

PERSONAL INFORMATION **MIRCEA MERCA**

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Gender Male | Nationality Romanian

## WORK EXPERIENCE

- Oct 2024 – present **Professor**  
National University of Science and Technology POLITEHNICA Bucharest Bucharest, Romania  
Department of Mathematical Methods and Models
- May 2023 – present **Associate Member**  
Academy of Romanian Scientists, Bucharest, Romania
- Nov 2022 – present **PhD Supervisor**  
National University of Science and Technology POLITEHNICA Bucharest, Bucharest, Romania  
Doctoral School of Applied Sciences
- Oct 2022 – Sept 2024 **Associate Professor**  
National University of Science and Technology POLITEHNICA Bucharest Bucharest, Romania  
Department of Mathematical Methods and Models
- June – July 2017 **Visiting Researcher**  
College of The Holy Cross, Worcester, USA  
Department of Mathematics and Computer Science
- May 2017 – July 2020 **Researcher**  
Academy of Romanian Scientists, Bucharest, Romania
- July 2016 – Oct 2022 **Associate Researcher**  
University of Craiova, Romania  
Department of Mathematics
- July 2014 **Visiting Researcher**  
College of The Holy Cross, Worcester, USA  
Department of Mathematics and Computer Science

## EDUCATION AND TRAINING

- 2021 **Habilitation in Mathematics**  
School of Advanced Studies of the Romanian Academy (SCOSAAR),  
Thesis: Truncated theta series, partition-theoretic interpretations and Rogers-Ramanujan type identities
- 2011–2014 **PhD in Mathematics**  
University of Craiova, Department of Mathematics  
Thesis: New Algorithms and Relations Involving Integer Partitions
- 2001–2003 **Bachelor of Applied Science in Computer Science**  
University Politehnica of Bucharest

1987–1991 **Bachelor of Science in Mathematics**

Babes-Bolyai University, Cluj-Napoca

## RESEARCH INTEREST

My research centers on the theory of partitions, number theory, combinatorics, special functions, algorithms and related areas. I have an interest in generating the integer partitions. The algorithm that I published in 2012 is considered the most efficient algorithm for generating the integer partitions. I am collaborating with George E. Andrews on truncated theta series. The first paper of this study appeared in november 2012, and the second in february 2018. In 2017, I published the Lambert series factorization theorem. This general result allowed me to obtain new connections between the seemingly disparate branches of the additive and multiplicative number theory. Few papers of this investigation appeared in 2017 and 2018. Recently, I published the first algorithm for proving the non-trivial linear homogeneous partition inequalities. Currently I am working on  $q$ -series and on further aspects of partitions and their amazing relationship with Rogers-Ramanujan's enigmatic identities.

## GRANTS, HONORS AND AWARDS

**2023 World's Top 2% Scientists** ranking by Stanford University

MDPI AG, Switzerland - Conference Travel Grant (CHF 300)

Romanian National Authority for Scientific Research, CNCS-UEFISCDI (RON 2000)

1. PN-IV-P2-2.3-PRECISI-2023-80691: On Two Truncated Quintuple Series Theorems, *Experimental Mathematics*, 31(2): 606–610 (2022) (RON 2000)

**2022 World's Top 2% Scientists** ranking by Stanford University**2021 World's Top 2% Scientists** ranking by Stanford University

Romanian National Authority for Scientific Research, CNCS-UEFISCDI (RON 24000)

1. PN-III-P1-1.1-PRECISI-2021-59317: Generalized Lambert Series and Euler's Pentagonal Number Theorem, *Mediterranean Journal of Mathematics*, 18:29 (2021) (RON 2000)
2. PN-III-P1-1.1-PRECISI-2021-62326: Truncated Theta Series and Rogers-Ramanujan Functions, *Experimental Mathematics*, 30(3): 364–371 (2021) (RON 2000)
3. PN-III-P1-1.1-PRECISI-2021-63799: On the partitions into distinct parts and odd parts, *Quaestiones Mathematicae*, 44(8): 1095–1105 (2021) (RON 6000)
4. PN-III-P1-1.1-PRECISI-2021-64647: A further look at a generalization of Waring's formula, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 115(4): 195 (2021) (RON 6000)
5. PN-III-P1-1.1-PRECISI-2021-65911: On the Ramanujan-type congruences modulo 8 for the overpartitions into odd part, *Quaestiones Mathematicae*, Early access (2021) (RON 6000)
6. PN-III-P1-1.1-PRECISI-2021-67965: The powers of two as sums over partitions, *Quaestiones Mathematicae*, 44(12): 1745-1755 (2021) (RON 2000)

**2020 Spiru Haret - 2018 Prize of the Romanian Academy.**

Romanian National Authority for Scientific Research, CNCS-UEFISCDI (RON 16000)

1. PN-III-P1-1.1-PRECISI-2020-40742:  $q$ -Series congruences involving statistical mechanics partition functions in regime III and IV of Baxter's solution of the hard-hexagon model, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 114:156 (2020) (RON 6000)
2. PN-III-P1-1.1-PRECISI-2020-41042: Bernoulli numbers and symmetric functions, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 114(1):20 (2020) (RON 6000)
3. PN-III-P1-1.1-PRECISI-2020-41447: Two Symmetric Identities Involving Complete and Elementary Symmetric Functions, *Bulletin of the Malaysian Mathematical Sciences Society*, 43: 1661–1670 (2020) (RON 2000)
4. PN-III-P1-1.1-PRECISI-2020-41771: On identities of Watson type, *ARS Mathematica Contemporanea*, 17(1): 277–290 (2019) (RON 2000)

**2019 Academy of Romanian Scientists - Research Grant: Applications of mathematical analysis in number theory, optimization, differential equations, other fields of mathematical or multidisciplinary research. (RON 12000)**

Romanian National Authority for Scientific Research, CNCS-UEFISCDI (RON 8000)

1. PN-III-P1-1.1-PRECISI-2019-32496: Jacobi's Four and Eight Squares Theorems and Partitions into Distinct Parts, *Mediterranean Journal of Mathematics*, 16, 16-26 (2019) (RON 6000)
2. PN-III-P1-1.1-PRECISI-2019-32511: The partition function  $p(n)$  in terms of the classical Möbius function, *The Ramanujan Journal*, 49, 87-96 (2019) (RON 2000)

**2018 European Mathematical Society - Solidarity Travel Grant (€900)**

Academy of Romanian Scientists - Research Grant: Applications of mathematical analysis in number theory, optimization, differential equations, other fields of mathematical or multidisciplinary research. (RON 15000)

Romanian National Authority for Scientific Research, CNCS-UEFISCDI (RON 28000)

1. PN-III-P1-1.1-PRECISI-2018-23027: Euler-Riemann Zeta Function and Chebyshev-Stirling Numbers of the First Kind, *Mediterranean Journal of Mathematics*, 15:123 (2018) (RON 6000)
2. PN-III-P1-1.1-PRECISI-2018-23034: New Connections Between Functions from Additive and Multiplicative Number Theory, *Mediterranean Journal of Mathematics*, 13:56 (2018) (RON 6000)
3. PN-III-P1-1.1-PRECISI-2018-23042: A  $q$ -analogue for sums of powers, *Acta Arithmetica*, 183, 185–190 (2018) (RON 2000)
4. PN-III-P1-1.1-PRECISI-2018-24072: Truncated Theta Series and a Problem of Guo and Zeng, *Journal of Combinatorial Theory, Series A*, 154, 610–619 (2018) (RON 6000)
5. PN-III-P1-1.1-PRECISI-2018-26481: Binomial transforms and integer partitions into parts of  $k$  different magnitudes, *The Ramanujan Journal*, 46, 765–774 (2018) (RON 2000)
6. PN-III-P1-1.1-PRECISI-2018-27721: Combinatorial proofs of two truncated theta series theorems, *Journal of Combinatorial Theory, Series A*, 160, 168–185 (2018) (RON 6000)

**2017 Nicolae Teodorescu - 2015** Prize of Academy of Romanian Scientists for contributions in combinatorics and algorithm theory.

Academy of Romanian Scientists - Research Grant: Fundamental properties of differential systems solutions (RON 9000)

Romanian National Authority for Scientific Research, CNCS-UEFISCDI (RON 10000)

1. PN-III-P1-1.1-PRECISI-201714957: New convolutions for the number of divisors, *Journal of Number Theory*, 170, 17–34 (2017) (RON 2000)
2. PN-III-P1-1.1-PRECISI-201714986: On families of linear recurrence relations for the special values of the Riemann zeta function, *Journal of Number Theory*, 170, 55–65 (2017) (RON 2000)
3. PN-III-P1-1.1-PRECISI-201715008: New relations for the number of partitions with distinct even parts, *Journal of Number Theory*, 176, 1–12 (2017) (RON 2000)
4. PN-III-P1-1.1-PRECISI-201720238: The Lambert series factorization theorem, *The Ramanujan Journal*, 44, 417–435 (2017) (RON 2000)
5. PN-III-P1-1.1-PRECISI-201721056: Parity of sums of partition numbers and squares in arithmetic progressions, *The Ramanujan Journal*, 44, 617–630 (2017) (RON 2000)

**2015** Romanian National Authority for Scientific Research, CNCS-UEFISCDI (RON 2000)

1. PN-II-RU-PRECISI-2015-9-9110: A generalization of Euler's pentagonal number recurrence for the partition function, *The Ramanujan Journal*, 37(3), 589-595 (2015) (RON 2000)

**2014** Romanian National Authority for Scientific Research, CNCS-UEFISCDI (RON 6000)

1. PN-II-RU-PRECISI-2014-8-5388: A note on the Jacobi-Stirling numbers, *Integral Transforms and Special Functions*, 25(3), 196-202 (2014) (RON 4000)
2. PN-II-RU-PRECISI-2014-8-5394: New upper bounds for the number of partitions into a given number of parts, *Journal of Number Theory*, 142, 298-304 (2014) (RON 2000)

**2013** Romanian National Authority for Scientific Research, CNCS-UEFISCDI (RON 4000)

1. PN-II-RU-PRECISI-2013-7-3442: The truncated pentagonal number theorem, *Journal of Combinatorial Theory, Series A*, 119(8), 1639-1643 (2012) (RON 2000)
2. PN-II-RU-PRECISI-2013-7-3443: Binary Diagrams for Storing Ascending Compositions, *The Computer Journal*, 56(11), 1320-1327 (2013) (RON 2000)

**2011–2014** Romanian Ministry of National Education (MEN) – PhD Student Grant (RON 35000)

## PUBLICATIONS

From 2011 to the present, I published 150 papers as follows: 130 papers indexed ISI Web of Science (2 papers as chapters books), 20 papers in journals indexed in other international data bases (4 papers as chapters books).

The impact of my work can be characterized by citations and  $h$ -index as follows: 1298 citations with 18  $h$ -index in Google Scholar, 1088 citations with 17  $h$ -index in Semantic Scholar, 894 citations with 14  $h$ -index in Scopus, 638 citations with 12  $h$ -index in MathSciNet, 772 citations with 13  $h$ -index in ISI Web of Science, 705 citations with 14  $h$ -index in zbMATH Open.

- 2011** 1. Mircea Merca: Inequalities and Identities Involving Sums of Integer Functions, *Journal of Integer Sequences*, 14(9): Article 11.9.1 (2011)

- 2012
2. Mircea Merca: Fast Algorithm for Generating Ascending Compositions, *Journal of Mathematical Modelling and Algorithms*, 11(1): 89–104 (2012) MR2910461.
  3. George E. Andrews, Mircea Merca: The truncated pentagonal number theorem, *Journal of Combinatorial Theory, Series A* 119: 1639–1643 (2012) MR2946378.
  4. Mircea Merca: A Note on Cosine Power Sums, *Journal of Integer Sequences*, 15(5): Article 12.5.3 (2012) MR2942747.
  5. Mircea Merca: A Special Case of the Generalized Girard-Waring Formula, *Journal of Integer Sequences*, 15(5): Article 12.5.7 (2012) MR2942751
  6. Mircea Merca: On a trigonometrical sum, *Gazeta Matematica Seria B*, Anul CXVII, Nr. 9, 380–384 (2012)
- 2013
7. Mircea Merca: Binary diagrams for storing ascending composition, *The Computer Journal* 56(11): 1320–1327 (2013).
  8. Mircea Merca: A convolution for complete and elementary symmetric functions, *Aequationes Mathematicae* 86(3), 217–229 (2013) MR3127006.
  9. Mircea Merca: A note on the  $r$ -Whitney numbers of Dowling lattices, *Comptes Rendus Mathematique* 351(17-18), 649–655 (2013) MR3124320.
  10. Mircea Merca: Integer partitions and directed acyclic graphs (in romanian), *Gazeta Matematica Seria A*, 31(110), No. 1-2, 15–23 (2013)
  11. Mircea Merca, Tanfer Tanriverdi: An Asymptotic Formula of Cosine Power Sums, *Matematika*, 68(1): 131–136 (2013) MR3060854
  12. Mircea Merca: A note on the determinat of a Toeplitz-Hessenberg matrix, *Special Matrices*, 1: 10–16 (2013) MR3155395
- 2014
13. Mircea Merca: A note on the Jacobi-Stirling numbers, *Integral Transforms and Special Functions* 25(3), 196–202 (2014) MR3172033.
  14. Mircea Merca: On some power sums of sine or cosine, *American Mathematical Monthly* 121(3), 244–248 (2014) MR3168997.
  15. Mircea Merca: A generalization of the symmetry between complete and elementary symmetric functions, *Indian Journal of Pure and Applied Mathematics* 45(1), 75–89 (2014) MR3180533.
  16. Mircea Merca: New upper bounds for the number of partitions into a given number of parts, *Journal of Number Theory* 142, 298–304 (2014) MR3208404.
  17. Mircea Merca: Some experiments with complete and elementary symmetric functions, *Periodica Mathematica Hungarica* 69(2), 182–189 (2014) MR3278955.
  18. Mircea Merca: A new connection between  $r$ -Whitney numbers and Bernoulli polynomials, *Integral Transforms and Special Functions* 25(12), 937–942 (2014) MR3267747.
  19. Mircea Merca: An infinite family of inequalities involving cosecant sums, *Gazeta Matematica Seria A*, 32(1-2): 7–10 (2014)
  20. Mircea Merca: A note on  $q$ -Stirling numbers In G.V. Milanović and M. Th. Rassias (Editors) *Analytic Number Theory, Approximation Theory, and Special Functions*, 239–244, Springer, New-York, 2014 MR3329239
- 2015
21. Mircea Merca: A new look on the generating function for the number of divisors, *Journal of Number Theory* 149, 57–69 (2015) MR3296001.
  22. Mircea Merca: A connection between Jacobi-Stirling numbers and Bernoulli polynomials, *Journal of Number Theory* 151, 223–229 (2015) MR3314211.
  23. Mircea Merca: An alternative to Faulhaber's formula, *American Mathematical Monthly* 122(6), 599–601 (2015) MR3361745.
  24. Mircea Merca: The bisectonal pentagonal number theorem, *Journal of Number Theory* 157, 223–232 (2015) MR3373239.
  25. Mircea Merca: A generalization of Euler's pentagonal number recurrence for the partition function, *The Ramanujan Journal* 37(3), 589–595 (2015) MR3370707.
  26. Mircea Merca: A double inequality involving Erdos-Borwein constants, *Miskolc Mathematical Notes*, 16(1), 277–281 (2015) MR3384606.
  27. Mircea Merca: Augmented monomials in terms of power sums, *SpringerPlus*, 4:724 (2015).

- 2016 28. Mircea Merca: The cardinal sine function and the Chebyshev-Stirling numbers, *Journal of Number Theory*, 160, 19–31 (2016) MR3425196.
29. Mircea Merca: Combinatorial interpretations of a recent convolution for the number of divisors of a positive integer, *Journal of Number Theory*, 160, 60–75 (2016) MR3425199.
30. Mircea Merca: A note on the partitions involving parts of  $k$  different magnitudes *Journal of Number Theory*, 162, 23–34 (2016) MR3448259.
31. Cristina Ballantine, Mircea Merca: Padovan numbers as sums over partitions into odd parts, *Journal of Inequalities and Applications*, 2016:1 (2016) MR3439399.
32. Mircea Merca: A new look on the truncated pentagonal number theorem, *Carpathian Journal of Mathematics*, 32(1), 97-101 (2016).
33. Mircea Merca: Asymptotics of the Chebyshev-Stirling numbers of the first kind, *Integral Transforms and Special Functions*, 27(4), 259-267 (2016) MR3462120.
34. Mircea Merca: Fast computation of the partition function, *Journal of Number Theory*, 164, 405-416 (2016) MR3474396.
35. Mircea Merca: Stirling numbers and integer partitions, *Quaestiones Mathematicae*, 39(4), 457-469 (2016) MR3439399.
36. Mircea Merca: Connections between central factorial numbers and Bernoulli polynomials, *Periodica Mathematica Hungarica*, 73(2), 259-264 (2016) MR3564569.
37. Mircea Merca: New convolutions for complete and elementary symmetric functions, *Integral Transforms and Special Functions*, 27(12), 965-973 (2016).
- 2017 38. Mircea Merca: On the Song recurrence relation for the Riemann zeta function, *Miskolc Mathematical Notes*, 17(2), 941–945 (2017)
39. Cristina Ballantine, Mircea Merca: New convolutions for the number of divisors, *Journal of Number Theory*, 170, 17-34 (2017) MR3541695.
40. Mircea Merca: On families of linear recurrence relations for the special values of the Riemann zeta function, *Journal of Number Theory*, 170, 55-65 (2017) MR3541698.
41. Mircea Merca: On the number of partitions into parts of  $k$  different magnitudes, *Discrete Mathematics*, 340(4), 644-648 (2017) MR3603542.
42. Mircea Merca: New relations for the number of partitions with distinct even parts, *Journal of Number Theory*, 176, 1–12 (2017) MR3622117.
43. Cristina Ballantine, Mircea Merca: Inequalities involving the generating function for the number of partitions into odd parts, *Quaestiones Mathematicae*, 40(3), 319–332 (2017) MR3651753.
44. Mircea Merca: Lambert series and conjugacy classes in  $GL$ , *Discrete Mathematics*, 340, 2223–2233 (2017) MR3665076.
45. Mircea Merca: The Riemann zeta function with even arguments as sums over integer partitions, *American Mathematical Monthly*, 124(6), 554–557 (2017) MR3654836.
46. Mircea Merca: New recurrences for Euler’s partition function, *Turkish Journal of Mathematics*, 41, 1184–1190 (2017) MR3711017.
47. Mircea Merca: The Lambert series factorization theorem, *The Ramanujan Journal*, 44, 417–435 (2017) MR3715424.
48. Mircea Merca: From a Rogers’s identity to overpartitions, *Periodica Mathematica Hungarica*, 75, 172–179 (2017) MR3718511.
49. Cristina Ballantine, Mircea Merca: Parity of sums of partition numbers and squares in arithmetic progressions, *The Ramanujan Journal*, 44, 617–630 (2017) MR3723444.
50. Cristina Ballantine, Mircea Merca: Finite differences of Euler’s zeta function, *Miskolc Mathematical Notes*, 18(2), 639–642 (2017) MR3768303.
51. Mircea Merca: On the arithmetic mean of the square roots of the first  $n$  positive integers, *The College Mathematics Journal*, 48(2): 129–133 (2017) MR3626273.
52. Mircea Merca: On a decomposition of augmented monomial symmetric functions, *Annals of the Academy of Romanian Scientists. Series on Mathematics and its Applications*, 9(2): 249–254 (2017) MR3742496



- 2018 53. Mircea Merca: An infinite sequence of inequalities involving special values of the Riemann zeta function, *Mathematical Inequalities & Applications*, 21(1), 17–24 (2018) MR3716206.
54. George E. Andrews, Mircea Merca: Truncated Theta Series and a Problem of Guo and Zeng, *Journal of Combinatorial Theory, Series A*, 154, 610–619 (2018) MR3718080.
55. Mircea Merca: On the number of partitions into odd parts or congruent to  $\pm 2 \pmod{10}$ , *Contributions to Discrete Mathematics*, 13(1), 51–62 (2018) MR3760065.
56. Mircea Merca: New connections between functions from additive and multiplicative number theory, *Mediterranean Journal of Mathematics*, 13:56 (2018) MR3765931.
57. Mircea Merca: A  $q$ -analogue for sums of powers, *Acta Arithmetica*, 183, 185–190 (2018) MR3798788.
58. Cristina Ballantine, Mircea Merca: Euler-Riemann zeta function and Chebyshev-Stirling numbers of the first kind, *Mediterranean Journal of Mathematics*, 15:123 (2018) MR3803736.
59. Cristina Ballantine, Mircea Merca, Donny Passary, Ae Ja Yee: Combinatorial Proofs of Two Truncated Theta Series Theorems, *Journal of Combinatorial Theory, Series A*, 160: 168–185 (2018) MR3846200.
60. Mircea Merca: Binomial transforms and partitions into parts of  $k$  different magnitudes, *The Ramanujan Journal*, 46(3): 765–774 (2018) MR3826754.
61. Mircea Merca: Generalizations of two identities of Guo and Yang, *Quaestiones Mathematicae*, 41(5): 643–652 (2018) MR3836412.
62. Mircea Merca, Maxie D. Schmidt: A Partition Identity Related to Stanley's Theorem, *American Mathematical Monthly*, 125(10): 929–933 (2018) MR3882061.
63. Mircea Merca: Higher-order differences and higher-order partial sums of Euler's partition function, *Annals of the Academy of Romanian Scientists. Series on Mathematics and its Applications*, 10(1): 59–71 (2018) MR3816890.
- 2019 64. Mircea Merca: Some notes on the  $(q, t)$ -Stirling numbers, *Discrete Mathematics*, 342(3): 628–634 (2019) MR3881666.
65. Cristina Ballantine, Mircea Merca: Jacobi's Four and Eight Squares Theorems and Partitions into Distinct Parts, *Mediterranean Journal of Mathematics*, 16:26 (2019) MR3910060.
66. Mircea Merca: On lacunary recurrences with gaps of length four and eight for the Bernoulli numbers, *Bulletin of the Korean Mathematical Society*, 56(2): pp. 491–499 (2019) MR3936483.
67. Mircea Merca, Maxie D. Schmidt: The partition function  $p(n)$  in terms of the classical Möbius function, *The Ramanujan Journal*, 49(1): 87–96 (2019) MR3942294.
68. Cristina Ballantine, Mircea Merca: On identities of Watson type, *ARS Mathematica Contemporanea*, 17(1):277–290 (2019) MR4031525.
69. Mircea Merca, Chun Wang, Ae Ja Yee: A truncated theta identity of Gauss and overpartitions into odd parts, *Annals of Combinatorics*, 23: 907–915 (2019) MR4039568.
70. Cristina Ballantine, Mircea Merca: A family of lacunary recurrences for Fibonacci numbers, *Miskolc Mathematical Notes*, 20(2): 767–772 (2019)
71. Mircea Merca: A further look at a complete characterization of Ramanujan-type congruences modulo 16 for overpartitions, *Proceedings of the Romanian Academy Series A*, 20(4): 329–335 (2019)
72. Mircea Merca, Maxie D. Schmidt: Generating Special Arithmetic Functions by Lambert Series Factorizations, *Contributions to Discrete Mathematics*, 14(1): 31–45 (2019) MR4050304.
73. Mircea Merca: Combinatorial interpretations of  $q$ -Vandermonde's identities, *Annals of the Academy of Romanian Scientists. Series on Mathematics and its Applications*, 11(1): 98–114 (2019) MR3973489.
74. Mircea Merca: On a combinatorial interpretation of the bisectional pentagonal number theorem, *Journal of Ramanujan Society of Mathematics and Mathematical Sciences*, 7(1): 7–18 (2019)

- 2020
75. Mircea Merca: Bernoulli numbers and symmetric functions, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 114(1):20 (2020) MR4039699.
  76. Mircea Merca, Jakob Katriel: A general method for proving the non-trivial linear homogeneous partition inequalities, *The Ramanujan Journal*, 51(2): 245–266 (2020) MR4056850.
  77. Mircea Merca, Maxie D. Schmidt: Factorization Theorems for Generalized Lambert Series and Applications, *The Ramanujan Journal*, 51(2): 391–419 (2020) MR4056859.
  78. Mircea Merca: Two symmetric identities involving complete and elementary symmetric functions, *Bulletin of the Malaysian Mathematical Sciences Society*, 43: 1661–1670 (2020) MR4061446.
  79. George E. Andrews, Mircea Merca: On the number of even parts in all partitions of  $n$  into distinct parts, *Annals of Combinatorics*, 24: 47–54 (2020)
  80. George E. Andrews, Mircea Merca: A new generalization of Stanley's theorem, *The Mathematics Student*, 89(1-2): 75–180 (2020).
  81. Cristina Ballantine, Mircea Merca: Bisected theta series, least  $r$ -gaps in partitions, and polygonal numbers, *The Ramanujan Journal*, 52: 433–444 (2020)
  82. Mircea Merca:  $q$ -Series congruences involving statistical mechanics partition functions in regime III and IV of Baxter's solution of the hard-hexagon model, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 114(3): 156 (2020)
  83. Cristina Ballantine, Mircea Merca: The minimal excludant and colored partitions, *Séminaire Lotharingien de Combinatoire*, 84B: Article #23 (2020)
  84. Mircea Merca: On the number of partitions into parts with the minimal part  $k$  and the minimal difference  $d$ , *Annals of the Academy of Romanian Scientists. Series on Mathematics and its Applications*, 12(1-2): 155–163 (2020)
  85. Mircea Merca: Connections between Fibonacci and Pell numbers, *Note di Matematica*, 40(2): 53–61 (2020).
  86. Mircea Merca: A connection between Fibonacci numbers and generalized pentagonal numbers, *Ars Combinatoria*, 153: 177–186 (2020).



- 2021 87. Cristina Ballantine, Mircea Merca: Combinatorial proofs of two theorems related to the number of even parts in all partitions of  $n$  into distinct parts, *The Ramanujan Journal*, 54(1): 107–112 (2021)
88. Mircea Merca: Generalized Lambert series and Euler pentagonal number theorem, *Mediterranean Journal of Mathematics*, 18:29 (2021)
89. Mircea Merca, Chun Whang, Ae Ja Yee: A Truncated Theta Identity of Gauss and Overpartitions into Odd Parts. In: Alladi K., Berndt B.C., Paule P., Sellers J.A., Yee A.J. (Editors) *George E. Andrews 80 Years of Combinatory Analysis*, Trends in Mathematics, pp. 553–561, Birkhäuser, Cham, 2021
90. Mircea Merca: Combinatorial interpretations of two identities of Guo and Yang, *Contributions to Discrete Mathematics*, 16(1): 20–27 (2021)
91. Mircea Merca: Geometric polynomials and integer partitions, *Contributions to Discrete Mathematics*, 16(1): 117–127 (2021)
92. Mircea Merca, Ae Ja Yee: On the sum of parts with multiplicity at least 2 in all the partitions of  $n$ , *International Journal of Number Theory*, 17(3): 665–681 (2021)
93. Cristina Ballantine, Mircea Merca: The  $r$ -Stirling numbers of the first kind in terms of the Möbius function, *The Ramanujan Journal*, 55: 593–608 (2021)
94. Mircea Merca: Polygonal numbers and Rogers-Ramanujan-Gordon theorem, *The Ramanujan Journal*, 55: 783–792 (2021)
95. Mircea Merca: On a nonlinear relation for computing the overpartition function, *Mathematica Slovaca*, 71: 535–542 (2021)
96. Mircea Merca: Congruence identities involving sums of the odd divisor function, *Proceedings of the Romanian Academy Series A*, 22: 119–125 (2021)
97. Mircea Merca: Overpartitions and functions from multiplicative number theory, *Politehnica University of Bucharest. Scientific Bulletin. Series A. Applied Mathematics and Physics*, 83(3): 97–106 (2021)
98. Mircea Merca: On the sum of parts in the partitions of  $n$  into distinct parts, *Bulletin of the Australian Mathematical Society*, 104(2): 228–237 (2021)
99. Mircea Merca: Truncated theta series and Rogers-Ramanujan functions, *Experimental Mathematics*, 30(3): 364–371 (2021)
100. Cristina Ballantine, Mircea Merca: Combinatorial proof of the minimal excludant theorem, *International Journal of Number Theory*, 17(8): 1765–1779 (2021)
101. Mircea Merca: A further look at a generalization of Waring's formula, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 115:195 (2021)
102. Mircea Merca: On the partitions into distinct parts and odd parts, *Quaestiones Mathematicae*, 44(8), 1095–1105 (2021)
103. Christian Krattenthaler, Mircea Merca and Cristian-Silviu Radu: Infinite product formulae for generating functions for sequences of squares, in A. Bostan and K. Raschel (Editors), *Transcendence in Algebra, Combinatorics, Geometry and Number Theory. TRANS 2019*, Springer Proceedings in Mathematics & Statistics, vol 373. pp 193–236, Springer, Cham (2021).
104. Mircea Merca: A theta identity of Gauss connecting functions from additive and multiplicative number theory, in A. Bostan and K. Raschel (Editors) *Transcendence in Algebra, Combinatorics, Geometry and Number Theory. TRANS 2019*, Springer Proceedings in Mathematics & Statistics, vol 373. pp 237–248, Springer, Cham (2021).
105. Mircea Merca: The reciprocal of  $(q; q)_n$  as sums over partitions, *The Ramanujan Journal*, 56: 1089–1097 (2021)
106. Mircea Merca: On the number of partitions into parts not congruent to  $0, \pm 3 \pmod{12}$ , *Periodica Mathematica Hungarica*, 83: 133–143 (2021)
107. Mircea Merca:  $q$ -Stirling recurrences, *Revue Roumaine de Mathématiques Pures et Appliquées*, 66(3-4): 767–772 (2021).
108. Mircea Merca: Overpartitions as sums over partitions, *Proceedings of the Romanian Academy Series A*, 22(4): 325–331 (2021).
109. Mircea Merca: The powers of two as sums over partitions, *Quaestiones Mathematicae*, 44(12): 1745–1755 (2021)

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111. Mircea Merca: Distinct partitions and overpartitions, *Carpathian Journal of Mathematics*, 38(1): 107–116 (2022)
112. Cristina Ballantine, Mircea Merca: Generalizations of Stanley's theorem: combinatorial proofs and related inequalities, *Mediterranean Journal of Mathematics*, 19:20 (2022)
113. Mircea Merca: Connections between partitions and divisors related to the parity of the partition function, *The College Mathematics Journal*, 53(1): 33–37 (2022)
114. Mircea Merca: Linear inequalities concerning partitions into distinct parts, *The Ramanujan Journal*, 58: 491–503 (2022)
115. William Craig, Mircea Merca: On Ramanujan-type congruences for multiplicative functions, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 116:123 (2022)
116. Cristina Ballantine, Mircea Merca: Almost 3-regular overpartitions, *The Ramanujan Journal*, 58: 957–971 (2022).
117. Mircea Merca: Families of Ramanujan-type congruences modulo 4 for the number of divisors, *Axioms*, 11(7): 342 (2022).
118. Mircea Merca, On two truncated quintuple series theorems, *Experimental Mathematics*, 31(2): 606–610 (2022)
119. Mircea Merca: A further look at the cubic partitions, *The Ramanujan Journal*, 59(1): 253–277 (2022)
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121. Mircea Merca: A reversal of Schur's partition theorem, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 116: 181 (2022)
122. Cristina Ballantine, Mircea Merca: Dyson's crank and unimodal compositions, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 116: 182 (2022)
123. Mircea Merca: On the Ramanujan-type congruences modulo 8 for the overpartitions into odd parts, *Quaestiones Mathematicae*, 45(10): 1567–1574 (2022)

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  126. Moussa Ahmia, Mircea Merca: A generalization of complete and elementary symmetric functions - Part I, *Politehnica University of Bucharest. Scientific Bulletin. Series A. Applied Mathematics and Physics*, 85(1): 119–128 (2023)
  127. Mircea Merca: A  $q$ -Series Congruence Inspired by Andrews and Ramanujan, *Axioms*, 13(6): 514 (2023)
  128. Moussa Ahmia, Mircea Merca: A generalization of complete and elementary symmetric functions - Part II, *Politehnica University of Bucharest. Scientific Bulletin. Series A. Applied Mathematics and Physics*, 85(2): 115–124 (2023)
  129. Cristina Ballantine, Mircea Merca: 6-regular partitions: new combinatorial properties, congruences, and linear inequalities, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 117: 159 (2023)
  130. Cristina Ballantine, Mircea Merca: 4-Regular partitions and the pod function, *Quaestiones Mathematicae*, 46(10): 2027–2051 (2023)
  131. Mircea Merca, Iulia-Ionelia Radu: Plane partitions as sums over partitions, *Symmetry*, 15(10): 1820 (2023)
  132. Mircea Merca: A note on a connection between partitions and divisors, *Annals of the Academy of Romanian Scientists. Series on Mathematics and its Applications*, 15(1-2): 163–174 (2023)
  133. Mircea Merca: Rank partition functions and truncated theta identities, *Applicable Analysis and Discrete Mathematics*, 17: 282–295 (2023)
  134. Mircea Merca: Linear inequalities concerning the sum of the distinct parts congruent to  $r$  modulo  $m$  in all the partitions of  $n$ , *Quaestiones Mathematicae*, 46(12): 2637–2659 (2023)
  135. Cristina Ballantine, Mircea Merca: Congruences modulo 4 for the number of 3-regular partitions, *Comptes Rendus Mathématique*, 361: 1577–1583 (2023)
  136. Mircea Merca, Emil Simion:  $n$ -color partitions into distinct parts as sums over partitions, *Symmetry*, 15(11): 2067 (2023)
  137. Mircea Merca: Plane partitions and a problem of Josephus, *Mathematics*, 11(24): 4996 (2023)
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138. George E. Andrews, Mircea Merca: A further look at the sum of the parts with the same parity in the partitions of  $n$ , *Journal of Combinatorial Theory, Series A*, 203: 105849 (2024)
  139. Cristina Ballantine, Mircea Merca: Plane partitions and divisors, *Symmetry*, 16(1): 5 (2024)
  140. Cristina Ballantine, Mircea Merca: Durfee rectangle identities via symmetric functions, *Mediterranean Journal of Mathematics*, 21:27 (2024)
  141. Mircea Merca: Additive evaluations of the number of divisors, *Ramanujan Journal*, 63(3): 583–601 (2024)
  142. Mircea Merca: The Euler-Riemann zeta function with even arguments in terms of binomial coefficients, In: Guàrdia J., Minculete N., Savin D., Vela M., Zekhnini A. (eds), *New Frontiers in Number Theory and Applications*, 313–331, Birkhäuser, Cham (2024)
  143. Mircea Merca: From sums of divisors to partition congruences, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 118: 115 (2024)
  144. Mircea Merca: Euler's partition function in terms of 2-adic valuation, *Boletín de la Sociedad Matemática Mexicana*, 30: 76 (2024)
  145. Andreea Goran-Dumitru, Mircea Merca: Ramanujan's tau function as sums over partitions, *Politehnica University of Bucharest. Scientific Bulletin. Series A. Applied Mathematics and Physics*, 86(3): 69–80 (2024)
  146. Mircea Merca: Overpartitions in terms of 2-adic valuation, *Aequationes Mathematicae*, (2024) <https://doi.org/10.1007/s00010-024-01117-6>
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147. Cristina Ballantine, Mircea Merca, Cristian-Silviu Radu: Parity of 3-regular partition numbers and Diophantine equations, *Proceedings of the Edinburgh Mathematical Society*, accepted (2024)
  148. Mircea Merca, Ae Ja Yee: On the sum of parts with multiplicity at least 2 in all the partitions of  $n$ , In: George E. Andrews, Michael Filaseta, Ae Ja Yee (eds), *Analytic and Combinatorial Number Theory: The Legacy of Ramanujan*, accepted, World Scientific Book (2024)
  149. Mircea Merca: Infinite families of inequalities involving the central factorial numbers of the first kind, *Communications in Calculus Analysis, Special Functions and Mathematical Physics*, accepted, (2024)

- online150. Cristina Ballantine, George Beck, Mircea Merca: Partitions and elementary symmetric polynomials – an experimental approach, *arXiv:2408.13346v1*, online (2024)

#### ADDITIONAL INFORMATION

- Conference Papers
1. M. Merca: *On the Toeplitz-Hessenberg determinant*, The XVI th Annual Conference of the Romanian Mathematical Society, Petroleum-Gas University of Ploiesti, Romania, Oct. 2012
  2. M. Merca: *A Special Case of Restricted Integer Partitions*, Special Session on Discrete Mathematics and Theoretical Computer Science, Joint American Mathematical Society-Romanian Mathematical Society Meeting, Alba Iulia, Romania, Jun. 2013
  3. M. Merca: *On a double inequality*, The twelfth conference on nonlinear analysis and applied mathematics, Valahia University of Targoviste, Romania, June 2014.
  4. M. Merca: *A convolution for the number of divisors*, Summer research seminar, College of the Holy Cross, Worcester, USA, Jul. 2014
  5. M. Merca: *A refined form of a recent convolution for the number of divisors*, The XVIII th National Conference of the Romanian Mathematical Society, Alexandru Ioan Cuza University of Iasi, Romania, Oct. 2014
  6. M. Merca: *Lambert series and conjugacy classes in GL*, Spring Session, Academy of Romanian Scientists, Bucharest, Romania, March 24, 2017
  7. M. Merca: *A partition identity related to Stanley's theorem and applications*, Autumn Session, Academy of Romanian Scientists, Timisoara, Romania, October 12-14, 2017
  8. C. Ballantine, M. Merca: *Bisected theta series, least r-gaps in partitions, and polygonal numbers*, Joint Mathematics Meetings, San Diego, USA, Jan. 2018
  9. M. Merca: *The partition function  $p(n)$  in terms of the classical Möbius function*, Scientific Conference, Academy of Romanian Scientists, Bucharest, Romania, March 30, 2018.
  10. M. Merca: *Non-trivial linear partition inequalities and the Prouhet-Tarry-Escott problem*, Combinatory Analysis 2018: Partitions,  $q$ -Series, and Applications, Pennsylvania State University, USA, June 2018.
  11. M. Merca: *A general method for proving the non-trivial linear homogeneous partition inequalities*, National Scientific Conference, The Romanian Academy of Scientists, Targoviste, Romania, September 20-22, 2018
  12. M. Merca: *A truncated theta identity of Gauss*, National Scientific Conference, Academy of Romanian Scientists, Bucharest, Romania, April 4-6, 2019.
  13. M. Merca: *Truncated Theta Series, Partitions Inequalities and Rogers-Ramanujan Functions*, Transient Transcendence in Transylvania, Brasov, Romania, May 13-17, 2019.
  14. M. Merca: *An algorithm for proving the non-trivial linear homogeneous partition inequalities*, The Ninth Congress of Romanian Mathematicians, Galati, Romania, June 28-July 3, 2019.
  15. M. Merca: *Truncated theta identities and rank partition functions*, National Scientific Conference, Academy of Romanian Scientists, Brasov, Romania, September 20-21, 2019.
  16. C. Ballantine, M. Merca: *On a minimal excludant theorem and its generalization*, Fall Southeastern Sectional Meeting, American Mathematical Society, University of Florida, Gainesville, USA, November 2-3, 2019.
  17. M. Merca: *Lacunary recurrence relations for the Bernoulli numbers and integer partitions*, National Scientific Conference, Academy of Romanian Scientists, Google Meet, June 8, 2020.
  18. C. Ballantine, M. Merca: *The minimal excludant and colored partitions*, The 32nd International Conference on Formal Power Series and Algebraic Combinatorics, FPSAC 2020 Online, July 6-24, 2020.
  19. M. Merca: *On a function involving the cubic partitions*, AMS Special Session on Partition Theory and Related Topics, Joint Mathematics Meetings, USA, April 6-9, 2022.
  20. C. Krattenthaler, M. Merca, C.-S. Radu: *Two different proofs of the Merca conjectures*, Algorithmic and Enumerative Combinatorics, Vienna, Austria, July 4-8, 2022.
  21. C. Ballantine, M. Merca: *Almost 3-regular overpartitions*, AMS Special Session on Number Theory at Non-PhD Granting Institutions I, Joint Mathematics Meetings, Boston, USA, January 4-7, 2023.
  22. M. Merca: *On the parts with the same parity in all the partitions of  $n$* , The Tenth Congress of Romanian Mathematicians, Pitesti, Romania, June 30-July 5, 2023.
  23. M. Merca: *New interpretation on parts with the same parity in the partitions of  $n$* , National Scientific Conference, Academy of Romanian Scientists, Constanta, September 21-23, 2023.
  24. C. Ballantine, M. Merca, C.-S. Radu: *Congruences for the number of 3 and 6-regular partitions and quadratic forms*, AMS Special Session on Partition Theory and  $q$ -Series I, Joint Mathematics Meetings, San-Francisco, USA, January 3-6, 2024.



- Conferences Attended**
1. *Srinivasa Ramanujan: in celebration of the centenary of his election as FRS*, The Royal Society, London, UK, October 15-16, 2018.
  2. *New York Number Theory Seminar: Combinatorial and additive number theory*, CANT 2020, New York, June 1-5, 2020.
  3. *Fourteenth Algorithmic Number Theory Symposium, ANTS-XIV*, University of Auckland, New Zealand, June 29 - July 4, 2020.
  4. *The 27th Annual Leonard C. Sulski Memorial Lecture*, College of the Holy Cross, USA, March 11, 2021.
  5. *The 33rd International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC)*, Bar-Ilan University in Ramat-Gan, Israel, January 17-20, 2022
  6. *International Conference on Enumerative Combinatorics and Applications (ICECA)*, University of Haifa, Israel, September 4-6, 2023
  7. *International Conference on Enumerative Combinatorics and Applications (ICECA)*, University of Haifa, Israel, August 26-28, 2024

- Editor Activity**
1. Annals of the Academy of Romanian Scientists. Series on Mathematics and its Applications. Ed. Acad. Oamen. Știință Rom., Bucharest. ISSN 2066-5997. (Since 2019)
  2. Axioms, Basel. ISSN 2075-1680. (Since 2021) [Q1 \(IF: 1.9\) Q4 \(AIS: 0.296\)](#)
  3. Fundamental Journal of Mathematics and Applications. ISSN 2645-8845. (Since 2023)
  4. Communications in Calculus Analysis, Special Functions and Mathematical Physics. eISSN: 3071-7000. (Since 2024)

**Reviewing Activity (223 Reviews)** I demonstrate my contribution to the scientific community with 29 reviews for Mathematical Reviews and 194 reviews for Zentralblatt MATH.

**Refereeing Activity (74 Journals)** I contributed to the peer review process for many works on 54 ISI journals as:

*Acta Mathematicae Applicatae Sinica - English Series, Acta Mathematica Scientia, Advances in Applied Mathematics, Advances in Difference Equations, Advances in Mathematics, Advances in Mathematics of Communications, AIMS Mathematics, American Mathematical Monthly, Annals of Combinatorics, Applicable Analysis and Discrete Mathematics, Applied and Computational Mathematics, Arabian Journal of Mathematics, ARS Combinatoria, Bulletin of the Australian Mathematical Society, Bulletin of the Malaysian Mathematical Sciences Society, Czechoslovak Mathematical Journal, Contributions to Discrete Mathematics, Discrete Applied Mathematics, Discrete Mathematics, Electronic Journal of Combinatorics, Electronic Research Archive, European Journal of Combinatorics, Filomat, High Energy Density Physics, IEEE Access, Indagationes Mathematicae, Indian Journal of Pure and Applied Mathematics, Information Processing Letters, Information Sciences, Integral Transforms and Special Functions, International Journal of Number Theory, Journal of Combinatorial Theory Series A, Journal of Computational and Applied Mathematics, Journal of Difference Equations and Applications, Journal of the Korean Mathematical Society, Journal of Mathematical Analysis and Applications, Journal of Number Theory, Mathematica Slovaca, Mathematical Problems in Engineering, Mathematics, Miskolc Mathematical Notes, Numerical Algorithms, Open Mathematics, Proceedings of the American Mathematical Society, Proceedings of the Edinburgh Mathematical Society, Proceedings of the Indian Academy of Sciences-Mathematical Sciences, Ramanujan Journal, Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas, Rocky Mountain Journal of Mathematics, Studia Scientiarum Mathematicarum Hungarica, Symmetry, Turkish Journal of Mathematics, Utilitas Mathematica, Zeitschrift für angewandte Mathematik und Physik*

and 20 refereed journals as:

*Acta et Commentationes Universitatis Tartuensis de Mathematica, Annals of the "Alexandru Ioan Cuza" University of Iași, Annales Mathematicae Silesianae, AppliedMath, Asian-European Journal of Mathematics, Boletín de la Sociedad Matemática Mexicana, Cubo, A Mathematical Journal, Demonstratio Mathematica, Heliyon, Integers, International Journal of Mathematics and Mathematical Sciences, Journal of Mathematical Modelling and Algorithms, Journal of Ramanujan Society of Mathematics and Mathematical Sciences, Kyungpook Mathematical Journal, Matematički Vesnik, Notes on Number Theory and Discrete Mathematics, Proceedings of Jangjeon Mathematical Society, Punjab University Journal of Mathematics, Special Matrices, The College Mathematics Journal.*