

MailOnline

'It's the Magna Carta of physics!' Albert Einstein's original theory of relativity manuscript goes on display for the first time

By [Daily Mail Reporter](#)

Last updated at 9:48 PM on 09th March 2010

The original manuscript of Albert Einstein's groundbreaking theory of relativity has gone on display in its entirety for the first time.

Einstein's 46-page handwritten explanation of his general theory of relativity is being shown at the Israel Academy of Sciences and Humanities in Jerusalem as part of its 50th anniversary celebration.

In the manuscript, which helps explain everything from black holes to the Big Bang and contains the famous equation of $E=MC^2$, Einstein demonstrates an expanding universe and shows how gravity can bend space and time.



Israeli students inspect Albert Einstein's General Theory of Relativity on display in its entirety for the first time

The academy's president Menahem Yaari said: 'We wanted something unique that would have global significance, and fortunately we could have access to a manuscript that has never been seen in its entirety before.'

First published in 1916, the general theory of relativity remains a pivotal breakthrough in modern physics.

Die Grundlage der allgemeinen Relativitätstheorie.

A. Prinzipielle Erwägungen zum Postulat der Relativität.

§1. Die spezielle Relativitätstheorie.

Die im Nachfolgenden dargelegte Theorie bildet die denkbar weitgehendste Verallgemeinerung der heute allgemein als "Relativitätstheorie" bezeichneten Theorie; die Teile im Folgenden, "spezielle Relativitätstheorie" und setze sie als bekannt voraus. Diese Verallgemeinerung wurde sehr wesentlich durch die Gestalt, welche der speziellen Relativitätstheorie durch die von Minkowski gegebene wurde, welcher Mathematiker zuerst das formal Gleichwertigkeit der räumlichen ^{Koordinaten} und der Zeitkomponente hier ein und für den Aufbau der Theorie nutzbar machte. Die für die allgemeine Relativitätstheorie nötigen mathematischen Hilfsmittel lagen für den "absoluten Differentialkalkül", welcher auf dem Forscher Riemann und Christoffel über nicht-euklidischen Problemen der Theorie und von Ricci und Levi-Civita in der

This is the first time the original manuscript has gone on display in its entirety for the first time

... (positiv gezeichnet, konkav ist) im geraden ...

$$B = \int_{-\infty}^{+\infty} \frac{\partial \gamma}{\partial x_1} dx_2,$$

und (23) und (20) ergeben

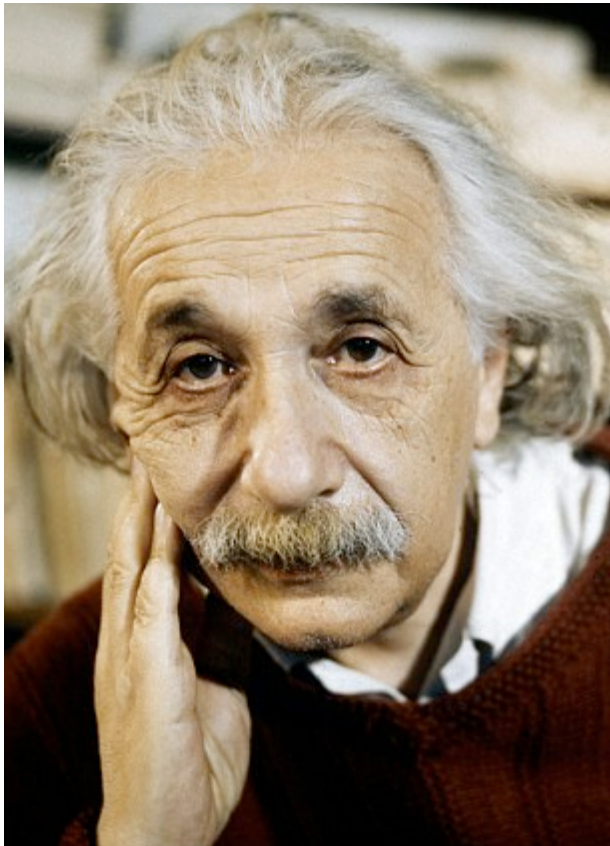
$$\gamma = \sqrt{\frac{g_{44}}{g_{22}}} = 1 + \frac{\alpha}{2v}$$

The manuscript contains Einstein's explanations of his theory, including equations such as the $E=MC^2$

Hanoch Gutfreund, former president of the Hebrew University and chair of its academic committee for the Albert Einstein Archives said: 'It changed our understanding of space, time, gravitation, and really the entire universe.

'I refer to it as the Magna Carta of physics. It's the most important manuscript in the entire archives.'

Despite its central place in the canon of Einstein's work, the original manuscript has never attracted as much attention as the man himself.



Einstein left his papers to the Hebrew University in his will

According to Mr Gutfreund, museums around the world have been content to display only a few pages of the manuscript at a time, as part of larger features on the personal and professional accomplishments of perhaps the modern era's most influential scientist.

That is partly because the contents of the general theory, especially in the original German, remain too obscure for non-scientists.

It took Einstein eight years after publishing his theory of special relativity to expand that into his theory of general relativity, in which he showed that gravity can affect space and time, a key to understanding basic forces of physics and natural phenomena, including the origin of the universe.

But exhibit organisers say the significance of Einstein's pages of careful writing and diagrams will not be lost on casual viewers.

They say the display will present the manuscript in the context of the theory's legacy - which includes everything from modern space exploration to commercial satellite and GPS technology.

Mr Gutfreund said: 'The greatest challenge at the frontier of physics is to make progress on these issues, the ideas that Einstein developed, discarded, and the errors he made.

'People will be able to appreciate this even if they're not able to understand the contents.'

Einstein was one of the founders of the Hebrew University in Jerusalem.

He contributed the manuscript to the university when it was founded in 1925, four years after he was awarded the Nobel Prize in physics.

His will bequeathed the rest of his papers to the university upon his death in 1955.

The university is lending the manuscript to the academy for the anniversary celebration.

The manuscript will be on display until March 25, overlapping with the 131st anniversary of Einstein's birth on March 14.

Read more: <http://www.dailymail.co.uk/news/article-1256764/Albert-Einsteins-original-theory-relativity-manuscript-goes-display-time.html#ixzz0hjpuOzaR>