

nanoMIR

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

Publication list (2021)

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

The need of deep etching to fabricate Ga-free InAs/InAsSb T2SL nBn mid-wave Infrared photodetector ? (oral, virtual conference)

M. Bouschet, V. Arounassalama, R. Alchaar, C. Bataillon, J.-P. Perez, N. Péré-Laperne, I. Ribet-Mohamed, P. Christol

SPIE Security + Defence 2021, Madrid, september 2021

Proceedings of the SPIE " Electro-optical and Infrared Systems: Technology and Applications XVIII and Electro-Optical Remote Sensing XV, vol 11866, p.12-19 (2021). <https://doi.org/10.1117/12.2600113>

Monolithic Integration of Mid-IR Lasers on Silicon

E. Tournié, M. Rio Calvo, L. Monge-Bartolome, Z. Loghmari, R. Teissier, A. N. Baranov, L. Cerutti, and J.-B. Rodriguez.

8th International Workshop Epitaxial Growth and Fundamental Properties of Semiconductor Nanostructures (SemiconNano), 30 August – 3 September 2021, Milano, Italy (on-line conference).

Mid-infrared III-V semiconductor lasers grown on (001)Si substrates

E. Tournié, L. Monge-Bartolome, M. Rio Calvo, D. A. Diaz-Thomas, Z. Loghmari, R. Teissier, A. N. Baranov, J.-B. Rodriguez and L. Cerutti,

IEEE Summer Topicals Meeting Series, 19 – 21 July 2021, on-line meeting: paper WC2.2.

Mid-IR lasers monolithically integrated on on-axis Silicon

E. Tournié, M. Rio Calvo, L. Monge-Bartolome, Z. Loghmari, D. A. Diaz-Thomas, G. Boissier, A. Meguekam, R. Teissier, A. N. Baranov, L. Cerutti, and J.-B. Rodriguez.

CLEO Europe, 20 – 24 June 2021, Munich (Germany): online presentation.

Mid-IR lasers epitaxially grown on on-axis (001)Si substrates

E. Tournié, M. Rio Calvo, L. Monge-Bartolome, Z. Loghmari, D. A. Diaz-Thomas, G. Boissier, A. Meguekam, M. Bahriz, R. Teissier, A. N. Baranov, L. Cerutti, and J.-B. Rodriguez.

SPIE Photonics West, Opto Symposium, 6 – 10 March 2021, paper PW21-OE602: online presentation. <https://doi.org/10.1117/12.2576790>.

Heavily doped semiconductor for bio-sensing and active plasmonics

P. Loren, J. Guise, F. Barho, E. Alvear-Cabazon, P. Felhen, M. Najem, F. Gonzalez-Posada-Flores, S. Blin, L. Cerutti, R. Smaali, E. Centeno and T. Taliercio

C-Nano 2020, Toulouse, GdR NACRE, Tuesday November 23rd, 2021

Semiconductor plasmonics for bio-sensing and active plasmonics

P. Loren, J. Guise, F. Barho, E. Alvear-Cabazon, P. Felhen, M. Najem, F. Gonzalez-Posada-Flores, S. Blin, R. Smaali, E. Centeno and T. Taliercio

Global Summit and Expo on Laser, Optics and Photonics (GSELOP2021) August 23-25, 2021, Paris, France

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

1. Monolithic Double Resonator for Quartz Enhanced Photoacoustic Spectroscopy. Rousseau, R.; Ayache, D.; Maurin, N.; Trzopil, W.; Bahriz, M.; Vicet, A. Appl. Sci. 2021, 11, 2094. <https://doi.org/10.3390/app11052094>
2. Analytic Optimization of Cantilevers for Photoacoustic Gas Sensor with Capacitive Transduction. Trzopil, W.; Maurin, N.; Rousseau, R.; Ayache, D.; Vicet, A.; Bahriz, M., Sensors 2021, 21, 1489. <https://doi.org/10.3390/s21041489>
3. Thermal performance of GaInSb quantum well lasers for silicon photonics applications, Christopher Richard Fitch, Graham W Read, Igor P. Marko, Dominic Andrew Duffy, Laurent Cerutti, Jean-Baptiste Rodriguez, Eric Tournié, and Stephen J. Sweeney, Appl. Phys. Lett. 118, 101105 (2021); <https://doi.org/10.1063/5.0042667>. Erratum: Appl. Phys. Lett. 118, 189903 (2021); <https://doi.org/10.1063/5.0054686>
4. GaSb-based laser diodes grown on MOCVD GaAs-on-Si templates, L. Monge-Bartolomé, B. Shi, B. Lai, G. Boissier, L. Cerutti, J.-B. Rodriguez, K.M. Lau, E. Tournié, Optics Express 29(7), 11268 (2021). <https://doi.org/10.1364/OE.419396>.
5. Near-Field Thermophotovoltaic Conversion with High Electrical Power Density and Cell Efficiency above 14%. Christophe Lucchesi, Dilek Cakiroglu, Jean-Philippe Perez, Thierry Taliercio, Eric Tournié, Pierre-Olivier Chapuis, and Rodolphe Vaillon, ACS NanoLetters 21(11), 4524 – 4529 (2021) ; <https://doi.org/10.1021/acs.nanolett.0c04847>
6. Modeling and Characterization of an MBE-Grown Concentrator P-N GaSb Solar Cells Using a Pseudo-3D Model. Joanna Kret, Stéphanie Parola, Frédéric Martinez, Alexandre Vauthelin, Julie Tournet, Yves Rouillard, Eric Tournié, and Yvan Cuminal, IEEE J. Photovolt. 11(4), 1032 – 1039 (2021) ; <https://doi.org/10.1109/JPHOTOV.2021.3075290>
7. Passive Electrical Damping of a Quartz Tuning Fork as a Path to Fast Resonance Tracking in QEPAS. R. Rousseau, D. Ayache, W. Trzopil, M. Bahriz and A. Vicet. Sensors 2021, 21(15), 5056; <https://doi.org/10.3390/s21155056>
8. Selective area growth by hydride vapor phase epitaxy and optical properties of InAs nanowires arrays. Gabin Grégoire, Mohammed Zeghouane, Curtis Goosney, Nebile Isik Goktas, Philipp Staudinger, Heinz Schmid, Kirsten E. Moselund, Thierry Taliercio, Eric Tournié, Agnès Trassoudaine, Evelyne Gil, Ray R. LaPierre, Yamina André, Cryst. Growth & Design, 21(9), 5158 – 5163 (2021). <https://doi.org/10.1021/acs.cgd.1c00518>
9. Breath acetone concentration: too heterogeneous to constitute a diagnosis or prognosis biomarker in heart failure? A systematic review and meta-analysis. Fares Gouzi, Diba Ayache, Christophe Hedon, Nicolas Molinari and Aurore Vicet. J. Breath Res. 16 (2022) 016001 <https://doi.org/10.1088/1752-7163/ac356d>
10. Relative intensity noise and intrinsic properties of RF mounted interband cascade laser. P. Didier, O. Spitz, L. Cerutti, D.A. Diaz Thomas, A.N. Baranov, M. Carras, and F. Grillot. Applied Physics Letters 119, 171107 (2021). <https://doi.org/10.1063/5.0070981>
11. Quantum well interband semiconductor lasers highly tolerant to dislocations. L. Cerutti, D.A. Diaz Thomas, J.B. Rodriguez, M. Rio-Calvo, G. Patriarche, A.N. Baranov, and E. Tournié. Optica, 8 (11), 2021. <https://doi.org/10.1364/OPTICA.438272>
12. Reshaping plasmonic resonances using epsilon-near-zero materials for enhanced infrared vibrational spectroscopy. Rafik Smaali, Thierry Taliercio, Antoine Moreau, and Emmanuel Centeno. Appl. Phys. Lett. 119, 183701, 2021. <https://doi.org/10.1063/5.0070748>
13. Inverse-designed terahertz modulators based on semiconductor multilayers. Emmanuel Centeno, Eduardo Alvear-Cabezón, Rafik Smaali, Antoine Moreau, Thierry Taliercio. Semicond. Sci. Technol., 36, 085014, 2021. <https://doi.org/10.1088/1361-6641/ac0d96>
14. 63 MeV proton-induced mild displacement effects in long-wave infrared InAs/GaSb type-II superlattice barrier infrared detectors. R. Alchaar, C. Bataillon, J.-P. Perez, O. Gilard, P. Christol. Journal of Applied Physics, 130, 184501-1084501-6 (2021). <https://doi.org/10.1063/5.0060794>
15. Magneto-spectroscopy investigation of InAs/InAsSb superlattices for midwave infrared detection. G. Krizman, F. Carosella, J. Bermejo-Ortiz, A. Philippe, J. B. Rodriguez, J.-P. Perez, P. Christol, L.-A. de Vaulchier, Y. Guldner. Journal of Applied Physics, 130, 055704-055704-8 (2021). <https://doi.org/10.1063/5.0054320>

16. Influence of pixel etching on electrical and electro-optical performances of a Ga-Free InAs/InAsSb T2SL Barrier Photodetector for mid-wave infrared imaging. M. Bouschet, U. Zavala-Moran, V. Arounassalame, R. Alchaar, C. Bataillon, I. Ribet-Mohamed, F. De Anda-Salazar, J.P. Perez, N. Péré-Laperne, P. Christol. *Photonics* 8, 194-194-12 (2021). <https://doi.org/10.3390/photonics8060194>
17. Robust evaluation of long term stability of an InAs/GaSb type II superlattice midwave infrared focal plane array. V Arounassalame, M Guénin, M Caes, L Höglund, E Costard, P Christol, I Ribet-Mohamed. *IEEE Transactions on Instrumentation and Measurement*, 70, 5001108-5001108-8 (2021) DOI: [10.1109/TIM.2020.3024406](https://doi.org/10.1109/TIM.2020.3024406)
18. A silicon micromechanical resonator with capacitive transduction for enhanced photoacoustic spectroscopy. Trzpil, W., Charenso, J., Ayache, D., Maurin, N., Rousseau, R., Vicet, A., & Bahriz, M. (2021). *Sensors and Actuators B: Chemical*, (November), 131070. <https://doi.org/10.1016/j.snb.2021.131070>.
19. On Feasibility of Population Inversion Between the Quantum Confinement Levels in Quantum Wells Under Interband Photoexcitation. S.V. Egorov, A.G. Petrov, A.N. Baranov, A.O. Zakhar'in, A.V. Andrianov, *J. of Infrared, Millimeter, and Terahertz Waves* 42, 986-1004 (2021) <https://doi.org/10.1007/s10762-021-00826-2>
20. Photoacoustic characteristics of carbon-based infrared absorbers. J. Rossi, J Uotila, S. Sharma, T. Laurila, R. Teissier, A. Baranov, E. Ikonen, M. Vainio, *Photoacoustics* 23, 100265 (2021), <https://doi.org/10.1016/j.pacs.2021.100265>
21. Investigation of AllInAsSb/GaSb tandem cells – A first step towards GaSb-based multi-junction solar cells. J. Kret, J. Tournet, S. Parola, F. Martinez, D. Chemisana, R. Morin, M. de la Mata, N. Fernandez-Delgado, A.A. Khan, S.I. Molina, Y. Rouillard, E. Tournié, Y. Cuminal. *Solar Energy Materials and Solar Cells* 219, 110795 (2021). <https://doi.org/10.1016/j.solmat.2020.110795>
22. High-resolution electrical characterization of RuO₂-borosilicate glass composites Andrea Piarristeguy, Rafael Nuernberg, Dylan Jouglard, Michel Ramonda, Richard Arinero, et al., *Journal of Alloys and Compounds*, 2021, 876, pp.160123. <https://doi.org/10.1016/j.jallcom.2021.160123>

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

1. Impact of proton radiation on dark current of InAs/GaSb type-2 superlattice longwave infrared photodetector - (oral). R. Alchaar, C. Bataillon, J.-P. Perez, O. Gilard, P. Christol. *European Conference on Radiation and its Effects on Components and Systems (RADECS 2021)*, Vienna (Austria), september 2021
2. Electro-optical characterizations to study minority carrier transport in Ga-free InAs/InAsSb T2SL X_{Bn} midwave infrared photodetector (oral, virtual conference). V. Arounassalame, M. Bouschet, R. Alchaar, C. Bataillon, J.-P. Perez, P. Christol, I. Ribet-Mohamed. *SPIE Security + Defence 2021*, Madrid, september 2021. *Proceedings of the SPIE " Electro-optical and Infrared Systems: Technology and Applications XVIII and Electro-Optical Remote Sensing XV*, vol 11866, p.25-34 (2021). <https://doi.org/10.1117/12.2598159>

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

Toward mid-infrared laser diodes on Silicon photonic integrated circuits

Laura Monge Bartolomé, Marta Rio Calvo, Michaël Bahriz, Jean-Baptiste Rodriguez, Laurent Cerutti, and Eric Tournié
CLEO/EUROPE-EQEC 2021, 21 – 25 June 2021, Munich, Germany (virtual conference): **oral communication**.

Carrier recombination and temperature-dependence of GaInSb quantum well lasers for silicon photonics applications

Christopher R Fitch, Graham W Read, Igor P Marko, Dominic A Duny, Laurent Cerutti, Jean-Baptiste Rodriguez, Eric Tournié, and Stephen J Sweeney
CLEO/EUROPE-EQEC 2021, 21 – 25 June 2021, Munich, Germany (virtual conference): **oral communication**.

Sb-based Interband Cascade Mid-IR Devices With Top GaAs Metamorphic Layers

D.A. Díaz-Thomas, O. Stepanenko, M. Bahriz, S. Calvez, C. Paranthoen, E. Tournié, A. Baranov, G. Almuneau, C. Levallois, and L. Cerutti
Compound Semiconductor Week, CSW2021, 10 – 13 May 2021, Stockholm, Sweden (virtual conference).

Mid-infrared Laser Diodes Grown On Various On-axis III-V-on-Si Templates

Laura Monge Bartolomé, Tiphaine Cerba, Mickael Martin, Marta Rio Clavo, Jean-Baptiste Rodriguez, Laurent Cerutti, Thierry Baron, Key May Lau, and Eric Tournié
Compound Semiconductor Week, CSW2021, 10 – 13 May 2021, Stockholm, Sweden (virtual conference).

Etched-facets Mid-IR laser on on-axis Silicon substrate for photonic integrated circuits, Semiconductor and Integrated Optoelectronics Conference

Laura Monge Bartolomé, Marta Rio Calvo, Michaël Bahriz, Jean-Baptiste Rodriguez, Laurent Cerutti and Eric Tournié
Semiconductor and Integrated Optoelectronics Conference (SIOE 2021), March 30 – April 1st, 2021, Cardiff, UK, paper A21-21 (on line).

Analysis and simulation of the relative intensity noise in Fabry-Perot interband cascade laser highlight relaxation oscillations in the GHz range

P. Didier, O. Spitz, D.A. Diaz-Thomas, A.N. Baranov, L. Cerutti, and F. Grillot

Oral: *Conference on Mid-infrared Optoelectronics: Materials and Devices (MIOMD), Paper [O1-5], Surrey, United Kingdom, 1-3 September 2021*

Analysis of the optical coupling between monolithically integrated GaSb laser diodes and SiN_x waveguides

M. Paparella, L. Monge-Bartolome, J.B. Rodriguez, L. Cerutti, M. Grande, L. O'Faloin and E. Tournié

Oral: *Conference on Mid-infrared Optoelectronics: Materials and Devices (MIOMD), Paper [O9-4], Surrey, United Kingdom, 1-3 September 2021*

Analysis of the optical coupling between monolithically integrated GaSb laser diodes and SiN_x waveguide

J.A.M Fordyce, D.A Diaz-Thomas, T. Piwonski, A.N. Baranov, L. O'Faolain, and L. Cerutti

Oral: *Conference on Mid-infrared Optoelectronics: Materials and Devices (MIOMD), Paper [O10-5], Surrey, United Kingdom, 1-3 September 2021*

Is a substrate miscut really required for high quantity III-V/Si monolithic integration?

C. Cornet, S. Charbonnier, L. Chen, A. Letoublon, K. Tavernier, T. Rohel, R. Bernard, J.B. Rodriguez, L. Cerutti, E. Tournié, Y.Leger, M. Bahri, G. Patriarche, L. LargeauA. Ponchet, and P. Turban

Oral: *International Conference on Molecular Beam Epitaxy (IC-MBE), Paper 70, Puerto-Vallarta, Mexico, 6-9 September 2021*

Anti-phase boundaries annihilation in the growth of GaSb on Silicon (001)

J. B Rodriguez, M. Rio-Calvo, C. Cornet, L. Cerutti, M. Ramonda, A. Trampert, G. Patriarche, and E. Tournié

Oral: *International Conference on Molecular Beam Epitaxy (IC-MBE), Paper 28, Puerto-Vallarta, Mexico, 6-9 September 2021*

Sb-based Mid-IR lasers grown by MBE on Silicon (001)

M. Rio-Calvo, J. B Rodriguez, L. Monge-Bartolome, L. Cerutti, Z. Loghmari, R. Teissier, A.N. Baranov, and E. Tournié

Oral: *International Conference on Molecular Beam Epitaxy (IC-MBE), Paper 154, Puerto-Vallarta, Mexico, 6-9 September 2021*

Surface-Enhanced InfraRed spectroscopy for selective and sensitive detection of organophosphorus compounds

P. Fehlen, G. Thomas, F. Gonzalez-Posada Florès, T. Taliercio, D. Spitzer

SENSORS, SMS/ EGF / NANOMED 2021 JOINT HYBRID Conference, 20 - 22 October, 2021 Milan, Italy

Low-energy bandgap thermophotovoltaic cells for harnessing near-field thermal photons

Dilek Cakiroglu, Jean-Philippe Perez, Axel Evirgen, Christophe Lucchesi, Pierre-Olivier Chapuis, Thierry Taliercio, Eric Tournié, Rodolphe Vaillon.

C Nano 2020, Toulouse, Nanomaterials for Energy, Nov 23rd-25th, 2021.

Barcoded Aluminum Bowties towards a broad-spectrum surface-enhanced spectroscopy

M. Najem, F. Carcenac, F. Gonzalez-Posada, T. Taliercio

5th International Workshop on Metallic Nano-Objects (MNO 2020), University of Saint-Etienne, 17th-19th nov. 2021. France

THz Modulator Based On Optically-Tuned Metasurfaces

J. Guise, S. Blin, E. Centeno and T. Taliercio

15th Mid Infrared Optoelectronic Materials and Devices (MIOMD) Conference, 1-3 September 2021 (Online), University of Surrey, United Kingdom

Semiconductor plasmonic microstructures for THz absorption modulation

F. Gonzalez-Posada, D.Coquillat, M. Najem, P.Loren, T. Taliercio

15th Mid Infrared Optoelectronic Materials and Devices (MIOMD) Conference, 1-3 September 2021 (Online), University of Surrey, United Kingdom

Perfect Absorbers based on high doped III-V semiconductor for the next generation of plasmonic platforms in the Mid-IR

P. Loren, F. Gonzalez-Posada, T. Taliercio

15th Mid Infrared Optoelectronic Materials and Devices (MIOMD) Conference, 1-3 September 2021 (Online), University of Surrey, United Kingdom

Surface-Enhanced InfraRed spectroscopy for selective and sensitive detection of organophosphorus compounds

P. Fehlen, G. Thomas, F. Gonzalez-Posada Florès, T. Taliercio, D. Spitzer

15th Mid Infrared Optoelectronic Materials and Devices (MIOMD) Conference, 1-3 September 2021 (Online), University of Surrey, United Kingdom

Multimodal infrared vibrational spectroscopy from 1.1 to 6.5 microns using MIM Aluminum Bowties

M. Najem, F. Carcenac, F. Gonzalez-Posada, T. Taliercio

15th Mid Infrared Optoelectronic Materials and Devices (MIOMD) Conference, 1-3 September 2021 (Online), University of Surrey, United Kingdom

Wide-Multimodal infrared vibrational spectroscopy from 1.1 to 6.5 μm with Aluminum Bowties

M. Najem, F. Carcenac, F. Gonzalez-Posada, T. Taliercio

GDR Plasmonique Active, Journées plénières, 28-29 juin 2021, Université de Technologie de Troyes

Absorption modulation with semiconductor plasmonic μ -structures from 1.1 to 2.5 THz

F. Gonzalez-Posada, D.Coquillat, M. Najem, P.Loren, T. Taliercio

GDR Plasmonique Active, Journées plénières, 28-29 juin 2021, Université de Technologie de Troyes

Photogenerated metasurface-based THz Modulator

T. Taliercio, S. Blin, E. Centeno, and J. Guise

GDR Plasmonique Active, Journées plénières, 28-29 juin 2021, Université de Technologie de Troyes

Low Optical Power-Driven THz Modulator

Julien Guise, Stéphane Blin, Emmanuel Centeno, Thierry Taliercio

Journées du GDR NanoTeraMIR, June 9-10, 2021, Metz (France) – Virtual conference

Multimodal vibrational infrared spectroscopy from 1.1 to 6.5 μm with Aluminum Bowties

M. Najem, F. Carcenac, F. Gonzalez-Posada, T. Taliercio

Journées du GDR NanoTeraMIR, June 9-10, 2021, Metz (France) – Virtual conference

Absorption modulation with semiconductor plasmonic microstructures from 1.1 to 2.5 THz

F. Gonzalez-Posada, D.Coquillat, M. Najem, P.Loren, T. Taliercio

Journées du GDR NanoTeraMIR, June 9-10, 2021, Metz (France) – Virtual conference

Low-energy bandgap thermophotovoltaic cells for medium-grade heat sources

Christophe Lucchesi, Dilek Cakiroglu, Jean-Philippe Perez, Thierry Taliercio, Eric Tournié, Pierre-Olivier Chapuis, Rodolphe Vaillon

2021 Spring Meeting of the European Materials Research Society (E-MRS), May 2021, En ligne, France

Efficient near-field thermophotovoltaic conversion with InSb cells

Christophe Lucchesi, Dilek Cakiroglu, Jean-Philippe Perez, Thierry Taliercio, Eric Tournié, Pierre-Olivier Chapuis, Rodolphe Vaillon

2021 Spring Meeting of the European Materials Research Society (E-MRS), May 2021, En ligne, France

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

Réduction du volume de detection par nanostructures en semiconducteur dope sur T2SL LWIR

Clement Gureghian, Gregory Vincent, Thierry Taliercio, Isabelle Ribet-Mohamed
Optique, Dijon, France, Nanophotonique, 05-09 juillet 2021

Multimodal vibrational infrared spectroscopy from 1.1 to 6.5 μm with Aluminum Bowties (Al BT)

Melissa Najem, Franck Carcenac, Fernando Gonzalez-Posada, Thierry Taliercio
Paris-Saclay/Munich, Summer school of surface plasmons, lundi 5 juillet au vendredi 9 juillet 2021

Surface-Enhanced InfraRed Spectroscopy for selective and sensitive detection of organophosphorus compounds

Pierre Fehlen, Guillaume Thomas, Fernando Gonzalez-Posada, Thierry Taliercio, Denis Spitzer
Paris-Saclay/Munich, Summer school of surface plasmons, lundi 5 juillet au vendredi 9 juillet 2021