Curriculum Vitae

Personal Information

Position	Professor of Experimental Physics, University of Cologne (Germany)
Birth	11/02/1985
Nationality	French
Website	ph2.uni-koeln.de/arbeitsgruppen/bocquillon
Phone	+49 221 470 2625
ORCID	0000-0002-5875-1718

Positions

Oct. 2021 - present	**Prof. of Experimental Physics (W2), University of Cologne** Tenure Track to W3 Professorship
2016 - 2021	**CNRS Junior Researcher, Laboratoire de Physique de l'ENS, Paris** formerly Laboratoire Pierre Aigrain, Mesoscopic Physics Group permanent civil servant position
2016	**CNRS Post-Doctoral Researcher, Laboratoire Pierre Aigrain, Paris** Mesoscopic Physics Group
2013 - 2016	**Post-doc, University of Würzburg** Chair of L. W. Molenkamp *Superconducting nanostructures on topological insulators* Fellowship from the A. von Humboldt foundation (2 years)
2009 - 2012	**Agrégé-Préparateur, École Normale Supérieure (Paris)** Teaching assistant with full teaching duty (192 hr/yr)

Education

2009 - 2012	**PhD in Physics** Ecole Normale Supérieure - Université Pierre et Marie Curie supervision : G. Fève and B. Plaçais *Electron quantum optics in quantum Hall edge channels*
2008 - 2009	**Master "Quantum Physics"** Ecole Normale Supérieure - Paris Sud 11 rank: 3rd, Very good (Summa cum Laude)
2007 - 2008	**Agrégation de Physique** Préparation à l'Agrégation de Montrouge National qualification exam for high school teachers, rank: 2^{nd} /$\sim$1300
2005 - 2009	**Student at École Normale Supérieure (Paris)** admitted at BSc level via national entrance exam (option MP)
2002 - 2005	**Classes préparatoires MPSI-MP*** Lycée Faidherbe, Lille

Short-term stays

Apr. 2015	Research stay with R.S. Deacon, group of K. Ishibaji RIKEN, Japan (3 weeks)
Mar. 2014	Research stay with R.S. Deacon, groups of K. Ishibaji & S. Tarucha RIKEN, Japan, DFG-JST program "Topological Electronics" (4 weeks)

Grants & Awards

2026 - 2031	PI of Cluster of Excellence ML4Q-2
2025 - 2028	PI of CRC 1238 (Project B07, 3rd funding period)
2022 - 2025	PI of Cluster of Excellence ML4Q
2022 - 2025	PI of CRC 1238 (Project B07, 2nd funding period)
2018 - 2023	ERC Starting Grant – Project CASTLES
2018 - 2020	"Mi-Lourds" Investment project (SIRTEQ, Région Ile de France)
2017	Nicholas Kurti Science Prize for Europe
2013 - 2015	Post-doctoral Fellow of the Humboldt Foundation

Collective responsibilities

2023	Module Coordinator for the Master specialization "Foundations of Quantum Technologies: Matter, Light and Information"
2022	Member of the steering board of Key Profile Area QM^2 Quantum Matter & Materials
2022	Coordinator of the Erasmus+ exchange program for the physics department
2020 - 2021	Elected member of the council of ENS Physics Department
2019 - 2021	Elected member of the council of LPENS
2019 - 2021	Co-organization of the LPENS seminar "Quantum Materials and Devices"
Since 2018	Committee member for the PhD defenses of 5 doctoral candidates
2018	Local organization committee member for "International Conference On Quantum Computing" Paris
Since 2015	Regular referee for Agence Nationale pour la Recherche, Nature Nanotechnology, Nature Comms, PRL, PRB...
2010-2012	Elected member of the council of Laboratoire Pierre Aigrain
	Organization of the "Students seminar"

Major past and active collaborations

2025 -	Group of **A. Kurzmann** (University of Cologne, Germany) – Transport in bilayer graphene quantum dots.

2024 -	**F. Hassler** (RWTH Aachen, Germany) – Anyons, Majoranas and fractionalization in edge states.
2024 -	**A. Rosch** (University of Cologne, Germany) – Transport and disorder in the QAH effect.
2024 -	Group of **M. Hashisaka** (University of Tokyo, Japan) – Noise and correlation measurement, heat transport in edge states.
2023 -	Group of **C. Stampfer** (RWTH Aachen, Germany) – Single electron sources in bilayer graphene quantum dots.
2022 -	Group of **Y. Ando** (University of Cologne, Germany) – Transport in quantum anomalous Hall insulators.
2016 - 2017	**D. Carpentier** (École Normale Supérieure Lyon, France), **M.-O. Goerbig**, **S. Tchoumakov** (University Paris-Sud) on the topic of topological/trivial heterojunctions
2016 - 2023	Group of **L.W. Molenkamp** (University of Würzburg, Germany) – HgTe-based topological insulators.
2017	**B. Trauzettel**, **R. Thomale**, **O. Kashuba**, **T. Müller** (University of Würzburg), on the topic of helical Luttinger liquids.
2014 - 2017	**T.M. Klapwijk** (Delft University of Technology, The Netherlands), **S. Tarucha**, **K. Ishibashi** and **R.S. Deacon** (RIKEN, Japan) on the study of induced superconductivity in topological insulators.
2009 – 2022	Group of **P. Degiovanni** (École Normale Supérieure Lyon, France), collaboration on the topic of electron quantum optics in quantum Hall edge channels and interactions.
2009 - 2015	Groups of **T. Martin** (University of Marseille, France) and **M. Büttiker** (University of Geneva, Switzerland), on electron quantum optics in quantum Hall edge channels

Teaching and supervision experience

- Invited lecturer in several local or international winter/summer schools: Topological Matter: theory and applications 2022, Mauterndorf 2020, Topological Matter 2017 & 2018, Summer Academy 2018 of SFB1277, Elitenetzwerk Bayern Winter School 2019
- Teaching experience as lecturer and teaching assistant, at BSc and MSc level
  - Teaching in English (fluent) and French (mother tongue), soon in German (currently level C1)
  - Experience in tutorials, lectures, labs, supervision of small projects, etc...
- Member of the committee, Entrance competitive exams to ENS
- Supervision of 3 Master students, co-supervision of 1 PhD student (in France), supervision of 2 Bachelor students, 4 Master students, supervision of 3 PhD students, co-supervision of 3 PhD students (in Germany)

Publications and scientific communications

Summary of scientific communications

- 36 talks at conferences and workshops (21 upon invitation)
- 15 seminars

Summary of publications:

- 41 published articles: 2 invited reviews in Annalen der Physik and Physica Status Solidi B, 2 Science, 1 Nature Physics, 2 Nature Nanotechnology (including one News & Views), 5 Nature Communications, 4 Physical Review Letters, 1 Physical Review X, 8 Physical Review B, 1 Physical Review A, 1 Physical Review Applied, 1 Physical Review Research, 1 NanoLetters, 1 New Journal of Physics, 2 Journal of Physics : Materials, 1 Journal of Physics B, 1 Physica Scripta, 1 Applied Science.
- 1 book chapter, in "Topological Matter", Springer Series in Solid-State Sciences
- h=23, with ∼2740 citations (Web of Science)

Selected publications

[1] T. Röper, H. Thomas, D. Rosenbach, A. Uday, G. Lippertz, A. Denis, P. Morfin, A. A. Taskin, Y. Ando, and E. Bocquillon, "Propagation, Dissipation, and Breakdown in Quantum Anomalous Hall Edge States probed by Microwave Edge Plasmons," *Phys. Rev. B* **110**, L161403 (2024).

[2] A. Gourmelon, E. Frigerio, H. Kamata, L. Lunczer, A. Denis, P. Morfin, M. Rosticher, J.-M. Berroir, G. Fève, B. Plaçais, H. Buhmann, L. W. Molenkamp, and E. Bocquillon, "Velocity and confinement of edge plasmons in HgTe-based two-dimensional topological insulators," *Phys. Rev. B* **108**, 035405 (2023).

[3] M. C. Dartiailh, S. Hartinger, A. Gourmelon, K. Bendias, H. Bartolomei, H. Kamata, J.-M. Berroir, G. Fève, B. Plaçais, L. Lunczer, R. Schlereth, H. Buhmann, L. W. Molenkamp, and E. Bocquillon, "Dynamical Separation of Bulk and Edge Transport in HgTe-Based 2D Topological Insulators," *Phys. Rev. Lett.* **124**, 076802 (2020).

[4] H. Bartolomei, M. Kumar, R. Bisognin, A. Marguerite, J. M. Berroir, E. Bocquillon, B. Plaçais, A. Cavanna, Q. Dong, U. Gennser, Y. Jin, and G. Fève, "Fractional statistics in anyon collisions," *Science* **368**, 173–177 (2020)

[5] R. S. Deacon, J. Wiedenmann, E. Bocquillon, F. Domínguez, T. M. Klapwijk, P. Leubner, C. Brüne, E. M. Hankiewicz, S. Tarucha, K. Ishibashi, H. Buhmann, and L. W. Molenkamp, "Josephson Radiation from Gapless Andreev Bound States in HgTe-Based Topological Junctions," *Phys. Rev. X* **7**, 021011 (2017).

[6] E. Bocquillon, R. S. Deacon, J. Wiedenmann, P. Leubner, T. M. Klapwijk, C. Brüne, K. Ishibashi, H. Buhmann, and L. W. Molenkamp, "Gapless Andreev Bound States in the Quantum Spin Hall Insulator HgTe," *Nature Nanotechnology* **12**, 137–143 (2017).

[7] J. Wiedenmann, E. Bocquillon, R. S. Deacon, S. Hartinger, O. Herrmann, T. M. Klapwijk, L. Maier, C. Ames, C. Brüne, C. Gould, A. Oiwa, K. Ishibashi, S. Tarucha, H. Buhmann, and L. W. Molenkamp, "4π-Periodic Josephson Supercurrent in HgTe-Based Topological Josephson Junctions," *Nat. Commun.* **7**, 10303 (2016).

[8] E. Bocquillon, V. Freulon, F. D. Parmentier, J.-M. Berroir, B. Plaçais, C. Wahl, J. Rech, T. Jonckheere, T. Martin, C. Grenier, D. Ferraro, P. Degiovanni, and G. Fève, "Electron Quantum Optics in Ballistic Chiral Conductors," *Ann. Phys. (Berlin)* **526**, 1–30 (2014).

[9] E. Bocquillon, V. Freulon, J.-M. Berroir, P. Degiovanni, B. Plaçais, A. Cavanna, Y. Jin, and G. Fève, "Separation of Neutral and Charge Modes in One Dimensional Chiral Edge Channels," *Nat. Commun.* **4**, 1839 (2013).

[10] E. Bocquillon, V. Freulon, J.-M. Berroir, P. Degiovanni, B. Plaçais, A. Cavanna, Y. Jin, and G. Fève, "Coherence and Indistinguishability of Single Electrons Emitted by Independent Sources," *Science* **339**, 1054–1057 (2013).