

Olivier BOURGEOIS
SECTION 7 collège A1
Directeur de Recherche CNRS



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Born the 02-02-1971 in Valence (France)

Professional Experience

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| 2025 | In prep. Co-founders NANOTIP start-up (CTO and scientific concealer). |
| 2020-2030 | Co-founder and Co-director of the GDR NAME NanoMaterials for Energy |
| 2022 | Directeur de Recherches 1 ^{ère} classe at CNRS, Institut NÉEL Grenoble, France. |
| 2020 | Co-founder, interim CTO and scientific concealer of MOÏZ start-up (6 employees) |
| 2014 | Directeur de Recherches 2 nd classe at CNRS, Institut NÉEL Grenoble, France. |
| 2005-2020 | Group leader team Thermodynamique et Biophysique des Petits Systèmes (NEEL). |
| 2007/2014 | Chargé de Recherches at CNRS, Institut NÉEL Grenoble, France. |
| 2001/2007 | Chargé de Recherches at CNRS, CRTBT Grenoble, France. |
| 1999/2001 | Post-Doctoral position at the Dynes lab (University of California San Diego), US. |
| 1994 | 6 month of Internship in physics at University of Sankt-Peterburg, Russia. |

Educations

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| 2017 | Formation HEC Paris, Challenge+. |
| 2008 | Habilitation à Diriger les Recherches (HDR), Université Grenoble Alpes, Grenoble, France. |
| 1999 | Ph.D. in Condensed Matter Physics. Université Joseph Fourier, Grenoble, France. |
| 1996 | Master of Science in Quantum Physics, Université Joseph Fourier, Grenoble, France. |
| 1994 | Bachelor of Science in Mathematics, Institut Fourier, Grenoble, France. |
| 1993 | Bachelor of Science in Physics, Magistère de Physique, Grenoble, France. |

Research activities

Group Leader of the team *Thermodynamic and Biophysics of Small Systems* at the Institut Néel 2005-2020.

100 publications in peer reviewed international journals (Phys. Rev. Lett., Science Adv., Nature Nano., Nature Commun., Phys. Rev. B, Appl. Phys. Lett., Nano Letters, ACS Nano, Rev. Sci. Instrum.), 4 patents and 2 patents pending, 5 articles for the general public, 6 chapters of book, 75 invited talks in international conferences, scientific schools and seminars abroad, 65 thesis jury (PhD and HDR), 2 start-up companies (MOÏZ, NANOTIP). h=24 ISI Web, 2000 citations.

Research themes:

- *Phonon transport at the nanoscale and heat management*: measurement of the phonon transport at the nanoscale, at low temperatures, in the quantum regime, in nanowire, in nanothermoelectric systems, phononic crystal, thermal diodes.

- *Thermodynamics and thermal physics of meso and nanoscopic systems*: superconductivity, phase coherence, quantification of magnetic flux in nano-objects highly sensitive specific heat measurement.
- *New materials for energy*: materials for nanothermoelectricity, application of new materials for innovative thermal sensing, energy harvesting for IoT.
- *Metal-to-Insulator and Superconductor-to-Insulator Transition materials*: nanocalorimetry of the phase transition at the superconductor to insulator transition in very thin film.
- *Biophysics (thermal transport in biomaterials) and Out of equilibrium thermodynamics*: biothermal sensors, thermal properties of polymer, protein, mitochondria, DNA denaturation, glass transition, spin glass, thermal denaturation etc...

Research management

Management: 17 thesis supervisions and 13 post-doctorates supervised along with 15 master 2R and 17 (Diplom Arbeit, Master 1, L3, école d'ingénieur, IUT, IUP, BUT).

Project funding: more than 5 millions euros raised in 22 years for fundamental/applied research and technological transfer projects. More than 30 projects financed (5 locals, 20 national ANR, 3 european (Nanocal, MicroKelvin, Merging), IRT, PEPR).

Industrial innovation: 5 patents, laureate of the i-lab prize 2018, co-founder of the Start-up company MoïZ with D. Tainoff and NANOTIP 2025 with N. Paillet.

Scientific activities and expertise: conference organisations (10), steering committee (Eurotherm, International Conference of Phonon, Phononics), participation to 55 thesis jury, 10 HDR jury, labs and project evaluations (AERES, ANR, etc...), Prospective de Physique 2023-2024.

Expert in thermal physics and thermoelectricity for: OMNT/CNANO, ANR, ANCRE, HCERES, Labex LANEF.

Teaching: Thermodynamic, Electrothermal physics and mathematics at IUT Mesures Physiques et Génie Thermique during 6 years. Ecole de cryogénie 2009-2021, Cryocourse (2011-2022).

Current Projects (lead or participant)

Current ANR projects: ANR FETh (part.), HANIBAL (lead) and THERMES 2D (lead and part.), NEXTOP (part.), ANTICHI (lead and part.) and start-up Cie NANOTIP (lead).

Current large project: QLOOP (IRT Nanoelectronic), CRYONEXT head of project 7.

5 selected papers

- 1- R. Swami, G. Julié, S. Le-Denmat, D. Singhal, J. Paterson, J. Maire, J.F. Motte, G. Pernot, H. Guillou, S. Gomès, and O. Bourgeois, *Experimental set-up for thermal measurements at the nanoscale using an SThM probe with niobium nitride thermometer*, Rev. Sci. Instrum. **95**, 054904 (2024).
- 2-C.A. Polanco, A. van Rookeghem, B. Brisuda, L. Saminadayar, O. Bourgeois, and N. Mingo, The phonon quantum of thermal conductance: are simulations and measurements estimating the same quantity? Sci. Adv. **9**, eadi7439 (2023).
- 3-D. Macherel, F. Haraux, H. Guillou, O. Bourgeois, *The conundrum of hot mitochondria*, BBA - Bioenergetics **1862**, 148348 (2021).
- 4-D. Cattiaux, I. Golokolenov, S. Kumar, M. Sillanpaa, L. Mercier de L'Epinay, R.R. Gazizulin, X. Zhou, A.D. Armour, O. Bourgeois, A. Fefferman and E. Collin, *A macroscopic object passively cooled into its quantum ground state of motion beyond single-mode cooling*. Nature Commun. **12**, 6182 (2021).
- 5- A. Tavakoli, K. Lulla, T. Crozes, E. Collin, and O. Bourgeois, *Heat conduction in a ballistic 1D phonon waveguide indicates breakdown of the thermal conductance quantization*, Nature Commun. **9**, 4287 (2018).