

Editorial

Non-Associative Structures and Other Related Structures

Florin F. Nichita 

Simion Stoilow Institute of Mathematics of the Romanian Academy, 21 Calea Grivitei Street, 010702 Bucharest, Romania; Florin.Nichita@imar.ro

Received: 7 April 2020; Accepted: 10 April 2020; Published: 13 April 2020



In January 2019, MDPI published a book titled *Hopf Algebras, Quantum Groups and Yang–Baxter Equations*, based on a successful special issue. We hope that a book titled *Non-Associative Structures and Other Related Structures* will be published soon.

Non-associative algebras are currently a fashionable research direction. There are two important classes of non-associative structures: Lie structures and Jordan structures. Various Jordan structures play an important role in quantum group theory and in fundamental physical theories. In recent years, several attempts to unify (non-)associative structures have led to interesting results. The UJLA structures are not the only structures that realize such a unification. Associative algebras and Lie algebras can be unified at the level of Yang–Baxter structures.

Several papers published in the open access journal *Axioms* deal with the Yang–Baxter equation. This equation first appeared in theoretical physics, in a paper (1968) by the Nobel laureate C.N. Yang, and in statistical mechanics, in R.J. Baxter’s work (1971). Later, it turned out that this equation plays a crucial role in: quantum groups, knot theory, braided categories, analysis of integrable systems, quantum mechanics, non-commutative descent theory, quantum computing, non-commutative geometry, etc. At the Kyoto International Mathematics Congress (1990), three of the four Fields Medalists were awarded prizes for their work related to the Yang–Baxter equation. Many scientists have used the axioms of various algebraic structures (quasi-triangular Hopf algebras, Yetter-Drinfeld categories, Lie (super)algebras, algebra structures, Boolean algebras, etc.) or computer calculations in order to produce solutions for the Yang–Baxter equation. However, the full classification of its solutions remains an open problem. The Yang–Baxter equation can also be interpreted in terms of logical circuits and, in logic, it represents a kind of compatibility condition when working with many logical sentences in the same time.

It is interesting to note that several special issues published by AXIOMS led to new solutions for the Yang–Baxter equations. In addition, the topics of these special issues were advertised at many conferences (Boston, Bucharest, Brasov, Caen, Galati, Iasi, Malta, Sofia, etc.). Moreover, at the 14th International Workshop on Differential Geometry and Its Applications, hosted by the Petroleum Gas University from Ploiesti, between 9–11 July 2019, the AXIOMS sponsored the “Best Poster Award” for best presented papers to support young scholars (including post-docs up to 35 years old). The winners were announced by the chairs during the workshop.

The authors who contributed to the special issue *Non-associative Structures and Other Related Structures* put in a lot of work in order to write high quality papers: [1–7]. Some other works related to this special issue are the following: [8–12]. Further comments and references for related articles will appear in our next special issues.

Funding: This research received no external funding.

Acknowledgments: We would like thank the authors who contributed to this special issue, the referees and the editorial staff of *Axioms*.

Conflicts of Interest: The author declares no conflict of interest.

References

1. Behr, N.; Dattoli, G.; Lattanzi, A.; Licciardi, S. Dual Numbers and Operational Umbral Methods. *Axioms* **2019**, *8*, 77. [[CrossRef](#)]
2. Kwon, N. Branching Functions for Admissible Representations of Affine Lie Algebras and Super-Virasoro Algebras. *Axioms* **2019**, *8*, 82. [[CrossRef](#)]
3. Ludkowski, S.V. Cohomology Theory of Nonassociative Algebras with Metagroup Relations. *Axioms* **2019**, *8*, 78. [[CrossRef](#)]
4. Ludkowski, S.V. Smashed and Twisted Wreath Products of Metagroups. *Axioms* **2019**, *8*, 127. [[CrossRef](#)]
5. Ludkowski, S.V. Separability of Nonassociative Algebras with Metagroup Relations. *Axioms* **2019**, *8*, 139. [[CrossRef](#)]
6. Nichita, F.F. Unification Theories: Examples and Applications. *Axioms* **2018**, *7*, 85. [[CrossRef](#)]
7. Nichita, F.F. Unification Theories: New Results and Examples. *Axioms* **2019**, *8*, 60. [[CrossRef](#)]
8. Lebed, V. Braided Systems: A Unified Treatment of Algebraic Structures with Several Operations. *Homol. Homotopy Appl.* **2017**, *19*, 141–174. [[CrossRef](#)]
9. Oner, T.; Katican, T. On Solutions to the Set-Theoretical Yang–Baxter Equation in Wajsberg-Algebras. *Axioms* **2018**, *7*, 6 [[CrossRef](#)]
10. Marcus, S.; Nichita, F.F. On Transcendental Numbers: New Results and a Little History. *Axioms* **2018**, *7*, 15. [[CrossRef](#)]
11. Nichita, F. Introduction to the Yang–Baxter Equation with Open Problems. *Axioms* **2012**, *1*, 33–37. [[CrossRef](#)]
12. Nichita, F.F. (Ed.) *Hopf Algebras, Quantum Groups and Yang–Baxter Equations*; MDPI: Basel, Switzerland, 2019; ISBN 978-3-03897-324-9 (Pbk); ISBN 978-3-03897-325-6 (PDF).



© 2020 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).