://doi.org/10.5802/jtnb.994>
- 2017 **On numbers n dividing the n th term of a Lucas sequence**
International Journal of Number Theory **13**, 725–734
<http://doi.org/10.1142/S1793042117500373>
- 2017 **On the p -adic valuation of Stirling numbers of the first kind**
 (with Paolo Leonetti)
Acta Mathematica Hungarica **151**, 217–231
<http://doi.org/10.1007/s10474-016-0680-4>
- 2016 **The p -adic valuation of Lucas sequences**
The Fibonacci Quarterly **54**, 118–124
<http://www.fq.math.ca/54-2>
- 2016 **On the p -adic valuation of harmonic numbers**
Journal of Number Theory **166**, 41–46
<https://doi.org/10.1016/j.jnt.2016.02.020>
- 2015 **Counting arithmetic formulas**
 (with Edinah K. Gnang and Maksym Radziwiłł)
European Journal of Combinatorics **47**, 40–53
<https://doi.org/10.1016/j.ejc.2015.01.007>
- 2015 **On the number of arithmetic formulas**
International Journal of Number Theory **11**, 1099–1106
<https://doi.org/10.1142/S1793042115500591>
- 2015 **On the sum of digits of the factorial**
Journal of Number Theory **147**, 836–841
<http://doi.org/10.1016/j.jnt.2014.09.003>

- 2014 **Covering an arithmetic progression with geometric progressions and vice versa**
International Journal of Number Theory **10**, 1577–1582
<http://doi.org/10.1142/S1793042114500456>
- 2014 **On the exponential sum with the sum of digits of hereditary base b notation**
INTEGERS **14**, article A36
<http://www.integers-ejcnt.org/vol14.html>
- 2014 **On the asymptotic density of the support of a Dirichlet convolution**
Journal of Number Theory **134**, 1–12
<http://doi.org/10.1016/j.jnt.2013.07.012>
- 2013 **Uncertainty principles connected with the Möbius inversion formula**
 (with Paul Pollack)
Bulletin of the Australian Mathematical Society **88**, 460–472
<http://doi.org/10.1017/S0004972712001128>
- 2012 **On arithmetic progressions of integers with a distinct sum of digits**
Journal of Integer Sequences **15**, article 12.8.1
<https://cs.uwaterloo.ca/journals/JIS/VOL15/Sanna/sanna3.html>
- 2012 **A new elementary proof of the inequality $\varphi(n) > \pi(n)$**
Notes on Number Theory and Discrete Mathematics **18**, No. 3, 35–37
<http://nntdm.net/volume-18-2012/number-3/35-37>

References

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