

PERSONAL INFORMATION **MIRCEA MERCA** mircea.merca@profinfo.edu.ro <http://mirceamerca.wixsite.com/prof>

Gender Male | Nationality Romanian

WORK EXPERIENCE

June 2018 **Visiting Researcher**College of The Holy Cross, Worcester, USA
Department of Mathematics and Computer ScienceJune – July 2017 **Visiting Researcher**College of The Holy Cross, Worcester, USA
Department of Mathematics and Computer ScienceMay 2017 – July 2020 **Researcher**

Academy of Romanian Scientists, Bucharest, Romania

July 2016 – present **Associate Researcher**University of Craiova, Romania
Department of MathematicsJuly 2014 **Visiting Researcher**College of The Holy Cross, Worcester, USA
Department of Mathematics and Computer Science

EDUCATION AND TRAINING

2011–2014 **PhD in Mathematics**University of Craiova, Department of Mathematics
Thesis: New Algorithms and Relations Involving Integer Partitions
Supervisor: Prof. Dr. Constantin P. Niculescu2001–2003 **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

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 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)

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 the Academy of Romanian Scientists for contributions in combinatorics and algorithm theory.

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 117 papers as follows: 93 papers in ISI Web of Science journals, 20 papers in journals indexed in other international data bases, 4 papers as chapters books (see my list of papers).

The impact of my work can be characterized by citations and h -index as follows: 660 citations with 13 h -index in Google Scholar, 388 citations with 9 h -index in Scopus, 271 citations with 9 h -index in MathSciNet, 302 citations with 9 h -index in ISI Web of Science, 281 citations with 9 h -index in zbMATH Open.

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, Academy of Romanian 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.

- 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.

Editor Activity Annals of the Academy of Romanian Scientists. Series on Mathematics and its Applications. Ed. Acad. Oamen. Știință Rom., Bucharest. ISSN 2066-5997. (Since 2019)

Reviewing Activity (107 Reviews) I demonstrate my contribution to the scientific community with 16 reviews for Mathematical Reviews and 91 reviews for Zentralblatt MATH.

