



# GEMaC

Groupe d'Étude  
de la Matière Condensée

## AXE 3 – PUBLICATIONS & THÈSES

### Thèses en cours / ongoing theses

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Helmi Fartas,

**"Controlling the emission hBN color centers by plasmonic structures"**

Hien Phan,

**"Super plasmonic structures based on fluorescent nano-aggregates for the generation of quantum states of light"**

Andrés Núñez Marcos,

**"Vers la création déterministe d'émetteurs quantiques dans les matériaux 2D pour les technologies quantiques optiques"**

Ayoub Galous,

**"Cristaux photoniques accordables et à protection topologique pour des émetteurs"**

quantiques"

Tien Thanh Nguyen,

**"Propriétés optiques de couches minces de pérovskites halogénées déposées sous vide"**

» Thèses soutenues / defended theses

## Publications 2015 - 2024

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### 2026

T. H. T. Nguyen, J. M. Urban, A. Delteil, G. Trippé-Allard, E. Deleporte, J. Even, S. Buil, J. -P. Hermier, D. Garrot,

**"Collective Spectral Diffusion of Defect Luminescence in CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> Halide Perovskites"**

J. Phys. Chem. Lett. **17**, 5652 (2026) – [HAL]

G.-M. Schnüriger, M. Kroner, E. Togan, P. Knüppel, A. Delteil, S. Fält, W. Wegscheider, A. Imamoglu,

**"Quantum correlations and dissipative blockade of polaritons in a tunable fiber cavity",**

arXiv:2603.23002 (2026) – [data]

A. Nuñez Marcos, C. Arnold, J. Barjon, S. Buil, J.-P. Hermier, A. Delteil,

**"Deterministic generation of single B centers in hBN by one-to-one conversion from UV centers",**

ACS Nano **20**, 10404 (2026) – [HAL] – [arXiv] – [data]

A. Delteil, S. Buil, J.-P. Hermier,

**"Photon correlation Fourier spectroscopy of a B center in hBN",**

Phys. Rev. B **113**, 125308 (2026) – [HAL] – [arXiv]– [data]

D. Gérard, S. Buil, K. Watanabe, T. Taniguchi, J.-P. Hermier, A. Delteil,

**"Resonance fluorescence and indistinguishable photons from a coherently driven**

**B centre in hBN",**

Nature Communications **17**, 1843 (2026) – [HAL] – [arXiv] - [data]

## **2025**

T. H. Phan, G. Quibeuf, T. Pons, N. Lequeux, A. Delteil, J.-P. Hermier, S. Buil,  
**"Size-Dependent Optical Properties of CdSe/CdS/ZnS Nanocrystal Aggregates Encapsulated in a Gold Nano-resonator: A Comprehensive Study",**  
Plasmonics **21**, 1513 (2025) – [HAL]

A. B. Chambissie Kameni, A. Py-Renaudie, D. Garrot, B. Berenguier, G. Bouchez, D. R. Ceratti, P. Schulz, J.-F. Guillemoles, and G. Delport,  
**"Polar Indirect Valley as a Limiting Factor for Radiative Efficiency in Gold-Based Mixed-Valence Double Perovskites",**  
Adv. Opt. Mater. (2025) – [arXiv]

H. Fartas, S. Hassani, J.-P. Hermier, N. D. Lai, S. Buil, A. Delteil,  
**"Reproducible generation of green-emitting color centers in hBN using oxygen annealing",**  
Appl. Phys. Lett. **127**, 014001 (2025) – [HAL] – [arXiv] – [data]

O. Capelle, G. Amiri, C. Sartel, S. Hassani, A. Lusson, J.-P. Hermier, S. Buil, V. Sallet, A. Delteil,  
**"Red and infrared colour centres in zinc oxide epitaxial nanowires",**  
Nanotechnology **36**, 245001 (2025) – [HAL] – [data]

D. Gérard, S. Buil, J.-P. Hermier, A. Delteil,  
**"Crossover from inhomogeneous to homogeneous response of a resonantly driven hBN quantum emitter",**  
Phys. Rev. B **111**, 085304 (2025) – [arXiv] – [HAL]

## **2024**

A. Delteil,  
**"N-qubit universal quantum logic with a photonic qudit and O(N) linear optics elements",**

APL Quantum 1, 046101 (2024) – [HAL] – [arXiv]

Y. Sun, C. Morice, D. Garrot, R. Weil, K. Watanabe, T. Taniguchi, M. Monteverde, and A. D. Chepelianskii,

**"Quantum transport and spectroscopy of 2D perovskite/graphene heterostructures"**,

Adv. El. Mater. 2400211 (2024) – [arXiv]

D. Gérard, A. Pierret, H. Fartas, B. Bérini, S. Buil, J.-P. Hermier, A. Delteil,

**"Quantum efficiency and vertical position of quantum emitters in hBN determined by Purcell effect in hybrid metal-dielectric planar photonic structures"**,

ACS Photonics 11, 5188 (2024) – [arXiv] – [HAL] – [data]

V. Blondot, D. Gérard, G. Quibeuf, C. Arnold, A. Delteil, A. Bogicevic, T. Pons, N. Lequeux, S. Buil, J-P. Hermier,

**"Photon correlations in the collective emission of hybrid gold-(CdSe/CdS/CdZnS) nanocrystal supraparticles"**,

Nanotechnology 35, 365001 (2024) – [HAL] – [arXiv]

A. Delteil, S. Buil, J.-P. Hermier,

**"Photon statistics of resonantly driven spectrally diffusive quantum emitters"**,

Phys. Rev. B 109, 155308 (2024) – [HAL] – [arXiv] – [Erratum]

G. L. Ngo., X. P. Le, Q. T. Pham, J.-P. Hermier, N. D. Lai,

**"High-directivity far-field radiation of quantum dot-based single-photon emitter coupled to polymeric circular waveguide resonant grating"**,

Nanotechnology 35, 165001 (2024)

## **2023**

M. Montes Bajo, J.-M. Chauveau, A. Vasanelli, A. Delteil, Y. Todorov, C. Sirtori, A. Hierro,

**"Perspectives and opportunities with multisubband plasmonics"**,

J. Appl. Phys. 134, 010901 (2023) – [HAL]

D. Gérard, M. Rosticher, K. Watanabe, T. Taniguchi, J. Barjon, S. Buil, J.-P. Hermier, A. Delteil,

**"Top-down integration of a hBN quantum emitter in a monolithic photonic**

**waveguide"**,

Appl. Phys. Lett. 122, 264001 (2023) – [HAL] – [arXiv] – [data]

C. Fournier, K. Watanabe, T. Taniguchi, S. Buil, J. Barjon, J.-P. Hermier, A. Delteil,  
**"Investigating the fast spectral diffusion of a quantum emitter in hBN using resonant excitation and photon correlations"**,

Phys. Rev. B **107**, 195304 (2023) – [HAL] – [arXiv] – [data].

G. L. Ngo, L. Nguyen, J.-P. Hermier, N. D. Lai,

**"On-Chip 3D Printing of Polymer Waveguide-Coupled Single-Photon Emitter Based on Colloidal Quantum Dots"**,

Polymers **15**, 2201 (2023) – [HAL]

C. Fournier, S. Roux, K. Watanabe, T. Taniguchi, S. Buil, J. Barjon, J.-P. Hermier, A. Delteil,

**"Two-photon interference from a quantum emitter in hexagonal boron nitride"**,

Phys. Rev. Applied **19**, L041003 (2023) – [HAL] – [arXiv] – [data]

J. M. Urban, T. T. Huyen Nguyen, G. Chehade, A. Delteil, G. Trippé-Allard, G. Delport, E. Deleporte, J.-P. Hermier, D. Garrot,

**"Discrete Donor-Acceptor Pair Transitions in CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> Perovskite Single Crystals"**,

PSS Rapid Research Letters (2023) – [HAL]

G. L. Ngo, J.-P. Hermier, N. D. Lai,

**"Single-photon splitting by polymeric submicropillars structures"**,

AVS Quantum Sci. **5**, 011403 (2023) – [HAL]

V. Blondot, C. Arnold, A. Delteil, D. Gérard, A. Bogicevic, T. Pons, N. Lequeux, J.-P. Hugonin, J.-J. Greffet, S. Buil, J.-P. Hermier,

**"Fluorescence decay enhancement and FRET inhibition in self-assembled hybrid gold CdSe/CdS/CdZnS colloidal nanocrystal supraparticles"**,

Opt. Exp. **31**, 4454 (2023) – [HAL] – [arXiv]

## **2022**

J. Urban, A. Jouaiti, N. Gruber, G. Delport, G. Trippé-Allard, J.-F. Guillemoles, E. Deleporte, S. Ferlay, D. Garrot,

**"Using chiral ammonium cations to modulate the structure of 1D hybrid lead bromide perovskites for linearly polarized broadband light emission at room temperature",**

J. Mater. Chem. C. **10**, 12436 (2022) – [HAL]

S. Roux, C. Fournier, K. Watanabe, T. Taniguchi, J.-P. Hermier, J. Barjon, A. Delteil,  
**"Cathodoluminescence monitoring of quantum emitter activation in hexagonal boron nitride",**

Appl. Phys. Lett. **121**, 184002 (2022) – [HAL] – [arXiv] – [data]

A. Bogicevic, X. Xu, S. Buil, C. Arnold, J.-P. Hermier, T. Pons, N. Lequeux,  
**"Synthesis and characterization of colloidal quantum dot superparticles - plasmonic gold nanoshell hybrid nanostructures",**

ChemRxiv-2022-1m9q5 (2022)

A. Delteil, V. Blondot, S. Buil, J.-P. Hermier,  
**"First-order coherence of light emission from inhomogeneously broadened mesoscopic ensembles",**

Phys. Rev. B. **106**, 115302 (2022) – [HAL] – [arXiv] – [data]

T. Campos, P. Dally, S. Gbegnon, A. Blaizot, G. Trippé-Allard, M. Provost, M. Bouttemy, A. Duchatelet, D. Garrot, J. Rousset, E. Deleporte,  
**"Unraveling the Formation Mechanism of the 2D/3D Perovskite Heterostructure for Perovskite Solar Cells Using Multi-Method Characterization",**

J. Phys. Chem. C **126**, 13527 (2022) – [HAL]

G. Garcia-Arellano, G. Trippé-Allard, T. Campos, F. Bernardot, L. Legrand, D. Garrot, E. Deleporte, C. Testelin, M. Chamarro,

**"Unexpected Anisotropy of the Electron and Hole Landé g-Factors in Perovskite CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> Polycrystalline Films",**

Nanomaterials **12**, 1399 (2022) – [HAL]

M. Cherasse, J. Dong, G. Trippé-Allard, E. Deleporte, D. Garrot, S. Maehrlein, M. Wolf, Z. Chen, E. Papalazarou, M. Marsi, J.-P. Rueff, A. Taleb-Ibrahimi, L. Perfetti,

**"Electron Dynamics in Hybrid Perovskites Reveal the Role of Organic Cations on the Screening of Local Charges",**

Nano Lett. **22**, 2065 (2022) – [HAL]

C. Mayer, H. Levy-Falk, M. Rémond, G. Trippé-Allard, F. Fossard, M. Vallet, M. Lepeltier, N. Guiblin, J.-S. Lauret, D. Garrot, E. Deleporte,  
**"Synthesis of highly calibrated CsPbBr<sub>3</sub> nanocrystal perovskites by soft chemistry"**,  
Chem. Comm. **58**, 5960 (2022) – [HAL]

## 2021

G. Garcia-Arellano, G. Trippé-Allard, L. Legrand, T. Barisien, D. Garrot, E. Deleporte, F. Bernardot, C. Testelin, M. Chamarro,  
**"Energy Tuning of Electronic Spin Coherent Evolution in Methylammonium Lead Iodide Perovskites"**,  
Journal of Physical Chemistry Letters **12**, 8272 (2021) – [HAL]

F. Lédée, P. Audebert, G. Trippé-Allard, L. Galmiche, D. Garrot, J. Marrot, J.-S. Lauret, E. Deleporte, C. Katan, J. Even, C. Quarti,  
**"Tetrazine molecules as efficient electronic diversion channel in 2D organic-inorganic perovskites"**,  
Materials Horizons **8**, 1547 (2021) – [HAL]

M. E. Bathen, A. Galeckas, R. Karsthof, A. Delteil, V. Sallet, A. Y. Kuznetsov, L. Vines,  
**"Resolving Jahn-Teller induced vibronic fine structure of silicon vacancy quantum emission in silicon carbide"**,  
Phys. Rev. B **104**, 045120 (2021) – [HAL] – [RC]

E. Garcia, C. Arnold, J.-P. Hermier, M. D'Amico,  
**"Gold plasmonic enhanced luminescence of silica encapsulated semiconductor hetero-nanoplatelets"**,  
Nanoscale Adv. (2021) (open access) – [HAL]

C. Fournier, A. Plaud, S. Roux, A. Pierret, M. Rosticher, K. Watanabe, T. Taniguchi, S. Buil, X. Quélin, J. Barjon, J.-P. Hermier, A. Delteil,  
**"Position-controlled quantum emitters with reproducible emission wavelength in hexagonal boron nitride"**,  
Nature Communications **12**, 3779 (2021) (open access) – [HAL] – [arXiv] – [data]

T. P. L. Ung, X. Quélin, J. Laverdant, R. Fulcrand, J.-P. Hermier, S. Buil,

**"Localization of plasmon modes in a 2D photonic nanostructure with a controlled disorder",**

Optics Express **29**, 20776 (2021) (open access) – [HAL]

## **2020**

V. Blondot, A. Bogicevic, A. Coste, C. Arnold, S. Buil, X. Quélin, T. Pons, N. Lequeux, J.-P. Hermier,

**"Fluorescence properties of self assembled colloidal supraparticles from CdSe/CdS /ZnS nanocrystals",**

New J. Phys. **22**, 113026 (2020) (open access) – [HAL] – [data].

T. P. L. Ung, R. Jazi, J. Laverdant, R. Flucrand, G. Colas des Francs, J.-P. Hermier, X. Quélin, S. Buil,

**"Scanning the plasmonic properties of a nanohole array with a single nanocrystal near field probe",**

Nanophotonics **9**, 793 (2020) - [HAL]

A. Coste, L. Moreaud, G. Colas des Francs, S. Buil, X. Quélin, E. Dujardin, J.-P. Hermier,

**"Dramatic decrease of the Joule losses in the coupling between a crystalline gold and single colloidal CdSe/CdS nanocrystals at 4K",**

Phys. Rev. B **101**, 075406 (2020) – [HAL]

T. H. Au, J. Audibert, D. T. Trinh, D. B. Do, S. Buil, X. Quélin, J.-P. Hermier, N. D. Lai,

**"Controllable movement of single-photon source in multifunctional magneto-photonic structures",**

Sci. Rep. **10**, 4843 (2020) – [HAL]

## **2019**

M. Manceau, S. Vezzoli, Q. Glorieux, E. Giacobino, L. Carbone, M. DeVittorio, J.P. Hermier, A. Bramati,

**"CdSe/CdS DotinRods Nanocrystals Fast Blinking Dynamics",**

ChemPhysChem. **19**, 3288 (2019) – [HAL] – [arXiv]

T. H. Au, S. Buil, X. Quélin, J.-P. Hermier, N. D. Lai,

**"High directional radiation of single photon emission in dielectric antenna",**

ACS Photonics **6**, 11 (2019) – [HAL]

A. Delteil, C. T. Ngai, T. Fink, A. Imamoglu,

**"Second-order photon correlation measurement with picosecond resolution using frequency upconversion"**,

Optics Lett. **44**, 3877 (2019) – [HAL] – [arXiv] – [RC]

T. H. Au, S. Buil, X. Quélin, J.-P. Hermier, N. D. Lai,

**"Photostability and long-term preservation of colloidal semiconductor-based single photon emitter in polymeric photonic structures"**,

Nanoscale Adv. **1**, 3225 (2019) – [HAL]

## **2018**

T. H. Au, S. Buil, X. Quélin, J.-P. Hermier, N. D. Lai,

**"Suppression of grey state and optimization of the single photon emission of a colloidal semiconductor at room temperature"**,

Appl. Phys. Lett. **113**, 111105 (2018) – [HAL]

R. Jazi, T. P. L. Ung, P. Maso, G. Colas des Francs, M. Nasilowski, B. Dubertret, J.-P. Hermier, X. Quélin, S. Buil,

**"Measuring the orientation of a single CdSe/CdS nanocrystal at the end of a near-field tip for the realization of a versatile active SNOM probe"**,

Phys. Chem. Chem. Phys. **20**, 16444 (2018) – [HAL]

D. Canneson, B. Berini, S. Buil, J.-P. Hermier, X. Quélin,

**"3D vector distribution of the electro-magnetic fields on a random gold film"**,

Optics Comm. **414**, 113 (2018) – [HAL]

## **2017**

A. Coste, F. Eloi, G. Colas des Francs, X. Quélin, S. Buil, A. Bouhelier, J.-C. Weeber, M. Nasilowski, B. Dubertret, J.-P. Hermier,

**"Significant decrease of the optical losses in the coupling between colloidal CdSe /CdS nanocrystals and a flat gold film at cryogenic temperature"**,

Phys. Rev. B **96**, 195416 (2017) – [HAL]

T. P. L. Ung, X. Quélin, B. Berini, G. Colas des Francs, M. Nasilowski, B. Dubertret, J.-

P. Hermier, S. Buil,

**"Probing the hot spot properties of semicontinuous gold films through the fluorescence polarization of CdSe/CdS colloidal nanocrystals",**

J. Nanophot. **11**, 046005 (2017) – [HAL]

## 2016

C. Sinito, X. Quélin, N. Simon, P. Gautier, A-M. Gonçalves, S. Buil, J-P. Hermier, D. Aureau,

**"Förster resonance energy transfer between individual semiconductor nanocrystal and an InP film",**

J. Nanophot. **10**, 046014 (2016) – [HAL]

D. Canneson, E. Le Moal, S. Cao, X. Quélin, H. Dallaporta, G. Dujardin, and E. Boer-Duchemin,

**"Surface plasmon polariton beams from an electrically excited plasmonic crystal",**

Opt. Express **24**, 26186 (2016)

F. Eloi, H. Frederich, F. Mazéas, A. Kumar, S. Buil, X. Quélin, A. Bouhelier, J.C. Weeber, M. Nasilowski, B. Dubertret, G. Colas des Francs, and J.-P. Hermier,

**"Enhanced and polarized emission from single colloidal CdSe/CdS nanocrystals coupled to a 1D gold grating",**

Phys. Rev. B **94**, 085301 (2016) – [HAL]

J.-C. Weeber, K. Hammani, G. Colas Des Francs, A. Bouhelier, J. Arocas, A. Kumar, F. Eloi, S. Buil, X. Quélin, J.-P. Hermier, M. Nasilowski, B. Dubertret,

**"Colloidal quantum dot integrated light sources for plasmon mediated photonic waveguide excitation",**

ACS Photonics **3**, 844 (2016)

## 2015

F. Eloi, H. Frederich, A. Leray, S. Buil, X. Quélin, B. Ji, E. Giovanelli, N. Lequeux, B. Dubertret, and J.-P. Hermier,

**"Unraveling the time cross correlations of an emitter switching between two states with the same fluorescence intensity",**

Optics Express **23**, 29921 (2015) – [HAL]

A. Kumar, J.-C. Weeber, A. Bouhelier, F. Eloi, S. Buil, X. Quélin, M. Nasilowski, B. Dubertret, J.-P. Hermier, G. Colas des Francs,

**"Spatially uniform enhancement of single quantum dot emission using plasmonic grating decoupler",**

Scientific Reports **5**, 16976 (2015) – [HAL]

L. Biadala, H. Frederich, L. Coolen, S. Buil, X. Quélin, C. Javaux, M. Nasilowski, B. Dubertret, and J.-P. Hermier,

**"Photon-correlation Fourier spectroscopy of the trion fluorescence in thick-shell CdSe/CdS nanocrystals",**

Phys. Rev. B **91**, 085416 (2015) – [HAL]

» Publications 2010-2014

» Publications 2006-2009