Laboratoire Charles Fabry (Palaiseau)

Riccardo MESSINA

- ~ 120 total members (~ 40 permanent members)
- Involved in GDR:

  Thermoplasmonics team (2 permanent members, 1 PhD, 1 postdoc)
  2 permanent members: P. Ben-Abdallah and R. Messina

- Main areas of expertise of the lab: **optics** and **photonics**
- CNRS sections of members of the GDR: 3, 10
- Preferential axis of the team involved in this GDR: **Simulations/Theory**

Scientific expertise, overview, major themes in relation to the GDR

- The members of LCF cover a broad spectrum of optics and photonics, spanning from fundamental research to applications.

- **Photons** are at the heart of the activity of basically all the groups in the lab.

- A variety of applications is targeted by researchers working at LCF, including:

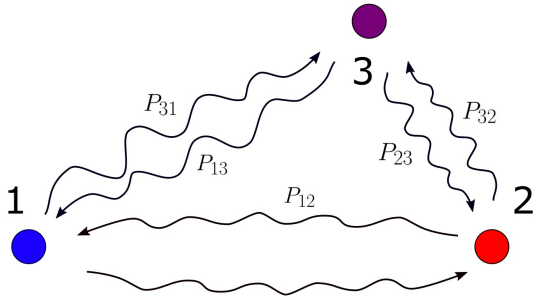
  - **Biomedical applications**, especially in terms of imaging techniques
  - Modeling **imaging systems,** enhancing digital processing, and designing advanced optical systems
  - Development of optimized **laser** sources

- In relation to the GDR, our expertise could be relevant for the following applications :

  - **Thermal management** at the nanoscale
  - Design of optimized **near-field thermophotovoltaic** devices
  - Optimization of (possibly multi-carrier) heat transfer in the **extreme near field**

Technical or technological expertise in relation to the GDR issues

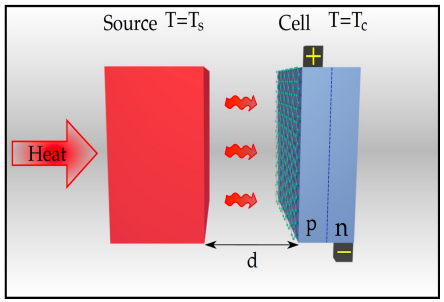
Many-body near-field radiative heat transfer



- Framework of **fluctuational electrodynamics**
- Necessity of a **fully many-body approach**
- Variety of **shapes** and **optical properties**

S.-A. Biehs et al., arXiv:2007.05604 (2020)

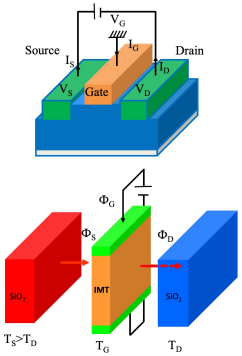
Graphene-based NTPV cell



Enhancement of NTPV cell through coupling with graphene

RM and P. Ben-Abdallah, Sci. Rep. **3**, 1383 (2013)

Thermotronics



Thermal equivalents of basic circuit elements (diode, transistor, memory…)

P. Ben-Abdallah et al., Phys. Rev. Lett. **112**, 044301 (2014)
A. Fiorino et al., ACS Nano **12**, 5774 (2018)