

How Einstein's theory of gravitation experienced a Renaissance after World War II

July 12 2017

Einstein's 1915 theory of gravitation, also known as General Relativity, is now considered one of the pillars of modern physics. It contributes to our understanding of cosmology and of fundamental interactions between particles. But that was not always the case. Between the mid-1920s and the mid-1950s, General Relativity underwent a period of stagnation, during which the theory was mostly considered as a stepping-stone for a superior theory. In a special issue of *The European Physical Journal H* just published, historians of science and physicists actively working on General Relativity and closely related fields share their views on the process, during the post-World War II era, in particular, which saw the "Renaissance" of General Relativity, following progressive transformation of the theory into a bona fide physics theory.

In this special issue, new insights into the historical process leading to this renaissance point to the extension of the foundation of the original theory, ultimately leading to a global transformation in its character. Contributions from several experts reveals that the theory of 1915 was insufficient to reach firm conclusions without being complemented by intuitions drawn from the resources of pre-relativistic [physics](#). Or, in the case of cosmology, the theory needed to be complemented by philosophical considerations that were hardly generalizable to help solve more mundane problems.

As physicist Pascual Jordan puts it, there was a "mismatch between the

simplicity of the physical and epistemological foundations and the annoying complexity of the corresponding thicket of formulae."

A number of contributions in this special issue also explain how the theory underwent a period of successive controversies, leading by the 1960s, to the renaissance of the [theory](#). Subsequently, it became in the 1970s, an important, empirically well-tested branch of theoretical physics related to the new, successful sub-discipline of relativistic astrophysics.

More information: Alexander Blum et al, Editorial introduction to the special issue "The Renaissance of Einstein's Theory of Gravitation", *The European Physical Journal H* (2017). [DOI: 10.1140/epjh/e2017-80023-3](https://doi.org/10.1140/epjh/e2017-80023-3)

Provided by Springer

Citation: How Einstein's theory of gravitation experienced a Renaissance after World War II (2017, July 12) retrieved 24 April 2024 from <https://phys.org/news/2017-07-einstein-theory-gravitation-experienced-renaissance.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.