

Peer reviewed relativity analyses 2002-2020

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1. A transparent single postulate special relativity exposition considered in prior literature (AJP 1984—Cornell physicist *David Mermin*) as ‘beyond general education’; an undocumented kernel ‘chronosity’ / velocity ratio $1/\lambda^2$; an elementary ‘indeterminacy’ theorem identifying the cosmic limit speed λ as c and a dual clocks cosmic limit speed rational function formula (more directly derived in a 2017 book), thereby disproving relativity pioneer *Henri Poincaré*’s 1898 twofold assertion: “no measurement of this velocity could be attempted. This [second] postulate could never be verified directly by experiment [even theoretically];” (Rev. Methaphys. Morale, 6, [XII]: https://en.wikisource.org/wiki/The_Measure_of_Time); a mathematically intricate (scripted) yet plausible single clock experiment (§5) for low cost detection of gravitational waves—(2003): <https://iopscience.iop.org/article/10.1088/0143-0807/24/3/311>. This paper was commended by an unsolicited 2006 *European Mathematical Society* posting: <https://zbmath.org/?q=ai%3Acoleman.brian>
2. A simpler cosmic limit speed formula, $\lambda = (cT/t)/(1-t^2/t^2)^{1/2}$, involving an idealised theoretical Gedankenexperiment measurement—(2004): <https://iopscience.iop.org/article/10.1088/0143-0807/25/3/L01>
3. Creation of *visualisable* spherical geometry models of relativistic velocity composition and acceleration, based on 10th century Islamic trigonometry and a seemingly hitherto unknown spherical spiral—(2004). First outlined at <http://www.astronomy.ie/lecture0507.html>
4. Exposition of an unprecedented straight path to a genesis of relativistic dynamics which properly contextualises Newton’s 3rd law of motion using hitherto unexploited calculus. The initially perplexed EJP reviewer’s U-turn also graciously affirmed apparent total absence of this novel approach in relativity literature; ascertainment of direct equivalences of five relativity dynamics principles, including $E=m\gamma c^2$ —(2005 / 2006): <https://iopscience.iop.org/article/10.1088/0143-0807/26/4/010> , <https://iopscience.iop.org/article/10.1088/0143-0807/27/4/029>
5. Rectification of a SAGNAC EFFECT related time dilation formula error in the 2004 Kluwer / Springer book *Relativity in Rotating Frames*, as generously conceded by a co-editor; identification of the scenario’s equivalence to *Hafele-Keating*’s 1972 time dilation experiment (‘in the limit’); clarification (kindly prompted by late Dublin physicists *Roy Johnston* and *Ian Elliot*) of Sagnac effect 1990s misinterpretations by the (also late) Irish engineer *Alphonsus Kelly* and Italian physicist *Franco Selleri* and outlined in <https://spacetimefundamentals.files.wordpress.com/2017/11/mvixra2015.pdf> (§4, §6). One *Foundations of Physics* journal reviewer keenly endorsed an unsuccessful 2008 submission which an FoP editor later retrospectively referred to as “interesting and correct” —(2008 / 2015).
6. Analytic invalidation of *generalized* Minkowski spacetime in special relativity—(Göttingen presentation 2012). <https://www.dpg-verhandlungen.de/year/2012/conference/goettingen/part/gr/session/4/contribution/4>
7. New detailed radar scenario analyses of ‘rigor mortis’ (Born’s ‘rigid motion’) and homogeneously accelerating media disqualifying widespread simplistic ‘2nd postulate’ overgeneralisations; detailed exposition of *Robert Brehme*’s 1968 twin rockets shutdown ‘interphenomena’—(2016): <http://dx.doi.org/10.1016/j.rinp.2016.01.001>
8. In-depth mathematical resolution of the 1959 ‘Bell’s string paradox’ enigma introducing a real-metric 3D ‘hemicoid’ as the sole possible differential manifold representation of a uniformly expanding accelerating medium —(2017): <http://dx.doi.org/10.1016/j.rinp.2017.07.013> . Outlined in two spacetime diagrams overleaf.
9. Generalisation of accelerating fixed-thrust constituents media theory, with 3D real-metric manifolds corroborated by differential geometry and radar trajectories which also call into question *hypothesised* general relativity geodesics—(2019): <https://doi.org/10.1016/j.rinp.2019.102721> . (Earlier ‘disowned’ by *Foundations of Physics*.) Already outlined at http://www.icra.it/mg/mg15/MG15_poster.pdf (Rome, July 2018), and at <https://agenda.infn.it/event/15395/attachments/59875/70694/Poster.pdf> (Rome, February 2019).
10. Dedactic expositions of issues 1-9 in a 22-chapters textbook published in 2017 in English and in 2018 in German: <https://spacetimefundamentals.com> , <https://spacetimefundamentals.files.wordpress.com/2020/05/prologue2.pdf>
11. PENDING: *General relativity* reassessments of Einstein’s *equivalence principle* and *black hole dynamics*; challenges to *conventional gravitational potential deployment* which fails to account for differently time-lagged gravitational effects of constituents of a relatively moving gravity source mass; authoring of a new book requested by Cambridge publisher www.cambridgescholars.com .



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