

Céline Zwikel – Curriculum Vitae

Personal details

Date of birth March 14th 1991
Citizenship Belgian & Canadian
Address Perimeter Institute, 31 Caroline Street North Waterloo, Ontario, Canada, N2L 2Y5
Email czwikel@perimeterinstitute.ca
ORCID <https://orcid.org/0000-0002-6582-6351>
INSPIRE <https://inspirehep.net/author/profile/C.Zwikel.1>
Webpage <https://celinezwikel.wixsite.com/webpage>

Academic positions

2021–present **Jocelyn Bell Burnell Fellow - Postdoctoral researcher**, *Perimeter Institute for Theoretical Physics, Canada*
2018–2021 **Lise Meitner Fellow - Postdoctoral researcher**, *TU Wien, Austria*

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
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 symmetries in gauge theories, in particular for gravitational spacetimes with boundaries. In particular I consider leaky boundaries that allow flux to pass through. For instance this flux could be made of gravitons. 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>

h-index 12, total citations 574 (google scholar)

Peer-reviewed papers (16):

My five most significant papers are denoted with a *

[1] Luca Ciambelli, Arnaud Delfante, Romain Ruzziconi, and Céline Zwikel. Symmetries and charges in Weyl-Fefferman-Graham gauge. *Phys. Rev. D*, 108(12):126003, 2023, [2308.15480]

* [2] R. McNees and C. Zwikel. Finite charges from the bulk action. *JHEP*, 08:154, 2023 [2306.16451]

* [3] M. Geiller and C. Zwikel. The partial Bondi gauge: Further enlarging the asymptotic structure of gravity. *SciPost Phys.*, 13:108, 2022 [2205.11401]

* [4] 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]

[5] D. Grumiller, R. Ruzziconi, and C. Zwikel. Generalized dilaton gravity in 2d. *SciPost Phys.*, 12:032, 2022 [2109.03266]

[6] M. Geiller, C. Goeller, and C. Zwikel. 3d gravity in Bondi-Weyl gauge: charges, corners, and integrability. *JHEP*, 09:029, 2021 [2107.01073]

[7] 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]

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

[9] 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]

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

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

* [12] 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]

- [13] S. Detournay, P. M. Petropoulos, and C. Zwikel. Asymptotic Symmetries of Three-Dimensional Black Strings. *JHEP*, 06:131, 2019 [1812.08764]
- [14] C. Zwikel. BTZ Black Holes and Flat Space Cosmologies in Higher Derivative Theories. *Class. Quant. Grav.*, 34(8):085003, 2017 [1604.02120]
- [15] 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]
- [16] S. Detournay and C. Zwikel. Phase transitions in warped AdS_3 gravity. *JHEP*, 05:074, 2015 [1504.00827]

Preprint (1):

- [17] D Grumiller, R Ruzziiconi, and C Zwikel. One-loop partition function of gravity with leaky boundary conditions. 12 2023 [2312.06744]

Conference Proceedings (2):

- [18] 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
- [19] M. Riegler and C. Zwikel. Canonical Charges in Flatland. *PoS*, Modave2017:004, 2018 [1709.09871]

Invited talks (22)

- 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

- Dec 2023 Guest lecturer for the class GS/PHYS 5230A of Graduate Program in Physics & Astronomy of York University, Canada.
- 2017–2023 **Co-supervision**, *1 bachelor thesis, 2 master thesis, 1 PhD project*
- 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-432] (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:

- 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

Referee for scientific journals:

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

Representative:

- 2022–2024 Postdoctoral representative at Perimeter Institute
- 2013–2014 Student representative at the “Comission Enseignement ” (Teaching commission)
- 2012–2014 Student representative at the ULB Physics Department

EDI initiatives

- 2023 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–present Participation at mentoring program at Perimeter institute for early career researcher
in the quality of mentor
- 2021–present 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 Southamp-
ton, United Kingdom

References

- Name: **Laurent Freidel**, *Perimeter Institute*
Address: 31 Caroline Street North, Waterloo, Ontario, Canada, N2L 2Y5
Email: lfreidel@perimeterinstitute.ca
- Name: **Daniel Grumiller**, *Institute for Theoretical Physics, TU Wien*
Address: Wiedner Hauptstrasse 8-10/136, 1040 Vienna, Austria
Email: grumil@hep.itp.tuwien.ac.at
- Name: **M.M. Sheikh-Jabbari**, *School of Physics, Institute for Research in Fundamental
Sciences (IPM)*

Address: P.O.Box 19395-5531, Tehran, Iran

Email: jabbari@theory.ipm.ac.ir

Name: **Stéphane Detournay**, *Physique Théorique et Mathématique, ULB*

Address: CP 231, Boulevard du Triomphe, B-1050 Bruxelles, Belgique

Email: Stephane.Detournay@ulb.be

Languages

French Native speaker

English, Full professional

Italian

Dutch, Basic

German