



Photonic and nAnomeTric High-sensitivity biO-Sensing

Results

Project Information

PATHOS

Grant agreement ID: 828946

[Project website](#)

DOI

[10.3030/828946](https://doi.org/10.3030/828946)

Project closed

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UNIVERSITA DEGLI STUDI DI
FIRENZE



Italy

CORDIS provides links to public deliverables and publications of HORIZON projects.

Links to deliverables and publications from FP7 projects, as well as links to some specific result types such as dataset and software, are dynamically retrieved from [OpenAIRE](#).

Deliverables

Websites, patent fillings, videos etc. (2)



[WEB](#)

Website, logo and social-media pages

[Press](#)

Articles on popular press and videos, e.g., publication video-abstracts, pedagogical video

Documents, reports (18)

[DD probing](#)

Report on novel DDbased probing protocols

[Correlated spectra](#)

Report on characterization of correlated spinbath spectra using NVcenters and NMR facilities

[AZE cooling](#)

Demonstrate AZE cooling in biomolecular experiments

[Optical CS imaging](#)

Report on optical CS imaging (still without NVs)

[MRI sensitivity](#)

Achieve enhanced MRI sensitivity drastic by cooling down a noisy spin environment

[DD Spectral density](#)

Report on the modification of spectral density by dynamical decoupling

[Non-Markovian probes](#)

Report on the environment characterisation via non-Markovian probes

[Intracell thermo.](#)

Demonstrate intracell high-sensitivity thermometry

[Noise Filters](#)

Report on the effects of the proposed noise filters on complex/biological systems

[AZE homonuclear](#)

Report on AZE for homonuclear mixing and recoupling

[Magnetic Sensing](#) 

Demonstrate highresolution magnetic field imaging with CS in NV

[ODMR neurons](#) 

Report on feasibility study of ODMR in neurons

[Optical ZD](#) 

Paper demonstrating advantage of ZD protocols in specific optical measurements procedures

[ODMR cell](#) 

Paper on ODMR measurements of mammalian cell currents

[NV imager](#) 

Report on construction of NV magnetic imager (still without CS)

[MRI control](#) 

Demonstrate novel control strategies for MRI

[ADRT cooling](#) 

Demonstrate optimized ADRT cooling

[NV-imaging + CS](#) 

Demonstrate high-resolution NV optical imaging with CS

Other (1)

[Workshop](#) 

Organisation of international workshop on Bio-Sensing

Open Research Data Pilot (1)

[Data Management Plan \(DMP\)](#) 

Data Management Plan - Pilot on Open Research Data in H2020

Publications

[Modified Split Ring Resonators for Efficient and Homogeneous Microwave Control of Large Volume Spin Ensembles](#) 

Author(s): Ben-Shalom, Yachel; Hen, Amir; Bar-Gill, Nir

Published in: 2024

Publisher: ArXiv

DOI: 10.48550/arxiv.2309.11130

[Bath-induced interactions and transient dynamics in open quantum systems at strong coupling: Effective Hamiltonian approach](#) 

Author(s): Marlon Brenes, Brett Min, Nicholas Anto-Sztrikacs, Nir Bar-Gill, Dvira Segal

Published in: 2024

Publisher: ArXiv

DOI: 10.48550/arxiv.2403.03386

[Realization of robust quantum noise characterization in the presence of coherent errors](#) 

Author(s): Pavel Penshin, Tamara Amro, Ty Zabelotsky, Amir Abramovich, Tanmoy Pandit, K. I. O Ben 'Attar, Amir Hen, Raam Uzdin, Nir Bar-Gill

Published in: AVS Quantum Science (accepted), 2024

Publisher: ArXiv

DOI: 10.48550/arxiv.2401.08291

Peer reviewed articles (79)



[Learning the noise fingerprint of quantum devices](#) 

Author(s): Filippo Caruso; Stefano Gherardini; STEFANO MARTINA; Lorenzo Buffoni

Published in: Quantum Machine Intelligence, 2022, ISSN 2524-4914

Publisher: Springer Nature

DOI: 10.1007/s42484-022-00066-0

[Single NV centers as sensors for radio-frequency fields](#) 

Author(s): Jingfu Zhang; Dieter Suter

Published in: PHYSICAL REVIEW RESEARCH, Issue 8, 2023, ISSN 2643-1564

Publisher: APS

DOI: 10.1103/physrevresearch.5.l022026

[Machine Learning based Noise Characterization and Correction on Neutral Atoms NISQ Devices](#) 

Author(s): Ettore Canonici; Stefano Martina; Riccardo Mengoni; Daniele Ottaviani; Filippo Caruso

Published in: Advanced Quantum Technologies, Issue 20, 2023, ISSN 2511-9044

Publisher: Wiley

DOI: 10.1002/qute.202300192

[Experimental multi-state quantum discrimination through optical networks](#)

Author(s): Alessandro Laneve; Andrea Gheraldi; Frenkli Hamiti; Paolo Mataloni; Filippo Caruso

Published in: Quantum Science and Technology, 2022, ISSN 2058-9565

Publisher: IOP

DOI: 10.1088/2058-9565/ac5a0f

[Relaxation-Assisted Magnetization Transfer Phenomena for a Sensitivity-Enhanced 2D NMR](#)

Author(s): Mihajlo Novakovic, Jihyun Kim, Xun-Cheng Su, Ēriks Kupče, and Lucio Frydman

Published in: Anal. Chem., 2023, ISSN 1520-6882

Publisher: ACS Publications

DOI: 10.1021/acs.analchem.3c03149

[Experimental characterization of the energetics of quantum logic gates](#)

Author(s): V. Cimini, S. Gherardini, M. Barbieri, I. Gianani, M. Sbroscia, L. Buffoni, M. Paternostro, F. Caruso

Published in: npj Quantum Information, Issue 6/1, 2020, Page(s) 96, ISSN 2056-6387

Publisher: Springer Nature

DOI: 10.1038/s41534-020-00325-7

[A biocompatible technique for magnetic field sensing at \(sub\)cellular scale using Nitrogen-Vacancy centers](#)

Author(s): Ettore Bernardi, Ekaterina Moreva, Paolo Traina, Giulia Petrini, Sviatoslav Ditalia Tchernij, Jacopo Forneris, Željko Pastuović, Ivo Pietro Degiovanni, Paolo Olivero, Marco Genovese

Published in: EPJ Quantum Technology, Issue 7/1, 2020, ISSN 2662-4400

Publisher: Springer Nature

DOI: 10.1140/epjqt/s40507-020-00088-2

[Spin-bath polarization via disentanglement](#)

Author(s): D D Bhaktavatsala Rao, Arnab Ghosh, David Gelbwaser-Klimovsky, Nir Bar-Gill, Gershon Kurizki

Published in: New Journal of Physics, Issue 22/8, 2020, Page(s) 083035, ISSN 1367-2630

Publisher: Institute of Physics Publishing

DOI: 10.1088/1367-2630/aba29a

[Sensitivity enhancement of homonuclear multidimensional NMR correlations for labile sites in proteins, polysaccharides, and nucleic acids](#)

Author(s): Mihajlo Novakovic, Ēriks Kupče, Andreas Oxenfarth, Marcos D. Battistel, Darón I. Freedberg, Harald Schwalbe, Lucio Frydman

Published in: Nature Communications, Issue 11/1, 2020, ISSN 2041-1723

Publisher: Nature Publishing Group

DOI: 10.1038/s41467-020-19108-x

[Experimental quantum pattern recognition in IBMQ and diamond NVs](#)

Author(s): Das, Sreetama; Zhang, Jingfu; Martina, Stefano; Suter, Dieter; Caruso, Filippo

Published in: Quantum Machine Intelligence, Issue 5, 2023, Page(s) 16, ISSN 2524-4914

Publisher: Springer Link

DOI: 10.1007/s42484-022-00093-x

[Cross-Polarization Schemes for Improved Heteronuclear Transfers Involving Labile Protons in Biomolecular Solution NMR](#)

Author(s): Jihyun Kim; J. Tassilo Grün; Mihajlo Novakovic; Eriks Kupce; Rina Rosenzweig; Lucio Frydman

Published in: Angewandte Chemie. International Edition, 62 (35), Issue 18, 2023, ISSN 0044-8249

Publisher: Wiley

DOI: 10.1002/anie.202304900

[The Incorporation of Labile Protons into Multidimensional NMR Analyses: Glycan Structures Revisited](#)

Author(s): Mihajlo Novakovic, Marcos D. Battistel, Hugo F. Azurmendi, Maria-Grazia Concilio, Darón I. Freedberg, Lucio Frydman

Published in: Journal of the American Chemical Society, Issue 143/23, 2021, Page(s) 8935-8948, ISSN 0002-7863

Publisher: American Chemical Society

DOI: 10.1021/jacs.1c04512

[New Trends in Quantum Machine Learning](#)

Author(s): Lorenzo Buffoni; Filippo Caruso

Published in: Europhysics Letters, 2021, ISSN 0295-5075

Publisher: EDP Sciences

DOI: 10.1209/0295-5075/132/60004

[Indirectly Detected Satellite-Transition Quadrupolar NMR via Progressive Saturation of the Proton Reservoir](#) 

Author(s): Tamar Wolf, Anna Eden-Kossoy, Lucio Frydman

Published in: Solid State Nuclear Magnetic Resonance, 2023, ISSN 1527-3326

Publisher: Elsevier

DOI: 10.1016/j.ssnmr.2023.101862

[Quantum Noise Sensing by Generating Fake Noise](#) 

Author(s): Paolo Braccia; Leonardo Banchi; Filippo Caruso

Published in: Phys. Rev. Applied, 2022, ISSN 2331-7019

Publisher: APS

DOI: 10.1103/physrevapplied.17.024002

[Noise fingerprints in quantum computers: Machine learning software tools](#) 

Author(s): Stefano Martina; Stefano Gherardini; Lorenzo Buffoni; Filippo Caruso

Published in: Software Impacts, 2022, ISSN 2665-9638

Publisher: Elsevier

DOI: 10.1016/j.simpa.2022.100260

[Quantum Zeno and Anti-Zeno probes of noise correlations in photon polarisation](#) 

Author(s): Salvatore Virzì; Alessio Avella; Fabrizio Piacentini; Marco Gramegna; Tomáš Opatrný; Abraham G. Kofman; Gershon Kurizki; Stefano Gherardini; Filippo Caruso; Ivo Pietro Degiovanni; Marco Genovese

Published in: Phys. Rev. Lett., 2022, ISSN 1079-7114

Publisher: APS

DOI: 10.1103/physrevlett.129.030401

[High-Sensitivity, High-Resolution Detection of Reactive Oxygen Species Concentration Using NV Centers](#) 

Author(s): Yoav Ninio, Nir Waiskopf, Idan Meirzada, Yoav Romach, Galya Haim, Shira Yochelis, Uri Banin, Nir Bar-Gill

Published in: ACS Photonics, Issue 8/7, 2021, Page(s) 1917-1921, ISSN 2330-4022

Publisher: American Chemical Society

DOI: 10.1021/acsphotonics.1c00431

[Anti-Zeno purification of spin baths by quantum probe measurements](#) 

Author(s): Durga Bhaktavatsala Rao Dasari, Sen Yang, Arnab Chakrabarti, Amit Finkler, Gershon Kurizki, Jörg Wrachtrup

Published in: Nature Communications, 2022, ISSN 2041-1723

Publisher: Nature Publishing Group

DOI: 10.1038/s41467-022-35045-3

[Magnetization Transfer to Enhance NOE Cross-Peaks among Labile Protons: Applications to Imino-Imino Sequential Walks in SARS-CoV-2-Derived RNAs](#) 

Author(s): Mihajlo Novakovic, Ēriks Kupče, Tali Scherf, Andreas Oxenfarth, Robbin Schnieders, J. Tassilo Grün, Julia Wirmer-Bartoschek, Christian Richter, Harald Schwalbe, Lucio Frydman

Published in: Angewandte Chemie International Edition, Issue 60/21, 2021, Page(s) 11884-11891, ISSN 1433-7851

Publisher: John Wiley & Sons Ltd.

DOI: 10.1002/anie.202015948

[Excitation transfer in disordered spin chains with long-range exchange interactions](#) 

Author(s): Nikolaos E. Palaiodimopoulos, Maximilian Kiefer-Emmanouilidis, Gershon Kurizki, David Petrosyan

Published in: SciPost Physics Core, 2022, ISSN 2666-9366

Publisher: SciPost Foundation

DOI: 10.48550/arxiv.2208.04161

[Doppler Gyroscopes: Frequency vs Phase Estimation](#) 

Author(s): John C. Howell, Merav Kahn, Einav Grynszpan, Ziv Roi Cohen, Stefania Residori, Umberto Bortolozzo

Published in: Phys. Rev. Lett., 2022, ISSN 0031-9007

Publisher: American Physical Society

DOI: 10.1103/physrevlett.129.113901

[Nanodiamond quantum sensors reveal temperature variation associated to hippocampal neurons firing](#) 

Author(s): G. Petrini, G. Tomagra, E. Bernardi, E. Moreva, P. Traina, A. Marcantoni, F. Picollo, K. Kvakova, P. Cigler, I.P. Degiovanni, V. Carabelli, M. Genovese

Published in: Advanced Science, 2022, ISSN 2198-3844

Publisher: Wiley

DOI: 10.1002/advs.202202014

[The Extended Hadamard Transform: Sensitivity-Enhanced NMR Experiments Among Labile and Non-Labile 1Hs of SARS-CoV-2-derived RNAs](#) 

Author(s): Jihyun Kim, Mihajlo Novakovic, Sundaresan Jayanthi, Adonis Lupulescu, Ēriks Kupče, J. Tassilo Grün, Klara Mertinkus, Andreas Oxenfarth, Harald Schwalbe, Lucio Frydman

Published in: ChemPhysChem, 2022, ISSN 1439-7641

Publisher: Wiley

DOI: 10.1002/cphc.202100704

[Is a Quantum Biosensing Revolution Approaching? Perspectives in NV-Assisted Current and Thermal Biosensing in Living Cells](#) 

Author(s): Giulia Petrini, Ekaterina Moreva, Ettore Bernardi, Paolo Traina, Giulia Tomagra, Valentina Carabelli, Ivo Pietro Degiovanni, Marco Genovese
Published in: Advanced Quantum Technologies, Issue 3/12, 2020, Page(s) 2000066, ISSN 2511-9044
Publisher: Wiley-VCH GmbH
DOI: 10.1002/qute.202000066

[Harnessing Water to Enhance Quadrupolar NMR Spectroscopy and Imaging](#)

Author(s): Ricardo P. Martinho, Lucio Frydman
Published in: Chem. Eur. Journal, Issue 28, 2022, Page(s) e202201490, ISSN 1521-3765
Publisher: John Wiley & Sons
DOI: 10.1002/chem.202201490

[How to enhance quantum generative adversarial learning of noisy information](#)

Author(s): Paolo Braccia, Filippo Caruso, Leonardo Banchi
Published in: New Journal of Physics, Issue 23/5, 2021, Page(s) 053024, ISSN 1367-2630
Publisher: Institute of Physics Publishing
DOI: 10.1088/1367-2630/abf798

[Work Generation from Thermal Noise by Quantum Phase-Sensitive Observation](#)

Author(s): Tomas Opatrný, Avijit Misra, Gershon Kurizki
Published in: Physical Review Letters, Issue 127/4, 2021, Page(s) 040602, ISSN 0031-9007
Publisher: American Physical Society
DOI: 10.1103/physrevlett.127.040602

[Information Theoretical Limits for Quantum Optimal Control Solutions: Error Scaling of Noisy Channels](#)

Author(s): Müller, Matthias; Gherardini, Stefano; Calarco, Tommaso; Montangero, Simone; Caruso, Filippo
Published in: Scientific Reports, Issue 16, 2022, ISSN 2045-2322
Publisher: Nature Publishing Group
DOI: 10.1038/s41598-022-25770-6

[Coherent interface between optical and microwave photons on an integrated superconducting atom chip](#)

Author(s): David Petrosyan, József Fortágh, Gershon Kurizki
Published in: EPJ Quantum Technology, 2024, ISSN 2196-0763
Publisher: Springer
DOI: 10.1140/epjqt/s40507-024-00229-x

[Topology identification of autonomous quantum dynamical networks](#)

Author(s): Stefano Gherardini; Henk J. van Waarde; Pietro Tesi; Filippo Caruso
Published in: Phys. Rev. A, 2022, ISSN 2469-9934
Publisher: APS
DOI: 10.48550/arxiv.2111.00812

[Efficient and robust signal sensing by sequences of adiabatic chirped pulses](#) 

Author(s): Genko T. Genov, Yachel Ben-Shalom, Fedor Jelezko, Alex Retzker, Nir Bar-Gill
Published in: Physical Review Research, Issue 2/3, 2020, ISSN 2643-1564
Publisher: APS
DOI: 10.1103/physrevresearch.2.033216

[Fast Quantum State Tomography in the Nitrogen Vacancy Center of Diamond](#) 

Author(s): Jingfu Zhang, Swathi S. Hegde, and Dieter Suter
Published in: Phys. Rev. Lett., 2023, ISSN 0031-9007
Publisher: American Physical Society
DOI: 10.1103/physrevlett.130.090801

[3D Heteronuclear Magnetization Transfers for the Establishment of Secondary Structures in SARS-CoV-2-Derived RNAs](#) 

Author(s): Jihyun Kim, Mihajlo Novakovic, Sundaresan Jayanthi, Adonis Lupulescu, Eriks Kupce, J. Tassilo Grün, Klara Mertinkus, Andreas Oxenfarth, Christian Richter, Robbin Schnieders, Julia Wirmer-Bartoschek, Harald Schwalbe, Lucio Frydman
Published in: Journal of the American Chemical Society, Issue 143/13, 2021, Page(s) 4942-4948, ISSN 0002-7863
Publisher: American Chemical Society
DOI: 10.1021/jacs.1c01914

[Experimental Quantum Embedding for Machine Learning](#) 

Author(s): Ilaria Gianani; Ivana Mastroserio; Lorenzo Buffoni; Natalia Bruno; Ludovica Donati; Valeria Cimini; Marco Barbieri; Francesco S. Cataliotti; Filippo Caruso
Published in: Advanced Quantum Technologies, 2022, ISSN 2511-9044
Publisher: Wiley
DOI: 10.1002/qute.202100140

[Variable bandwidth, high efficiency microwave resonator for control of spin-qubits in nitrogen-vacancy centers](#) 

Author(s): Anton Savitsky; Jingfu Zhang; Dieter Suter
Published in: Rev. Sci. Instrum., Issue 12, 2023, ISSN 1089-7623
Publisher: AIP
DOI: 10.1063/5.0125628

[Hyperpolarized water as universal sensitivity booster in biomolecular NMR](#)

Author(s): Christian Hilty, Dennis Kurzbach, Lucio Frydman

Published in: Nature Protocols, 2022, ISSN 1754-2189

Publisher: Nature Publishing Group

DOI: 10.1038/s41596-022-00693-8

[Nitrogen-Vacancy Singlet-Manifold Ionization Energy](#)

Author(s): Wolf, Sigal A.; Meirzada, I.; Haim, G.; Bar-Gill, N.

Published in: Phys. Rev. Applied, Issue 034076, 2023, ISSN 2331-7019

Publisher: APS

DOI: 10.1103/physrevapplied.19.034076

[Noise sensing via stochastic quantum Zeno](#)

Author(s): Matthias M. Müller, Stefano Gherardini, Nicola Dalla Pozza, Filippo Caruso

Published in: Physics Letters A, 2020, Page(s) 126244, ISSN 0375-9601

Publisher: Elsevier BV

DOI: 10.1016/j.physleta.2020.126244

[Experimental proof of quantum Zeno-assisted noise sensing](#)

Author(s): Hoang-Van Do, Cosimo Lovecchio, Ivana Mastroserio, Nicole Fabbri, Francesco S Cataliotti, Stefano Gherardini, Matthias M Müller, Nicola Dalla Pozza, Filippo Caruso

Published in: New Journal of Physics, Issue 21/11, 2019, Page(s) 113056, ISSN 1367-2630

Publisher: Institute of Physics Publishing

DOI: 10.1088/1367-2630/ab5740

[Role of the filter functions in noise spectroscopy](#)

Author(s): Nicola Dalla Pozza, Stefano Gherardini, Matthias M. Müller, Filippo Caruso

Published in: International Journal of Quantum Information, 2020, Page(s) 1941008, ISSN 0219-7499

Publisher: World Scientific Publishing Co

DOI: 10.1142/s0219749919410089

[Quantum Stochastic Walk models for quantum state discrimination](#)

Author(s): Nicola Dalla Pozza, Filippo Caruso

Published in: Physics Letters A, Issue 384/9, 2020, Page(s) 126195, ISSN 0375-9601

Publisher: Elsevier BV

DOI: 10.1016/j.physleta.2019.126195

[Characterizing spin-bath parameters using conventional and time-asymmetric Hahn-echo sequences](#)



Author(s): D. Farfurnik, N. Bar-Gill

Published in: Physical Review B, Issue 101/10, 2020, ISSN 2469-9950

Publisher: APS

DOI: 10.1103/physrevb.101.104306

[Robust mode conversion in NV centers using exceptional points](#)



Author(s): A. Pick, S. Silberstein, N. Moiseyev, N. Bar-Gill

Published in: Physical Review Research, Issue 1/1, 2019, ISSN 2643-1564

Publisher: APS

DOI: 10.1103/physrevresearch.1.013015

[Hamiltonian engineering of general two-body spin-1/2 interactions](#)



Author(s): K. I. O. Ben 'Attar, D. Farfurnik, N. Bar-Gill

Published in: Physical Review Research, Issue 2/1, 2020, ISSN 2643-1564

Publisher: APS

DOI: 10.1103/physrevresearch.2.013061

[Enhanced spin state readout of nitrogen-vacancy centers in diamond using infrared fluorescence](#)



Author(s): I. Meirzada, S. A. Wolf, A. Naiman, U. Levy, N. Bar-Gill

Published in: Physical Review B, Issue 100/12, 2019, ISSN 2469-9950

Publisher: APS

DOI: 10.1103/physrevb.100.125436

[Anti-Zeno quantum advantage in fast-driven heat machines](#)



Author(s): Victor Mukherjee, Abraham G. Kofman, Gershon Kurizki

Published in: Communications Physics, Issue 3/1, 2020, ISSN 2399-3650

Publisher: Nature

DOI: 10.1038/s42005-019-0272-z

[Enhanced precision bound of low-temperature quantum thermometry via dynamical control](#)



Author(s): Victor Mukherjee, Analia Zwick, Arnab Ghosh, Xi Chen, Gershon Kurizki

Published in: Communications Physics, Issue 2/1, 2019, ISSN 2399-3650

Publisher: Nature

DOI: 10.1038/s42005-019-0265-y

[Optimal photon energies for initialization of hybrid spin quantum registers of nitrogen-vacancy centers in diamond](#)



Author(s): K. Rama Koteswara Rao, Yihua Wang, Jingfu Zhang, Dieter Suter

Published in: Physical Review A, Issue 101/1, 2020, ISSN 2469-9926

Publisher: APS

DOI: 10.1103/physreva.101.013835

[Assessing Site-Specific Enhancements Imparted by Hyperpolarized Water in Folded and Unfolded Proteins by 2D HMQC NMR](#) 

Author(s): Or Szekely, Gregory Lars Olsen, Mihajlo Novakovic, Rina Rosenzweig, Lucio Frydman

Published in: Journal of the American Chemical Society, Issue 142/20, 2020, Page(s) 9267-9284, ISSN 0002-7863

Publisher: American Chemical Society

DOI: 10.1021/jacs.0c00807

[Spectral super-resolution spectroscopy using a random laser](#) 

Author(s): Alice Boschetti, Andrea Taschin, Paolo Bartolini, Anjani Kumar Tiwari, Lorenzo Pattelli, Renato Torre, Diederik S. Wiersma

Published in: Nature Photonics, Issue 14/3, 2020, Page(s) 177-182, ISSN 1749-4885

Publisher: Nature Pub. Group

DOI: 10.1038/s41566-019-0558-4

[Practical Applications of Quantum Sensing: A Simple Method to Enhance the Sensitivity of Nitrogen-Vacancy-Based Temperature Sensors](#) 

Author(s): E. Moreva, E. Bernardi, P. Traina, A. Soso, S. Ditalia Tchernij, J. Forneris, F. Picollo, G. Brida, Ž. Pastuović, I. P. Degiovanni, P. Olivero, M. Genovese

Published in: Physical Review Applied, Issue 13/5, 2020, ISSN 2331-7019

Publisher: APS

DOI: 10.1103/physrevapplied.13.054057

[Efficient Implementation of a Quantum Algorithm in a Single Nitrogen-Vacancy Center of Diamond](#) 

Author(s): Jingfu Zhang, Swathi S. Hegde, Dieter Suter

Published in: Physical Review Letters, Issue 125/3, 2020, ISSN 0031-9007

Publisher: American Physical Society

DOI: 10.1103/physrevlett.125.030501

[Efficient Quantum Gates for Individual Nuclear Spin Qubits by Indirect Control](#) 

Author(s): Swathi S. Hegde, Jingfu Zhang, Dieter Suter

Published in: Physical Review Letters, Issue 124/22, 2020, ISSN 0031-9007

Publisher: American Physical Society

DOI: 10.1103/physrevlett.124.220501

[Identifying and Overcoming Artifacts in 1 H-Based Saturation Transfer NOE NMR Experiments](#) 

Author(s): J Tassilo Grün, Jihyun Kim, Sundaresan Jayanthi, Adonis Lupulescu, E Riks Kupče, Harald Schwalbe, Lucio Frydman

Published in: J. Am. Chem. Soc., 2023, ISSN 0002-7863

Publisher: American Chemical Society

DOI: 10.1021/jacs.2c13087

[Irreversibility mitigation in unital non-Markovian quantum evolutions](#) 

Author(s): Stefano Gherardini, Stefano Marcantoni, Filippo Caruso

Published in: Physical Review Research, Issue 2/3, 2020, Page(s) 033250, ISSN 2643-1564

Publisher: APS

DOI: 10.1103/physrevresearch.2.033250

[Transfer-tensor description of memory effects in open-system dynamics and multi-time statistics](#) 

Author(s): Filippo Caruso; Susana F HUELGA; Stefano Gherardini; Andrea Smirne

Published in: Quantum Science and Technology, 2022, ISSN 2058-9565

Publisher: IOP

DOI: 10.1088/2058-9565/ac4422

[Quantum Reinforcement Learning: the Maze problem](#) 

Author(s): Filippo Caruso; Nicola Dalla Pozza; STEFANO MARTINA; Lorenzo Buffoni

Published in: Quantum Machine Intelligence, 2022, ISSN 2524-4914

Publisher: Springer Nature

DOI: 10.1007/s42484-022-00068-y

[Information flow and error scaling for fully quantum control](#) 

Author(s): Stefano Gherardini; Matthias M. Müller; Simone Montangero; Tommaso Calarco; Filippo Caruso

Published in: Phys. Rev. Research, 2022, ISSN 2643-1564

Publisher: APS

DOI: 10.1103/physrevresearch.4.023027

[Limitations of Bulk Diamond Sensors for Single-Cell Thermometry](#) 

Author(s): Andrea Alessio, Ettore Bernardi, Ekaterina Moreva, Ivo Pietro Degiovanni, Marco Genovese, Marco Truccato

Published in: Sensors, 2023, ISSN 1424-8220

Publisher: Multidisciplinary Digital Publishing Institute (MDPI)

DOI: 10.3390/s24010200

[Secondary structure determination of conserved SARS-CoV-2 RNA elements by NMR spectroscopy](#) 

Author(s): Anna Wacker, Julia E Weigand, Sabine R Akabayov, Nadide Altincekic, Jasleen Kaur Bains, Elnaz Banijamali, Oliver Binas, Jesus Castillo-Martinez, Erhan Cetiner, Betül Ceylan, Liang-Yuan Chiu, Jesse Davila-Calderon, Karthikeyan Dhamotharan, Elke Duchardt-Ferner, Jan Ferner, Lucio Frydman, Boris Fürtig, José Gallego, J Tassilo Grün, Carolin Hacker, Christina Haddad, Martin Hähnke, Martin Hengesb

Published in: Nucleic Acids Research, Issue 48/22, 2020, Page(s) 12415-

12435, ISSN 0305-1048

Publisher: Oxford University Press

DOI: 10.1093/nar/gkaa1013

[Experimental quantum enhanced optical interferometry](#) 

Author(s): Marco Genovese

Published in: AVS Quantum Sci., 2021, ISSN 2639-0213

Publisher: AIP Publishing

DOI: 10.1116/5.0062114

[Does Decoherence Select the Pointer Basis of a Quantum Meter?](#) 

Author(s): Abraham G. Kofman, Gershon Kurizki

Published in: Entropy, Issue 24/1, 2022, Page(s) 106, ISSN 1099-4300

Publisher: Multidisciplinary Digital Publishing Institute (MDPI)

DOI: 10.3390/e24010106

[Heteronuclear transfers from labile protons in biomolecular NMR: Cross polarization, revisited](#) 

Author(s): Mihajlo Novakovic, Sundaresan Jayanthi, Adonis Lupulescu, Maria Grazia Concilio, Jihyun Kim, David Columbus, Ilya Kuprov, Lucio Frydman

Published in: Journal of Magnetic Resonance, 2021, ISSN 1090-7807

Publisher: Academic Press

DOI: 10.1016/j.jmr.2021.107083

[Enhanced quantum properties of shallow diamond atomic defects through nitrogen surface termination](#) 

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