
CURRICULUM VITAE

François D. Parmentier
born September 3, 1983 in Paris
French Nationality

<https://nanoelectronicsgroup.com>

Education

- **2022:** *Habilitation à Diriger les Recherches*, Université Paris-Saclay
- **2007-2011:** Ph.D in physics at Université Pierre et Marie Curie (UPMC, Paris)
- **2004-2007:** Physics graduate program (*prédoctorat*) at Ecole Normale Supérieure, Paris

Research experience

- **2015 - present:** CNRS Researcher (CRCN)
Nanoelectronics group, Service de Physique de l'Etat Condensé (SPEC), CEA, CNRS, Université Paris-Saclay, France
- **2015:** visiting scholar, CNRS Researcher
Physics Department, University of California – Santa Barbara, CA, USA
- **2014 - 2015:** Postdoctoral researcher
Service de Physique de l'Etat Condensé, CEA, CNRS, Université Paris-Saclay, France
- **2010 - 2014:** Postdoctoral researcher
Center for Nanostructures and Nanotechnology (C2N), CNRS, France (formerly *Laboratoire de Photonique et de Nanostructures*)
- **2007 - 2010:** Graduate student
Laboratoire Pierre Aigrain, CNRS, Ecole Normale Supérieure, France
- **2006:** Masters intern
Physical Science Laboratory, NTT Basic Research Laboratories, Japan

PhD students supervision

- **Gaëlle Le Breton:** 100 % supervision
Start date: October 2019 (ongoing)
Topic: *Quantum heat transport in graphene Van der Waals heterostructures*
Funded by ERC StG *QUAHQ* (PI: F. D. Parmentier) Publications: 1 in press

- **Paul Brasseur:** 10 % supervision (official PhD advisors: Patrice Roche and Preden Roulleau - 90 %)
Period: October 2017 - October 2020
Topic: *Electron quantum optics in graphene*
Funded by CEA Publications: 2+1 in preparation (PI: P. Roulleau)
- **Ramiro H. Rodriguez:** 50 % supervision (official PhD advisor: Patrice Roche - 50 %)
Period: October 2015 - February 2019
Topic: *Relaxation of quasiparticles injected above the Fermi sea of a Quantum Hall edge channel*
Funded by CEA Publications: 2 (PI: P. Roche)

Masters students supervision

- **Aifei Zhang:** 100 % supervision
Period: March 2022 - August 2022
Topic: *Quantum heat transport in graphene moire systems*
Funded by ERC StG QUAHQ (PI: F. D. Parmentier)
- **Gaëlle Le Breton:** 100 % supervision
Period: April 2019 - August 2019
Topic: *Quantum heat transport in graphene Van der Waals heterostructures*
Funded by ERC StG QUAHQ (PI: F. D. Parmentier)
- **Paul Brasseur:** 10 % supervision (90 % Preden Roulleau)
Period: June 2017 - September 2017 (ongoing)
Topic: *Electron quantum optics in graphene*
Funded by ERC StG COHEGRAPH (PI: P. Roulleau)
- **Thibault Cazimajou:** 50 % supervision (50 % P. Roulleau)
Period: April 2015 - August 2015
Topic: *Study of a Mach-Zehnder interferometer for electrons in graphene. Observation of quantum hall effect at constant magnetic field (1 T) and low temperature for a graphene device.*
Funded by CEA Publications: 1 (PI: P. Roulleau)
- **Ramiro H. Rodriguez:** 50 % supervision (50 % P. Roche)
Period: April 2015 - August 2015
Topic: *Relaxation of quasiparticles injected above the Fermi sea of a Quantum Hall edge channel*
Funded by CEA

Postdoctoral fellows supervision

- **Manjari Garg:** 100 % supervision
Start date: December 2021 (ongoing)

Topic: *Quantum heat transport in graphene Van der Waals heterostructures*
 Funded by ERC StG QUAHQ (PI: F. D. Parmentier).

- **Himadri Chakraborty:** 10 % supervision (90 % Preden Roulleau)

Start date: May 2021 (ongoing)

Topic: *Electron quantum optics in graphene*

Funded by ERC StG COHEGRAPH (PI: P. Roulleau).

- **Raphaëlle Delagrangé:** 100 % supervision

Period: October 2019 - June 2021

Topic: *Quantum heat transport in graphene Van der Waals heterostructures*

Funded by ERC StG QUAHQ (PI: F. D. Parmentier). Publications: 1 in preparation

- **Alexandre Assouline:** 10 % supervision (90 % Preden Roulleau)

Start date: October 2018 (ongoing)

Topic: *Electron quantum optics in graphene*

Funded by ERC StG COHEGRAPH (PI: P. Roulleau). Publications: 2 + 2 in preparation (PI: P. Roulleau)

- **Myunglae Jo:** 10 % supervision (90 % Preden Roulleau)

Start date: March 2017 (ongoing)

Topic: *Electron quantum optics in graphene*

Funded by ERC StG COHEGRAPH (PI: P. Roulleau). Publications: 2 + 2 in preparation (PI: P. Roulleau)

- **Minky Seo:** 90 % supervision (10 % Preden Roulleau)

Period: June 2016 - June 2018 Topic: *Shot noise in MOSFET quantum dots*

Funded by CEA PT-Nanosciences and EUROTALENTS programs (PI: F. D. Parmentier). Publications: 1 (PI: F. D. Parmentier)

Fundings

- **2019-2024:** ERC Starting Grant QUAHQ (project leader). *Probing exotic quantum Hall states with heat quantum transport*. Budget: 1.5 M€
 The goal of this project is use heat transport to investigate exotic states of the quantum Hall effect in graphene, where interactions lead to the appearance of charge-neutral collective modes.
- **2018:** Labex PALM junior chair ROTAMAG (project leader). *Probing broken symmetry quantum Hall states in graphene with heat transport*. Budget: 18 k€
 This seed fundings covers basic equipment (piezoelectric rotator and electronics) for the investigation of exotic states of the quantum Hall effect in graphene.
- **2018:** DIM Sirteq small equipment funding QuHeTGraph (project leader). *Quantum heat transport in Graphene*. Budget: 60 k€
 This seed fundings covers the purchase of an optical microscope for the *van der Waals* heterostructures assembly platform developed in the Nanoelectronics group, as well as measurement electronics. Related publications: 3 in preparation.

- **2017:** Univ. Paris-Saclay IQUPS QuWaa (project leader). *Quantum transport in Van der Waals heterostructures*. Budget: 20 k€
This seed fundings covers the purchase of an atomic force microscope microscope for the *van der Waals* heterostructures assembly platform developed in the Nanoelectronics group. Related publications: 3 in preparation.
- **2016-2017:** CEA Projets Transverses Nanoscience NanoSiN (project leader). *Quantum shot noise and THz response in Silicon nano-FETs*. Budget: 75 k€
The goal of this project was to investigate the shot noise properties of MOSFET quantum dots. Covered 1 year of post-doctoral fellow. Related publications: 1.
- **2016-2017:** Labex PALM junior chair ZerHall (project leader). *Heat transport in the $\nu = 0$ quantum Hall state of graphene*. Budget: 38 k€
This seed funding covered the development of the *van der Waals* heterostructures assembly platform in the Nanoelectronics group. It was crucial in obtaining all subsequent grants, in particular the ERC starting grant, related to graphene. Related publications: 3 in preparation.

Participation in research consortia

- **2020-2024:** Labex NanoSaclay flagship project MaCaCQu (minor participant, no funding). *Manipulating Heat Carriers: from the Classical to the Quantum Regime*. Budget: 1.5 M€
This project gathers 11 research teams working in thermal transport, nanoelectronics, optics, material science, and acoustics at the nanoscale, addressing related problems both from the theoretical and experimental approaches. Coordinator: Daniel Lanzillotti Kimura (C2N)

Scientific event organisation

- **2021:** co-organiser of the summer school of the *Quantum Mesoscopic Physics* GDR in Cargese, Corsica.

Scientific, administrative and community activities

- **2021 - 2025:** elected member of the *Comité National de la Recherche Scientifique* (CoNRS), Section 03 (electronic properties of condensed matter)
- **2020 - present:** member of the laboratory council at SPEC
- **2018 - 2022:** co-organizer of SPEC's general meetings
- **2018 - present:** member of the steering committee of SPEC's nanofabrication facility
- **2018:** licentiate committee member at Chalmers University
- **2017 - present:** mentor¹ of 5 PhD students at SPEC

¹ We refer to the EDPIF graduate school's guidelines.

- **2017:** member of the hiring committee for a clean room engineer position at SPEC
- **2016 - present:** reviewer for APS journals (Physical Review X, Physical Review Letters, Physical Review B), Nature Physics, Annalen der Physik

Prizes and awards

- **2017:** Nicholas Kurti Science Prize for Europe

Outreach

- **2019:** Invited presentation at Maison de Sciences, Chateaufort
- **2016:** Invited at outreach radio show "La Méthode Scientifique", France Culture, 14/09/2016
- **2009:** Organizer of a scientific outreach program at Lycée Lakanal, Sceaux, France

Invited presentations

- International Workshop on Quantum Materials and Circuits (Jouvenot, Quebec, Canada)
- **2017:** LT28 - 28th International Conference on Low Temperature Physics, August 2017 (Gothenburg, Sweden) Invited presentation at the Oxford Instruments Socialize with Science event
- **2016:** Meso School 2016: Topological matter interactions and light-matter coupling (Cargèse, France) Low-noise measurements (invited seminar)
- **2014:** Condensed Matter in Paris, August 2014 (Paris, France)
- **2014:** Perspectives in quantum thermoelectricity: time-dependent systems, correlations and measurements, November 2014 (Marseille, France)

Publications

Web of Science citation report: 28 publications (20 without the thesis supervisor, 5 as first author, 2 as shared first author, 1 as last author) , including 2 Nature, 2 Science, 3 Nature Physics, 5 Physical Review Letters, 1 Physical Review X, 5 Nature Communications

Nuber of citations (excluding self-citations): 1290

h-index: 17

- *Excitonic nature of magnons in a quantum Hall ferromagnet* (0 citation)
A. Assouline, M. Jo, P. Brasseur, K. Watanabe, T. Taniguchi, Th. Jolicoeur, D. C. Glattli, N. Kumada, P. Roche, F. D. Parmentier, P. Roulleau
Nature Physics **17**, 1369 (2021).

- *Dynamical Coulomb blockade under a temperature bias* (4 citations)
H. Duprez, F. Pierre, E. Sivre, A. Aassime, F. D. Parmentier, A. Cavanna, A. Ouerghi, U. Gennser, I. Safi, C. Mora, A. Anthore
Phys. Rev. Research **3**, 023122 (2021).
- *Quantum Hall Valley Splitters and a Tunable Mach-Zehnder Interferometer in Graphene* (7 citations)
M. Jo, P. Brasseur, A. Assouline, G. Fleury, H.-S. Sim, K. Watanabe, T. Taniguchi, W. Dumnernpanich, P. Roche, D.C. Glatli, N. Kumada, F.D. Parmentier, P. Roulleau
Phys. Rev. Letters **126**, 146803 (2021).
- *Electronic Wave-Packets in Integer Quantum Hall Edge Channels: Relaxation and Dissipative Effects* (2 citations)
G. Rebora, D. Ferraro, R. H. Rodriguez, F. D. Parmentier, P. Roche, M. Sassetti
Entropy **23**, 138 (2021).
- *Relaxation and revival of quasiparticles injected in an interacting quantum Hall liquid* (11 citations)
R. H. Rodriguez, F. D. Parmentier, D. Ferraro, P. Roulleau, U. Gennser, A. Cavanna, M. Sassetti, F. Portier, D. Mailly, P. Roche
Nature Communications **11**, 2426 (2020).
- *Electronic heat flow and thermal shot noise in quantum circuits* (15 citation)
A. Anthore, Z. Iftikhar, E. Boulat, F. D. Parmentier, A. Cavanna, A. Ouerghi, U. Gennser, F. Pierre
Nature Communications **10**, 5638 (2019).
- *Circuit Quantum Simulation of a Tomonaga-Luttinger Liquid with an Impurity* (20 citations)
A. Anthore, Z. Iftikhar, E. Boulat, F. D. Parmentier, A. Cavanna, A. Ouerghi, U. Gennser, F. Pierre
Phys. Rev. X **8**, 031075 (2018).
- *Strongly correlated charge transport in silicon metal-oxide-semiconductor field-effect transistor quantum dots* (2 citations)
M. Seo, P. Roulleau, P. Roche, D. C. Glatli, M. Sanquer, X. Jehl, L. Hutin, S. Barraud, F. D. Parmentier
Phys. Rev. Lett. **121**, 027701 (2018).
- *Tunable quantum criticality and super-ballistic transport in a "charge" Kondo circuit* (39 citations)
Z. Iftikhar, A. Anthore, A. K. Mitchell, F. D. Parmentier, U. Gennser, A. Ouerghi, A. Cavanna, C. Mora, P. Simon, F. Pierre
Science **360**, 1315-1320 (2018).
- *Graphene n-p junctions in the quantum Hall regime: numerical study of incoherent scattering effects* (6 citations)

- Q. Ma, F. D. Parmentier, P. Roulleau, G. Fleury
Phys. Rev. B **97**, 205445 (2018).
- *Heat Coulomb Blockade of One Ballistic Channel* (44 citations)
E. Sivre, A. Anthore, F. D. Parmentier, A. Cavanna, U. Gennser, A. Ouerghi, Y. Jin, F. Pierre
Nature Physics **14**, 145 (2017).
 - *Quantum Hall effect in epitaxial graphene with permanent magnets* (9 citations)
F. D. Parmentier, T. Cazimajou, Y. Sekine, H. Hibino, H. Irie, D.C. Glatli, N. Kumada, P. Roulleau
Scientific Reports **6**, 38393 (2016).
 - *Primary thermometry triad at 6 mK in mesoscopic circuits* (29 citations)
Z. Iftikhar, A. Anthore, S. Jezouin, F. D. Parmentier, Y. Jin, A. Cavanna, A. Ouerghi, U. Gennser, F. Pierre
Nature Communications **7**, 12908 (2016).
 - *Controlling charge quantization with quantum fluctuations* (287 citations)
S. Jezouin, Z. Iftikhar, A. Anthore, F. D. Parmentier, U. Gennser, A. Cavanna, A. Ouerghi, I. P. Levkivskyi, E. Idrisov, E. V. Sukhorukov, L. I. Glazman, F. Pierre
Nature **536**, 58-62 (2016).
 - *Photon-Assisted Shot Noise in Graphene in the Terahertz Range* (16 citations)
F. D. Parmentier, L. N. Serkovic-Loli, P. Roulleau, D. C. Glatli
Phys. Rev. Lett. **116**, 227401 (2016).
 - *Two-channel Kondo effect and renormalization flow with macroscopic quantum charge states* (87 citations)
Z. Iftikhar, S. Jezouin, A. Anthore, U. Gennser, F. D. Parmentier, A. Cavanna, F. Pierre
Nature **526**, 233 (2015).
 - *Shot noise generated by graphene p-n junctions in the quantum Hall effect regime* (33 citations)
N. Kumada, F. D. Parmentier, H. Hibino, D.C. Glatli, P. Roulleau
Nature Communications **6**, 8068 (2015).
 - *Electron quantum optics in ballistic chiral conductors* (140 citations)
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, G. Fève
Annalen der Physik **526**, 1 (2014).
 - *Quantum Limit of Heat Flow Across a Single Electronic Channel* (171 citations)
S. Jezouin, F. D. Parmentier, A. Anthore, U. Gennser, A. Cavanna, Y. Jin, F. Pierre
Science **342**, 601-604 (2013).

- *Tomonaga-Luttinger liquid physics in electronic quantum circuits* (50 citations)
S. Jezouin, M. Albert, F. D. Parmentier, A. Anthore, U. Gennser, A. Cavanna, I. Safi, F. Pierre
Nature Communications **4**, 1802 (2013).
- *Electron quantum optics: partitioning electrons one by one* (141 citations)
E. Bocquillon, F. D. Parmentier, C. Grenier, J.-M. Berroir, P. Degiovanni, D. C. Glattli, B. Plaçais, G. Fève, A. Cavanna, Y. Jin
Physical Review Letters **108**, 196803 (2012).
- *Current noise spectrum of a single particle emitter: theory and experiment* (89 citations)
F. D. Parmentier, E. Bocquillon, J.-M. Berroir, D. C. Glattli, B. Plaçais, G. Fève, M. Albert, C. Flindt, M. Büttiker
Phys. Rev. B **85**, 165438 (2012).
- *Coupling a quantum dot, fermionic leads and a microwave cavity on-chip* (158 citations)
M.R. Delbecq, V. Schmitt, F. D. Parmentier, N. Roch, J.J. Viennot, G. Fève, B. Huard, C. Mora, A. Cottet, T. Kontos
Phy. Rev. Lett. **107**, 256804 (2011).
- *Strong back-action of a linear circuit on a single electronic quantum channel* (31 citations)
F. D. Parmentier, A. Anthore, S. Jezouin, H. le Sueur, U. Gennser, A. Cavanna, D. Mailly, F. Pierre
Nature Physics **7**, 935-938 (2011).
- *Single electron quantum tomography in quantum Hall edge channels* (86 citations)
C. Grenier, R. Hervé, E. Bocquillon, F. D. Parmentier, B. Plaçais, J.-M. Berroir, G. Fève, P. Degiovanni
New Journal of Physics **13**, 093007 (2011).
- *A high sensitivity ultralow temperature RF conductance and noise measurement setup* (14 citations)
F. D. Parmentier, A. Mahé, A. Denis, J.-M. Berroir, D.C. Glattli, B. Plaçais, G. Fève
Review of Scientific Instruments **82**, 013904 (2011).
- *Current correlations of an on-demand single-electron emitter* (113 citations)
A. Mahé, F. D. Parmentier, E. Bocquillon, J.-M. Berroir, D.C. Glattli, T. Kontos, B. Plaçais, G. Fève, A. Cavanna, Y. Jin
Phys. Rev. B **82**, 201309(R) (2010).
- *Subnanosecond single electron source in the time-domain* (17 citations)
A. Mahé, F. D. Parmentier, G. Fève, J.-M. Berroir, T. Kontos, A. Cavanna, B. Etienne, Y. Jin, D.C. Glattli, B. Plaçais
Journal of Low Temperature Physics **153**, 339-349, (2008).