Julia Brandes
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Julia Brandes

February 17, 2024

Education

Mar 2020 Oavlönad docent (Habilitation) at University of Gothenburg

Jun 2014 PhD in Mathematics (University of Bristol)
Area of specialisation: Analytic Number Theory
Thesis: *Local-Global Principles for Linear Spaces on Hypersurfaces*
Supervisor: Prof. Trevor D. Wooley FRS

Oct 2010 – Sep 2013 Postgraduate Studies in Mathematics at the University of Bristol

Dec 2009 Diplom in Mathematics (University of Stuttgart)
Area of specialisation: Analytic Number Theory
Thesis: *Paare s-freier Zahlen (Twins of s-free numbers)*
Supervisor: Prof. Jörg Brüdern
secondary subject: Theoretical Physics

Oct 2007 – Dec 2009 Studies in Mathematics at Stuttgart University

Oct 2004 – Sep 2007 Studies in Mathematics at the University of Göttingen

June 2004 Graduation from Felix-Klein-Gymnasium Göttingen
Top of the year

Positions held

Since Feb 2022 Senior Lecturer at the University of Gothenburg
Courses: Lecturer for *MMGF11 Analysis and Linear Algebra, part 1*, *LGMA20 Calculus* and *MMA310 Galois Theory*.

Feb 2018 – Jan 2022 Associate Senior Lecturer at the University of Gothenburg
Courses: Lecturer for *MMGF11 Analysis and Linear Algebra, parts 1 and 2*.

Sep 2017 – Jan 2018 Postdoc at the University of Waterloo
Courses: Instructor for *MATH135: Algebra for Honours Students*.

Jan 2017 – May 2017 Viterbi Postdoc at MSRI within the programme *Analytic Number Theory*

Sep 2015 – Aug 2017 Postdoc at the University of Gothenburg
Courses: Lecturer for *Analytic Number Theory* and for *Linear Algebra*.

Oct 2013 – Sep 2015 Postdoc ('wissenschaftliche Mitarbeiterin') at the University of Göttingen
Courses: Lecturer for *Introduction to the circle method*
Assistant (Vice course coordinator) for *Analysis I*, for *Abstract Algebra*, for *Number Theory* (twice) and for *Diophantine Equations*.

Oct 2010 – Sep 2013 Teaching support assistant at the University of Bristol
Courses: Tutorials in *Analysis* (4 times), *Further Topics in Analysis* (3 times), *Number Theory and Group Theory*, *Calculus*, *Maths 1AM* and *Maths 1A20* (Mathematics for science degrees)

Oct 2007 – Mar 2009 Student Assistant Teacher at the University of Stuttgart
Courses: Tutorials in *Advanced Maths I–III* (Maths for engineers and physicists; 2 classes each)

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Grants awarded

Major grants

- **Starting Grant from Swedish National Science Foundation (Vetenskapsrådet)**
  Project title: *Higher-dimensional Structures on Hypersurfaces.*
  Period: 2018–2021.

- **Grant from the Knut and Alice Wallenberg Foundation**
  Purpose: To employ a postdoc from outside of Sweden.
  Project title: *Diophantine problems with restricted sets of variables.*
  Period: 2020–2021.

- **Project Grant from Swedish National Science Foundation (Vetenskapsrådet)**
  Project title: *Diophantine Equations between Analysis and Geometry.*
  Period: 2023–2026.

Smaller grants

- Grant from Längmanska Kulturfonden for conference $\mathbb{N}^3$-*Days XI*, held in Gothenburg in November 2019.
- Conference grant from Vetenskapsrådet for conference *Where Geometry meets Number Theory*, held in July 2017.
- Grant from Gothenburg Centre of Advanced Studies for conference *Where Geometry meets Number Theory*, held in July 2017.
- Grant from Gothenburg Centre of Advanced Studies for the Seminar in Algebraic Geometry and Number Theory (2016).
- Grant from Gothenburg Centre of Advanced Studies for Workshop $\mathbb{N}^3$-*Days V*, held in November 2016.

Other

- Approved application for Conference *Arithmetic (and) Harmonic Analysis* at Institute Mittag-Leffler (May 2020, re-scheduled to June 2021).
- EPSRC DTA Studentship, Oct 2010 – Mar 2014.
- Fellowship of the Studienstiftung des deutschen Volkes e.V., Mar 2005 – Dec 2006.

Students and Postdocs

Postdoc

- Kirsti Biggs (PhD Bristol), 2020–2021.

Bachelor Projects

- Johan Davegård, Tobias Magnusson, Feras Mofleh
  Primtalssatsen: Två olika bevis.
  Bachelor Thesis. Göteborg, May 2016.

- Alexander Karlsson, Markus Klyver, Kajsa Wahl
  Artins förmodan: p-adiska tal, ändliga kroppar, och ekvationer utan heltalslösningar.
  Bachelor Thesis. Göteborg, May 2019.

- Hugo Bäckman, Tony Gromer, Rebecka Mårtensson, Elina Möller
  Lösning av diofantiska ekvationer med hjälp av Fourieranalys. Bachelor Thesis. Göteborg, May 2023.

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Conference and Seminar Organisation

- Co-group leader in workshop *Women in numbers Europe (WINE–4)* at the University of Utrecht, September 2022.

- Co-organiser of workshop *Arithmetic (and) Harmonic Analysis* at the Institute Mittag-Leffler (Stockholm) in June 2021.

- Co-organiser of the $\mathbb{N}^3$-days XI in Gothenburg in November 2019.

- Co-organiser of a conference in honour of Per Salberger's 60th birthday, held in Gothenburg in July 2017.

- Organiser of the Seminar in Number Theory and Algebraic Geometry at Chalmers/University of Gothenburg (Sep 2016 – Dec 2016)

- Co-organiser of the $\mathbb{N}^3$-Days V in Gothenburg in November 2016.

- Organiser of the Junior Number Theory Seminar in Göttingen (Dec 2013 – Aug 2015).

- Co-organiser of the conference *Young Researchers in Mathematics 2012*, held in Bristol in April 2012.

Departmental and committee work

- Since 2023: Panel member in Mathematics for Vetenskapsrådet (Swedish National Science Foundation), to evaluate applications for Starting and Project Grants

- Since 2023: Work environment representative (substitute) at the Department for Mathematical Sciences, University of Gothenburg

- 2023: PhD selection committee at the Division for Algebra and Geometry

- 2021: Postdoc selection committee at Oxford University, to work with James Maynard

Participation in long-term research programmes

- March/April 2021: *Analytic Number Theory*, Institut Mittag-Leffler, Stockholm, 3 weeks.
- June-Aug 2021: *Harmonic Analysis and Analytic Number Theory*, Hausdorff Institute of Mathematics, Bonn, 2 months.
- April 2021: *Analytic Number Theory*, Institut Mittag-Leffler, Stockholm (shifted to online).
- May/June 2019: *Reinventing Rational Points*, Institut Henri Poincaré, Paris, 6 weeks.
- March/April 2017: *Thematic program on unlikely intersections, heights, and efficient congruencing*, Fields Institute, Toronto, Canada, 3 weeks.
- Spring term 2017: *Analytic Number Theory*, MSRI (programme postdoc), 5 months.

Outreach

- Lower Saxon Maths Olympiad
  2004 – 05 and 2014–15: Member of the organising committee
  2006 – 10: Member of the support team

- German Maths Olympiad
  2010: Member of the support team

- Mathematischer Korrespondenzzirkel (A maths problems club for high school students)
  2004–06: Member of the team
  Contributor to the second volume of collected problems and solutions [Zir]

[Zir] Mathematischer Korrespondenzzirkel (Hrsg.), *Voller Neuer Knobeleien*, Göttinger Universitätsdrucke, Göttinger Universitätsverlag, Göttingen, 2007.

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Publications

[1] *Forms representing forms and linear spaces on hypersurfaces*. Proc. London Math. Soc. **108** (2014), 809–835.

[2] *A note on p-adic solubility for forms in many variables*, Bull. London Math. Soc. **47** (2015), 501–508.

[3] *Sums and differences of power-free numbers*, Acta Arith. **169** (2015), 169–180.

[4] *Forms representing forms: The definite case*, J. London Math. Soc. **92** (2015), 393–410.

[5] (with Scott T. Parsell) *Simultaneous additive equations: Repeated and differing degrees*, Canad. J. Math. **69** (2017), 258–283.

[6] *The Hasse Principle for systems of quadratic and cubic diagonal equations*, Q. J. Math. **68** (2017), 831–850.

[7] *Linear spaces on hypersurfaces over number fields*, Michigan Math. J. **66** (2017), 769–784.

[8] (with Trevor D. Wooley) *Vinogradov systems missing the linear slice*, Mathematika **63**, no. 3 (2017), 797–817.

[9] *On the number of linear spaces on hypersurfaces with a prescribed discriminant*, Math. Z. **289** (2018), no. 3–4, 803–827.

[10] (with S. T. Parsell, C. Poulias, G. Shakan, R. C. Vaughan) *On generating functions in additive number theory, II: Lower-order terms and applications to PDEs*, Mathematische Annalen **379** (2021), no. 1, 347–376.

[11] *The density of rational lines on hypersurfaces: A bihomogeneous perspective*. Monatsh. Math. **195** (2021), no. 2, 191–231.

[12] (with Rainer Dietmann) *Rational lines on cubic hypersurfaces*, Math. Proc. Camb. Philos. Soc. **171** (2021), No. 1, 99–112.

[13] (with Trevor D. Wooley) *Optimal mean value estimates beyond Vinogradov's mean value theorem*, Acta Arith. **200** (2021), 149-182.

[14] (with Scott T. Parsell) *The Hasse principle for diagonal forms restricted to lower-degree hypersurfaces*, Algebra and Number Theory **15** (2021), No. 9, 2289–2314.

[15] (with Kevin Hughes) *On the inhomogeneous Vinogradov system*. Bull. Aust. Math. Soc. **106** (2022), 396–403.

[16] (with Igor E. Shparlinski) *Two-dimensional Weyl sums failing square-root cancellation along lines*. Arkiv för Matematik **61** (2023), 267–276.

[17] (with Francesca Balestrieri, Miriam Kaesberg, Judith Ortmann, Marta Pieropan and Rosa Winter) *Campana points on diagonal hypersurfaces*. Accepted for publication in the Springer AWM volume "Women in Numbers Europe 4 – Research Directions in Number Theory".

[18] (with Kirsti D. Biggs and Kevin Hughes) *Reinforcing a Philosophy: A counting approach to square functions over local fields*. Submitted, available under ArXiv:2201.09649.

[19] (with Changhao Chen and Igor E. Shparlinski) Local mean value estimates for Weyl sums. Submitted, available under ArXiv:2303.11913.

[20] (with Kirsti Biggs) A minimalist version of the circle method and Diophantine problems over thin sets. Submitted, available under ArXiv:2304.07891.

[21] (with Rainer Dietmann) Rational lines on cubic hypersurfaces II. Submitted, available under ArXiv:2307.094491.

Qualification theses

[1] *Paare s-freier Zahlen (Twins of s-free numbers)*. Diploma thesis, University of Stuttgart, 2009. Available under arXiv:1307.2066.

[2] *Local-Global Principles for Linear Spaces on Hypersurfaces*. PhD thesis, University of Bristol, 2014.