

nanoMIR

Groupe “nanoMIR” / “nanoMIR” group
“Composants à nanostructures pour Moyen Infra-Rouge”
“Nanostructure-based devices for Mid-Infra-Red Applications”

Publication list (2022)

C-INV : Communications invitées / Invited communications (national or international)

E. Tournié, MBE growth of mid-infrared lasers on Silicon, 22nd International Conference on Molecular-Beam Epitaxy (MBE 2022), 4 – 9 September 2022, Sheffield (UK): plenary conference.

J.-B. Rodriguez, L. Cerutti, A.N. Baranov, A. Gilbert, M. Rio-Calvo, A.J. Remis, D. A. Diaz Thomas, A. Meguekam, Z. Lohgmarí, R. Teissier, and E. Tournié, Cascade lasers epitaxially grown on Silicon substrates, IQCLSW 2022, 23 – 28 August 2022, Zürich (Switzerland).

Thierry Taliercio, Plasmonique Infrarouge dans les Semiconducteurs, Optical Systems and Quantum Devices for MIR and THz technologies, GDR Nano-THz-MIR, Fréjus - France, 27 juin – 1 juil. 2022

E. Centeno, R. Smaali, F. Gonzalez-Posada, L. Cerutti, A. Moreau, F. Omeis, T. Taliercio, Plasmonic and metamaterial devices based on highly doped semiconductors for infrared applications. 8th International Conference on Antennas and Electromagnetic Systems, AES 2022, Marrakesh – Morocco, 24-27 May 2022

P. Loren, J. Guise, F. Barho, P. Fehlen, M. Najem, F. Gonzalez-Posada-Flores, S. Blin, L. Cerutti, R. Smaali, E. Centeno and T. Taliercio, Semiconductor plasmonics and metamaterials for IR applications, Photonic West OPTO (SPIE), San Francisco, CA, United States, 22-27 January 2022

P. Loren, J. Guise, F. Barho, N. Aubergier, P. Fehlen, M. Najem, F. Gonzalez-Posada-Flores, S. Blin, L. Cerutti, R. Smaali, E. Centeno and T. Taliercio, Quantum plasmonics and hyperbolic material for biosensing, Photonic West OPTO (SPIE), San Francisco, CA, United States, 22-27 January 2022

ACL : Articles dans des revues internationales avec comité de lecture référencées par ISI web / Peer reviewed publications referenced by ISIweb

1. Marta Rio Calvo, Jean-Baptiste Rodriguez, Charles Cornet, Laurent Cerutti, Michel Ramonda, Achim Trampert, Gilles Patriarche, and Éric Tournié. Crystal Phase Control during Epitaxial Hybridization of III-V Semiconductors with Silicon. Adv. Electron. Mater. 2022, 2100777, <https://doi.org/10.1002/aelm.202100777>
2. C. Avogadri, S. Gebert, S. S. Krishtopenko, I. Castillo, C. Consejo, S. Ruffenach, C. Roblin, C. Bray, Y. Krupko, S. Juillaguet, S. Contreras, A. Wolf, F. Hartmann, S. Höfling, G. Boissier, J.-B. Rodriguez, S. Nanot, E. Tournié, F. Teppe, and B. Jouault, Large inverted band-gap in strained three-layer InAs/GaSb quantum wells, Phys. Rev. Res. 4, L042042 (2022). <https://doi.org/10.1103/PhysRevResearch.4.L042042>.

3. K. Kinjalk, A. Gilbert, A. Remis, Z. Loghmari, L. Cerutti, G. Patriarche, M. Bahriz, R. Teissier, A.N. Baranov, J.-B. Rodriguez, and E. Tournié, Quantum cascade lasers monolithically integrated on germanium, *Optics Express* 30(25), 45259 (2022). <https://doi.org/10.1364/OE.472473>.
4. Michele Paparella, Laura Monge Bartolome, Jean-Baptiste Rodriguez, Laurent Cerutti, Marco Grande, Liam O'Faolain, and Eric Tournié, Analysis of the optical coupling between GaSb diode lasers and passive waveguides: a step toward monolithic integration on Si platforms, *IEEE Photon. Journal* 14(5), 6651206 (2022). <https://doi.org/10.1109/JPHOT.2022.3203593>
5. Laura Monge-bartolome , Laurent Cerutti , Eric Tournié, Impact of the ridge etching-depth on GaSb-based laser diodes, *Electronics Letters*, 58, 4, pp162-163 February 2022, <https://doi.org/10.1049/ell2.12392>.
6. Eric Tournié, Laura Monge-Bartolome, Marta Rio Calvo, Zeineb Loghmari, Roland Teissier, Alexei N. Baranov, Laurent Cerutti, and Jean-Baptiste Rodriguez, Mid-infrared III-V semiconductor lasers epitaxially grown on Si substrates (reviewpaper), *Light: Sci. & Appl.*, 11, 165 (2022). <https://doi.org/10.1038/s41377-022-00850-4>
7. L. Gavotto, S. Parola, F. Martinez, Y. Rouillard, E. Tournié, and Y. Cuminal, Characterization and simulation of AlGaAsSb/GaSb tandem solar cell, *IEEE J. Photovolt.* 12(4), 968 – 975 (2022). <https://doi.org/10.1109/JPHOTOV.2022.3164690>.
8. Diba Ayache, Wioletta Trzpił, Roman Rousseau, Kumar Kinjalk, Roland Teissier, Alexei N. Baranov, Michael Bahriz, and Aurore Vicet, "Benzene sensing by Quartz Enhanced Photoacoustic Spectroscopy at 14.85 μm ," *Opt. Express* 30, 5531-5539 (2022) <https://doi.org/10.1364/OE.447197>
9. Melissa Najem, Franck Carcenac, Thierry Taliercio, and Fernando Gonzalez-Posada, Aluminum Bowties for Plasmonic-Enhanced Infrared Sensing, *Adv. Optical Mater.* 2201025 (2022) <https://doi.org/10.1002/adom.202201025>
10. O. Spitz, P. Didier, L. Durupt, D.A. Diaz-Thomas, A.N. Baranov, L. Cerutti and F. Grillot "Free-Space Communication With Directly Modulated Mid-Infrared Quantum Cascade Devices" *IEEE Journal of Selected Topics in Quantum Electronics* 28 (1) 1200109 (2022). [10.1109/JSTQE.2021.3096316](https://doi.org/10.1109/JSTQE.2021.3096316)
11. E. Rogowicz, J. Kopacek, M.P. Polak, O. Delorme, L. Cerutti, E. Tournié, J.B. Rodriguez, R. Kudrawiec, and M. Syperek "Carrier dynamics in (Ga,In)(Sb,Bi)/GaSb quantum wells for laser applications in the mid-infrared spectral range" *Scientific Reports*, 12:12961 (2022). <https://doi.org/10.1038/s41598-022-16966-x>
12. J.A.M. Fordyce, D.A. Diaz-Thomas, L. O'Faolain, A.N. Baranov, T. Piwonski, and L. Cerutti "Single-Mode interband cascade laser with a slotted waveguide" *Applied Physics Letters* 121, 211102 (2022). <https://doi.org/10.1063/5.0120460>
13. Aouad, F. Z. Meharrar, A. Cheriet, P. Christol, H. Aït-Kaci, "Energy band offsets and charge transport process in an InAsSb based nBn structure: A numerical simulation", *Micro and Nanostructures* 172, 207448 (2022), <https://doi.org/10.1016/j.micrna.2022.207448>
14. M. Bouschet, V. Arounassalame, A. Ramiandrasoa, I. Ribet-Mohamed, J.P. Perez, N. Péré-Laperne, P. Christol, "Temperature Dependence Study of Electrical and Electro-Optical Performances of Midwave Infrared Ga-Free T2SL Barrier Photodetector" *Applied Sciences* 12, 10358 (2022). <https://doi.org/10.3390/app122010358>
15. V. Arounassalame, M. Bouschet, R. Alchaar, R. Ferreira, F. Carosella, A. Ramiandrasoa, J.P. Perez, N. Péré-Laperne, P. Christol, I. Ribet-Mohamed "Anisotropic transport investigation through different etching depths in InAs/InAsSb T2SL barrier midwave infrared detector" *Infrared Physics & Technology*, 126, 104315 (2022), <https://doi.org/10.1016/j.infrared.2022.104315>
16. Cheriet, M. Mebarki, P. Christol, H. Aït-Kaci "Role of metallic contacts and defects on performances of an antimonide based thermo-photovoltaic cell: A numerical analysis" *Solar Energy* 241, 660-670 (2022), <https://doi.org/10.1016/j.solener.2022.06.040>
17. Kumar Kinjalk, Daniel Andres Díaz-Thomas, Zeineb Loghmari, Michael Bahriz, Roland Teissier, et al.. InAs-Based Quantum Cascade Lasers with Extremely Low Threshold. *Photonics*, 2022, 9 (10), pp.747. <https://doi.org/10.3390/photonics9100747>

18. E. Cherotchenko, V. Dudevlev, D. Mikhailov, S. Losev, A. Babichev, et al.. Observation of Long Turn-on Delay in Pulsed Quantum Cascade Lasers. *Journal of Lightwave Technology*, 2022, 40 (7), pp.2104-2110.
<https://doi.org/10.1109/JLT.2021.3134837>
19. Jussi Rossi, Juho Uotila, Sucheta Sharma, Tuomas Hieta, Toni Laurila, et al.. Optical power detector with broad spectral coverage, high detectivity, and large dynamic range. *Optics Letters*, 2022, 47 (7), pp.1689-1692.
<https://doi.org/10.1364/OL.455191>

C-ACTI : Communications avec actes dans un congrès international / Communications with proceedings at international conferences.

1. D. Ayache, W. Trzpil, J. Charenzol, R. Rousseau, N. Maurin, F. Gouzi, M. Bahriz, A. Vicet. Infrared spectroscopy for exhaled breath diagnosis, Photonics West 22-27 January 2022, San Francisco USA
2. W. Trzpil, D. Ayache, R. Rousseau, J. Charenzol, A. Vicet and M. Bahriz. A silicon micromechanical resonator with capacitive transduction for laser-based photoacoustic spectroscopy Photonics West 22-27 January 2022, San Francisco USA
3. W. Trzpil, R. Rousseau, D. Ayache, J. Charenzol, A. Vicet and M. Bahriz. A capacitive resonant MOEMS on silicon for photoacoustic spectroscopy Photonics West 22-27 January 2022, San Francisco USA
4. P. Loren, J. Guise, F. Barho, P. Fehlen, M. Najem, F. Gonzalez-Posada-Flores, S. Blin, L. Cerutti, R. Smaali, E. Centeno and T. Taliercio, Semiconductor plasmonics and metamaterials for IR applications, Photonic West OPTO (SPIE), San Francisco, CA, United States, 22-27 January 2022
5. P. Loren, J. Guise, F. Barho, N. Aubergier, P. Fehlen, M. Najem, F. Gonzalez-Posada-Flores, S. Blin, L. Cerutti, R. Smaali, E. Centeno and T. Taliercio, Quantum plasmonics and hyperbolic material for biosensing, Photonic West OPTO (SPIE), San Francisco, CA, United States, 22-27 January 2022
6. M. Bouschet, V. Arounassalame, R. Alchaar, J. P. Perez, N. Péré-Laperne, I. Ribet-Mohamed, P. Christol "Electro-optical performances and anisotropic transport study of Ga-free type-II superlattice barrier structure. QSIP 2022 conference, Krakow (Poland), July 2022 Proc. Optoelectronics Review, 31, e144549 (2023)
7. C. Bataillon, J.P. Perez, R. Alchaar, A. Michez, O. Gilard, O. Saint-Pé, P. Christol, " Superlattice-based infrared photodetectors under proton irradiation » QSIP 2022 conference, Krakow (Poland), July 2022. Proc. Optoelectronics Review, 31, e144552 (2023)
8. C. Bataillon, J.P. Perez, R. Alchaar, D.A. Díaz-Thomas, O. Saint-Pé, O. Gilard, P. Christol "Irradiation Temperature Influence on the Degradation of the Dark Current of MidWave InfraRed T2SL Detectors". Proc. IEEE TNS, IEEE Nuclear & Space Radiation Effects Conference (NSREC 2022), Provo(Utah, USA), July 2022, doi : 10.1109/TNS.2022.3223158

C-COM : Communications orales sans actes dans un congrès international ou national / Oral communications without proceedings at international or national conferences.

F. Rusconi, P. Fehlen, F. Gonzalez-Posada, L. Cerutti, G. Pellegrini, M. Finazzi, P. Biagioni, T. Taliercio, Mid-infrared dielectric antennas on ENZ substrates, The 16th International Conference on Near-Field Optics, Nanophotonics and Related Techniques, Victoria, BC, Canada, 29 August - 2 September 2022

M. Najem, F. Carcenac, T. Taliercio, F. Gonzalez-Posada Flores, Aluminum bowties for broadband SEIRA sensing, Nanophotonics and Micro/Nano Optics International Conference 2022, Paris, France, 25 - 27 October 2022

F. Rusconi, P. Fehlen, F. Gonzalez-Posada, L. Cerutti, G. Pellegrini, M. Finazzi, P. Biagioni, T. Taliercio, Mid-infrared dielectric antennas on ENZ substrates, 8th edition of the Workshop on Plasmonics and its Applications, "PLASMONICA 2022", Turin, Italy, July 7-8, 2022.

M. Najem, F. Carcenac, F. Gonzalez-Posada, T. Taliercio, Barcode-like Aluminum Bowties towards an extended SEIRA sensing, 8th edition of the Workshop on Plasmonics and its Applications, "PLASMONICA 2022", Turin, Italy, July 7-8, 2022.

J. Guise, S. Blin, F. Gonzalez-Posada Flores, H. Ratovo, L. Cerutti, Rafik Smaali, E. Centeno, M. Thual and T. Taliercio, Optically-tuned THz modulator based on meta-surface (integrated in WR1.0 waveguide), French - German Terahertz Conference, La Grande Motte, France, 16th-18th May 2022

L. Cerutti, D. A. Diaz-Thomas, J.B. Rodriguez, M. Rio Calvo, A.N. Baranov, and E. Tournié "Long Life time interband cascade laser grown on on-axis Si(100)" SPIE Photonics West, Opto-2022, "Novel In-plane Semiconductor Lasers XIX", 22 – 27 January 2022, San Francisco (USA), paper 120210A. <https://doi.org/10.1117/12.2607755>

A. Rémis, L. Monge Bartolomé, G. Boissier, J.B. Rodriguez, L. Cerutti and E. Tournié "Effect of quantum-well number on the performance of GaSb-based type-I laser diodes grown on silicon" SPIE Photonics West, Opto-2022, "Novel In-plane Semiconductor Lasers XIX", 22 – 27 January 2022, San Francisco (USA), paper 120210I. <https://doi.org/10.1117/12.2607753>

A. Rémis, D.A. Diaz-Thomas, L. Monge Bartolomé, M. Rio-Calvo, A. Gilbert, G. Boissier, A.N. Baranov, J.B. Rodriguez, L. Cerutti and E. Tournié "Mid-Infrared Sb-based interband lasers grown on on-axis Si(001) substrates" Oral: Compound semiconductor Week (CSWeek 2022), Ann-Arbor, USA, 1-3 June 2022. <https://doi.org/10.1109/CSW55288.2022.9930402>

O. Spitz, S. Zhao, D. Diaz-Thomas, L. Cerutti, A.N. Baranov, D. Rontani, and F. Grillot "Characterization of optical chaos in mid-Infrared interband cascade lasers" Oral: Advanced Photonics Congress, Paper NP2W2F.2, Maastricht, Netherlands, 24-28 July 2022.

O. Spitz, S. Zhao, P. Didier, D. Diaz-Thomas, L. Cerutti, A.N. Baranov, H. Knötig, R. Weih, J. Köth, B. Schwarz, and F. Grillot "Interband cascade technology for next-generation mid-IR communication and quantum applications" Oral: 2022 IEEE Photonics society Summer topicals Meeting series (SUM) , Cabo Santa Lucas, Mexico, 11-13 July 2022. <https://doi.org/10.1109/SUM53465.2022.9858128>

A. Gilbert, J.B. Rodriguez, M. Rio-Calvo, M. Ramonda, L. Cerutti, C. Cornet, A. Trampert, G. Patriarche and E. Tournié "Molecular beam epitaxy of III-V semiconductors on group-IV (001) substrates: Formation and burying of antiphase domains" Oral: International Conference on Molecular Beam Epitaxy (IC-MBE), Sheffield, UK, 4-9 September 2022.

A. Arnoult, Y. Rousseau, P. Gérard, and L. Cerutti, C. Cornet, A. Trampert, G. Patriarche and E. Tournié "Automatic lattice mismatch control assisted by curvature" Oral: International Conference on Molecular Beam Epitaxy (IC-MBE), Sheffield, UK, 4-9 September 2022.

L. Cerutti, D. A. Diaz-Thomas, M. Fagot, A. Gilbert, J.B. Rodriguez, A.N. Baranov, and E. Tournié "Type-II interband cascade lasers grown on mismatched substrates" Oral: International Conference on Molecular Beam Epitaxy (IC-MBE), Sheffield, UK, 4-9 September 2022.

P. Didier, H. Knötig, O. Spitz, L. Cerutti, A. Lardschneider, D.A. Diaz-Thomas, A.N. Baranov, R. Weih, J. Köth, B. Schwarz and F. Grillot "Interband cascade technology enables high speed free-space communication in the mid-infrared transparency windows of the atmosphere" Oral: Laser Congress 2022, Paper LsTh2C.4, Barcelona, Spain, 11-15 December 2022.

G. Krizman, F. Carosella, J. Bermejo-Ortiz*, J.P. Perez, P. Christol, L.A. de Vaulchier, Y. Guldner, "Engineering InAs/InAsSb superlattices for midwave infrared detection using magneto-optics" QSIP 2022 conference, Krakow (Poland), July 2022

V. Arounassalame, M. Guénin, P. Christol, L. Höglund, I. Ribet-Mohamed "Study of Electro-optical Performances of T2SL Technology" QSIP 2022 conference, Krakow (Poland), July 2022

B. Roux*, M. Bouschet, S. Parola, F. Martinez, P. Christol, J.P. Perez, R. Vaillon, « Harvesting mid-wave infrared radiation with type-II InAs/InAsSb superlattices: from photodetectors to thermophotovoltaic cells" 13th Conference on Thermophotovoltaic Generation of Electricity (TPV-13) , Miyazaki (Japan) & online (hybrid), April 2022

C-AFF : Communications par affiche dans un congrès international ou national / Poster at international or national conferences.

A. Taleb Bendiab, C. Pohar, M. Mortamais, N. Marchi, J. Perroy, A. Baghdadli, T. Taliercio, F. Gonzalez-Posada Flores, Glyphosate IR spectroscopy with a plasmonic sensor optical transducer based in

functionalized semiconductor nanoantennas, Nanophotonics and Micro/Nano Optics International Conference 2022, Paris, France, 25 - 27 October 2022

F. Gonzalez-Posada Flores, D. Coquillat, M. Najem, T. Taliercio, THz time-domain spectroscopy modulated with semiconductor plasmonic perfect absorbers, Nanophotonics and Micro/Nano Optics International Conference 2022, Paris, France, 25 - 27 October 2022

M. Najem, F. Carcenac, T. Taliercio, F. Gonzalez-Posada, Multiresonant Aluminum Bowties for broadband SEIRA sensing, Conference on Micro and Nano Engineering, MNE EuroSensors, Leuven, Belgium, 19th-23rd September 2022

C. Gureghian, G. Vincent, J-B. Rodriguez, G. Sombrio, I. Ribet-Mohamed, T. Taliercio, Heavily doped semiconductor nanostructures on LWIR T2SL for reduced detector thickness, 12th International Conference on Metamaterials, Photonic Crystals and Plasmonics, META, Torremolinos - Spain, 19 - 22 July 2022.

J. Guise, H. Ratovo, S. Blin, L. Cerutti, J.-B. Rodriguez, E. Centeno, M. Thual and T. Taliercio, Waveguide-integrated optically-controlled THz modulator, 47th International Conference on Infrared, Millimeter and Terahertz Waves (IRMMW-THz) 2022, Delf, The Netherlands, 28th August – 2 September 2022.

F. Gonzalez-Posada Flores, D. Coquillat, M. Najem, T. Taliercio, THz time-domain spectroscopy modulated with semiconductor plasmonic perfect absorbers, French - German Terahertz Conference, La Grande Motte, France, 16th-18th May 2022

Eduardo Alvear-Cabezon, Emmanuel Centeno, Rafik Smaali, Fernando Gonzalez-Posada, Stephane Blin, Thierry Taliercio, All-optical terahertz modulation with an epsilon near-zero material, 8th International Conference on Antennas and Electromagnetic Systems, AES 2022, Marrakesh – Morocco, 24-27 May 2022