

Simone De Liberato

PERSONAL DATA

Date of birth: 26 September 1981
Nationality: Italian
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POSITIONS

2019-present: Professorial Fellow, University of Southampton
2014-present: University Research Fellow, Royal Society
2014-2019: Associate Professor, University of Southampton
2013-2014: Lecturer, University of Southampton
2012-2013: Marie Curie IEF Fellow, University of Southampton
2010-2014: Co-founder and board member at AdQuantic SAS
2011-2012: Postdoc at Université Paris Diderot-Paris 7
2009-2010: Postdoc at University of Tokyo
2008-2010: Co-founder and Chief Scientific Officer at Hypios SAS
2006-2009: Teaching assistant at Université Pierre et Marie Curie
2006-2009: PhD at Université Paris Diderot-Paris 7

EDUCATION

2003-2006: *École Normale Supérieure*, Physics (Paris, France)
2000-2003: *Politecnico di Milano*, Electronic Engineering (Milan, Italy)

FUNDING AND GRANTS

2019-present: Philip Leverhulme Research Grant (£110k)

2018-present: Philip Leverhulme Prize (£100k)

2018-present: Royal Society Enhancement Award (£250k)

2018-present: Royal Society University Research Fellowship Extension (£300k)

2018-present: Innovation Fund of the EPSRC Programme on Metadevices (£40k)

2017-present: Royal Society Enhancement Award (£100k)

2014-2017: EPSRC-Royal Society Grant (£250k)

2014-2016: Leverhulme Trust Artist in Residence grant (£14k)

2014-2016: EPSRC First Grant (£125k)

2014-2018: Royal Society University Research Fellowship (£570k)

2013-2014: Annual Adventures in Research grant (£10k)

2012-2014: Marie Curie IEF Fellowship (€200k)

Over 2M€ of funds from private and institutional investors acquired for companies I founded.

BIBLIOMETRY

- 67 papers published in peer reviewed journals, including Science, Optica, Phys. Rev. X, 6 Nature journals, and 12 Phys. Rev. Lett.
- h-index 30
- >4000 citations
- 2 patents (1 commercially exploited)

HONORS AND AWARDS

- 7 papers I authored were highlighted or reviewed on WoS, Nature, AIP, and APS platforms.
- In 2018 I was awarded the [Philip Leverhulme prize](#) in physics by the Levehulme Trust.
- In 2018 my short film on quantum mechanics “Approaching Reality” has been included in the science exhibition [All Possible Paths: Richard Feynman’s Curious Life](#) by the ArtScience Museum in Singapore.
- In 2018 I was awarded the Deeptech Founders European prize.
- In 2016 my short film on quantum mechanics “Approaching Reality” has been one of the finalists of the Quantum Short film festival (website: shorts2016.quantumlah.org), receiving a honourable

mention of the jury.

- In 2016 I was selected for a Royal Society secondment at BBC and I worked six months part-time with the Factual team of the BBC which produces the Horizon documentary series.
- In 2016 I was nominated as “Most engaging lecturer” by the Southampton Student Union (SUSU).
- In 2014 I was awarded the “Dean’s Awards for Early Career Researchers” by the University of Southampton.
- I was awarded the “Young researcher prize 2009” (Prix jeune chercheur Daniel Guinier) of the French Physical Society.
- Alumnus of the Japan Society for the Promotion of Science.
- Alumnus of the École Normale Supérieure.
- Graduation prize of the Politecnico di Milano.

PROFESSIONAL TRAINING

2020 Royal Society Scientific Policy Primer

2013 Royal Society Leadership Effectiveness Course

2009 C’Nano IdF Formation à la Création d’Entreprise

TECHNOLOGY TRANSFER ACTIVITIES

Technology Transfer in Southampton

From 2015 to 2019 I have been in charge of research impact for the School of Physics and Astronomy, at the University of Southampton. I identified, vetted, and coached entrepreneurial activities originating from research performed in the School. I have also been more broadly involved in the entrepreneurial ecosystem of the University of Southampton, mentoring undergraduate students’ entrepreneurial activities at Future World, the Business Incubator of our Faculty.

Consulting and Quantika

Between 2010 and 2014 I worked as a freelance scientific valorization and technology transfer consultant, offering my services to a number of small and large companies and to private investors. Recently I was included as one of the founding members in Quantika (web address Quantika.co), a consulting hub offering services along the whole chain of value on thematic linked with quantum

technologies and nanophotonics. Quantika has been included in the last BCG report on quantum technology, available [here](#).

AdQuantic SAS

In 2010 I founded AdQuantic SAS, a research-based startup applying quantum and statistical physics to the optimization of online marketing. We patented our technology, AdQuantic was recognised as a Young Innovative Company by the French Government and it received public funding for its R&D activities. We closed a second round of fundraising in 2013, becoming the second European player in online bid management. AdQuantic won competitions for our technology. In 2014 I sold the entirety of the company, of which I remained the leading shareholder until the end, to Criteo (NASDAQ: CRTO). The acquisition attracted substantial attention from the specialised press, here for example the Techcrunch coverage: <http://techcrunch.com/2014/04/10/criteo-buys-adquantic>.

Hypios SAS

In 2008 I co-founded Hypios SAS (www.hypios-ci.com), an open-innovation startup allowing client corporations to submit their internal R&D problems to a social network of researchers and engineers that can solve them for a reward. I was in charge of the administration of Hypios research department. During my two years tenure my department conducted research on the application of semantic web technologies to knowledge discovery, leading to both publications in prestigious conferences and patented technology. Hypios also won many national and international prizes for innovative startups: 3rd place in TechCrunch Paris competition, Silicon Alleys Top 10 and the Club 600 Entrepreneurship Award between the others. I left the company in 2010 in order to concentrate on research and other projects.

TEACHING AND PUBLIC ENGAGEMENT ACTIVITIES

Graduate Teaching

PhD students I supervised:

2018- : Wang Yuan

2015-2020: Erika Cortese

2012-2016: Christopher Gubbin

2013-2016: Nathan Shammah

2011-2012: Luc Nguyen-the (postdoctoral supervisor)

2008-2010: David Hagenmüller (postdoctoral supervisor)

2009-2012: Milan Stankovitch*

* Milan Stankovitch did a CIFRE PhD in collaboration between my company Hypios SAS and Paris IV, of which I was the company supervisor, while the academic supervisor was Dr. Philippe Laublet.

PhD students I examined:

- 2019: Lucy Pickup (University of Southampton)
- 2019: Timur Yagafarov (Skoltech, Moscow)
- 2019: Anton Baranikov (Skoltech, Moscow)
- 2019: Robert Cernansky (University of Southampton)
- 2019: Xiaofei Xiao (Imperial College London)
- 2018: Janine Keller (ETHZ)
- 2018: Jamie Fitzgerald (Imperial College London)
- 2017: Vincenzo Macrì (Università di Messina)
- 2017: Matteo Silva (University of Southampton)
- 2016: Kristinn Kristinsson (NTU Singapore)
- 2016: Joe Spencer (University of Southampton)
- 2016: Carlos Sanchez Muñoz (Universidad Autónoma de Madrid)
- 2014: Oleksandr Kyriienko (University of Reykjavik)

Courses at summer schools:

- 2018: Nicolas Cabrera summer school (Miraflores de la Serra)
- 2017: Recent trends in light-matter interaction (EPFL)
- 2013: International School of Nanophotonics and Photovoltaics (Maratea)

Undergraduate Teaching

- 2015, 2018: Atomic Physics (University of Southampton)
- 2006 - 2009: Introduction to physics for biology (UPMC-Paris VI)

Scientific Entrepreneurship Masterclass

2020: University of Wolverhampton

2017: University of Southampton

2016: Technology Transfer course, École Polytechnique (Paris)

2015: Nanoscale Quantum Optics COST action workshop (Malta)

2015: Agoranov Incubator (Paris)

Approaching Reality

With funding from the Leverhulme Trust and the University of Southampton I produced *Approaching Reality*, a musical video explaining the concept of quantum superposition. The composition premiered in 2015 at the Linköpings music festival. In 2016 the video was one of the 10 shortlisted finalists, out of 203 submissions from 51 countries, at the [Quantum Short](#) film festival. The film was screened worldwide and in 2018 it has been included in the science exhibition [All Possible Paths: Richard Feynman's Curious Life](#), by the ArtScience Museum of Singapore.

BBC Secondment

In 2016 I spent 6 months part-time in a Royal-Society sponsored secondment at BBC. Amongst other activities I participated to the production of the 2017 Horizon episode “Strange Signals from Outer Space!”, and the 2016 The Sky at Night episode “Review of the Year”.

Pint of Science

In 2015 my group organised for the first time the Pint of Science Festival in Southampton, where we had the chance to showcase our research in a local pub to a paying public. The event was sold out.

OTHER PROFESSIONAL TITLES AND ACTIVITIES

- Italian National Habilitation for Full Professor (ASN 2016).
- Organization of the international workshop: “Present and future trends in ultrastrong light-matter coupling”. Website: qtt.phys.soton.ac.uk/uscworkshop.
- Scientific committee of Terametanano-4, ICSC10, and Photoptics-2020 conferences.
- Editor for the journal Scientific Reports.
- Panelist for the Agoranov incubator in Paris.

MOST RECENT INVITED PRESENTATIONS

2019: HPM2019 (Naxos, Grece)
2019: Nanop 2019 (München, Germany)
2019: Terametanano-4 (Lecce, Italy)
2019: Dinamo2019 (San Cristóbal, Ecuador)
2019: Quantum Nanophotonics (Benasque, Spain)
2018: ICSC9 (Montreal, Canada)
2018: ICPS18 (Montpellier, France)
2018: Terametanano-3 (Uxmal, Mexico)
2017: HPM2017 (Mykonos, Grece)
2017: Terametanano-2 (Venice, Italy)
2017: Dinamo2017 (Siglufjördur, Iceland)
2017: Quantum Nanophotonics, upgraded (Benasque, Spain)
2017: Workshop: Virtual photons in ultra-strongly coupled systems (Tokyo, Japan)
2016: FNM2016 (Tbilisi, Georgia)
2016: International Conference on Ultra-Strong Light-Matter Interactions (Bilbao, Spain)
2016: Terametanano (Cartagena, Colombia)

SPOKEN LANGUAGES

Italian: fluent
English: fluent
French: fluent
Spanish: basic

PUBLICATION LIST

Peer reviewed papers

66. *Excitons bound by photon exchange*
E. Cortese, L. Tran, J.-M. Manceau, A. Bousseksou, I. Carusotto, G. Biasiol, R. Colombelli, and S. De Liberato
Nature Physics, in Press
65. *Near-Field Spectroscopy of Cylindrical Phonon-Polariton Antennas*
A. Mancini, C. R. Gubbin, R. Berté, F. Martini, A. Politi, E. Cortés, Y. Li, S. De Liberato, and S. A. Maier
Nano Letters, in Press
64. *Optical Nonlocality in Polar Dielectrics*
C. R. Gubbin and S. De Liberato
Phys. Rev. X **10**, 021027 (2020)
63. *Electro-optical sampling of quantum vacuum fluctuations in dispersive dielectrics*
S. De Liberato
Phys. Rev. A **100**, 031801(R) (2019)
62. *Multielectron ground state electroluminescence*
M. Cirio, N. Shammah, N. Lambert, S. De Liberato, and F. Nori
Phys. Rev. Lett. **122**, 190403 (2019)
61. *Hybrid Longitudinal-Transverse Phonon Polaritons*
C. R. Gubbin, R. Berte, M. A. Meeker, A. J. Giles, C. T. Ellis, J. G. Tischler, V. D. Wheeler, S. A. Maier, J. D. Caldwell, and S. De Liberato
Nature Communications **10**, 1682 (2019)
60. *Polaritonics: from microcavities to sub-wavelength confinement*
D. Ballarini and S. De Liberato
Nanophotonics **8**, 641 (2019)
59. *Strong coupling of ionising transitions*
E. Cortese, I. Carusotto, R. Colombelli, and S. De Liberato
Optica **6**, 354 (2019)
58. *Ultrastrong coupling between light and matter*
A. F. Kockum, A. Miranowicz, S. De Liberato, S. Savasta, and F. Nori
Nature Physics Reviews **1**, 19 (2019)
57. *Open quantum systems with local and collective incoherent processes: Efficient numerical simulations using permutational invariance*
N. Shammah, S. Ahmed, N. Lambert, S. De Liberato, and F. Nori
Phys. Rev. A **98**, 063815 (2018)

56. *Breakdown of gauge invariance in ultrastrong-coupling cavity QED*
D. De Bernardis, P. Pilar, T. Jaako, S. De Liberato, and P. Rabl
Phys. Rev. A **98**, 053819 (2018)
55. *Second harmonic generation from strongly coupled localized and propagating phonon-polariton modes*
I. Razdolski, N. C. Passler, C. R. Gubbin, C. J. Winta, R. Cernansky, F. Martini, A. Politi, S. A. Maier, M. Wolf, A. Paarmann, and S. De Liberato
Phys. Rev. B **98**, 125425 (2018)
54. *Strong Coupling of Epsilon-Near-Zero Phonon Polaritons in Polar Dielectric Heterostructures*
N. C. Passler, C. R. Gubbin, T. G. Folland, I. Razdolski, D. S. Katzer, D. F. Storm, M. Wolf, S. De Liberato, J. D. Caldwell, and A. Paarmann
Nano Letters **18**, 4285 (2018)
53. *Sub-nanometer Thin Oxide Film Sensing with Localized Surface Phonon Polaritons*
R. Berte, C. R. Gubbin, V. D. Wheeler, A. J. Giles, V. Giannini, S. A. Maier, S. De Liberato, and J. D. Caldwell
ACS Photonics **5**, 2807 (2018)
52. *Resolution of superluminal signalling in non-perturbative cavity quantum electrodynamics*
C. Sánchez Muñoz, F. Nori, and S. De Liberato
Nature Communications **9**, 2924 (2018)
51. *Resonant intersubband polariton-LO phonon scattering in an optically pumped polaritonic device*
J.-M. Manceau, N.-L. Tran, G. Biasiol, T. Laurent, I. Sagnes, G. Beaudoin, S. De Liberato, I. Carusotto, and R. Colombelli
Applied Physics Letters **112**, 191106 (2018)
50. *Strong coupling in a microcavity containing β -carotene*
R. T. Grant, R. Jayaprakash, D. M. Coles, A. Musser, S. De Liberato, I. D. W. Samuel, G. A. Turnbull, J. Clark, and D. G. Lidzey
Optics Express **26**, 3320 (2018)
49. *Polariton spectrum of the Dicke-Ising model*
E. Cortese, L. Garziano, and S. De Liberato
Phys. Rev. A **96**, 053861 (2017)
48. *Virtual photons in the ground state of a dissipative system*
S. De Liberato
Nature Communications **8**, 1465 (2017)
47. *Theory of Four-Wave-Mixing in Phonon Polaritons*
C. R. Gubbin and S. De Liberato
ACS Photonics **5**, 284 (2017)
46. *Cavity QED Beyond Rotating Wave Approximation: Photon Bunching from the Emission of Individual Dressed Qubits*
L. Garziano, A. Ridolfo, S. De Liberato, and S. Savasta
ACS Photonics **4**, 2345 (2017)

45. *Superradiance with local phase-breaking effects*
N. Shammah, N. Lambert, F. Nori, and S. De Liberato
Phys. Rev. A **96**, 023863 (2017)
44. *Collective optomechanical effects in cavity quantum electrodynamics*
E. Cortese, P. Lagoudakis, and S. De Liberato
Phys. Rev. Lett. **119**, 43604 (2017)
43. *Experimental verification of the very strong coupling regime in a GaAs quantum well microcavity*
S. Brodbeck, S. De Liberato, M. Amthor, M. Klaas, M. Kamp, L. Worschech, C. Schneider, and S. Höfling
Phys. Rev. Lett. **119**, 027401 (2017)
42. *Theory of nonlinear polaritonics: $\chi^{(2)}$ scattering on a β -SiC surface*
C. R. Gubbin and S. De Liberato
ACS Photonics **4**, 1381 (2017)
41. *Theoretical Investigation of Phonon Polaritons in SiC Micropillar Resonators*
C. R. Gubbin, S. A. Maier, and S. De Liberato
Phys. Rev. B **95**, 035313 (2017)
40. *Bosonic cascades of indirect excitons*
A. V. Nalitov, S. De Liberato, P. Lagoudakis, P. G. Savvidis, and A. V. Kavokin
Superlattice. Microst. **108**, 27 (2017)
39. *Real-space Hopfield diagonalization of inhomogeneous dispersive media*
C. R. Gubbin, S. A. Maier, and S. De Liberato
Phys. Rev. B **94**, 205301 (2016)
38. *Strong and coherent coupling between localised and propagating phonon polaritons*
C. R. Gubbin, F. Martini, A. Politi, S. A. Maier, and S. De Liberato
Phys. Rev. Lett. **116**, 246402 (2016)
37. *Ground State Electroluminescence*
M. Cirio, S. De Liberato, N. Lambert, and F. Nori
Phys. Rev. Lett. **116**, 113601 (2016)
36. *Excitonic spectral features in strongly coupled organic polaritons*
J. A. Cwik, P. Kirton, S. De Liberato, and J. Keeling
Phys. Rev. A **93**, 033840 (2016)
35. *Quantum statistics of bosonic cascades*
T. C. H. Liew, Y. G. Rubo, A. S. Sheremet, S. De Liberato, I. A. Shelykh, F. P. Laussy, and A. V. Kavokin
New J. Phys. **18**, 023041 (2016)
34. *Light-matter decoupling and A^2 term detection in superconducting circuits*
J. J. García-Ripoll, B. Peropadre, and S. De Liberato
Sci. Rep. **5**, 16055 (2015)

33. *Theory of intersubband resonance fluorescence*
N. Shammah and S. De Liberato
Phys. Rev. B **92**, 201402(R) (2015)
32. *Perspectives for gapped bilayer graphene polaritonics*
S. De Liberato
Phys. Rev. B **92**, 125433 (2015)
31. *Generation of Rabi frequency radiation using exciton-polaritons*
F. Barachati, S. De Liberato, and S. Kéna-Cohen
Phys. Rev. A **92**, 033828 (2015)
30. *Quantum control and long-range quantum correlations in dynamical Casimir arrays*
R. Stassi, S. De Liberato, L. Garziano, B. Spagnolo, and S. Savasta
Phys. Rev. A **92**, 013830 (2015)
29. *Terahertz emission from AC Stark-split asymmetric intersubband transitions*
N. Shammah, C. C. Phillips, and S. De Liberato
Phys. Rev. B **89**, 235309 (2014)
28. *Light-matter decoupling in the deep strong coupling regime: The breakdown of the Purcell effect*
S. De Liberato
Phys. Rev. Lett. **112**, 016401 (2014)
27. *Comment on “System-environment coupling derived by Maxwell’s boundary conditions from the weak to the ultrastrong light-matter coupling regime”*
S. De Liberato
Phys. Rev. A **89**, 017801 (2014)
26. *Radical-pair model of magnetoreception with spin-orbit coupling*
N. Lambert, S. De Liberato, C. Emary, and F. Nori
New J. Phys. **15**, 083024(R) (2013)
25. *Many-body physics of intersubband polaritons*
L. Nguyen-Thê, S. De Liberato, M. Bamba, and C. Ciuti
Phys. Rev. B **87**, 235322 (2013)
24. *Ultrastrong light-matter coupling at terahertz frequencies with split ring resonators and inter-Landau level transitions*
G. Scalari, C. Maissen, D. Hagenmüller, S. De Liberato, C. Ciuti, C. Reichl, W. Wegscheider, D. Schuh, M. Beck, and J. Faist
J. Appl. Phys. **113**, 136510 (2013)
23. *Terahertz lasing from intersubband polariton-polariton scattering in asymmetric quantum wells*
S. De Liberato, C. Ciuti, and C. C. Phillips
Phys. Rev. B **87**, 241304 (2013)
22. *Quantum Phases of a Multimode Bosonic Field Coupled to Flat Electronic Bands*
S. De Liberato and C. Ciuti

- Phys. Rev. Lett. **110**, 133603 (2013)
21. *Ultrastrong Coupling of the Cyclotron Transition of a 2D Electron Gas in a THz Metamaterial*
G. Scalari, C. Maissen, D. Turcinková, D. Hagenmüller, S. De Liberato, C. Ciuti, D. Schuh, C. Reichl, W. Wegscheider, M. Beck and J. Faist,
Science **335**, 1323 (2012)
 20. *Quantum theory of intersubband polarons*
S. De Liberato and C. Ciuti
Phys. Rev. B **85**, 125302 (2012)
 19. *Back-reaction effects of quantum vacuum in cavity quantum electrodynamics*
I. Carusotto, S. De Liberato, D. Gerace and C. Ciuti
Phys. Rev. A **85**, 023805 (2012)
 18. *Carnot's theorem for nonthermal stationary reservoirs*
S. De Liberato and M. Ueda
Phys. Rev. E **84**, 051122 (2011)
 17. *Quantum noise in photothermal cooling*
S. De Liberato, N. Lambert and F. Nori
Phys. Rev. A **83**, 033809 (2011)
 16. *Quantum Szilard Engine*
S. W. Kim, T. Sagawa, S. De Liberato and M. Ueda
Phys. Rev. Lett. **106**, 070401 (2011)
 15. *Switching ultrastrong light-matter coupling on a subcycle scale*
R. Huber, A. A. Anappara, G. Guenter, A. Sell, S. De Liberato, C. Ciuti, G. Biasiol, L. Sorba, A. Tredicucci and A. Leitenstorfer
J. App. Phys. **109**, 102418 (2011)
 14. *Ultrastrong Light-Matter Coupling Regime with Polariton Dots*
Y. Todorov A. M. Andrews, R. Colombelli, S. De Liberato, C. Ciuti, P. Klang, G. Strasser and C. Sirtori
Phys. Rev. Lett. **105**, 196402 (2010)
 13. *Ultrastrong coupling between a cavity resonator and the cyclotron transition of a two-dimensional electron gas in the case of an integer filling factor*
D. Hagenmüller, S. De Liberato and C. Ciuti
Phys. Rev. B **81**, 235303 (2010)
 12. *Extracavity quantum vacuum radiation from a single qubit*
S. De Liberato, D. Gerace, I. Carusotto and C. Ciuti
Phys. Rev. A **80**, 053810 (2009)
 11. *Fermionized Photons in an Array of Driven Dissipative Nonlinear Cavities*
I. Carusotto, D. Gerace, H. Tureci, S. De Liberato, C. Ciuti and A. Imamoglu
Phys. Rev. Lett. **103**, 033601 (2009)

10. *Signatures of the ultrastrong light-matter coupling regime*
A. A. Anappara, S. De Liberato, A. Tredicucci, C. Ciuti, G. Biasiol, L. Sorba and F. Beltram
Phys. Rev. B **79**, 201303(R) (2009)
9. *Stimulated Scattering and Lasing of Intersubband Cavity Polaritons*
S. De Liberato and C. Ciuti
Phys. Rev. Lett. **102**, 136403 (2009)
8. *Sub-cycle switch-on of ultrastrong light-matter interaction*
G. Guenter, A. A. Anappara, J. Hees, G. Biasiol, L. Sorba, S. De Liberato, C. Ciuti, A. Tredicucci,
A. Leitenstorfer and R. Huber
Nature **458**, 178 (2009)
7. *Quantum theory of electron tunneling into intersubband cavity polariton states*
S. De Liberato and C. Ciuti
Phys. Rev. B **79**, 075317 (2009)
6. *Optical properties of atomic Mott insulators: from slow light to the dynamical Casimir effects*
I. Carusotto, M. Antezza, F. Bariani, S. De Liberato and C. Ciuti
Phys. Rev. A **77**, 063621 (2008)
5. *Quantum model of microcavity intersubband electroluminescent devices*
S. De Liberato and C. Ciuti
Phys. Rev. B **77**, 155321 (2008)
4. *Cavity polaritons from excited-subband transitions*
A. Anappara, A. Tredicucci, F. Beltram, G. Biasiol, L. Sorba, S. De Liberato and C. Ciuti
Appl. Phys. Lett. **91**, 231118 (2007)
3. *Observing the evolution of a quantum system that does not evolve*
S. De Liberato
Phys. Rev. A **76**, 042107 (2007)
2. *Quantum vacuum radiation spectra from a semiconductor microcavity with a time-modulated vacuum Rabi frequency*
S. De Liberato, C. Ciuti and I. Carusotto
Phys. Rev. Lett. **98**, 103602 (2007)
1. *Tunnelling dynamics of Bose-Einstein condensate in a four-well loop-shaped system*
S. De Liberato and C. J. Foot
Phys. Rev. A **73**, 035602 (2006)

Proceedings

5. *Terahertz emission from asymmetric, doped quantum wells under resonant pumping*
N. Shammah, C. C. Phillips, and S. De Liberato
J. Phys. Conf. Ser. **619**, 012021 (2015)

4. *Inter-branch terahertz lasing in asymmetric intersubband polariton systems*
S. De Liberato, C. Ciuti, and C. C. Phillips
Proc. International Conference on the Physics of Semiconductors (2012)
AIP Conf. Proc. **1566**, 459 (2013)
3. *Ultrastrong coupling of integer Landau Level Polaritons*
D. Hagenmüller, S. De Liberato and C. Ciuti
Proc. International Conference on the Physics of Semiconductors (2010)
AIP Conf. Proc. **1399**, 457 (2011)
2. *Terahertz Quantum Optics with Solid-state Systems*
A. Leitenstorfer, R. Huber, A. A. Sell, A. A. Anappara, G. Guenter, S. Leinss, K. Von Volkmann,
T. Kampfrath, M. Wolf, S. De Liberato, C. Ciuti, G. Biasiol, L. Sorba and A. Tredicucci
Proc. 35th International Conference on Infrared, Millimeter, and Terahertz Waves (2010)
1. *How fast electrons and photons mix: sub-cycle switching of intersubband cavity polaritons*
R. Huber, A. A. Anappara, G. Guenter, A. Sell, A. G. Biasiol, L. Sorba, A. Tredicucci, S. De
Liberato, C. Ciuti and A. Leitenstorfer
J. Phys. Conf. Ser. **193**, 012060 (2009)

Book chapters

1. *Towards Intersubband Polaritonics: How Fast Can Light and Electrons Mate?*
A. A. Anappara, L. Sorba, A. Tredicucci, G. Günter, A. Sell, A. Leitenstorfer, R. Huber, S. De
Liberato, C. Ciuti, and G. Biasiol
In S. Luryi, J. Xu, and A. Zaslavsky, (eds) (2010) Future Trends in Microelectronics: From Nanopho-
tonics to Sensors and Energy, John Wiley & Sons, Inc., Hoboken, NJ, USA.

Patents

2. *Device for aiding the management of visualization objects*
C. Chanal and S. De Liberato
Patent WO 2014027155 A1
1. *High Efficiency Hybrid Strongly Coupled Longitudinal-Transverse Phonon Polaritons*
S. De Liberato
Patent GB1812285.3

Other publications

2. *Lasing from dressed dots*
S. De Liberato
Nature Photonics **12**, 4 (2017)

1. *Cervellone da record*
N. Shammah and S. De Liberato
Il Sole 24 ore, 15/05/2013