Thomas ALLARD
PhD in Condensed Matter Theory

Research interests: time-varying media, polaritonics, topological photonics

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28 years old
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RESEARCH EXPERIENCES

2024/10 - UNIVERSIDAD AUTÓNOMA DE MADRID.
Postdoctoral researcher in the group of P. A. Huidobro (IFIMAC). Researches in the framework of the ERC TIMELIGHT (Time-Varying Nanophotonics for New Regimes of Light-Matter Interactions).

2023/10 - 2024/10 UNIVERSITÉ DE STRASBOURG.
Postdoctoral position (temporary lecturer) in the group of G. Weick (IPCMS), in collaboration with D. Hagenmüller (CESQ).

2020/10 - 2023/10 UNIVERSITÉ DE STRASBOURG.
PhD in Condensed Matter Theory, supervised by G. Weick (IPCMS): *Disorder and topology in strongly-coupled light-matter systems*.

2020/04 - 2020/08 UNIVERSITÉ DE STRASBOURG.
Master thesis, supervised by G. Weick (IPCMS): *Quantum theory of polaritons in nanoplasmonics*.

EDUCATION

2024 UNIVERSITÉ DE STRASBOURG.
Qualification to "Maître de conférence", section 28.

2019-2020 ECOLE NORMALE SUPÉRIEURE DE PARIS.
Master degree in Physics, 2nd year: International Center for Fundamental Physics, Theoretical Physics track (with honours).

2018-2019 UNIVERSITÉ DE STRASBOURG.
Higher education competitive teaching examination: "Préparation à l'Agrégation"
➢ Admitted to the "Agrégation de Sciences Physiques option Physique".

2017-2018 UNIVERSITÉ DE STRASBOURG.
Master degree in Physics, 1st year (with honours)
➢ Exchange semester with LUDWIG MAXIMILIANS UNIVERSITÄT, MÜNCHEN.

2016-2020 UNIVERSITÉ DE STRASBOURG.
"Magistère de Physique Fondamentale" (with honours).

2014-2017 UNIVERSITÉ DE STRASBOURG.
Bachelor degree in Physics (with honours).

TEACHING AND MENTORING EXPERIENCES

2024- UNIVERSIDAD AUTÓNOMA DE MADRID.
Participation to the supervision of the PhDs of J. E. Sustaeta-Osuna and A. Caballero.

2020-2024 UNIVERSITÉ DE STRASBOURG.
- Lecturer for the course Mathematics for Phycisists (1st year).
- Teaching assistant in Laboratory Works (1st year), Computer Science (1st year), Advanced Classical Mechanics (2nd year) and Statistical Physics (3rd and 4th year).

PUBLICATIONS AND PREPRINTS

[1] **T. F. Allard** and G. Weick, Quantum theory of plasmon polaritons in chains of metallic nanoparticles: From near- to far-field coupling regime, Phys. Rev. B **104**, 125434 (2021).

[2] **T. F. Allard** and G. Weick, Disorder-enhanced transport in a chain of lossy dipoles strongly coupled to cavity photons, Phys. Rev. B **106**, 245424 (2022).

[3] **T. F. Allard** and G. Weick, Multiple polaritonic edge states in a Su-Schrieffer-Heeger chain strongly coupled to a multimode cavity, Phys. Rev. B **108**, 245417 (2023).

[4] **T. F. Allard** and G. Weick, Mirror-induced effects in cavity polaritonics: Influence on edge states, Phys. Rev. B **110**, 125423 (2024).

[5] A. Miguel-Torcal, **T. F. Allard**, P. A. Huidobro, F. J. García-Vidal and A. I. Fernández-Domínguez, Constructing Qubit Edge States by Inverse-Designing the Electromagnetic Environment, ACS Photonics **12**, 10, 5434-5442 (2025).

[6] **T. F. Allard** and G. Weick, Reentrant localization transition in a dimerized quasiperiodic dipolar chain, arXiv:2501.16514.

[7] **T. F. Allard**, J. E. Sustaeta-Osuna, F. J. García-Vidal and P. A. Huidobro, Broadband Dipole Absorption in Dispersive Photonic Time Crystals arXiv:2508.04619.

[8] J. E. Sustaeta-Osuna, **T. F. Allard**, F. J. García-Vidal and P. A. Huidobro, Near-Field Gain and Far-Field Control via a Plasmonic Time Crystal Slab arXiv:2508.04619.

[9] A. Caballero, **T. F. Allard** and P. A. Huidobro, Interface states in space-time photonic crystals: topological origin, propagation and amplification arXiv:2510.18523.

PEER REVIEWING ACTIVITY

- Referee for Phys. Rev. A, Phys. Rev. B, Phys. Rev. Lett., Nanophotonics.

PRESENTATIONS

2025/10 PLENARY SESSION GDR ONDES 2025, BESANÇON, FRANCE.
Poster: *Broadband Dipole Absorption in Dispersive Photonic Time Crystals.*

2025/10 MOLECULAR POLARITONICS 2025, MIRAFLORÈS, SPAIN.
Invited talk: *Topology in the strong coupling regime: polaritonic and non-polaritonic effects.*

2025/09 METAMATERIALS, AMSTERDAM, NETHERLANDS.
Contributed talk: *Broadband Dipole Absorption in Dispersive Photonic Time Crystals.*

2025/06 STRONG COUPLING IN ORGANIC MOLECULES 2025, ODENSE, DENMARK.
Poster: *Mirror-induced effects in cavity polaritonics: Influence on edge states.*

2025/06 SPANISH CONFERENCE ON NANOPHOTONICS, MADRID, SPAIN.
Poster: *Broadband Dipole Absorption in Dispersive Photonic Time Crystals.*

2025/05 WAVES IN TIME-VARYING MEDIA WORKSHOP, MADRID, SPAIN.
Poster: *Broadband Dipole Absorption in Dispersive Photonic Time Crystals.*

2025/01 GEFES, OVIEDO, SPAIN.
Poster: *Photonics of Time-Varying Media.*

2025/01 QNANOLIGHT WORKSHOP, MIRAFLORÈS, SPAIN.
Invited talk: *Photonics of Time-Varying Media.*

2024/10 IFIMAC INFORMAL SEMINAR, MADRID, SPAIN.
Invited talk: *Topology in the strong-coupling regime.*

2024/05 SPRING MEETING OF THE EUROPEAN MATERIALS RESEARCH SOCIETY, STRASBOURG, FRANCE.
Contributed talk: *Disorder-enhanced transport in a chain of lossy dipoles strongly coupled to cavity photons.*

2023/11 PLENARY SESSION GDR QUANTUM MESOSCOPIC PHYSICS, AUSSOIS, FRANCE.
Poster: *Multiple polaritonic edge states in a Su-Schrieffer-Heeger chain strongly coupled to a multimode cavity.*

2023/06 WORKSHOP ON TOPOLOGICAL PHOTONICS, MADRID, SPAIN.
Poster: *Multiple polaritonic edge states in a Su-Schrieffer-Heeger chain strongly coupled to a multimode cavity.*

2022/11 PLENARY SESSION GDR 2426 MESOSCOPIC QUANTUM PHYSICS, AUSSOIS, FRANCE.
Poster: *Disorder-enhanced transport in a chain of lossy dipoles strongly coupled to cavity photons.*

2022/09 WORKSHOP ON MOLECULAR POLARITONICS, STRAUBING, GERMANY.
Poster: *Disorder-enhanced transport in a chain of lossy dipoles strongly coupled to cavity photons.*

2022/06 WORKSHOP ON TOPOLOGICAL PHOTONICS, DONOSTIA-SAN SEBASTIÁN, SPAIN.
Contributed talk: *Disorder-enhanced transport in a chain of lossy dipoles strongly coupled to cavity photons.*

2022/04 EUROPEAN SPRING SCHOOL ON QUANTUM SCIENCE AND TECHNOLOGIES, STRASBOURG, FRANCE.
Contributed talk: *Disorder-enhanced transport in a chain of lossy dipoles strongly coupled to cavity photons.*

2021/11 PLENARY SESSION GDR 2426 MESOSCOPIC QUANTUM PHYSICS, AUSSOIS, FRANCE.
Contributed talk: *Absence of Anderson localization in 1D due to cavity photons.*

2021/10 SUMMER SCHOOL ON MESOSCOPIC QUANTUM PHYSICS, CARGÈSE, FRANCE.
Poster: *Absence of Anderson localization in 1D due to cavity photons.*

2021/07 PARIS-SACLAY/MUNICH SUMMER SCHOOL ON SURFACE PLASMONS, SACLAY, FRANCE.
Poster: *Quantum theory of plasmon-polaritons in chains of metallic nanoparticles.*

2020/11 PLENARY SESSION GDR 2426 QUANTUM MESOSCOPIC PHYSICS, AUSSOIS, FRANCE.
Poster: *Polaritons in periodic chains of metallic nanoparticles: a QED approach.*

LANGUAGES

French: Native.

English: Fluent.

German: Intermediate.

Spanish: Intermediate.

Programming: LaTeX, UNIX, Python.

HOBBIES

In- and outdoor climbing, hiking, volunteer activities in a cultural association.