Bibliography of Selected Articles and Papers that pertain to and support new theoretical directions in quantum physics, general relativity, integrated quantum gravity, also vacuum-energy (dark energy) photon extraction, stable wormholes, and non-classical temporal order and causality.

This is supportive of the general themes and directions of Reflexive Topological Dynamics (RTD) and also the implications for energy sources that can lead to generation of useful power for propulsion and other technological applications, as well as for long-distance displacement and travel of macroscopic objects in spacetime.

Some of these are for the general audience, some are semi-technical, and some are formal technical papers (as indicated by annotations). Most of the general-audience articles are in basic plain English and with some graphics, explaining a few points about emerging New Physics which all supports, confirms, adds-to, and/or provides some of the basis for all of this including my work in the field.

There is a concentrated group of research scientists working in these areas, and particularly in the relevant quantum gravity and quantum relativity domains which involve time dilation and macroscopic quantum events. These are persons and groups with whom collaboration is now desirable.

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[1]
Extraction (generation, production) of useful energy from the "quantum vacuum" (dark energy)

https://phys.org/news/2011-11-scientists-vacuum.html

https://www.scientificamerican.com/article/something-from-nothing-vacuum-can-yield-flashes-of-light/

https://en.wikipedia.org/wiki/Quantum_vacuum_thruster
relates to variety of speculative (and mostly doubtful) work done and claims made, including some @ NASA, about thrusters that work similar to ion engines but are claiming to get energy (photons) from the quantum vacuum

https://physicstoday.scitation.org/do/10.1063/PT.6.1.20190204a/full/
Negative-energy particles may extract energy from black holes

https://arxiv.org/pdf/1411.4986.pdf
Extracting Hidden-Photon Dark Matter From an LC-Circuit (technical paper)

https://arxiv.org/pdf/1210.6751.pdf
Exploring quantum vacuum with low-energy photons (technical paper)

http://inspirehep.net/record/1705081/
Mechanically generating entangled photons from the vacuum: A microwave circuit-acoustic resonator analog of the oscillatory Unruh effect (technical paper)

https://arxiv.org/pdf/1811.10065.pdf
Mechanically Generating Entangled Photons from the Vacuum: A MicrowaveCircuit-Acoustic Resonator Analogue of the Unruh Effect (technical paper)
Hui Wang (王惠),[1]M. P. Blencowe,[1]C. M. Wilson,[2]and A. J. Rimberg[1][1]Department of Physics and Astronomy, Dartmouth College, Hanover, New Hampshire 03755, USA[2]Institute for Quantum Computing and ECE Department, University of Waterloo, Waterloo, Canada(Dated: November 27, 2018

https://arxiv.org/pdf/1811.07526.pdf
Experimental investigating communication in a superposition of causal orders (technical paper)
Yu Guo,[1, 2]Xiao-Min Hu,[1, 2]Zhi-Bo Hou,[1, 2]Huan Cao,[1, 2]Jin-Ming Cui,[1, 2]Bi-Heng Liu,[1, 2, *]Yun-Feng Huang,[1, 2]Chuan-Feng Li,[1, 2,†]and Guang-Can Guo[1, 2][1]CAS Key Laboratory of Quantum Information, University of Science and Technology of China, Hefei, 230026, People's Republic of China[2]Synergetic Innovation Center of Quantum Information and Quantum Physics,University of Science and Technology of China, Hefei, Anhui 230026, People's Republic of China(Dated: November 20, 2018)

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[2]
Fundamentals of emergent spacetime and particle physics

https://physicsworld.com/a/quantum-spin-liquid-state-pathway-emerges/
Quantum spin liquid state pathway emerges

https://phys.org/news/2018-04-entanglement-near-macroscopic.html
2018

https://www.photonics.com/Article.aspx?AID=53136
Entanglement observed in near-macroscopic objects
Virtual Photons Become Real in a Vacuum

https://phys.org/news/2018-11-probing-quantum-physics-macroscopic-scale.html
Probing quantum physics on a macroscopic scale

https://www.sciencedaily.com/releases/2018/04/180425131858.htm
Einstein's 'spooky action' goes massive
The elusive quantum mechanical phenomenon of entanglement has now been made a reality in objects almost macroscopic in size

https://iopscience.iop.org/article/10.1088/1742-6596/1051/1/012019/pdf
Macroscopic entanglement and time reversal causality by data of the Baikal Experiment (technical paper)
S Korotaev1,2, N Budnev3,V Serdyuk2, E Kiktenko1,2, J Gorohov4and V Zurbanov

https://www.nature.com/articles/s41567-019-0663-9
Quantum superposition of molecules beyond 25 kDa (technical paper)
Yaakov Y. Fein, Philipp Geyer, Patrick Zwick, Filip Kiałka, Sebastian Pedalino, Marcel Mayor, Stefan Gerlich & Markus Arndt

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[3]
Temporal order, time dilation, time reversal, and much to do with integration or quantum mechanics with general relativity

https://www.cnn.com/2019/03/14/world/russia-scientists-reverse-time-scli-scn-intl/index.html

https://www.youtube.com/watch?v=0ui9ovrQuKE
Delayed Choice Quantum Eraser: Shocking Results may show Future Affects Past (video lecture)

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All of the following are connected with Zych, Brukner, Costa, Pikovski, et al

[1]
https://www.eurekalert.org/pub_releases/2019-08/uov-qgt082219.php
News Release 22-Aug-2019
Quantum gravity's tangled time
General-audience article

[2]
https://thenextweb.com/science/2019/10/03/this-quantum-physics-breakthrough-could-be-the-origin-story-for-time-travel/
General-audience article

[3]
https://thenextweb.com/science/2019/08/28/this-thought-experiment-explains-how-quantum-computers-can-time-travel/
General-audience article

Technical papers

[4] ###
https://www.nature.com/articles/s41467-019-11579-x.pdf
Bell’s theorem for temporal orderMagdalena Zych1, Fabio Costa1, Igor Pikovski2,3,4&Časlav Brukner

[5] ###

https://advances.sciencemag.org/content/advances/3/3/e1602589.full.pdf
Experimental verification of an indefinite causal order
Giulia Rubino,[1]* Lee A. Rozema,[1]Adrien Feix,[1,2]Mateus Araújo,[1,2]Jonas M. Zeuner,[1]Lorenzo M. Procopio,[1]Časlav Brukner,[1,2]Philip Walther

[6] ###
https://arxiv.org/pdf/1712.06884.pdf
Experimental Entanglement of Temporal Orders
Giulia Rubino[1]∗, Lee A. Rozema[1], Francesco Massa[1], Mateus Ara ´ujo[2],Magdalena Zych[3],ˇCaslav Brukner[1,4], Philip Walther[1]∗

[7] ##
https://arxiv.org/pdf/1809.04999.pdf
Relativity of quantum superpositions
Magdalena Zych,[1,]∗Fabio Costa,[1]and Timothy C. Ralph

[8] ###
https://iopscience.iop.org/article/10.1088/1367-2630/aa5d92/pdf
Time dilation in quantum systems and decoherence
Igor Pikovski[1,2], Magdalena Zych[3], Fabio Costa[3]andČaslav Brukner[4]

[9]
https://arxiv.org/pdf/1206.0965.pdf
General relativistic effects in quantum interference of photons
Magdalena Zych,[1]Fabio Costa,[1]Igor Pikovski,[1]Timothy C. Ralph,[2]andˇCaslav Brukner
Nov 2012

[10] ###
https://arxiv.org/pdf/1311.1095.pdf
Universal decoherence due to gravitational time dilation
Igor Pikovski,1, 2, 3, 4,∗Magdalena Zych,1, 2, 5Fabio Costa,1, 2, 5andˇCaslav Brukner1,
June 2015

[11] ##
https://arxiv.org/pdf/1508.03296.pdf
Time Dilation in Quantum Systems and Decoherence: Questions and Answers
Igor Pikovski,1, 2Magdalena Zych,3Fabio Costa,3andˇCaslav Brukner4
Aug 2015

[12]
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6777965/pdf/aax8966.pdf
Interference of clocks: A quantum twin paradox
Sina Loriani[1]*, Alexander Friedrich[2]*†, Christian Ufrecht[2], Fabio Di Pumpo[2], Stephan Kleinert[2],Sven Abend[1], Naceur Gaaloul[1], Christian Meiners[1], Christian Schubert[1], Dorothee Tell[1],Étienne Wodey[1], Magdalena Zych[3], Wolfgang Ertmer[1], Albert Roura[2], Dennis Schlippert[1],Wolfgang P. Schleich[2,4,5], Ernst M. Rasel[1], Enno Giese[2]

[13]
https://arxiv.org/pdf/1607.04022.pdf
General relativistic effects in quantum interference of “clocks”
M Zych[1], I Pikovski[2,3], F Costa[1]and˘C Brukner
July 2016

[14] ##
https://www.researchgate.net/publication/313424051_Quantum_Systems_under_Gravitational_Time_Dilation/stats
2017 PhD thesis/book

[15] ##
https://arxiv.org/pdf/1612.07735.pdf
Gravity is not a Pairwise Local Classical Channel
Natacha Altamirano,[1, 2,]∗Paulina Corona-Ugalde,[3, 2,]†Robert B. Mann,[1, 3, 2,]‡and Magdalena Zych
Aug 2018

[16]
https://arxiv.org/pdf/1906.03980.pdf
Mass-energy equivalence in harmonically trapped particles
Rebecca Haustein,1Gerard J. Milburn,1and Magdalena Zych1
June 2019

[17] ###
Testing collapse mechanisms with high frequency quantum optomechanics
Stefan Forstner[1], Magdalena Zych[1], Sahar Basiri-Esfahani[2], Kiran E. Khosla[3], and Warwick P. Bowen[1]
Sept 2019

[18] ###
https://arxiv.org/pdf/1703.00779.pdf
Reversible time travel with freedom of choice
Ämin Baumeler,1, 2Fabio Costa,3Timothy C. Ralph,4Stefan Wolf,5, 2and Magdalena Zych
Oct 2019

Zych bibliography on Arxiv.org
https://arxiv.org/search/quant-ph?searchtype=author&query=Zych%2C+M

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[4]
Wormhole/Blackhole related

https://www.physics-astronomy.org/2018/05/new-research-shows-that-time-travel-is.html
General-audience

https://www.rt.com/news/471745-wormhole-theory-how-to-find/
General-audience
+
https://journals.aps.org/prd/abstract/10.1103/PhysRevD.100.083513
Observing a wormhole
De-Chang Dai and Dejan Stojkovic
Phys. Rev. D **100**, 083513 – Published 10 October 2019
[must request – cannot download pdf]

https://www.rt.com/viral/346164-wormhole-spacecraft-blackhole-universe/
General-audience
+
https://iopscience.iop.org/article/10.1088/0264-9381/33/11/115007
Impact of curvature divergences on physical observers in a wormhole space–time with horizons
Gonzalo J Olmo1,2, D Rubiera-Garcia3 and A Sanchez-Puente1
Published 28 April 2016 • © 2016 IOP Publishing Ltd
Classical and Quantum Gravity, Volume 33, Number 11
[must request – cannot download pdf]

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("Fringe stuff" (mixed speculative science and pseudo-science, in my opinion), but still useful to take a look, because it describes that some funding support has gone into even these far-out fringe areas, from US government agencies)

https://metro.co.uk/2019/04/18/us-navy-secretly-designed-super-fast-futuristic-aircraft-resembling-ufo-documents-reveal-9246755/

https://www.vice.com/en_us/article/3kg8v5/the-governments-secret-ufo-program-

funded-research-on-wormholes-and-extra-dimensions

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Development Plan for Collaborations involving TETRAD Institutes with some of these people and centers

USA
Abraham (Avi) Loeb, chair of the Astronomy department, Harvard University
Breakthrough Initiatives and Starshot

CA
Perimeter

AU
Zych

RU
(also Breakthrough people)

(Granichin et al)

DK
DTU

SE
Linnaus

Chalmers

FI
Aalto/VTT

AT

Brukner
Univ. of Vienna, Physics

IQOQI, Austrian Acad. Of Science

IL

UK
F. Markopoulou and Doppel, and thus some things in physics networks

Europe-other

CN