

Céline Zwikel – Curriculum Vitae

Personal details

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Academic positions

1/10/2025– **Ingénieur-chercheuse (postdoctoral researcher)**, *Collège de France, France*
1/09/2025– **Postdoctoral researcher**, *ULB, Belgium*
30/09/2025
1/09/2021– **Jocelyn Bell Burnell Fellow - Postdoctoral researcher**, *Perimeter Institute for Theoretical Physics, Canada*
31/08/2025
1/10/2018– **Lise Meitner Fellow - Postdoctoral researcher**, *TU Wien, Austria*
31/08/2021

Education

2014–2018 **PhD**, *ULB, Belgium*, Obtained on 15th of June 2018
Thesis: “Aspects of non-AdS holographic dualities in three dimensions”.
Advisor: Stéphane Detournay
2009–2014 **Bachelor and Master degree in Physics**, *ULB, Belgium*
Grade: magna cum laude
Thesis: “Thermodynamic and Phase Transition of Warped AdS Black Holes”.
Advisor: Stéphane Detournay

Awards & Fellowships

2021 **Jocelyn Bell Burnell postdoctoral fellowship**
4 years of postdoc instead of the standard 3 for highly promising researchers. CAD 340,000+ (42 days of collaborator visits per year where accommodation and per diem are provided)
2020 Essay awarded an honorable mention in the Gravity Research Foundation 2020 Awards for Essays on Gravitation, [link](#)
2019 **Postdoctoral Fellowship: Lise Meitner Programme**, “Near horizon physics for Kerr black holes” M 2665
Financing two years of postdoctoral research, 159,340.00 €
2017 **Young Investigator Training Program**, *GGI Firenze & Scuola Normale Pisa, Italy*
3000 €

2015 **Ph.D. Fellowship**, *FRIA, Brussels, Belgium*
Financing four-year PhD contract

Research interests

My research focuses on open systems in gravity, considering spacetimes with leaky boundaries, using symmetries. This has a wide range of applications from (flat) holographic scenarios to the identification of the symmetry principle under which quantum gravity should be organized.

Key words: Gravity, Asymptotic Symmetries, Black Holes, Holography

Publications (the author list is in alphabetical order)

INSPIRE profile: <https://inspirehep.net/author/profile/C.Zwikel.1>

Peer-reviewed papers (21):

My six most significant papers are denoted with a *

- [1] F. Girelli, J. Qiu, and C. Zwikel. Teleparallel gravity at null infinity. *Phys. Rev. D*, 111(8):084047, 2025 [2412.14258]
- [2] R. McNees and C. Zwikel. The symplectic potential for leaky boundaries. *JHEP*, 01:049, 2025 [2408.13203]
- * [3] M. Geiller, A. Laddha, and C. Zwikel. Symmetries of the gravitational scattering in the absence of peeling. *JHEP*, 12:081, 2024 [2407.07978]
- * [4] M. Geiller and C. Zwikel. The partial Bondi gauge: Gauge fixings and asymptotic charges. *SciPost Phys.*, 16:076, 2024 [2401.09540]
- [5] D. Grumiller, R. Ruzziconi, and C. Zwikel. One-loop partition function of gravity with leaky boundary conditions. *JHEP*, 02:080, 2024 [2312.06744]
- [6] L. Ciambelli, A. Delfante, R. Ruzziconi, and C. Zwikel. Symmetries and charges in Weyl-Fefferman-Graham gauge. *Phys. Rev. D*, 108(12):126003, 2023, [2308.15480]
- * [7] R. McNees and C. Zwikel. Finite charges from the bulk action. *JHEP*, 08:154, 2023 [2306.16451]
- * [8] M. Geiller and C. Zwikel. The partial Bondi gauge: Further enlarging the asymptotic structure of gravity. *SciPost Phys.*, 13:108, 2022 [2205.11401]
- * [9] H. Adami, D. Grumiller, M. M. Sheikh-Jabbari, V. Taghiloo, H. Yavartanoo, and C. Zwikel. Null boundary phase space: slicings, news & memory. *JHEP*, 11:155, 2021 [2110.04218]
- [10] D. Grumiller, R. Ruzziconi, and C. Zwikel. Generalized dilaton gravity in 2d. *SciPost Phys.*, 12:032, 2022 [2109.03266]
- [11] M. Geiller, C. Goeller, and C. Zwikel. 3d gravity in Bondi-Weyl gauge: charges, corners, and integrability. *JHEP*, 09:029, 2021 [2107.01073]
- [12] H. Adami, M. M. Sheikh-Jabbari, V. Taghiloo, H. Yavartanoo, and C. Zwikel. Chiral Massive News: Null Boundary Symmetries in Topologically Massive Gravity. *JHEP*, 05:261, 2021

[2104.03992]

* [13] R. Ruzziconi and C. Zwikel. Conservation and Integrability in Lower-Dimensional Gravity. *JHEP*, 04:034, 2021 [2012.03961]

[14] H. Adami, M.M. Sheikh-Jabbari, V. Taghiloo, H. Yavartanoo, and C. Zwikel. Symmetries at null boundaries: two and three dimensional gravity cases. *JHEP*, 10:107, 2020 [2007.12759]

[15] D. Grumiller, M. M. Sheikh-Jabbari, and C. Zwikel. Horizons 2020. *Int. J. Mod. Phys. D*, 29(14):2043006, 2020 [2005.06936]

[16] H. Adami, D. Grumiller, S. Sadeghian, M.M. Sheikh-Jabbari, and C. Zwikel. T-Witts from the horizon. *JHEP*, 04:128, 2020 [2002.08346]

* [17] D. Grumiller, A. Pérez, M. M. Sheikh-Jabbari, R. Troncoso, and C. Zwikel. Spacetime structure near generic horizons and soft hair. *Phys. Rev. Lett.*, 124(4):041601, 2020 [1908.09833]

[18] S. Detournay, P. M. Petropoulos, and C. Zwikel. Asymptotic Symmetries of Three-Dimensional Black Strings. *JHEP*, 06:131, 2019 [1812.08764]

[19] C. Zwikel. BTZ Black Holes and Flat Space Cosmologies in Higher Derivative Theories. *Class. Quant. Grav.*, 34(8):085003, 2017 [1604.02120]

[20] S. Detournay, L. Douchamps, G. Ng, and C. Zwikel. Warped AdS_3 black holes in higher derivative gravity theories. *JHEP*, 06:014, 2016 [1602.09089]

[21] S. Detournay and C. Zwikel. Phase transitions in warped AdS_3 gravity. *JHEP*, 05:074, 2015 [1504.00827]

Preprint (1):

[22] R. Ruzziconi and C. Zwikel. Celestial Symmetries of Black Hole Horizons. 4 2025 [2504.08027]

Conference Proceedings (2):

[23] V. Taghiloo, H. Adami, M. M. Sheikh-Jabbari, H. Yavartanoo, and C. Zwikel. Symmetries at Null Boundaries: 3-dimensional Einstein gravity. *PoS*, Regio2021:008, 2022

[24] M. Riegler and C. Zwikel. Canonical Charges in Flatland. *PoS*, Modave2017:004, 2018 [1709.09871]

Invited talks (31)

May-June- **Celestial Symmetries of Black Hole Horizons**

July 2025 “Workshop on holography, gauge theories and black holes”, Southampton, UK, Jul 2025
“Holography in & beyond the AdS Paradigm” workshop, Montevideo, Uruguay, May 2025
Relativity seminars, Oxford University, May 2025
“From Asymptotic Symmetries to Flat Holography: Theoretical Aspects and Observable Consequences” conference, GGI, Florence, Italy, June 2025
“Mathematical Physics of Gravity and Symmetry 2025” workshop, Lyon, France, Jun 2025

- Jan 2025 **Symmetries of the gravitational scattering in the absence of peeling**
Rencontres théoriciennes, Paris, France, Jan 2025
- 2024-2025 **New developments on asymptotically leaky boundaries**
“Black holes, Holography and de Sitter spacetimes” workshop, Milan, Italy, Jan 2025
Mini-workshop, Thessaloniki, Sep 2024
Carrollian Physics and Holography, Vienna, Austria, Apr 2024
- Nov 2023 **New gauge for asymptotically flat spacetimes**
IRCHEP 1402, Iranian Conference on High Energy Physics, Deciphering the Universe Ciphers
- Sep 2023 **Leaky Carrollian boundaries**
3rd Carroll workshop, Thessaloniki, Greece
- 2023 **Leaky boundary conditions for JT gravity**
String Seminar at University of Amsterdam, Netherlands, Mar 2023
Ecole Polytechnique, Paris, Dec 2023
- 2022-2023 **The partial Bondi gauge: Further enlarging the asymptotic structure of gravity**
London-Oldenburg Relativity Seminar, May 2022
Utah State University Theoretical Physics, United States, Feb 2023
University of Edinburgh, Edinburgh, United Kingdom, Feb 2023
King’s college London, United Kingdom, June 2023
- 2021-2022 **Symmetries at Null Boundaries**
Potsdam, Germany; Mar 2021
Carroll Workshop Vienna, Austria, Feb 2022
Celestial symmetries in Montevideo Workshop, Uruguay, Mar 2022
- Nov 2020 **Charges in three dimensional Bondi gauge**
Solvay Workshop “Asymptotic structure of spacetime”, Belgium
- 2020 **Symmetries at Null Boundaries**
University of Cape Town, South Africa, Aug 2020
Rencontres Théoriciennes, Paris, France, Oct 2020
Perimeter Institute, Canada, Nov 2020
- 2019 **Spacetime structure near generic horizons and soft hair**
Corfu Summer Institute on Elementary Particle Physics and Gravity 2019
- Sep 2019 **T-Witts from the horizon**
Ecole polytechnique, Paris, France
- 2019 **Near horizon soft hair of non-extremal black holes**
University of Vienna, Austria, Feb 2019
Universidad Andres Bello, Chile, Mar 2019
Pontificia Universidad Catolica de Valparaiso, Chile, Mar 2019
- Apr 2017 **Warped AdS_3 black hole in higher derivative gravity theories**
Scuola Normale Superiore, Pisa, Italy
- Oct 2016 **BTZ black holes, warped AdS_3 black holes and flat space cosmologies in higher derivative gravity theories**
TU Wien, Austria

Contributed talks (3)

- Jan 2020 **Near Horizon Symmetries**
Iberian Strings 2020, Spain
- Sep 2019 **Spacetime structure near generic horizons and soft hair**
10th Aegean Summer School, Greece
- Sep 2018 **Asymptotic symmetries of three-dimensional black string**
High Energy Theory and Gender, CERN

Teaching experience

- Feb 2025 Winter school project supervision for master students: “JT gravity and symplectic reduction”
- Dec 2023 Guest lecturer for the class GS/PHYS 5230A of Graduate Program in Physics & Astronomy of York University, Canada
- 2017–2024 **Co-supervision**, 1 bachelor thesis, 2 master thesis, 1 PhD project – see [1] [2412.14258]
- Dec 2019 **Lecture**, “BMS & asymptotic symmetries in 4d flat space”
XV Avogadro Meeting on Strings, Supergravity and gauge theories
- Sep 2017 **Lecture**, “Canonical charges in flatland”
Modave Summer School of Mathematical Physics, Belgium; link to the lecture notes
- 2016–2017 **Teaching Assistant**, *General Relativity [PHYS-F-432]*
total: 24 hours; ULB, Belgium
- 2015–2016 **Teaching Assistant**, *Physique générale I [PHYS-F-110] (Newtonian Mechanics)*
total: 92 hours; ULB, Belgium
- 2015 **Teaching Assistant**, *Laboratoire de Physique générale (Laboratory sessions)*
total: 16 hours; ULB, Belgium
- 2012–2014 Tutoring session for undergraduate students at ULB
- 2012–2014 Scientific activity-leader for children at Jeunesses Scientifiques de Belgique

Academic Service

Organizer:

- 10-14 Mar 2025 **Main organizer for the conference “Emmy Noether Workshop on Quantum Space Time”**
Perimeter Institute, Canada
- 3-7 Oct 2022 **Main organizer for the conference “Quantum Gravity around the Corner”**
Perimeter Institute, Canada
- 2022–2023 Weekly Quantum Gravity seminars at Perimeter Institute, Canada
- 24 Oct 2022 Main organizer for the conference “Postdoc welcome conference” at Perimeter Institute, Canada
- 2019–2021 Weekly hep-th seminars at TU Wien
- 2015–2017 Modave Summer School in Mathematical Physics, Modave, Belgium

Member of PhD thesis committees:

- Sep 2025 PhD of Jose Figuero, Universidad de Concepción, Chile & ULB, Belgium
- Jun 2025 Comité de suivi de thèse (Thesis Advisory Committee), Antoine Vincenti, ENS Lyon, France
- Sep 2024 PhD of Matthieu Vilatte, Ecole Polytechnique, France
- Sep 2024 PhD of Antoine Somerhausen, ULB, Belgium

Representative:

- 2022–2025 Postdoctoral representative at Perimeter Institute
- 2013–2014 Student representative at the “Comission Enseignement ” (Teaching commission)
- 2012–2014 Student representative at the ULB Physics Department

Referee for scientific journals:

SciPost, Journal of High Energy Physics (JHEP), European Physical Journal C (EPJC), Int. J. Mod. Phys. D (IJMPD), Nuclear Physics B, Journal of Physics A

--- EDI initiatives

- 29-30 April 2024 **Organizer of GenHET meeting in String Theory**, *Meeting addressing the latest advancements in string theory and discuss gender-related and equal opportunities issues in this field.*
CERN, Switzerland
- 2023–2025 Participation at mentoring program for the string theory community in the quality of **mentor**
- May 2023 Organizer of “Women* Physicists Networking Event” at Perimeter Institute
- 2021–2025 Participation at mentoring program at Perimeter institute for early career researcher in the quality of mentor
- 2021–2025 Member of “Women in Physics” group at Perimeter Institute
- Sep 2018 Participation at High Energy Theory and Gender, CERN, Switzerland
- Mar 2017 Participation at 3rd Workshop on String Theory and Gender, University of Southampton, United Kingdom

--- Languages

- French Native speaker
- English, Full professional
- Italian
- Dutch, Basic
- German