Presentation Charts for

FUNDAMENTALLY ANISOTROPIC LIGHT-VELOCITY AT THE FOUNDATION OF CLASSICAL PHYSICS

Given at the Annual AAAS-PD Conference (June 2015) in San Francisco

Probably the most recognized principle at the foundation of Einstein's special relativity (1905) is isotropic light-speed—i.e., c=constant, irrespective of relative velocity between observer and the experimental apparatus (e.g., the Michelson-Morley setup). But is light-speed truly isotropic...and here we may keep in mind that Einstein himself allowed that the principle was a *stipulation*, rather than fundamental. (Einstein referred to the subject several times, beginning with his 1905 paper. A good overview is given by Selleri in "Recovering the Lorentz ether" (2004): "2. Conventional simultaneity".)

In fact, the c=constant "principle" is a special case—where the reader is referred to Rizzi et al. (2008) for an exhaustive treatise on the matter—a special case that greatly simplifies the mathematics (of the Maxwell equations, for example…see Rizzi et al. Appendix A,2) while encompassing space-time physics at the time, as did general relativity ten years later. Anisotropic light-speed by itself does not provide measureable empirical traction. But when we recognize singular anisotropic light-speed in conjunction with the Hubble expansion such traction does emerge. This is the subject of the next technical presentation at the AAAS-PD San Diego conference in 2016.

Our interest now turns to the charts shown at the 2015 conference in San Francisco, which charts, as a primary intent, demonstrated the multi-state character of physical reality within the classical perspective (which I understand to include special and general relativity). Chart #4 (Schrodinger's Cat---Dead and Alive) may be considered the core of the talk, with the two preceding charts addressing relevant coordinate transformations. This condition in classical theory follows from Einstein's dual synchronization methods: a) synchronization via light-pulses (1905); and b) synchronization via same-motion acceleration (1907). At the end of synchronization 'b', repeat of synchronization 'a' immediately exhibits the multi-state character (two states in his case).

While the relativistic theory presented below is not new in its empirical attributes—in other words, there are no new predictions or explanations—its (relativistic) extension for modeling galactic-rotation

flattening by accounting for anisotropic light-velocity within the Hubble flow (presented at the 2016 AAAS-PD conference (San Diego)) is significant in that it resolves Newtonian/GRT predictive breakdown without recourse to dark matter.

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16 June 2015

"… any two clocks of [accelerated system] Σ are synchronous with respect to [nonaccelerated reference system] S at the time t = 0, and undergo the same motion, they remain continuously synchronous with respect to S.

On the other hand, we must not consider the [same-motion] local time σ as simply the "time" of Σ, because, in fact, two [clocks] at two different points of Σ are not [synchronous] in the sense of [special relativity] when their local times σ are equal to each other." Quotations in reversed order. (Albert Einstein, <u>Principle of Relativity and Gravitation</u>, 1907, p. 900)

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<u>EINSTEIN'S SAME-MOTION TRANSFORMATION</u>

(From *Principle of Relativity and Gravitation*, 1907)

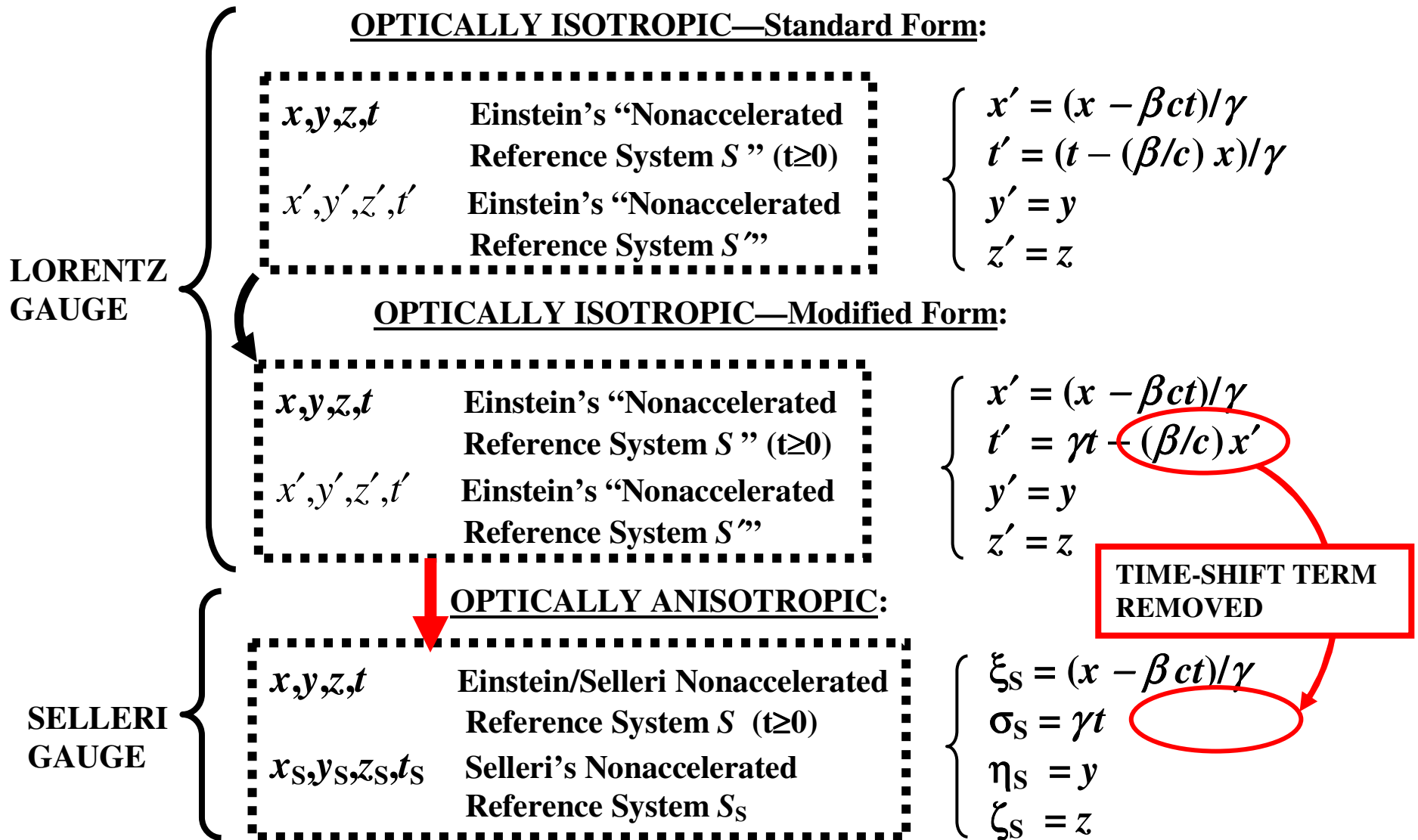"We consider now a reference system Σ which is uniformly accelerated relative to the nonaccelerated reference system *S* in the direction of the x axis of the latter." Einstein (1907), p. 899.

- **THIS IS THE <u>SECOND</u> EINSTEIN SYNCHRONIZATION CONVENTION;**

- **RESULTS IN FUNDAMENTALLY ANISOTROPIC LIGHT-SPEED IN SYSTEM Σ.**

x,y,z,t : Einstein's "Nonaccelerated Reference System *S* "

ξ,η,ζ,σ : Einstein's Same-Motion "Reference System Σ" (t≥0)

$$\xi = (x - \beta ct)/\gamma = X/\gamma; \; X \text{ invariant.}$$
$$\sigma = \gamma t + f(t)$$
$$\eta = y$$
$$\zeta = z$$

- **EMPIRICALLY LEGITIMATE—Because it predicts *Progressive Time-Shift*— two ways: (1) using the Einstein-Lorentz transformation (1905); and (2) using the Selleri gauge. (Both derivation-approaches are in the paper, resulting in: PT-S=aξ/c^2 .)**

- **PROVIDES THE EMPIRICAL BASIS for the deeper *Neoclassical Paradigm*.**

RELATIONSHIP OF SELLERI GAUGE TO LORENTZ TRANSFORMATION (Empirically Equivalent; Rizzi et.al, 2008)

LORENTZ GAUGE

OPTICALLY ISOTROPIC—Standard Form:

x,y,z,t Einstein's "Nonaccelerated Reference System S " ($t \geq 0$)

x',y',z',t' Einstein's "Nonaccelerated Reference System S'"

$$\begin{cases} x' = (x - \beta ct)/\gamma \\ t' = (t - (\beta/c)\,x)/\gamma \\ y' = y \\ z' = z \end{cases}$$

OPTICALLY ISOTROPIC—Modified Form:

x,y,z,t Einstein's "Nonaccelerated Reference System S " ($t \geq 0$)

x',y',z',t' Einstein's "Nonaccelerated Reference System S'"

$$\begin{cases} x' = (x - \beta ct)/\gamma \\ t' = \gamma t - (\beta/c)\,x' \\ y' = y \\ z' = z \end{cases}$$

SELLERI GAUGE

OPTICALLY ANISOTROPIC:

x,y,z,t Einstein/Selleri Nonaccelerated Reference System S ($t \geq 0$)

x_S,y_S,z_S,t_S Selleri's Nonaccelerated Reference System S_S

$$\begin{cases} \xi_S = (x - \beta ct)/\gamma \\ \sigma_S = \gamma t \\ \eta_S = y \\ \zeta_S = z \end{cases}$$

TIME-SHIFT TERM REMOVED

SCHRODINGER'S CAT---DEAD AND ALIVE
(Classical Theory, Exclusive of QM)
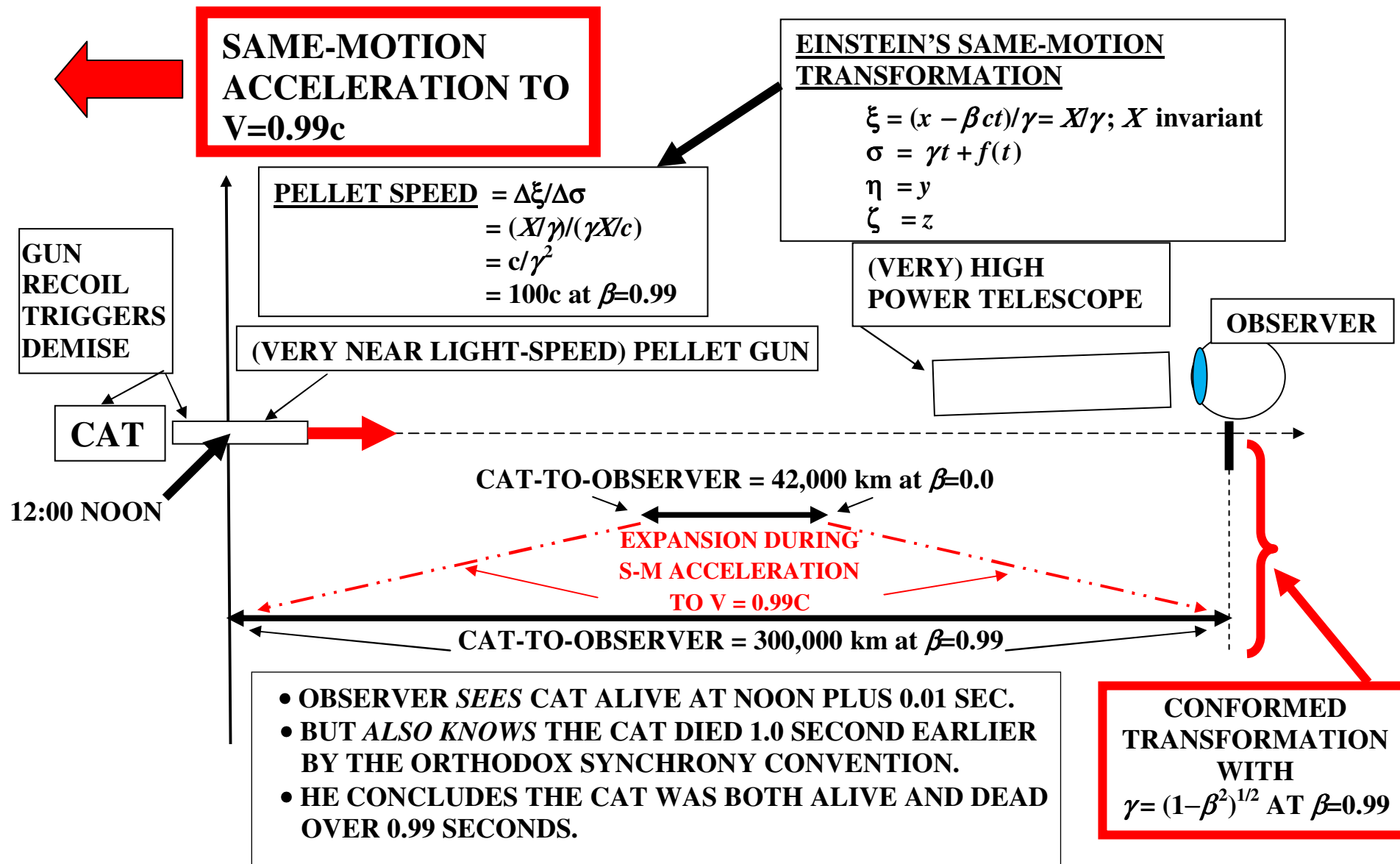
CONCLUSIONS

- **Einstein Pointed Towards the Deeper Neoclassical Paradigm by "Same-Motion Synchrony" (1907);**

- **Einstein's "Same-Motion Transformation" Is Given Empirical Legitimacy by its Use in Deriving the Experimentally Confirmed "Progressive Time-Shift";**

- **Superluminal Photon Speed and Indeterminate Space-Time Emerge from the Same-Motion Transformation;**

- **Schrodinger's Cat "Dead and Alive" Is Demonstrated Thereby Promoting the Neoclassical Paradigm;**

- **These Advances Recommend *Singularly* Unbounded (i. e., One-Way Infinite) Light-Speed for Resolution of the Bell-EPR Impasse and Relativity versus Quantum Theory Divide.**