

# Arne Van Antwerpen

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Born: July 07, 1993—Edegem, Belgium  
Nationality: Belgian

## Current position

*Junior Post-Doc*, Research group ALAN (WIDS), Vrije Universiteit Brussel, Brussel (via FWO grant)

## Areas of specialization

Yang-Baxter equation • Group Theory • Ring Theory

## Positions held (with external funding)

2016-2020 FWO aspirant, Vrije Universiteit Brussel, Brussel  
2020-current FWO junior post doctoral fellow, Vrije Universiteit Brussel, Brussel

## Education

2014 BSc in Mathematics, Universiteit Antwerpen  
2016 MSc in Mathematics, Universiteit Antwerpen  
2020 PhD in Science (Mathematics), Vrije Universiteit Brussel

## Grants

2016-2020 Grant - FWO Aspirant - Fonds Wetenschappelijk Onderzoek Vlaanderen, Belgium  
2020-2023 Grant - FWO junior post-doctoral fellow - Fonds Wetenschappelijk Onderzoek Vlaanderen, Belgium  
2022 Grant - Conference funding FWO for conference "Groups, rings and Yang-Baxter equation" (joint w. I. Colazzo and L. Vendramin) - 5000 euro  
2022 Grant - Conference funding Compositio Mathematica for conference "Groups, rings and Yang-Baxter equation" (joint w. I. Colazzo and L. Vendramin) - 5000 euro

## Publications & talks

### JOURNAL ARTICLES

2023 1. Jespers Eric, Van Antwerpen Arne, Vendramin Leandro (2022), "Nilpotency of skew braces and multipermutation solutions of the Yang-Baxter equation", Accepted: *Communications in Contemporary Mathematics*

- 2023 2. Cedó Ferran, Jespers Eric, Kubat Łukasz, Van Antwerpen Arne, Verwimp Charlotte (2020), "On various types of nilpotency of the structure monoid and group of a set-theoretic solution of the Yang-Baxter equation", *Journal of Pure and Applied Algebra* 227 (2): 107194
- 2022 3. Colazzo Ilaria, Jespers Eric, Van Antwerpen Arne, Verwimp Charlotte (2021), "Left non-degenerate set-theoretic solutions of the Yang-Baxter Equation and semitrusses", *Journal of Algebra* 610: 409-462
- 2020 4. Jespers Eric, Kubat Łukasz, Van Antwerpen Arne, Vendramin Leandro (2021), "Radical and weight of skew braces and their applications to structure groups of solutions of the Yang-Baxter equation", *Advances in Mathematics* 385: 107767
- 2020 5. Jespers Eric, Kubat Łukasz, Van Antwerpen Arne (2020), "Corrigendum et addendum to The structure monoid and algebra of a non-degenerate set-theoretic solution of the Yang-Baxter equation", *Transactions of the American Mathematical Society* 373 (6): 4517-4521
- 2019 6. Colazzo Ilaria, Van Antwerpen Arne (2019), "The algebraic structure of left semi-trusses", *Journal of Pure and Applied Algebra* 225 (2): 106467
- 2019 7. Jespers Eric, Kubat Łukasz, Van Antwerpen Arne, Vendramin Leandro (2019), "Factorizations of skew braces", *Mathematische Annalen* 375 (3-4): 1649-1663
- 2019 8. Jespers Eric, Kubat, Łukasz, Van Antwerpen Arne (2019), "The structure monoid and algebra of a non-degenerate set-theoretic solution of the Yang-Baxter equation", *Transactions of the American Mathematical Society* 372 (10): 7191-7223
- 2019 9. Jespers Eric, Van Antwerpen, Arne (2019), "Left semi-braces and solutions of the Yang-Baxter equation", *Forum Mathematicum* 31 (1): 241-263
- 2018 10. Van Antwerpen, Arne (2018), "Coleman Automorphisms of finite groups and their minimal normal subgroups", *Journal of Pure and Applied Algebra* 222 (11): 3379-3394

#### PRE-PRINT

- 2022 Colazzo Ilaria, Jespers Eric, Kubat Łukasz, Van Antwerpen Arne, Verwimp Charlotte, "Finite idempotent set-theoretic solutions of the Yang-Baxter equation", ArXiv:2212.07361

#### SELECTION OF TALKS

- 2022 The structure algebra of set-theoretic solutions to the Yang-Baxter equation, Groups and Algebras in Bicocca 2022, Milan, Italy
- 2022 Nilpotency in skew braces and set-theoretic solutions to the Yang-Baxter equation, MSU-IIT Seminar in Algebra, online (MSU-ITT, Philippines)
- 2022 Skew braces, the Yang-Baxter equation and non-associative algebras, Workshop on non-associative algebras 2022, Covilha, Portugal
- 2022 Skew braces and the Yang-Baxter equation, Algebra, Geometry and Physics seminar, joint MPIM and HU Berlin, Berlin, Germany
- 2022 Central nilpotency of skew braces, Algebra Seminar Edinburgh University, Edinburgh, UK
- 2022 Central nilpotency of skew braces, Algebra Seminar Università del Salento, online (Lecce, Italy)
- 2019 The structure monoid of left non-degenerate solutions to the Yang-Baxter equation, Lecce Reading Seminar, Lecce, Italy
- 2019 Factorizations of skew left braces, Oberwolfach mini-workshop: Algebraic tools to solve YBE, Oberwolfach, Germany
- 2018 Left semi-braces and solutions of the Yang-Baxter equation, II Joint meeting Spain-Brazil in Mathematics, Cadiz, Spain
- 2018 Left semi-braces and solutions of the Yang-Baxter equation, Noncommutative and Non-associative structures, braces and applications, Malta
- 2017 Left semi-braces and solutions of the Yang-Baxter equation, The Antwerp Algebra Seminar, Antwerp, Belgium

- 2017 Coleman automorphisms of finite groups and their minimal normal subgroups, AGTA: Young Researchers in Algebra, Naples, Italy
- 2017 Coleman automorphisms of finite groups and their minimal normal subgroups, Groups, Rings, Group rings and the Yang-Baxter equation, Spa, Belgium
- 2017 Coleman automorphisms of finite groups and their minimal normal subgroups, AGTA: Advances in Group Theory and Applications, Lecce, Italy
- 2017 Coleman automorphisms of finite groups and their minimal normal subgroups, Groups, Rings and Related Topics, Khorfakkan, United Arab Emirates

#### UPCOMING TALKS

- 02/2023 Nilpotency of skew braces: an overview, Oberwolfach mini-workshop: skew braces and the Yang-Baxter equation, Oberwolfach, Germany
- 04/2023 Centrally nilpotent skew braces, University of Exeter, UK
- 04/2023 Skew braces: a combinatorial approach, St. Andrews, UK

### Evaluator selection committee

- 2019 For professor position "Discrete techniques in data science" at VUB
- 2020 For professor position "Algebra: groups, rings or the Yang-Baxter equation" at VUB
- 2023 For PhD-mandate (6 years) at VUB

### Referee for international journals

Algebras and Representation Theory  
 Canadian Mathematical Bulletin  
 Journal of Algebra and its Applications  
 Journal of Combinatorial theory, series A  
 Journal of London Mathematical Society  
 Journal of Pure and Applied Algebra  
 Publicacions Matematiques

### Evaluator PhD committee

- 2022 Charlotte Verwimp, Set-theoretic solutions of the Yang-Baxter equation and associated algebraic structures, VUB

### Teaching

- 2016-2017 Exercise sessions (WPO) Discrete Mathematics (Ba 1 Mathematics)
- 2016-2017 WPO Calculus (Ba 1 Biology)
- 2016-current WPO Linear Algebra (Ba 1 Biology)
- 2017-2020 WPO Probability Theory (Ba 2 Mathematics)
- 2017-current WPO Ring and Module Theory (Ba 2 Mathematics)
- 2022-current WPO Mathematical Statistics (Ba 3 Mathematics)
- 2022-current WPO Basic skills in Mathematics (Ba 1 of all Sciences, except Physics and Mathematics)
- occasionally Replacing Prof. Jespers for HOC Associative Algebra
- 2020-current HOC Introduction to Group Theory (Ba 1 Mathematics)

## Mentoring

### BACHELOR

- 2017 (joint with E. Jespers) Jente Bosmans - Quandles and their automorphisms
- 2020 S. Frycia - To be nil or not to be nil: the extraordinary counterexample of A. Smoktunowicz
- 2021 S. Croux - Embedding semigroups in groups
- 2021 B. D'Hauwer - Unique product groups and the unit conjecture

### MASTER

- 2017-2018 (joint with E. Jespers) C. Verwimp - Braces and the Yang-Baxter equation
- 2020-2021 S. Trappeniers - Skew braces and the Yang-Baxter equation: an exposition on structure theorems

### PHD

- 2021-current (joint with L. Vendramin) S. Trappeniers - The combinatorics of set-theoretic solutions to the Yang-Baxter equation and related algebraic structures - FWO Aspirant (2021-2025)
- 2023-current (joint with L. Vendramin) S. Properzi - Skew braces, quivers and applications to the Yang-Baxter equation - VUB mandate - FWO application submitted

## Administrative tasks

### AT VRIJE UNIVERSITEIT BRUSSEL

- 2017-2019,2020-current PhD and Post-doc representative in RWIDS (department council)
- 2017-current PhD and Post-doc representative in ORWIS (education council for mathematics) (secretary since 2019)
- 2019-current PhD and Post-doc representative in faculty education council
- 2020-current PhD and Post-doc representative in faculty council
- 2021-current PhD and Post-doc representative in faculty board
- 2020-current PhD and Post-doc representative in education quality council

### AT NATUUR EN WETENSCHAP VZW (YOUTH ORGANIZATION POPULARIZING SCIENCE)

- 2014-current Member of the Board
- 2018-current Secretary of the Board

## Research stays

- 2019 Lecce, Italy, visiting F. Catino, I. Colazzo and P. Stefanelli between 4th of February and 1st of March
- 2019 Shanghai, China, visiting L. Vendramin, between 5th April and 17th April
- 2019 Buenos Aires, Argentina, visiting L. Vendramin between 23rd of September and 8th of October
- 2022 Berlin, Germany, Visiting P. Tamaroff between 7th of November and 12th of November
- 2022 Edinburgh, UK, Visiting A. Smoktunowicz between 15th of November and 22nd of November

## Organized conferences

- 2023 local organizer: Doctor honoris causa for Prof. Efim Zelmanov, VUB
- 2023 main organizer: Groups, rings and the Yang-Baxter equation, Blankenberge, Belgium

2019 local organizer: Groups, rings and associated structures, Spa, Belgium  
2017 local organizer: Groups, rings and the Yang-Baxter equation, Spa, Belgium

## Language proficiency

Dutch, native speaker  
English, fluent (C1 certificate)  
French, intermediate  
Italian, intermediate