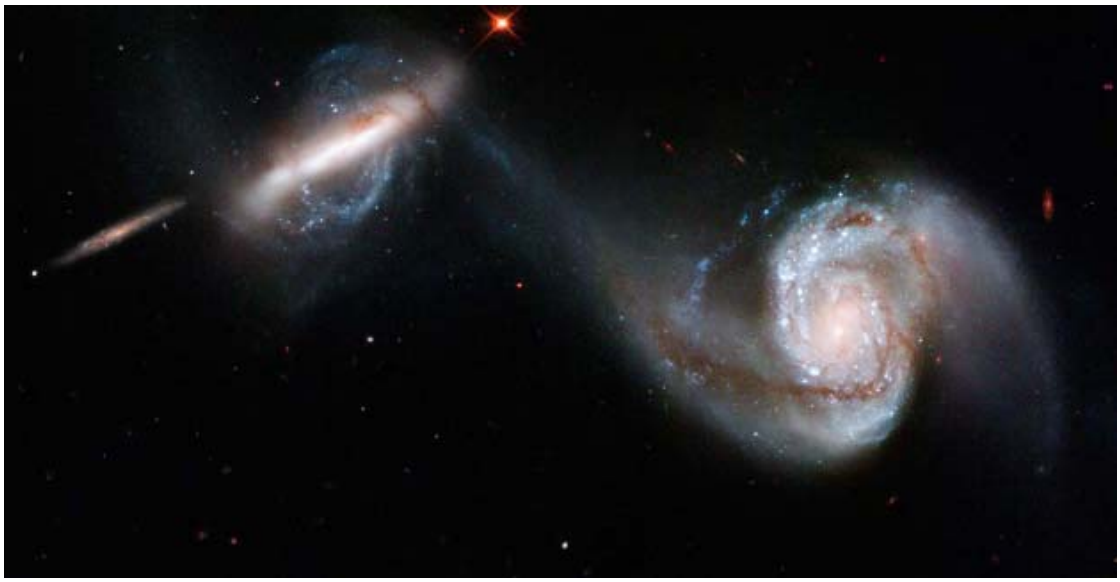
Mogens True Wegener

NON-STANDARD RELATIVITY

A PHILOSOPHER'S HANDBOOK OF HERESIES IN PHYSICS

New Concise Edition, Revised 2021.06.09



Entangled Galaxies, Arp 87
"Hubble Heritage"
Courtesy of NASA & STSci

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FIGURE 1.

The dispersion of galaxies
according to Hubble's law
(velocity $\propto$ distance)

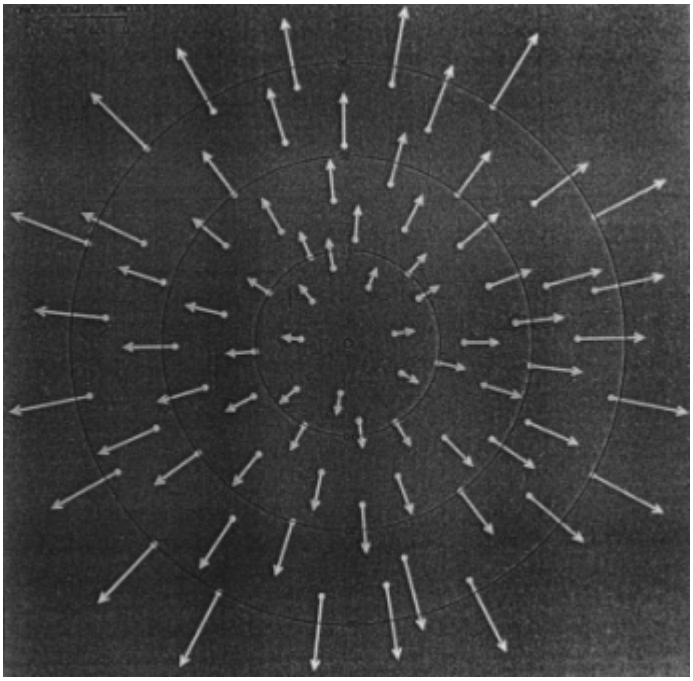

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FIGURE 2.

The Milne "big bang" model,
a pseudo-sphere expanding with the speed of light.
Remove the arrows, and you find the
static pseudo-sphere of my new "steady-state" model.

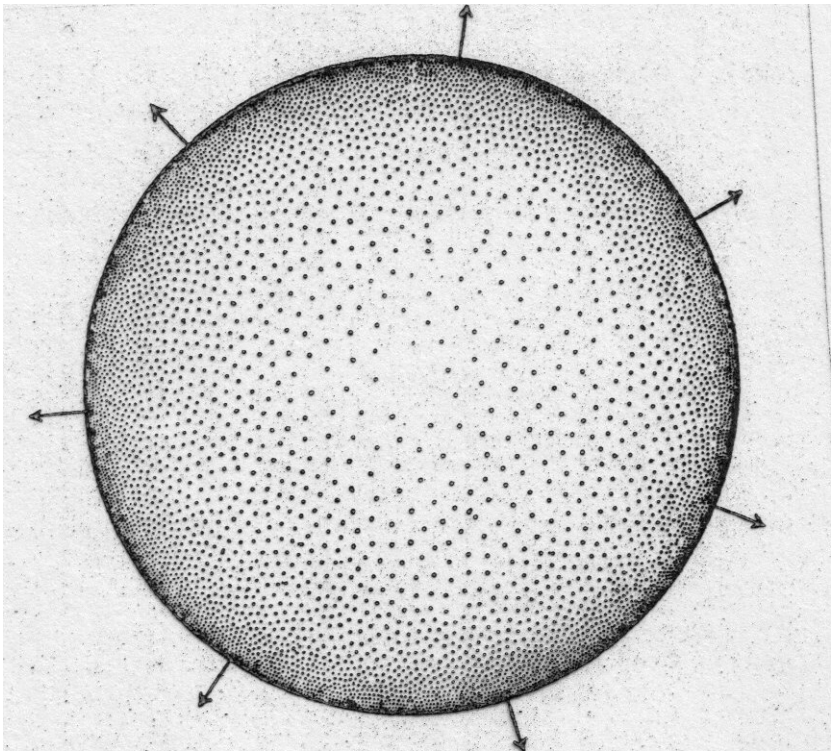

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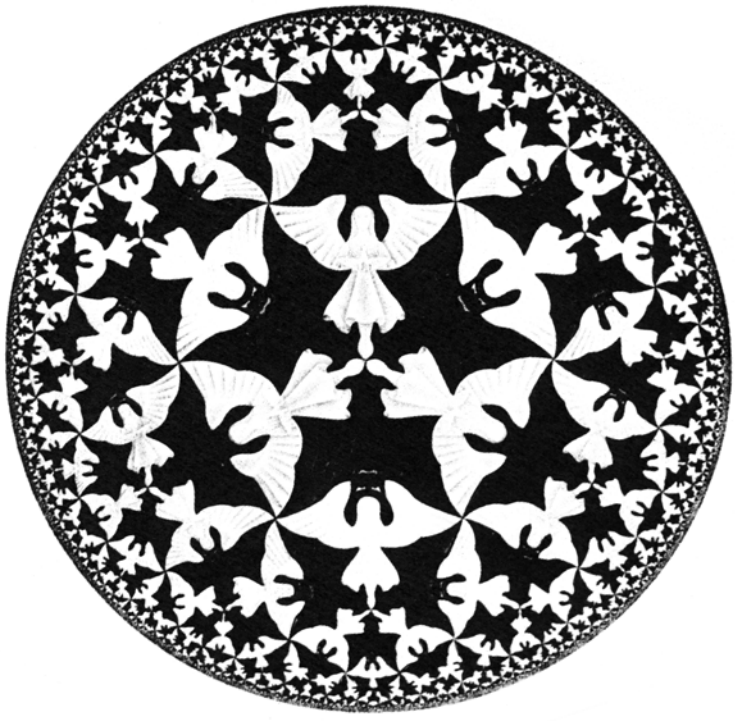
FIGURE 3.

M.C. Escher: 'Circle Limit 4'
a most wonderful illustration of the
shrinking of galaxies with distance
in a flat space of finite radius.



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Heard melodies are sweet,
but those unheard are sweeter;
therefore, ye soft pipes, play on;
not to the sensual ear, but, more endear'd,
pipe to the spirit ditties of no tone: ...

'Beauty is Truth, Truth Beauty' - that is all
ye know on earth, and all ye need to know.

John Keats: 'Ode on a Grecian Urn'
(find the urn on the next page)

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"The essence of scientific freedom is the right to come to conclusions which differ from those of the majority." *E.A. Milne: Modern Cosmology .., 1952.*

"In fact there is no experimental evidence at all for the theory (i.e. Special Relativity); all that appears to support it does so through a circular argument."
H. Dingle, introduction to Bergson, 1965.

"If science is not to degenerate into a medley of ad hoc hypotheses, it must become philosophical and must enter upon a thorough criticism of its own foundations."
A.N. Whitehead: Science & the Modern World, 1925.

"We come thus finally to what is perhaps the most destructive aspect of any physical theory that is 'too succesful' in the social or political sense - it destroys human freedom, and particularly the most precious one, the freedom to think. Forbidden thoughts, censored in their cradle - in this instance typified by the concept of distant simultaneity - always slip in by the back way, to the total confounding of rational thought processes .."
T.E. Phipps, jr.: Heretical Verities .., 1986.

"Imagine two clocks ... which are permanently keeping a perfect agreement. This may happen in three different ways. The first way is to presuppose a natural, or causal, influence (this is the way of the vulgar philosophy) ... The second way to make two clocks agree is to let them be controlled by a skilled craftsman who permanently adjusts the one to the other (this is the way of the occasionalist philosophy). The third way consists in adjusting their mechanisms so well from the beginning that this alone is sufficient to secure their agreement (this is the way of the pre-established harmony)." *G.W. Leibniz: Eclairciss. du Nouveau Systeme, 1695.*

"Leibniz's universe was composed of monads which he regarded as mutually independent but his famous principle of pre-established harmony stipulates that the states of all monads at every instant correspond with each other. Leibniz illustrated this principle by the simile of two clocks that have been so perfectly constructed that they keep perfect time with each other without either mutual influence or external assistance. Consequently, in so far as the temporal aspect of the universe is concerned, Leibniz's principle of harmony is equivalent to the postulate of a single universal time. We must therefore discard this principle if we are to reconcile Leibniz's way of regarding time with Einstein's theory of relativity."
G.J. Whitrow: What is Time? London 1972.

It is a tacit assumption of all physics that atoms of the same type, if exposed to the same conditions, oscillate at the same natural rate. Whenever we make use of atoms as "Zeitgebers" in atomic clocks we exploit their Leibnizian Harmony. As hinted at by Leibniz it is non-sensical, indeed vulgar, to ask for a causal explanation of this fundamental fact. Moreover, the standard metric of modern cosmology makes use of a temporal parameter which serves as a cosmic time. So why not simply accept that time is universal, and simultaneity absolute, even though this would necessitate a radical re-interpretation of relativity theory?
Mogens True Wegener

Nature's Code: "We only comprehend the part by connecting it instantly to the whole."
Peter Rowlands

PREFACE

The author of the present book has spent many years on a deep study of relativity theory and its physical interpretation, applying a range of skills - philosophic, scientific, mathematical, historical - that are seldom combined in a single individual. He believes, rightly in my opinion, that it is time to remove the mythology which has always surrounded relativity theory and to establish its real scientific basis on a logically coherent foundation. One of the key aspects of his analysis is a new understanding of time and its place in cosmology. He has been influenced in this by the British tradition of relativistic cosmology, established by E.A. Milne, and developed by his associates A.G. Walker (of Robertson-Walker metric fame) and G.J. Whitrow, and has made a strong argument for its continued relevance.

He believes that, as a philosopher, it is his obligation to search for a way of reconciling the diverging traditions represented by conflicting mathematical and physical interpretations. Only in this way can we arrive at an understanding of the deeper questions concerning the nature of space and time and their relation to cosmology that still remain unanswered at the end of the great twentieth-century physics project. One of Wegener's most significant findings is that, using a version of Milne's kinematic relativity, it is possible to create a world model which can be tested against experience, and which makes sense of both 'big bang' and 'steady state' aspects of cosmology. He has also shown that this cannot be done without an understanding of time which is deeper than any available in the current literature.

Although he has built his argument on a clear philosophical foundation, he has also shown that it can be presented in a rigorously mathematical and logical form. Of course, while some questions can be answered, others still remain, and one of the most fascinating parts of the book comes in chapter 9, where the extent of our knowledge of some of the most fundamental questions ever asked by philosophers, or by scientists - *What is Truth? Is the World Real? Is the World Just One? Is Nature Governed by Laws? Are Occurrences Predestined?* etc. - is put to the test of the methodology developed in the earlier chapters. Current physics and cosmology have left us with a confusion of empirically-derived models which do not yet combine into a coherent structure and which are most often *ad hoc*. Wegener is surely right in believing that the only way to tackle this problem is to go back to the foundations, and he has used skills acquired in many different disciplines to show us that a coherent solution is now within our grasp.

I thoroughly enjoyed reading the book.

Peter Rowlands
Physics Department
University of Liverpool

BRIEF PREAMBLE

In my opinion he (Einstein) would be one of the greatest theoretical physicists of all times even if he had not written a single line on relativity ... Max Born [1950]

With this quotation I believe to have paid my due homage to the great man. Nevertheless, it is the firm conviction of the present writer that the significance of Einstein's contribution to relativity theory has been grossly exaggerated, partly due to a media hype bursting forth shortly after ***WW1***, partly due to the need of the contemporary lay public to admire a non-martial hero. Since then his fame has reached mythological heights. But science is incompatible with myth.

As regards Special Relativity, it has been argued convincingly by Keswani [1964/65] that Poincaré had the entire theory, and that he had it all before Einstein. Against Grünbaum [1960], who has criticized Poincaré for lacking the candour and courage to face the full revolutionary import of the theory, it can be objected that the hesitation of Poincaré to abandon the Newtonian presuppositions of classical mechanics only shows his more mature judgment of the situation.

With respect to General Relativity, it was stressed already by Whittaker [1947] that it is "unwise to accept a theory hastily on the grounds of agreement between its predictions and the results of observations in a limited number of instances". In view of the more recent studies of the theory by Rowlands [1994, 2007] demonstrating in depth that "the revolutionary insights" of General Relativity not only *can* be reproduced on non-relativistic, almost Newtonian, premisses, but that they *were* in fact anticipated long before 1916, Whittaker's remark is most appropriate. In ch.5, §9, I have demonstrated how the (excess) advance of a planetary periastron, as well as the (excess) bending of light rays, are deducible from a few exceedingly simple assumptions.

So there is no binding reason to accept the widespread view that time is not universal, but only the fourth dimension of spacetime, that gravity is nothing but an effect of spatial curvature, and that inertia is nothing but an effect of gravity. Neither is there any reason to believe in the existence of "timewarps" or "wormholes", except those in the brains of brain-washed physicists. Many of the ideas derived from Einsteinian relativity are nothing but phantasy and mythology; but not all Einsteinians were seized by dark orthodoxy or hampered by blind dogmatism.

My late mentor André Mercier made three assertions which I take to be very important: 1) "Gravitation *is* Time" [1975]. 2) "There is no such thing as 'real space'" [1979]. 3) "Spacetime should be reconstructed as Timespace or Supertime" [2000]. Indeed, nothing of this is orthodox. I can only hope that he would not have entirely denounced this handbook of heresies.

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SHORT INTRODUCTION

The present *Handbook of Heresies* consists of three of my contributions to the biennial conferences on the *Physical Interpretations of Relativity Theory (PIRT)*, London 1988-2002, supplemented with two papers delivered at the *PIRT*-conferences in Budapest 2005 & 2007, plus two more papers, one published in the *Foundations of Physics 34*, 2004, the other presented at the *1st International Poincaré Conference*, Nancy 1994, and published by *ACERHP* 1996.

Chapter one, entitled *Relativities at Variance*, is a philosopher's report from the first *PIRT*-conferences 1988-1998. Criticizing two different attitudes, considered as ideal types, viz., naïve formalism and naïve realism, or materialism, I discuss three different ways of interpreting the theory of special relativity or *la théorie de la relativité restreinte*, as Poincaré baptized it: 1) *the spacetime approach*, 2) *the substratum approach*, and 3) *the constructive approach*.

Chapter two, entitled *The Idea of a Cosmic Time*, and dedicated to Franco Selleri, is my attempt to debunk "Einstein's unfinished revolution" (Davies) which seeks to eliminate time, in line with his program for science, viz., "to reduce everything in physics to spacelike concepts". An earlier version of the paper was published in *Foundations of Physics 34*, pp.1777-99, 2004.

Chapter three, entitled *Milne's Kinematic Relativity*, was originally printed with the title *Ideas of Cosmology, A Philospher's Synthesis*, as my own contribution to the collective volume *Recent Advances in Relativity Theory I*, Duffy & Wegener eds., printed by Hadronic Press 2000. It contains the result of my efforts to vindicate the *British Tradition of Relativistic Cosmology* as represented by the names of E.A. Milne and his assistants A.G. Walker and G.J. Whitrow.

The fourth paper, *Some Cosmological Models, their Time Scales and Space Metrics*, was presented at the 2002 *PIRT*-conference in London. Most of the cosmological stuff is standard, except that my new model of a universe based on Continued Creation is briefly sketched.

The fifth paper, entitled *Big Bang versus Steady State*, was presented in Budapest 2007. It elaborates on the model hinted at in chapters 3-4, from the perspective of kinematic relativity, demonstrating that the idea of a "big bang" is not incompatible with that of a "steady state".

The sixth paper, entitled *New Axioms for Cosmology*, was presented in Budapest 2009. It contains my attempt to reconstruct spatial geometry from a set of purely temporal axioms, in accordance with the program of André Mercier, viz., *to reconstruct spacetime as timespace*

The seventh paper, bearing the title *Constructivism in Science*, was first published 1996. This paper outlines the philosophy of science advanced by Poincaré, with inspiration from Kant, followed by a short sketch of some similar thoughts to be found in Eddington and Milne.

Article eight, entitled *Fundamental Queries*, contains my recent reflections on some basic problems of a more philosophical, or even "metaphysical", character. Philosophically minded readers might profitably begin with this survey of "deep questions" in modern cosmology.

In general, I recommend my readers to ignore most of the mathematics at a first reading. Finally, I apologize for repetitions and overlappings between the various chapters of the book. When read with friendly eyes, its contents might be described as: *thema con variazione.*

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