



# ISYA 2018

41<sup>th</sup> International School  
for Young Astronomers  
Socorro, Santander-Colombia



“Once upon a time...the science”

Ysabel Briceño y Héctor Rago

@ysabelbr

@hectorrago



@AstroAlAire

# CONTENT

The popularization paradox: The Sábato's Parable

A historical / personal view

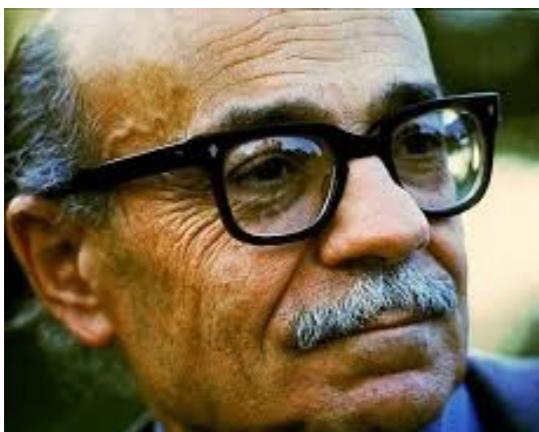
Our personal experience: Astronomía Al Aire



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## Sábato's paradoxe

Is efficient popularization of science?



EDUCACIÓN »

**Un 25% de los españoles cree que el Sol gira alrededor de la Tierra**

Una encuesta oficial constata el analfabetismo científico de la población, pese a que la situación ha mejorado en los últimos años

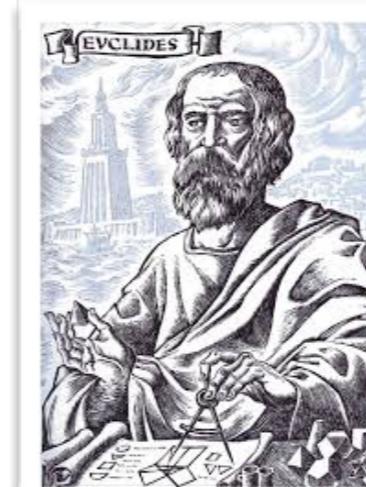


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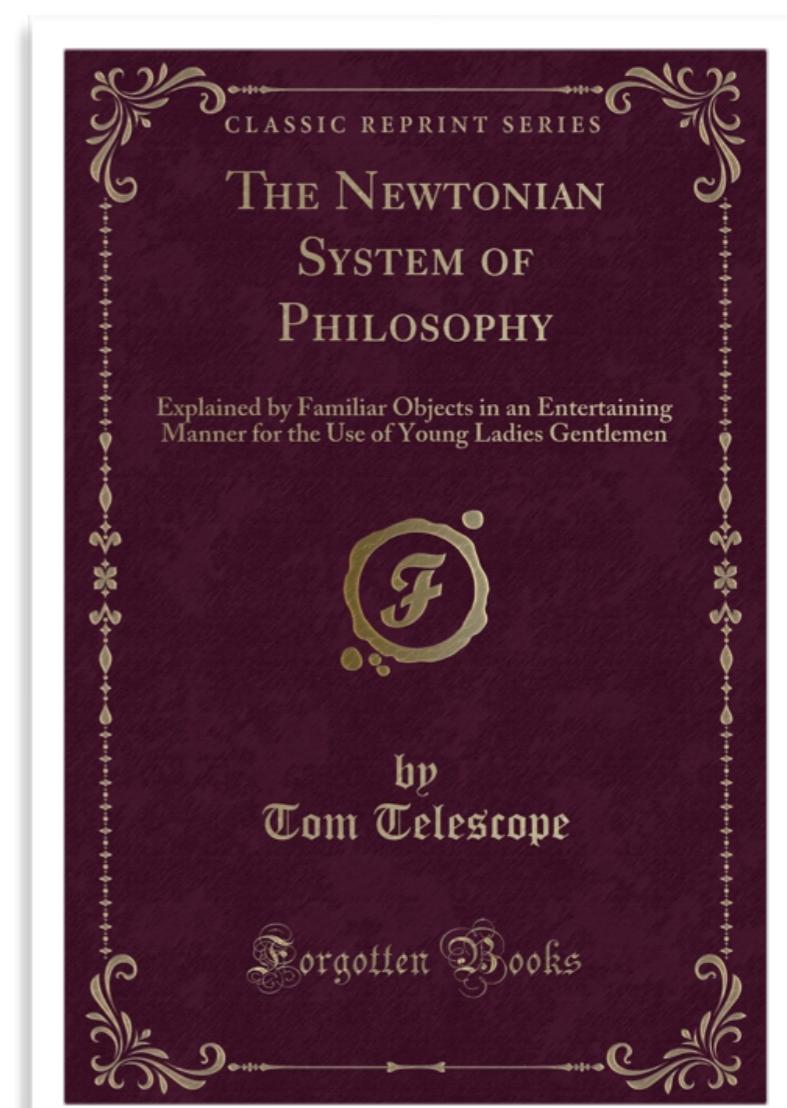
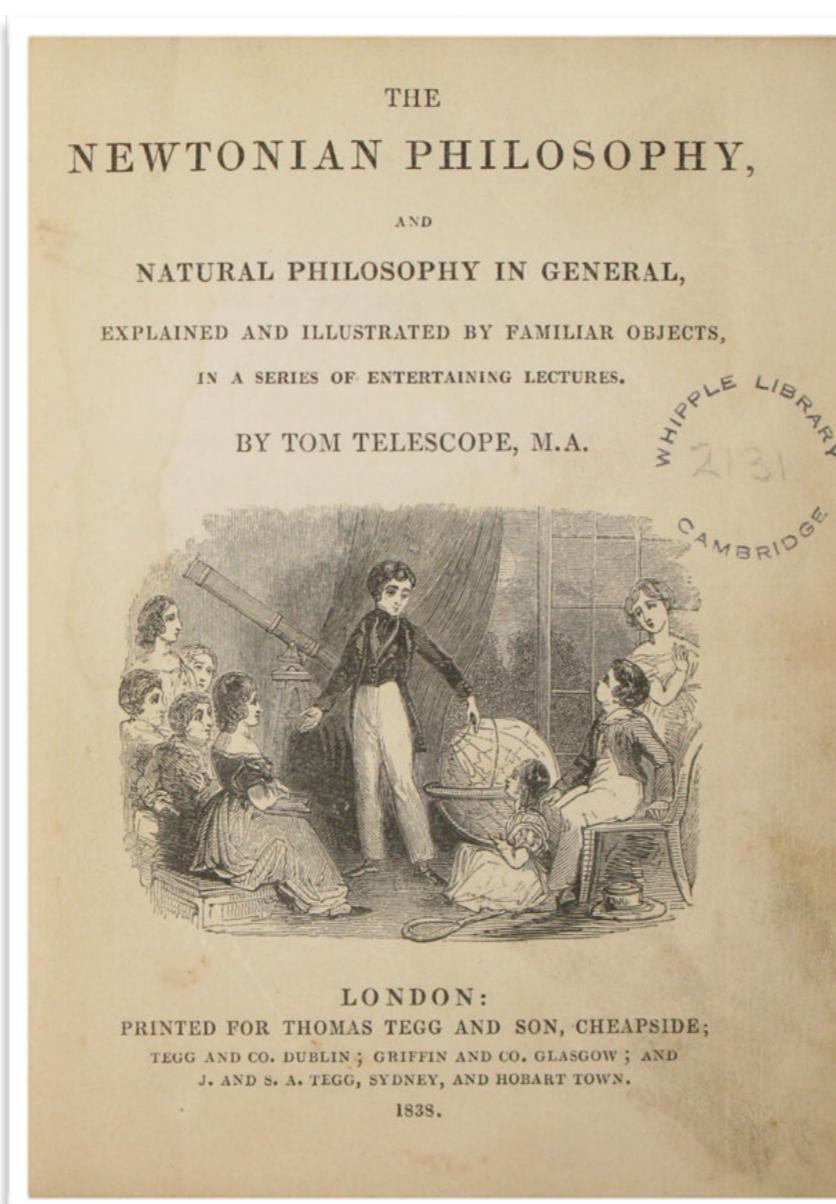
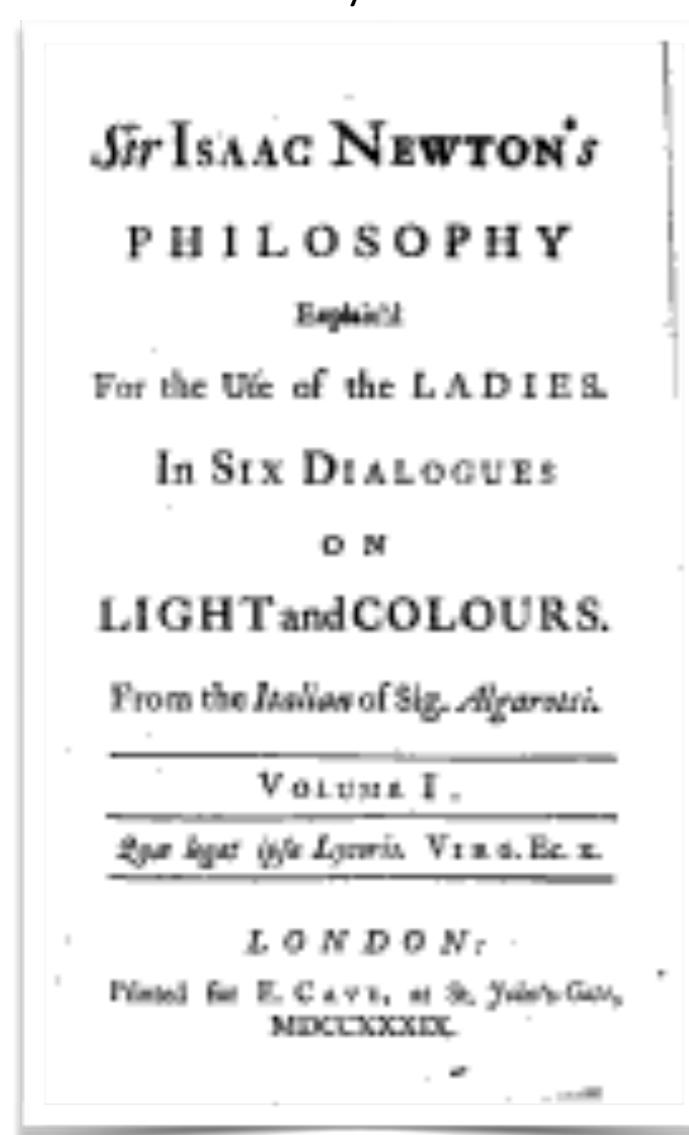
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“There is no real road for geometry...”  
{Euclid to Ptolemy ~ 285BC}



The post-newtonian  
~ 1760





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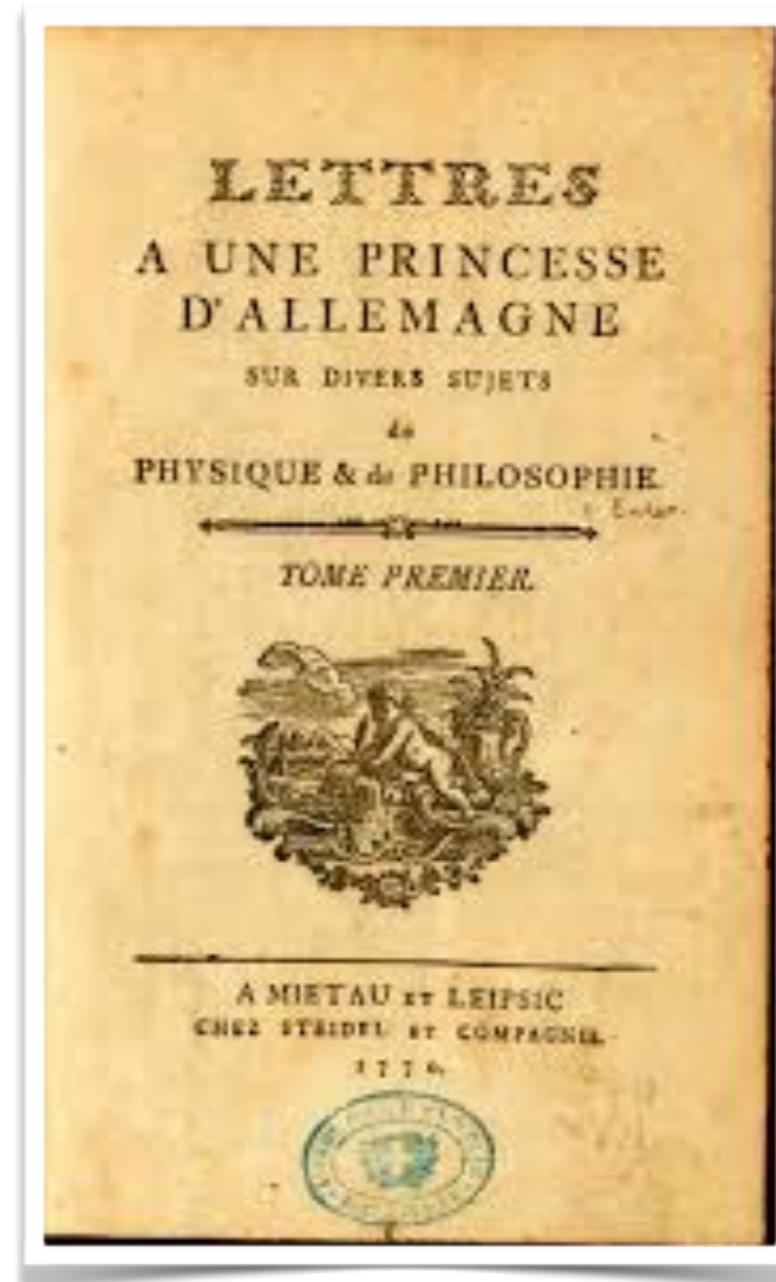
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Leonhard Euler

~ 1760





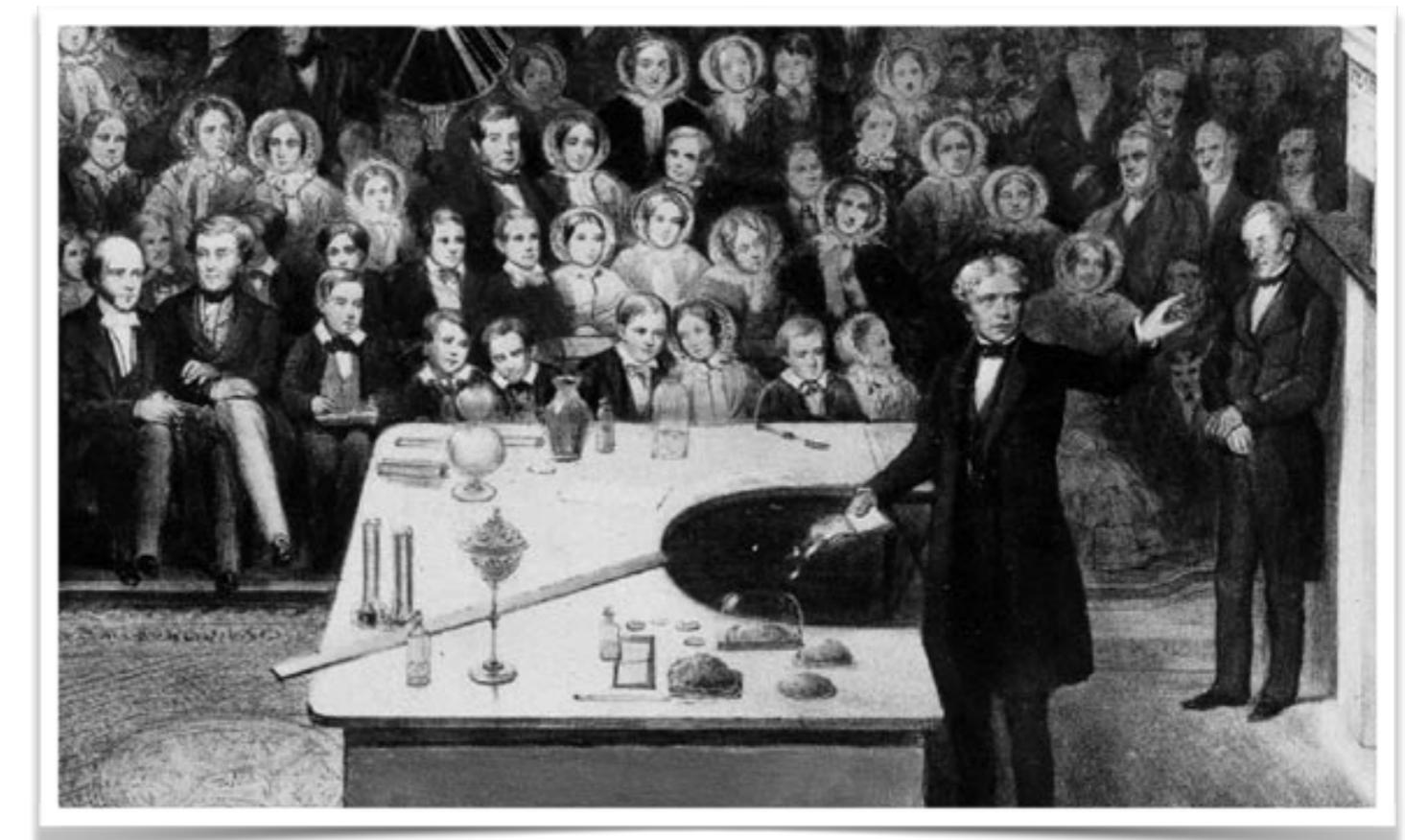
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Michel Faraday

Friday Evening  
Discourses at the Royal Institution  
~ 1826





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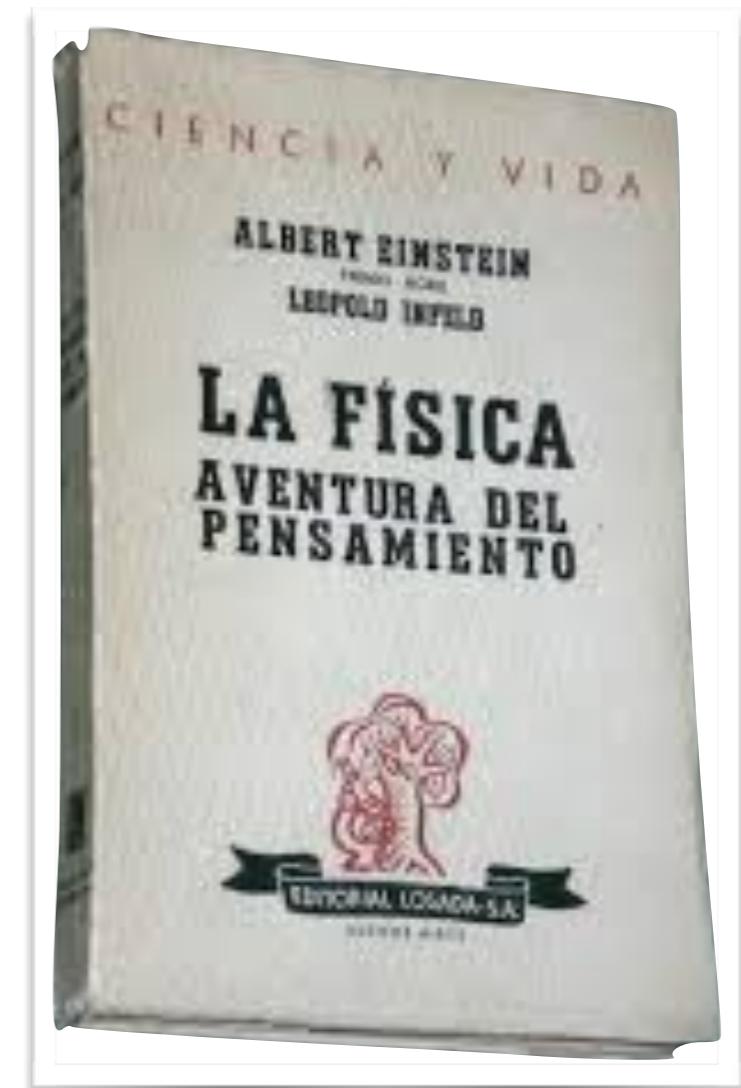
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## Einstein in Argentina



**1932**



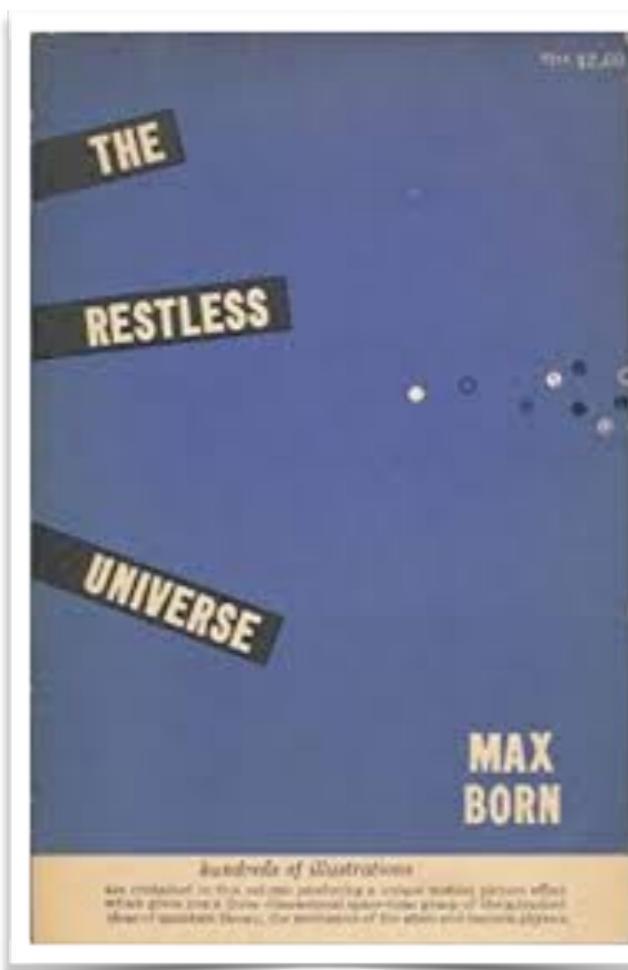
**1938**



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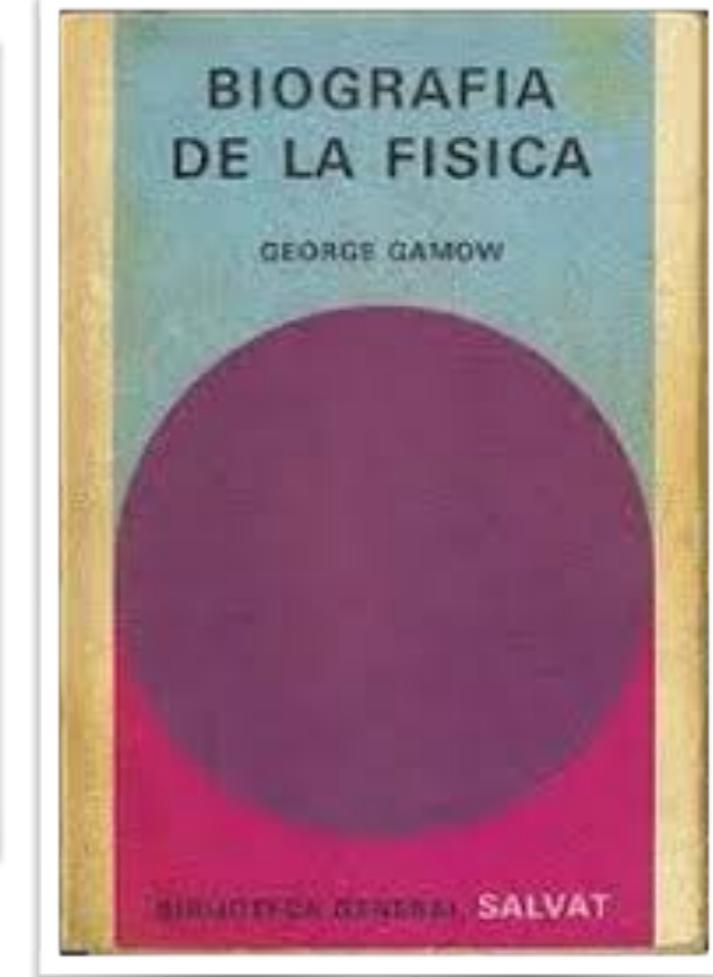
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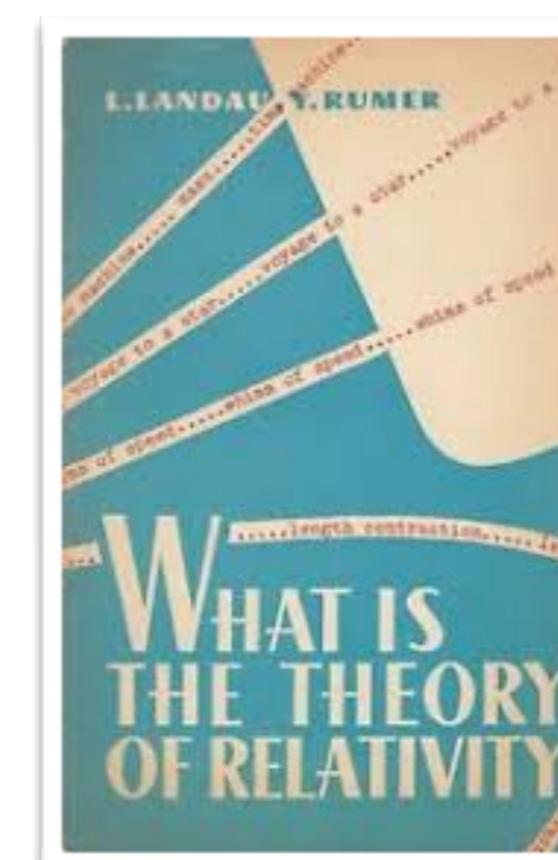
**Max Born 1951**



**George Gamow**



**George Gamow**



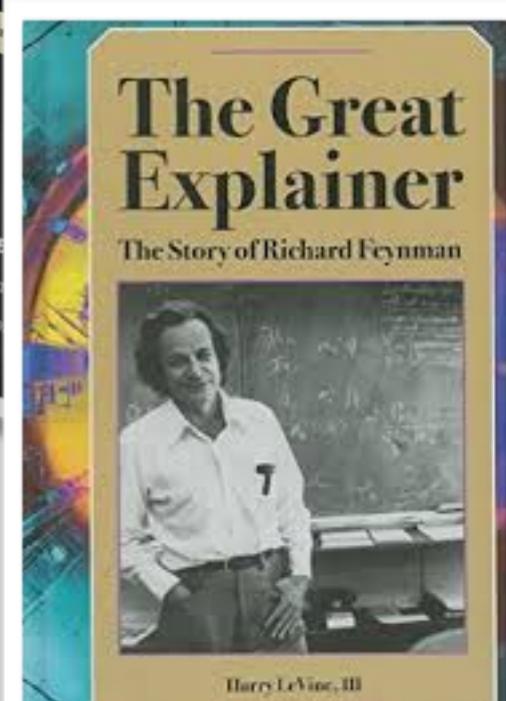
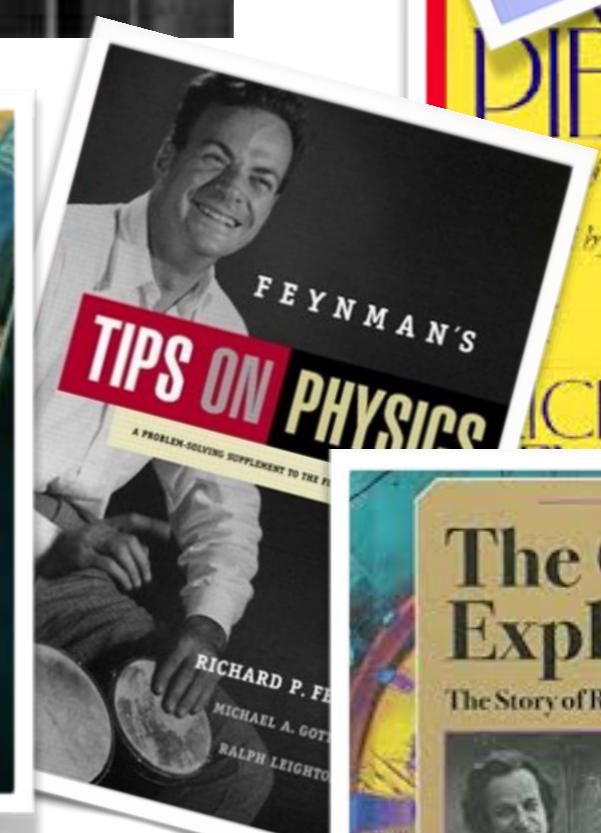
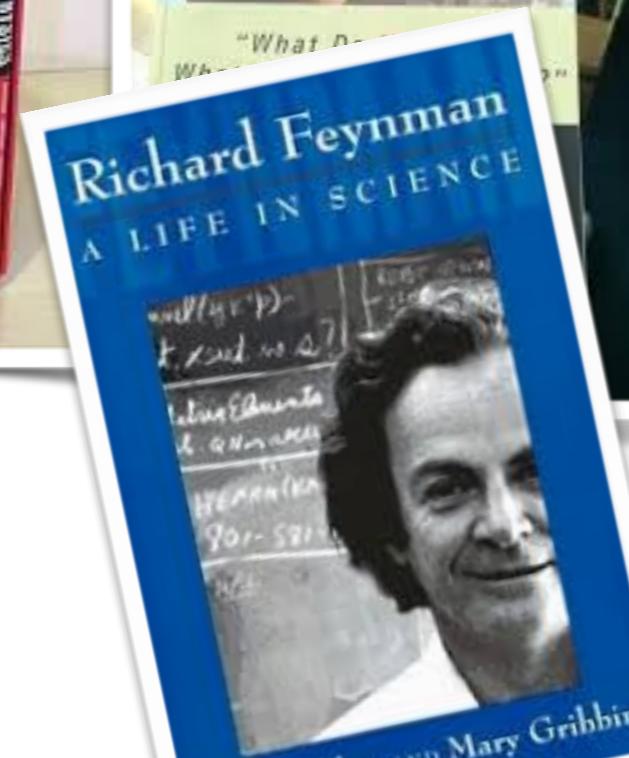
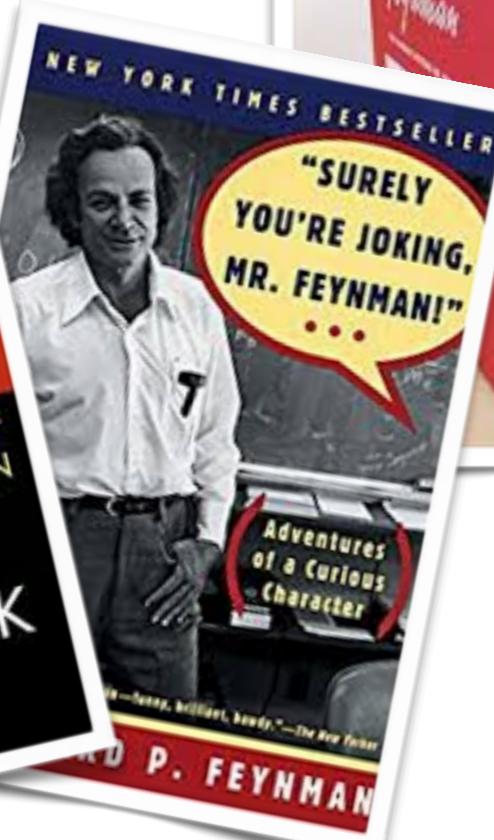
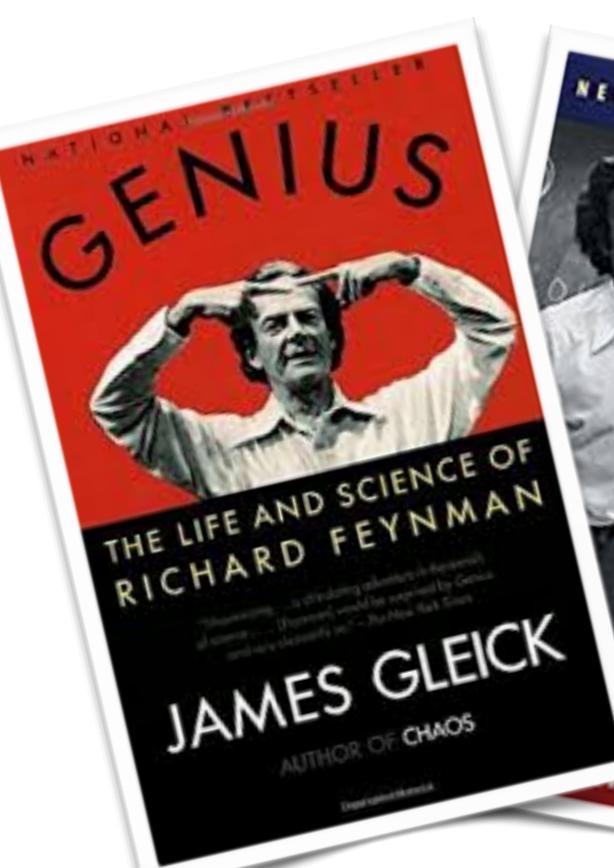
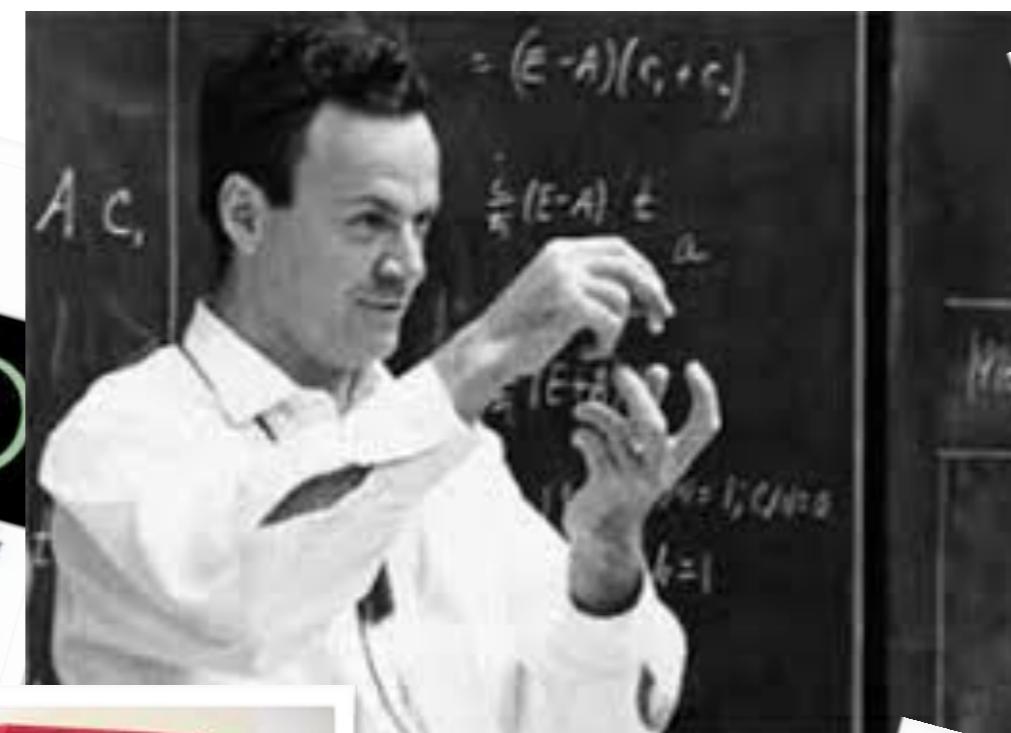
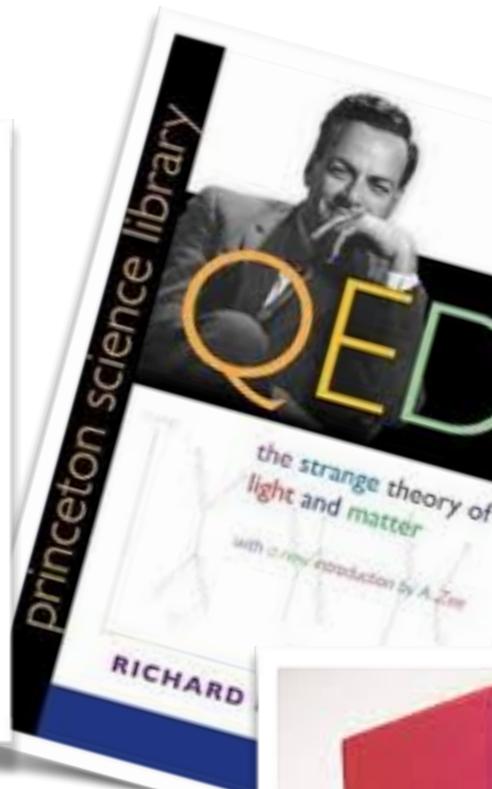
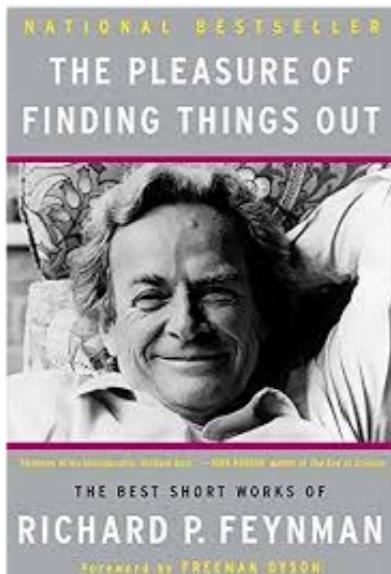
**Lev Landau**



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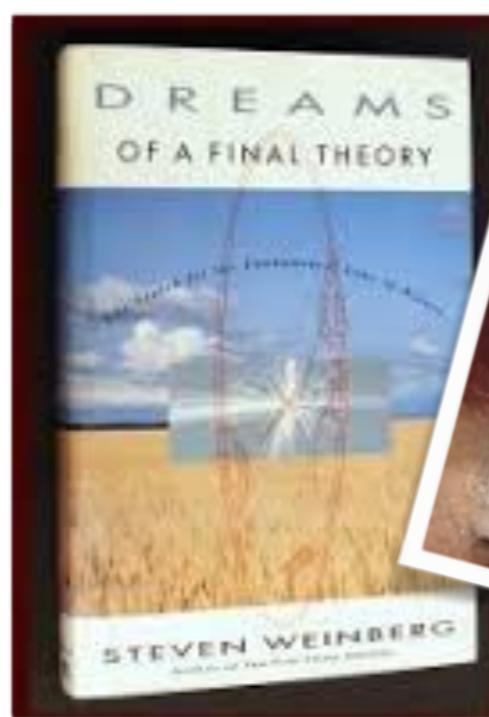
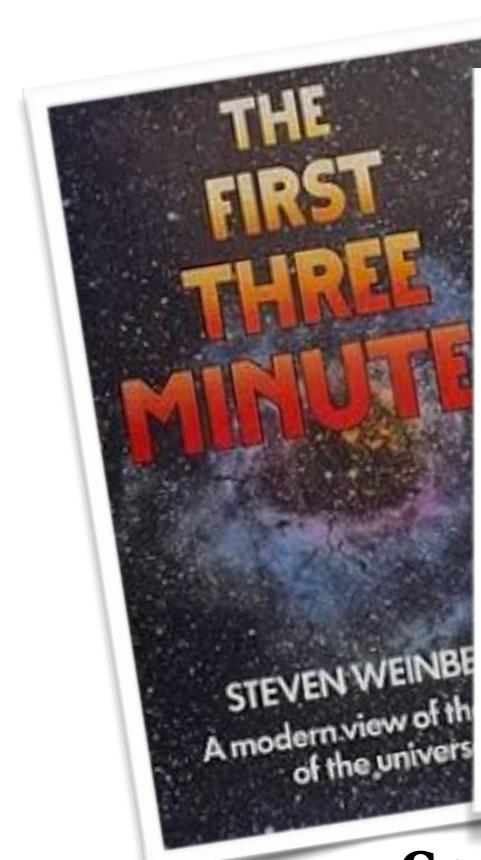


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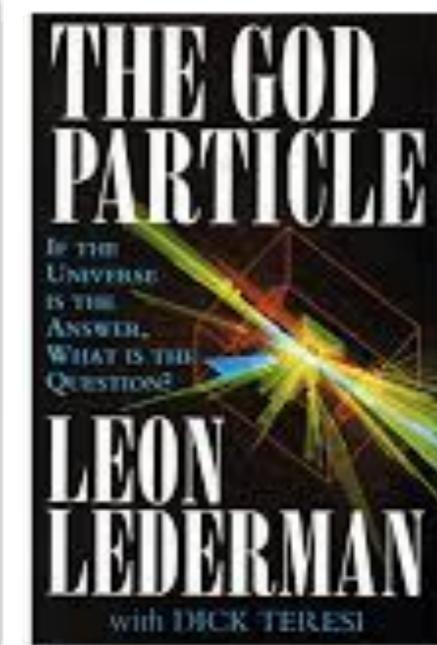
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# The American connexion



Steven Weinberg



Leo Lederman



Carl Sagan



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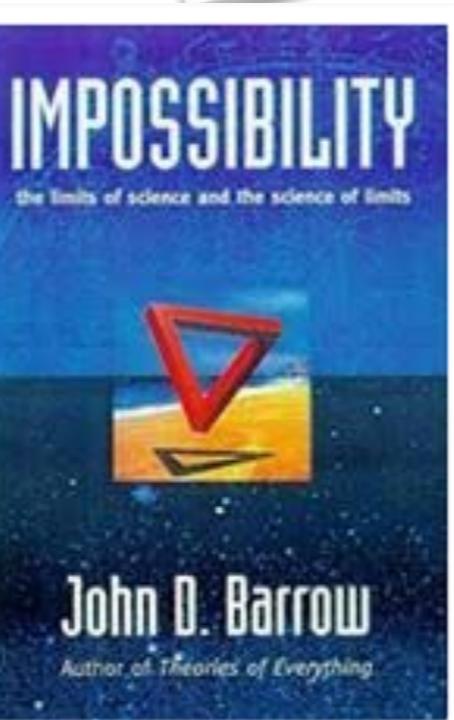
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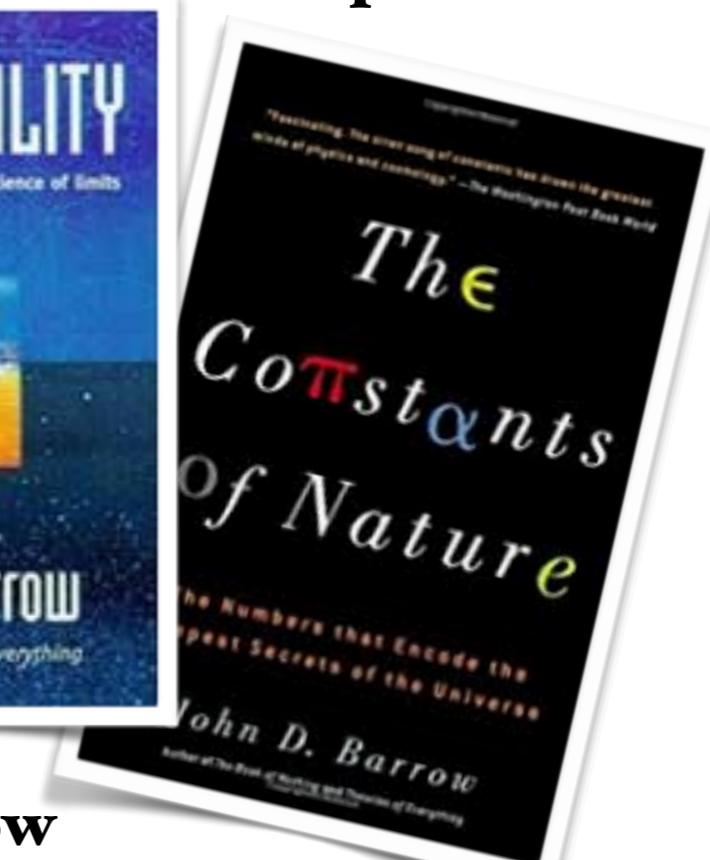
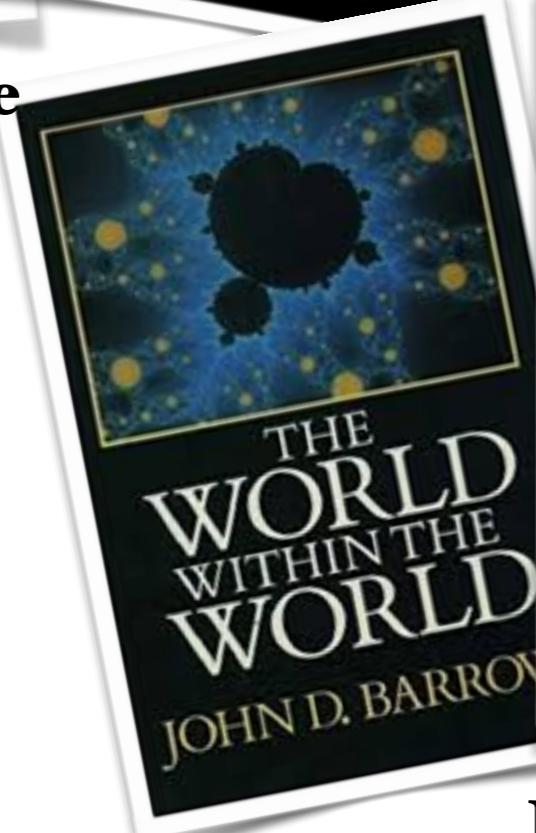
# The England connexion



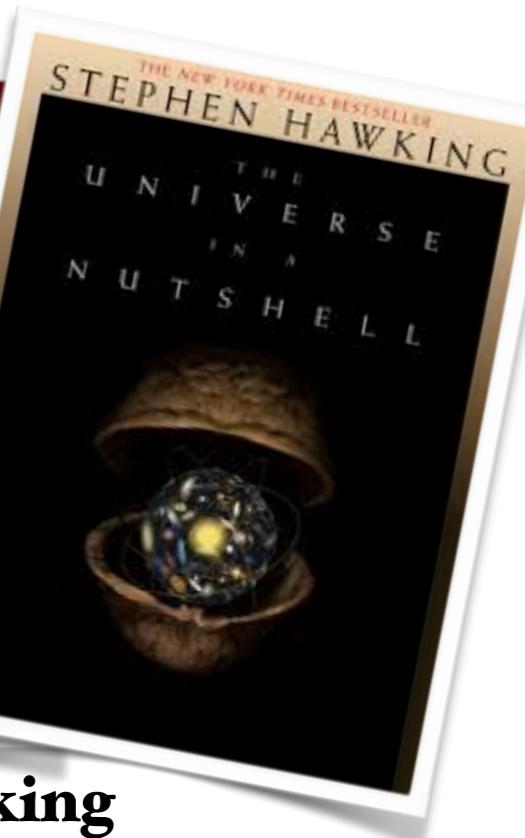
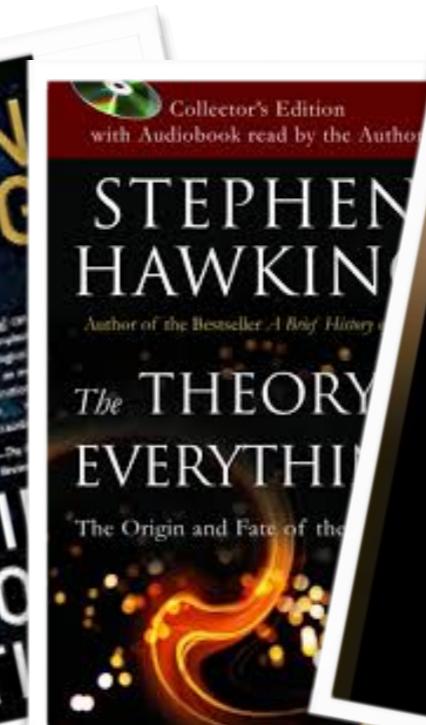
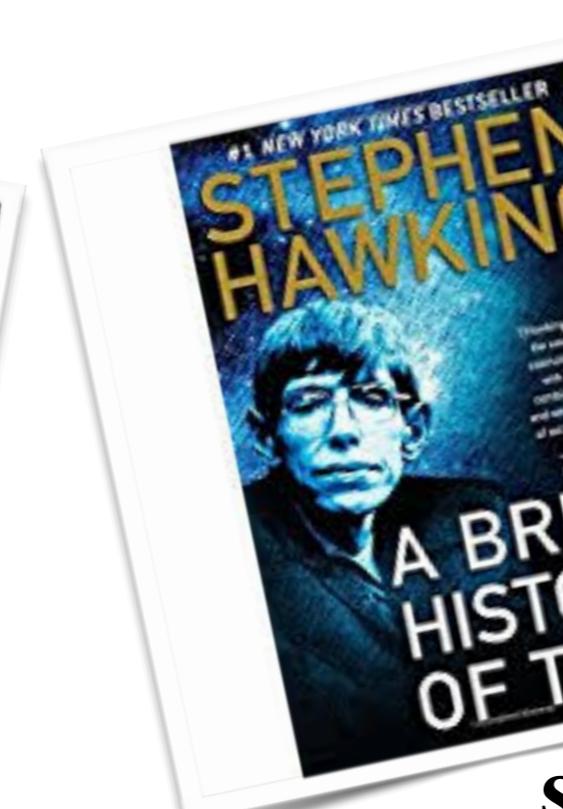
Roger Penrose



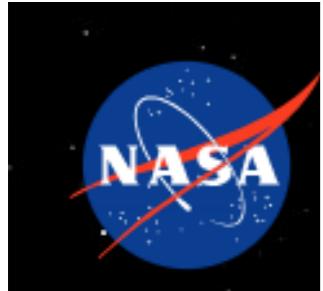
John Barrow



Stephen Hawking



# The Internet counter-attack



@NASA



@CERN



@LIGO



@PERIMETER

## FaceBook

Universities

MinutePhysics

## Youtube

quantumfracture

The physics Girl

Veritasium

Date un Vlog

Neil deGrasse Tyson

## Blogs

BackReaction

Not Even Wrong

Science Blogs

## Media Convergence

@nunezluis

Radio Clips

Newspaper

Radial program

Video



Blog

Pocket-books

Podcast

MicroBlog  
Twt - Instagram

@hectorrago

Post-edition

Music

...

Voice

The scientist

Aim

Non pedagogical

To seduce



Language

Precise but  
non-technical  
Metaphorical  
Seductive  
Attractive

Themes  
Astronomy  
Cosmology  
Basic Theories  
Physics  
Science  
Biographies  
Value of Science

Where it is  
transmitted

[f](#) [v](#) [in](#) [p](#)

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ASECIC (Asociación Española de Cine e  
Imagen Científicos) Red Colaborativa  
Iberoamericana de Programas  
Radiofónicos dedicados a la Ciencia

# The Figures

Allan Turing,

Marie Curie

Kurt Gödel, Einstein

Richard Feynman,

Ettore Majorana

Emmy Noether, Edwin

Hubble,

Grigori Perelman,

Robert Oppenheimer.

Jocelyn Bell,

Stephen Hawking

Isaac Newton

George Riemann

# The entities

Gravitational waves

The electron

The neutrino

Supernova

The weight of vacuum

The kilonova

Cosmic radiation

Exoplanets

The photon

The strange case of the  
cosmological constant

Extra dimensions

Time, the sculptor

Cosmic rays

The attractive gravity

Let the light be

The strange world of  
antimatter

# SCIENCE

The Beauty of science

Einsteinian lessons

Scientists and charlatans

Myth, religion and science

Price and value of science

The Sokal Affaire

The twin paradox

Science, metaphores and  
universes

Music, matematicians and  
crazy

The centennial relativity

Impossibilities

The Olbers paradox

Relativity and GPS

The corners of universe

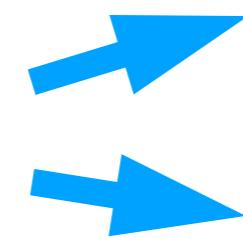
The music and the irrational

The incestuous relations  
between math and physics



## The construction of a post

The post



Short -terms

Internet

Persistent

Internet

## The relevance of the first paragraph

La sabiduría convencional suele vislumbrar una relación entre creatividad y locura. Imaginamos a los genios en la triple frontera de la excentricidad, la normalidad y el desorden mental. La idea del “científico loco” es moneda corriente en la cinematografía y en la iconografía cultural de la modernidad. Nos figuramos al matemático de acuerdo con el estereotipo hollywoodense de alguien obsedido por la búsqueda descabellada de patrones. ¿Existe realmente una correlación entre la aptitud para la abstracción matemática y una propensión al trastorno mental?

## The context

“Eran tiempos convulsos en la Europa de entre guerras, y Viena era un efervecencia intelectual. La música dodecafónica de Schönberg, el psicoanálisis de Freud, la física cuántica de Schrödinger, la influencia de la Bauhaus de Gropius flotaban en la Viena de Wittgenstein. El joven Gödel asistía a los café donde filósofos y matemáticos conocidos como el Círculo de Viena, deslastraban a la filosofía de elementos metafísicos.”

## In the end...

Robert Oppenheimer conoció el pecado, pero su formidable entereza y su carácter complejo y profundo pudieron redimirlo. El 18 de febrero de 1967 el mundo fue un poco más pobre. Robert Oppenheimer había fallecido de un cáncer de garganta.

## Along the road: the music

Astor Piazzola  
The Beatles  
Eric Satie  
Xenakis  
Salsa  
RadioHead  
Gilberto Rebolledo  
Rick Wakeman  
Bjork  
Stravinsky  
Folk Russian songs

## To the four cardinal points

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