

# Sandro Michel Roch



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Born: 04.02.1994  
Biberach a. d. Riß  
Citizenship: German



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## Mathematical interests

- Combinatorics & Graph Theory
- Sampling algorithms & PTAS
- Computational Geometry
- Combinatorial Optimization

## Language skills

- German: native
- English: C1
- Spanish: B2

## Publications & Preprints

- Flip Graphs for Arrangements of Pseudocircles**  
with Yan Alves Radtke, Stefan Felsner, Johannes Obenaus, Manfred Scheucher and Birgit Vogtenhuber  
Proc. of the 2024 Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), 2024.
- Block coupling and rapidly mixing k-heights**  
with Stefan Felsner, Daniel Heldt and Peter Winkler  
Preprint: [arXiv:2410.08992]
- On exact covering with unit disks**  
with Ji Hoon Chun and Christian Kipp  
Preprint: [arXiv:2401.15821] Extended abstract: 40<sup>th</sup> European Workshop on Computational Geometry (EuroCG), 2024.
- Arrangements of Pseudocircles: On Digons and Triangles**  
with Stefan Felsner and Manfred Scheucher  
Proc. of 28th Int. Symp. on Graph Drawing and Network Visualization (GD 2022), p. 441-455, LNCS 13764, Springer, 2023.
- Coloring problems on arrangements of pseudolines**  
Preprint: [arXiv:2402.12564] Extended abstract: 40<sup>th</sup> European Workshop on Computational Geometry (EuroCG), 2024.
- Zufällige Erzeugung von Pseudogeradenarrangements**  
(engl. *Random generation of pseudoline arrangements*)  
This introductory article was written for the German Mathematical Society (DMV) and is therefore in German.  
Mitteilungen der Deutschen Mathematiker-Vereinigung, vol. 32, no. 1, 2024, pp. 27-33.

## Theses

- Algorithmen zur Erzeugung zufälliger Pseudogeradenarrangements**  
(engl. *Algorithms for sampling random pseudoline arrangements*)  
Master's thesis supervised by Prof. Dr. Stefan Felsner and Prof. Dr. Martin Skutella, grade: 1.0
- Sortieren in Netzwerken aus Stacks und Queues**  
(engl. *Sorting using networks of stacks and queues*)  
Bachelor's thesis supervised by Prof. Dr. Stefan Felsner and Prof. Dr. Martin Skutella, grade: 1.0

## Education & Practical Experience

since Feb. 2022

**Ph.D. student / Wissenschaftlicher Mitarbeiter**  
TU Berlin, BMS  
Supervisor: Prof. Dr. Stefan Felsner  
Funding: DFG Graduiertenkolleg *Facets of Complexity*

Oct. 2019 – Nov. 2022	<b>Msc. Mathematics</b> <i>TU Berlin, BMS (Phase I)</i> Final grade: 1.0
Aug. 2020 – Jan. 2022	<b>Data Scientist (part time)</b> <i>DocCirrus GmbH</i>
Sep. 2019 – Jan. 2020	<b>Semester abroad (ERASMUS+)</b> <i>Universitat de Barcelona, Spain</i>
Oct. 2015 – Jul. 2019	<b>Bsc. Mathematics</b> <i>TU Berlin</i> Final grade: 1.3
Apr. 2015 – Sep. 2015	<b>Software Developer (Full Time)</b> <i>Axaris Software &amp; Systeme GmbH</i>
Sep. 2012 – Feb. 2015	<b>Software Developer (Apprenticeship)</b> <i>CompuGroup Medical AG</i> Final grade: 1.4
Sep. 2009 – Jun. 2012	<b>Technisches Gymnasium</b> <i>Karl-Arnold-Schule Biberach</i> Final grade: 1.8

### Conferences, Workshops, Talks, Summer Schools and Research Stays

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Sep. 9 – 28, 2024	<b>Research Stay</b> <i>MPI MiS Leipzig, Stochastic Topology &amp; Applications group</i>
23. Jul. 2024	<b>Coloquio de Matemática</b> <i>Pontificia Universidad Javeriana, Bogotá, Colombia</i> Talk “Random Generation of Pseudoline Arrangements”
Jun. 17 – 28, 2024	<b>ECCO 2024</b> (VIII Encuentro Colombiano de Combinatoria) <i>Popayán, Colombia</i>
Mar. 13 – 15, 2024	<b>EuroCG 24</b> (Europ. Workshop on Comput. Geom.) <i>Ioannina, Greece</i>
Sep. 19 – 22, 2023	<b>AYDN Summer School 2023</b> (Algorithm Engineering for Network Problems) <i>Potsdam, Germany</i>
Aug. 21 – 23, 2023	<b>StuKon 23</b> (DMV Studierendenkonferenz) <i>Bremen, Germany</i>
Mar. 29 – 31, 2023	<b>EuroCG 23</b> (Europ. Workshop on Comput. Geom.) <i>Barcelona, Spain</i>
Sep. 13 – 16, 2022	<b>GD 2022</b> (30 <sup>th</sup> Int. Symp. on Graph Drawing and Net. Vis.) <i>Tokyo, Japan (online participation)</i>
Sep. 13 – 18, 2022	<b>Order &amp; Geometry 2022</b> (research workshop) <i>Ciążeń, Poland</i>
Sep. 5 – 7, 2022	co-organizer of <b>BMS-BGSMath Junior Meeting 2022</b> <i>Barcelona, Spain</i>
Aug. 3 – 5, 2022	<b>StuKon 22</b> (DMV Studierendenkonferenz) <i>Leipzig, Germany</i>
Jun. 14 – 25, 2022	<b>ECCO 2022</b> (VII Encuentro Colombiano de Combinatoria) <i>Bogotá, Colombia</i>
Jun. 7 – 10, 2022	<b>SoCG 2022</b> (38 <sup>th</sup> Int. Symp. on Comput. Geom.) <i>Berlin, Germany</i>

Apr. 11 – 15, 2022	<b>7<sup>th</sup> ArrDra workshop 2022</b> <i>Leucorea, Wittenberg</i>
Apr. 4 – 8, 2022	<b>Joint workshop Berlin-Graz-Zürich</b> <i>Graz (Semriach), Austria</i>
Mar. 14 – 16, 2022	<b>EuroCG 22</b> (Europ. Workshop on Comput. Geom.) <i>Perugia, Italy</i>
Feb. 28 – Mar. 4, 2022	<b>FoC Problem solving workshop</b> <i>Kloster Chorin, Chorin</i>
Feb. 2022	co-organizer of <b>10<sup>th</sup> BMS Student Conference</b> <i>(online event)</i>
Jan. 17 – 21, 2022	<b>XVII Escuela de Verano en Matemáticas Discretas</b> <i>(online event)</i>
Apr. 7 – 9, 2021	<b>EuroCG 21</b> (Europ. Workshop on Comput. Geom.) <i>(online event)</i>
Mar. 3 – 5, 2021	<b>9th BMS Student Conference</b> <i>(online event)</i>
Sep. 9 – 13, 2020	<b>Order &amp; Geometry 2020</b> (research workshop) <i>Leucorea, Wittenberg</i>
Sep. 14 – 17, 2018	<b>Order &amp; Geometry fall school</b> <i>Gutshof Sauen, Rietz-Neuendorf</i>

## Scholarships and Prizes

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Aug. 2023	<b>Preis des Max Planck Instituts MiS</b> <i>Studierendenkonferenz StuKon 2023</i>
Nov. 2022	<b>price for best talk</b> “ <i>Dies Mathematicus 2022</i> ”, TU Berlin
Sep. 2019 – Jan. 2020	<b>ERASMUS+</b> scholarship
Nov. 2019	<b>Bachelorpreis der Berliner Mathematischen Gesellschaft</b>
Oct. 2017 – Oct. 2018	<b>Deutschlandstipendium der TU Berlin</b>

## Teaching Experience and Volunteering

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Oct. 2020 – present	<b>legal representative of student dorm self-adminstration</b> <i>Studentische Selbstverwaltung Spandauer Damm e.V.</i>
15. Jul. – 19. Jul. 2024	<b>mini class “Una Introducción al Arreglo de Pseudolíneas”</b> <i>Universidad Distrital José de Caldas, Bogotá, Colombia</i>
Oct. 2022 – Feb. 2023	<b>organizer of student seminar</b> <i>Constructions in combinatorics via neural networks</i>
Sep. 2022 – Jun. 2024	<b>co-organizer of BMS-BGSMath Junior Meeting 2022 / 2024</b> <i>Universidad de Barcelona (2022) / Math+ Berlin (2024)</i>
Apr. 2022 – Jul. 2022	<b>teaching assistant</b> <i>Discrete Geometry I</i>
Dec. 2020 – Dec. 2021	<b>BMS / MATH+ student representative</b>
Apr. 2017 – Oct. 2020	<b>student teaching assistant (Tutor)</b> <i>Institut für Mathematik, TU Berlin</i>
Oct. 2017 – Mat. 2018	<b>volunteer mentor</b> For students of first semester, TU Berlin
Jan. 2016 – Nov. 2017	<b>volunteer German teacher</b> Organizer of <i>Zwille Deutschkurs, TU Berlin</i>