Title: Mario Livio: Brilliant Blunders

Date: Jun 01, 2016 07:00 PM

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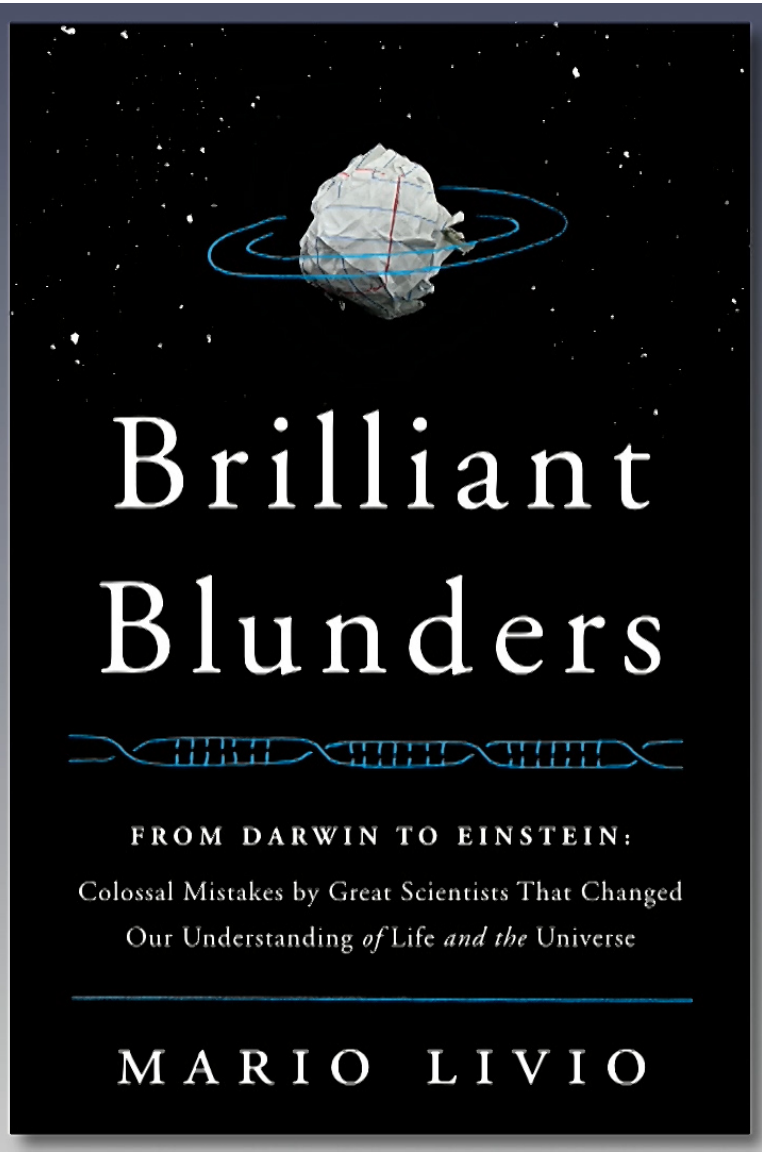
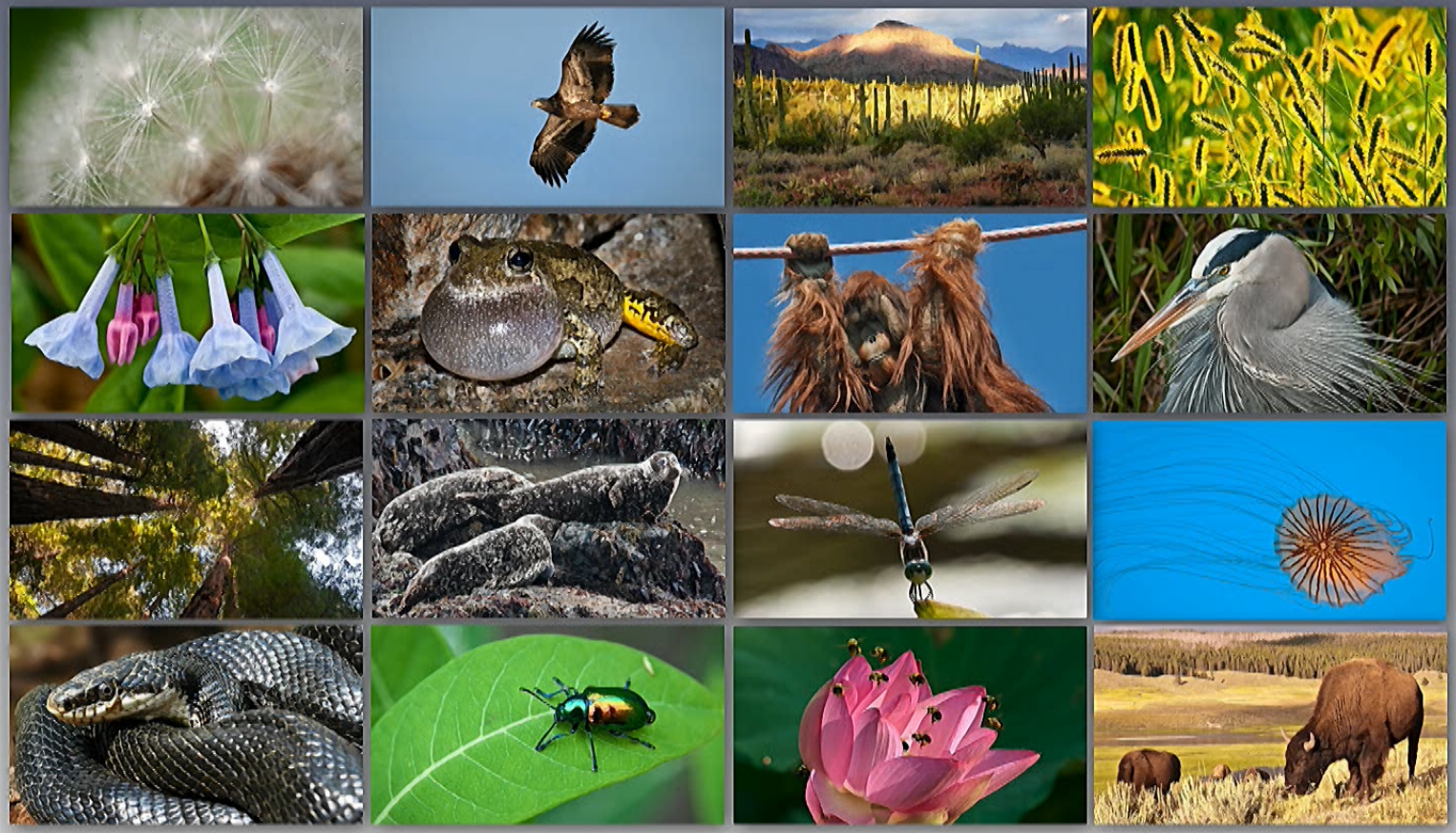
Abstract: Even the greatest scientists have made some serious blunders. "Brilliant Blunders" concerns the evolution of life on Earth, of the Earth itself, of stars, and of the universe as a whole.

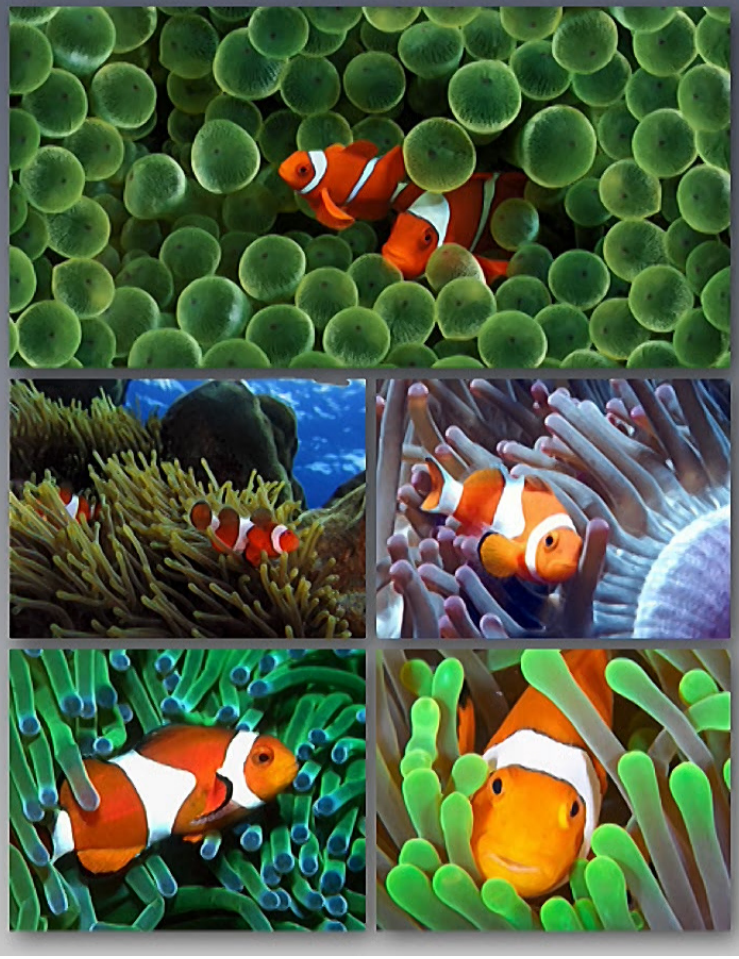
In this talk, astrophysicist Dr. Mario Livio will explore and analyze major errors committed by such luminaries as Charles Darwin, Linus Pauling, and Albert Einstein. Dr. Livio will scrutinize the various types of blunders and attempt to explain how they happen. Blunders are not only inevitable, argues Dr. Livio, but also an integral component of the process of science.


Brilliant
Blunders
FROM DARWIN TO EINSTEIN:
Colossal Mistakes by Great Scientists That Changed
Our Understanding *of* Life *and the* Universe
MARIO LIVIO

Diversity of life

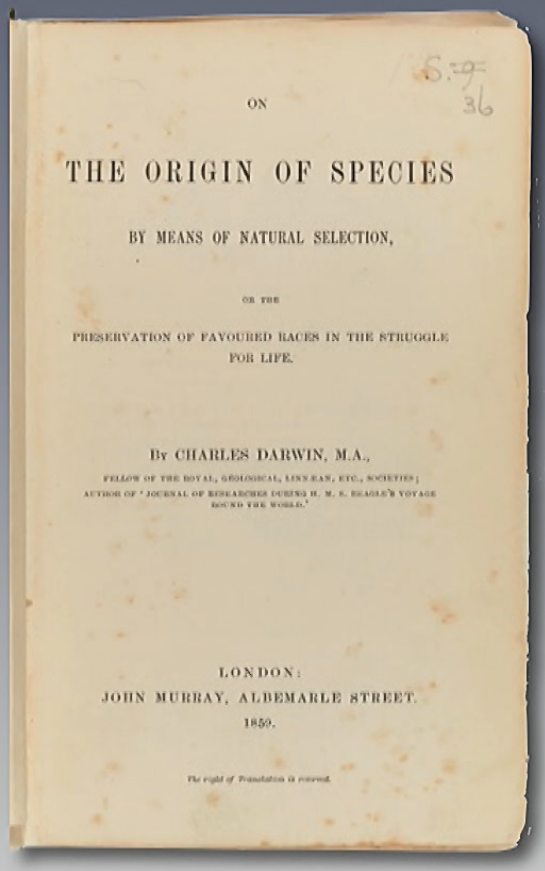


Adaptation and symbiosis



Darwin: Evolution

Life



ON

THE ORIGIN OF SPECIES

BY MEANS OF NATURAL SELECTION,

OR THE

PRESERVATION OF FAVOURED RACES IN THE STRUGGLE FOR LIFE.

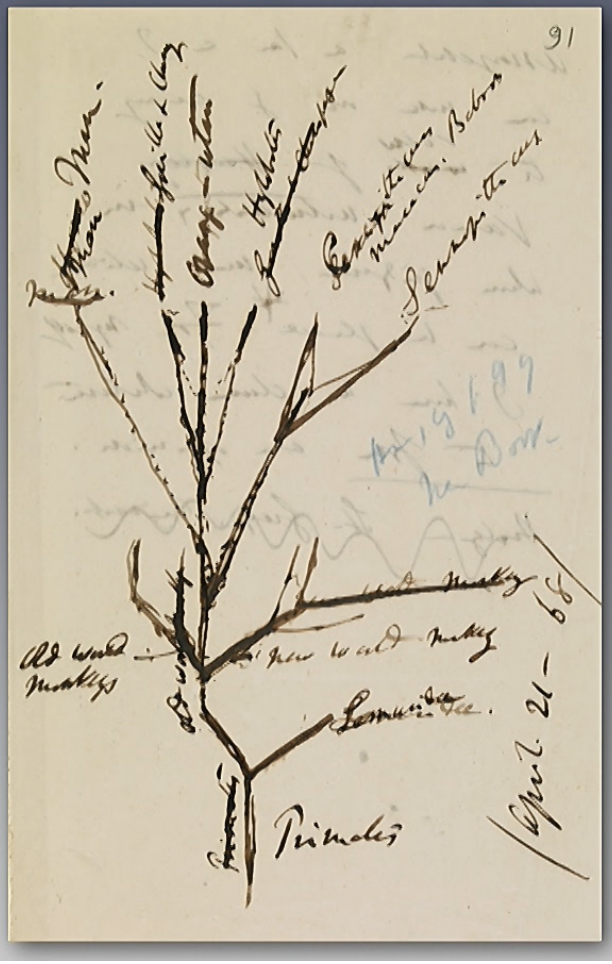
By CHARLES DARWIN, M.A.,

FELLOW OF THE ROYAL, GEOLOGICAL, LINNEAN, ETC., SOCIETIES;
AUTHOR OF 'JOURNAL OF RESEARCHES DURING H. M. S. BEAGLE'S VOYAGE ROUND THE WORLD.'

LONDON:
JOHN MURRAY, ALBEMARLE STREET.
1859.

Evolution

Darwin rarely did genealogy



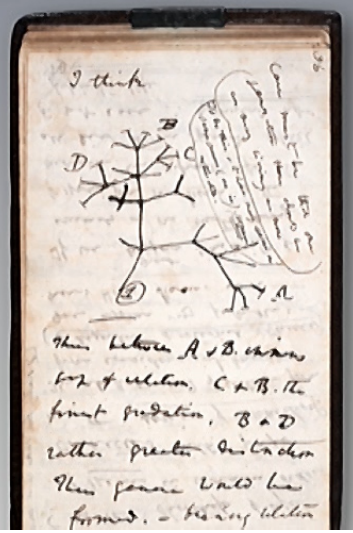
Pillars of "The Origin"

Evolution

Gradualism

Common Descent

Speciation

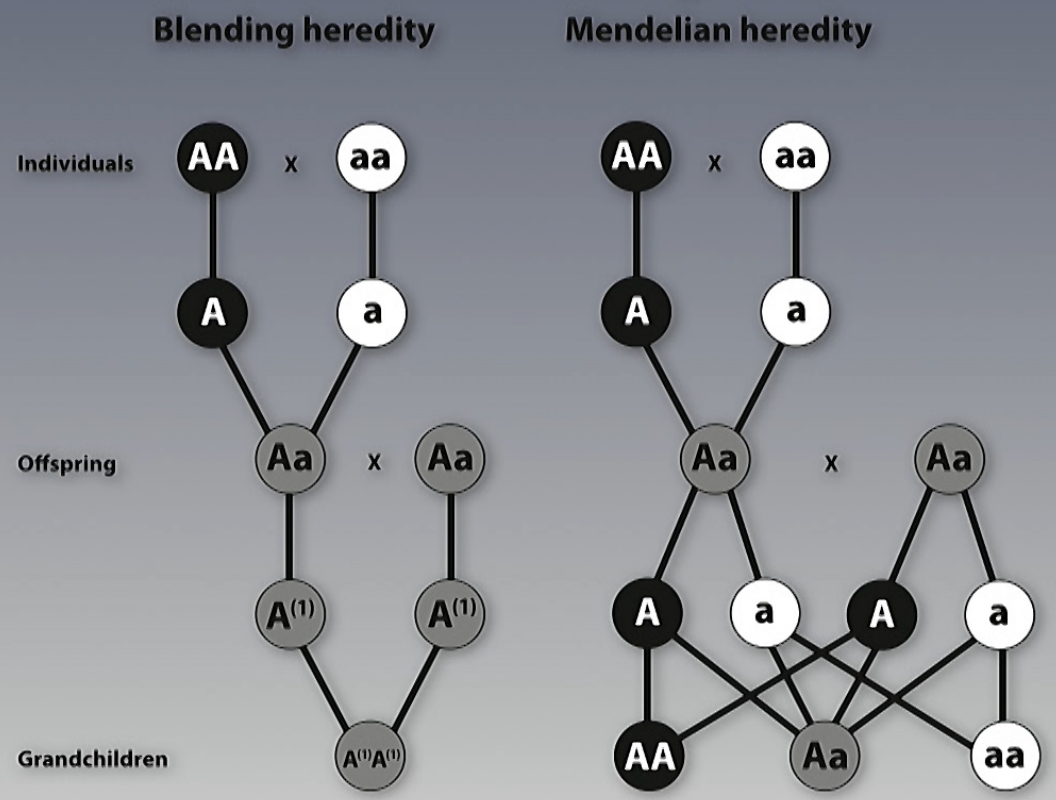


All supported by one mechanism.

Natural Selection


Darwin's Blunder:
Blending Heredity

Blending vs. Particulate Heredity



Thoughts on particulate heredity?

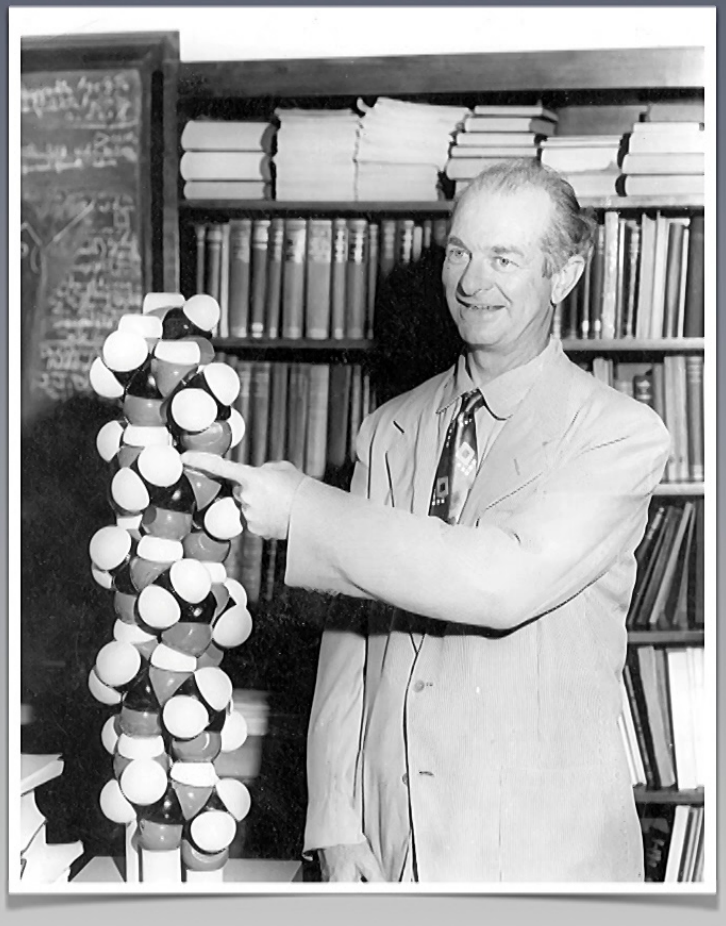
Darwin (1857): "propagation by true fertilization, will turn out to be sort of mixing and not true fusion."

Darwin (1866): "every female in the world producing distinct male and female offspring."

Did Darwin know of Mendel's 1865 work?

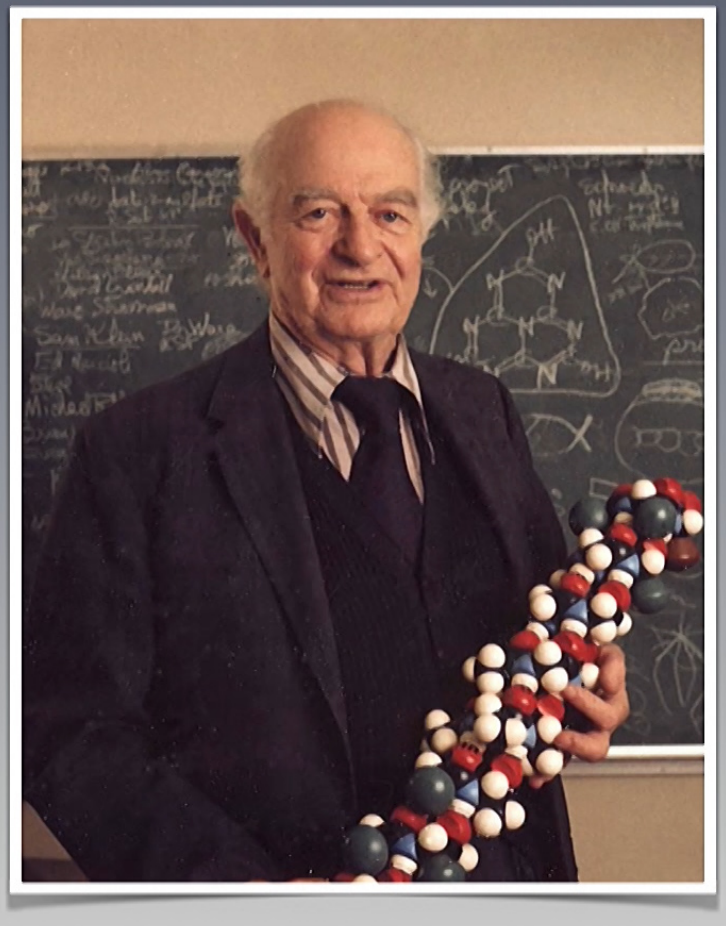
Pauling: Life's Molecules

Proteins

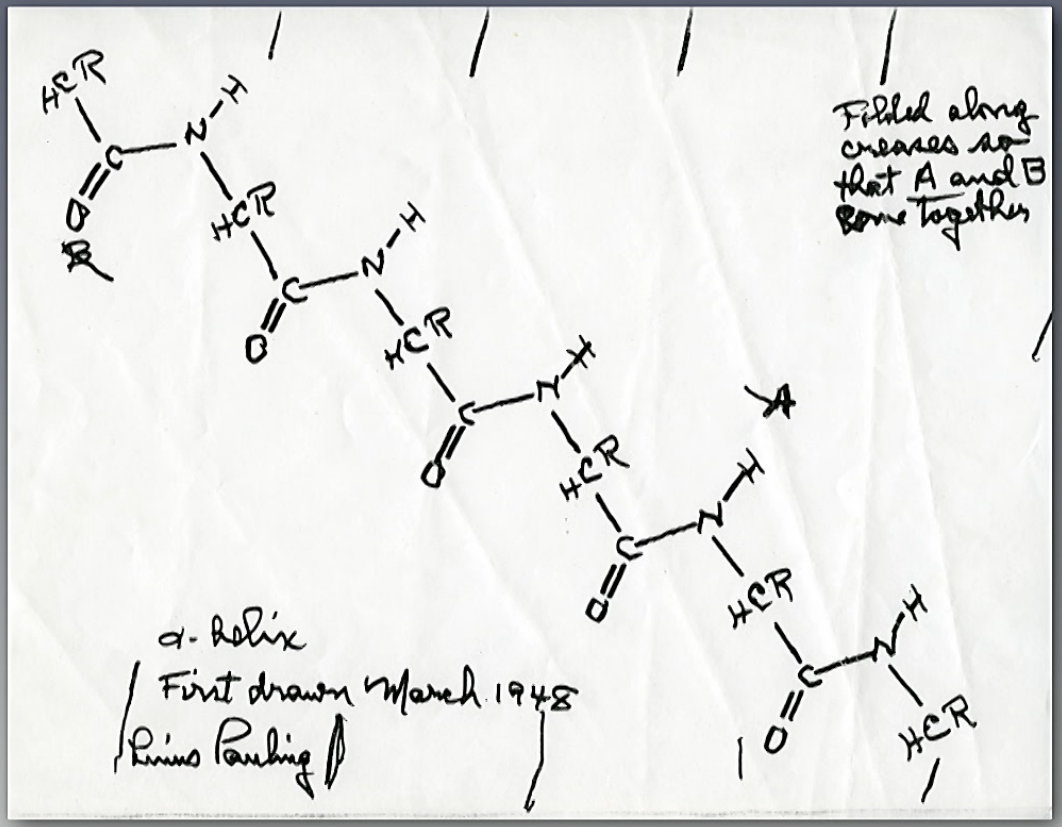


Life's Molecules

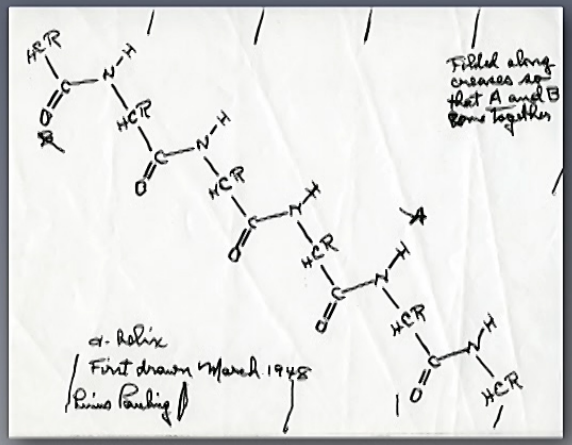
Proteins



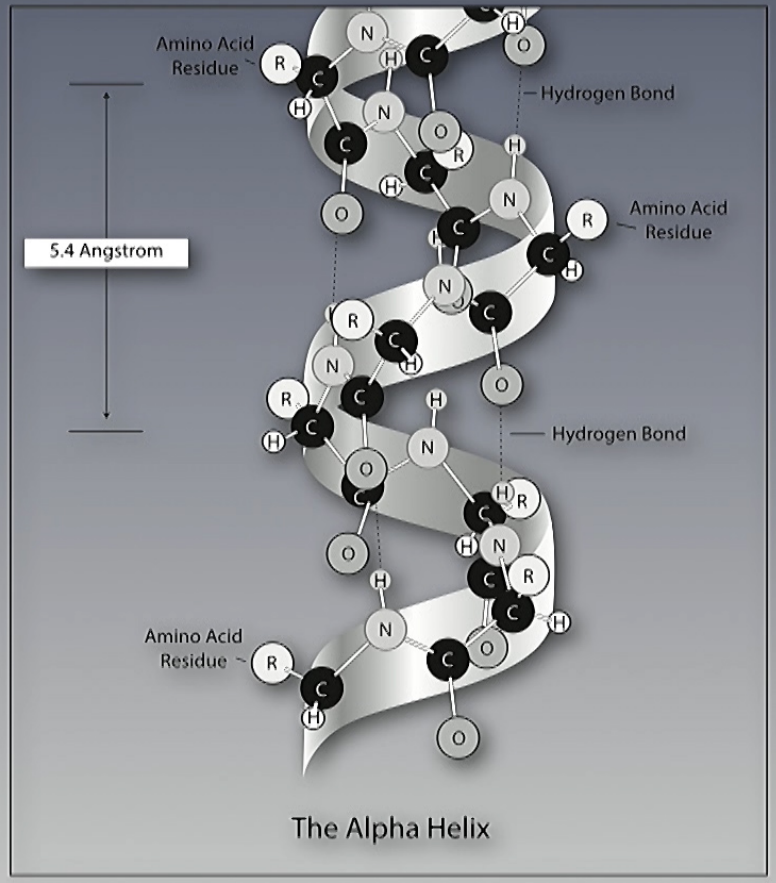
The structure of proteins



The structure of proteins



But why 5.1Å in x-ray diffraction image?

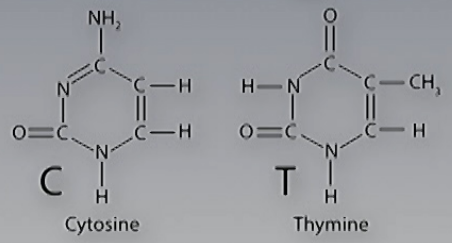


The secret of life!

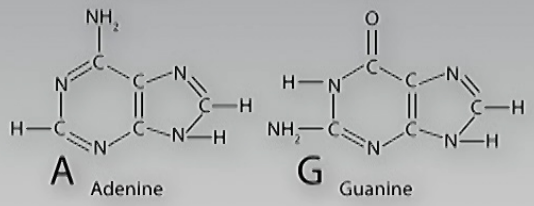
Pauling (1948)

"If the structure that serves as a template consists of, say, two parts, ... of duplicates of itself."

Chargaff rules



A=T
C=G

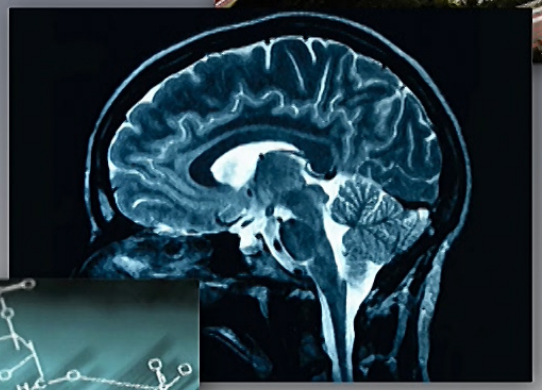


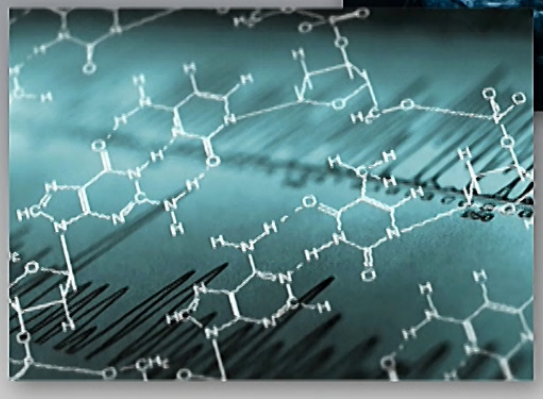
Anatomy of a blunder

Why the rush?

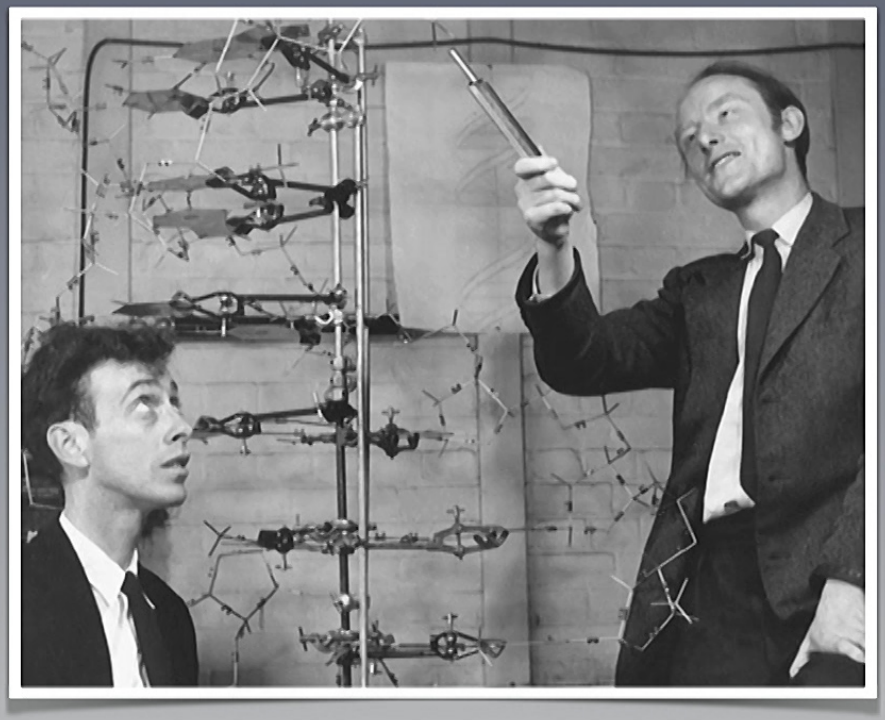
Why the forgetfulness?

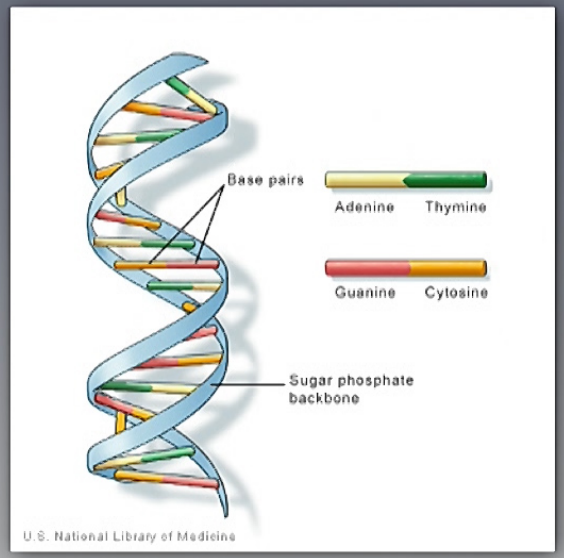
What about rules of basic chemistry?





Life's Molecules

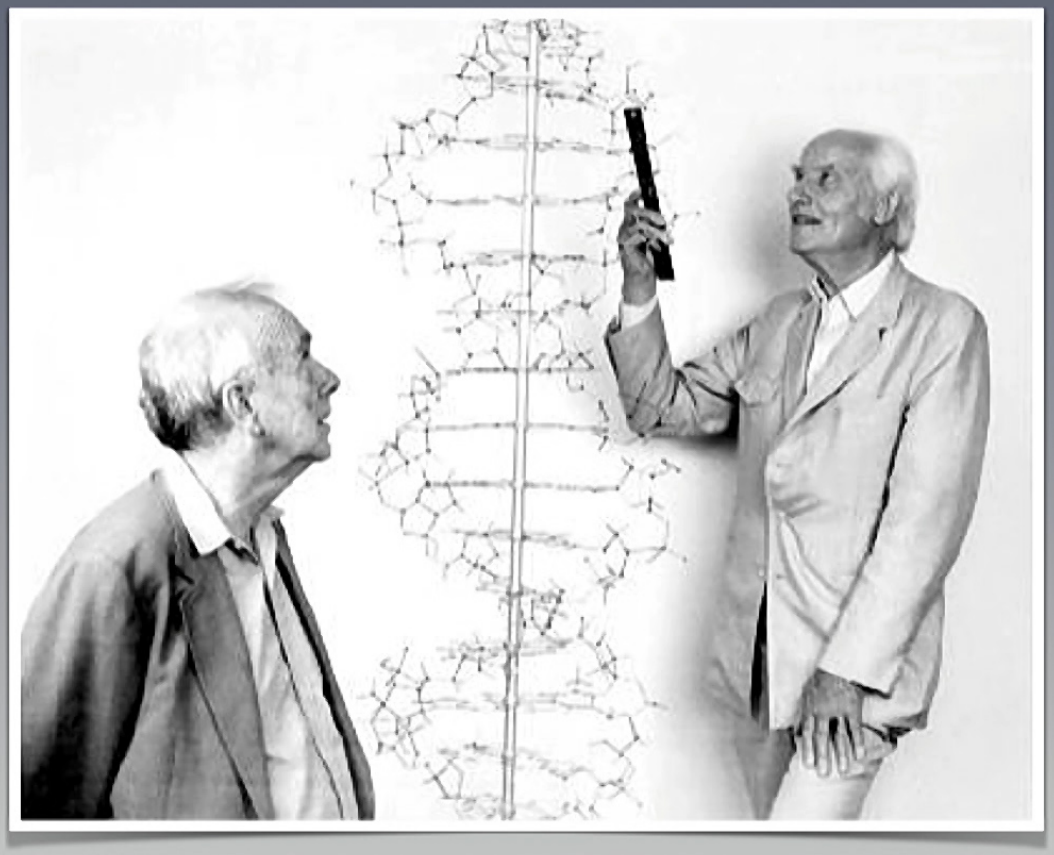




DNA

The Eagle Pub

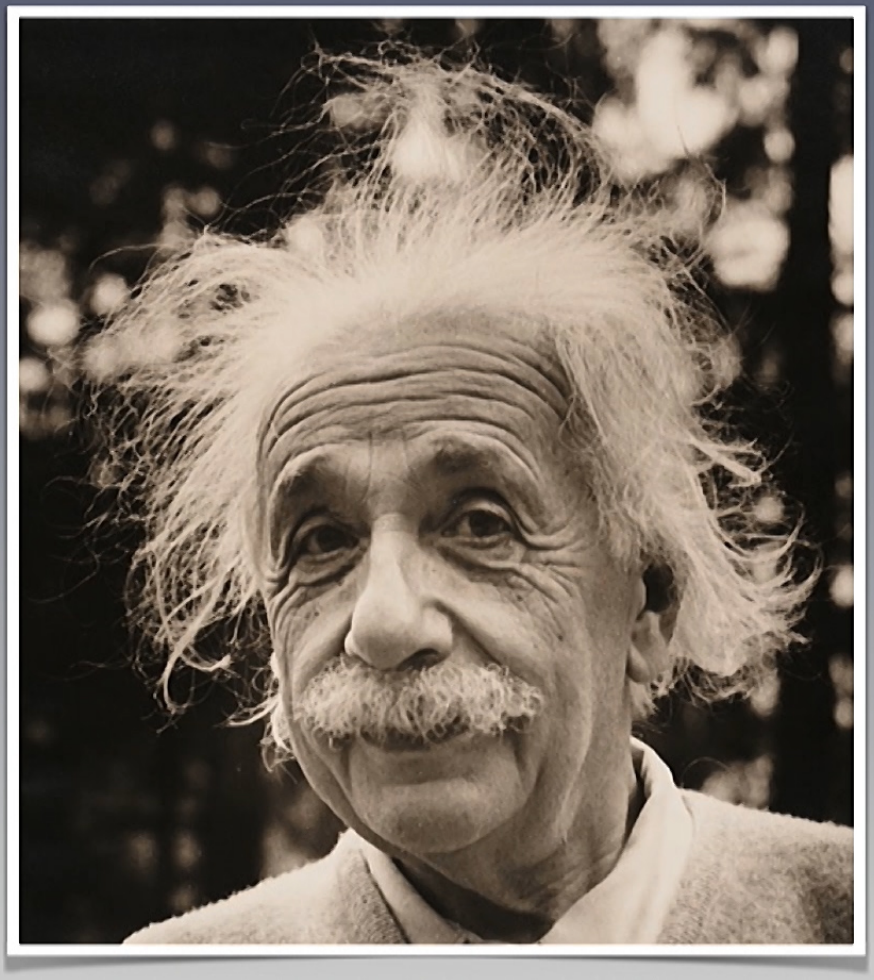
Life's Molecules



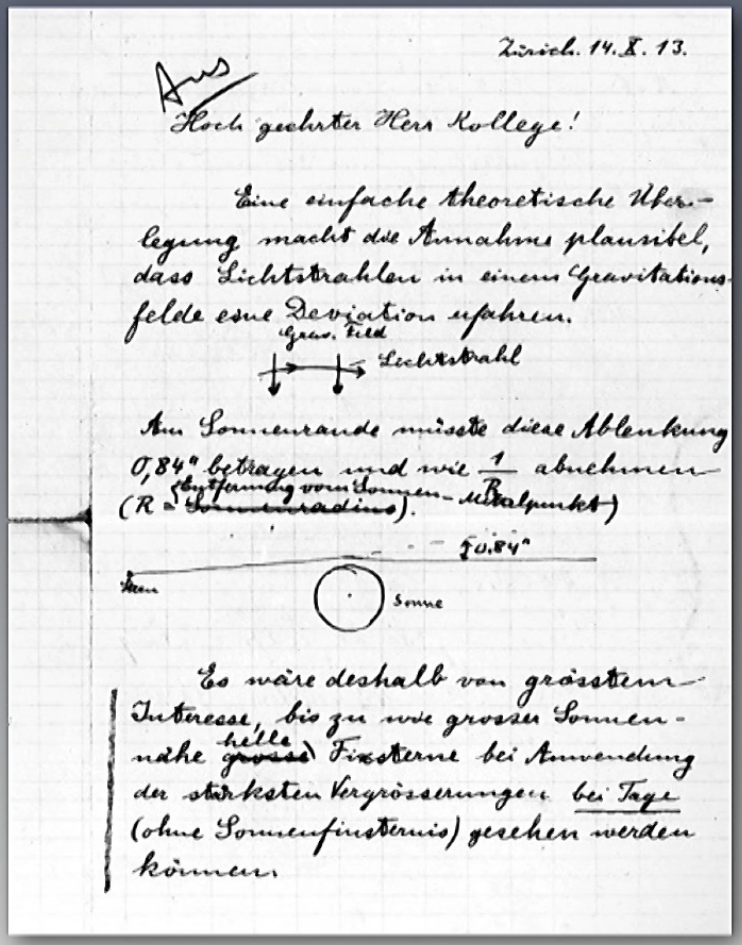
DNA

Key players in DNA story

Einstein: The "biggest blunder"?



Einstein's thoughts on general relativity



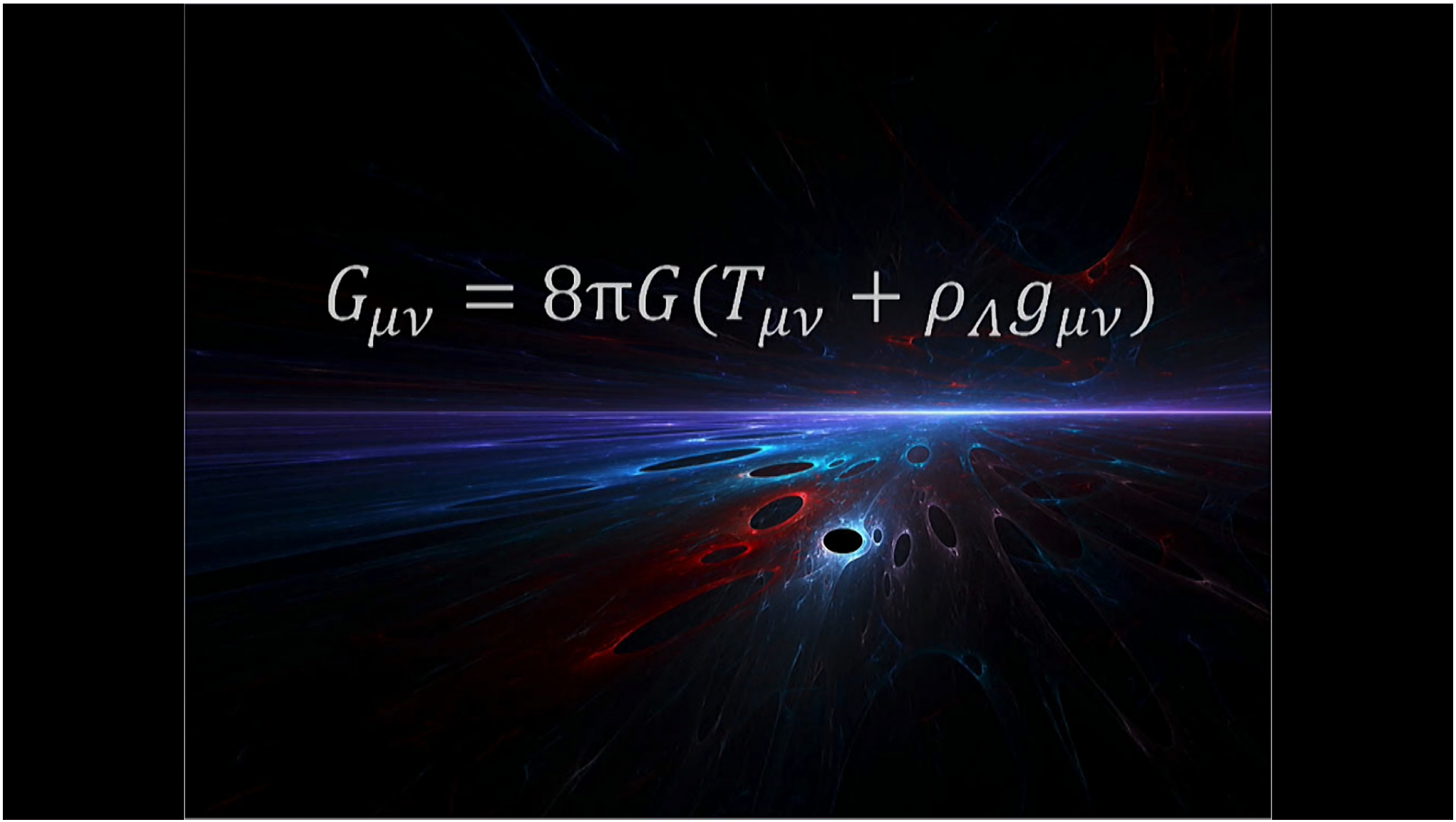
Zürich. 14. X. 13.

Hoch geehrter Herr Kollege!

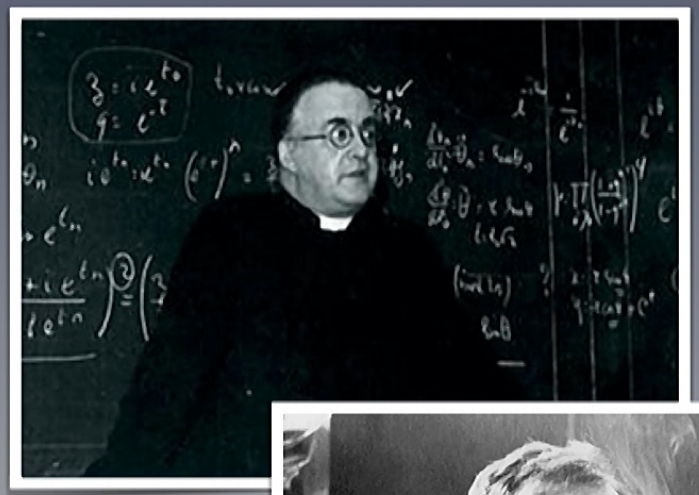
Eine einfache theoretische Überlegung macht die Annahme plausibel, dass Lichtstrahlen in einem Gravitationsfelde eine Deviation erfahren.

Am Sonnenrande müsste diese Ablenkung 0,84" betragen und wie $\frac{1}{R}$ abnehmen (R = ~~Entfernung vom Sonnen-~~ Mittelpunkt).

Es wäre deshalb von grösstem Interesse, bis zu wie grossen Sonnennähe ~~grosse~~ helle Fixsterne bei Anwendung der stärksten Vergrösserungen bei Tage (ohne Sonnenfinsternis) gesehen werden können.


$G_{\mu\nu} = 8\pi G(T_{\mu\nu} + \rho_\Lambda g_{\mu\nu})$

Cosmic expansion



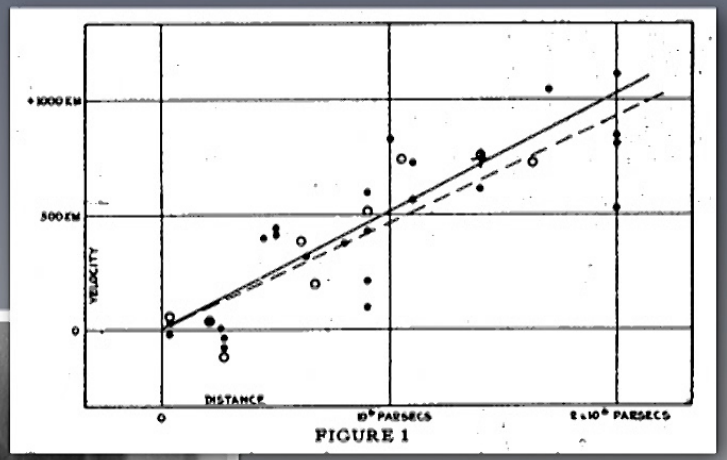
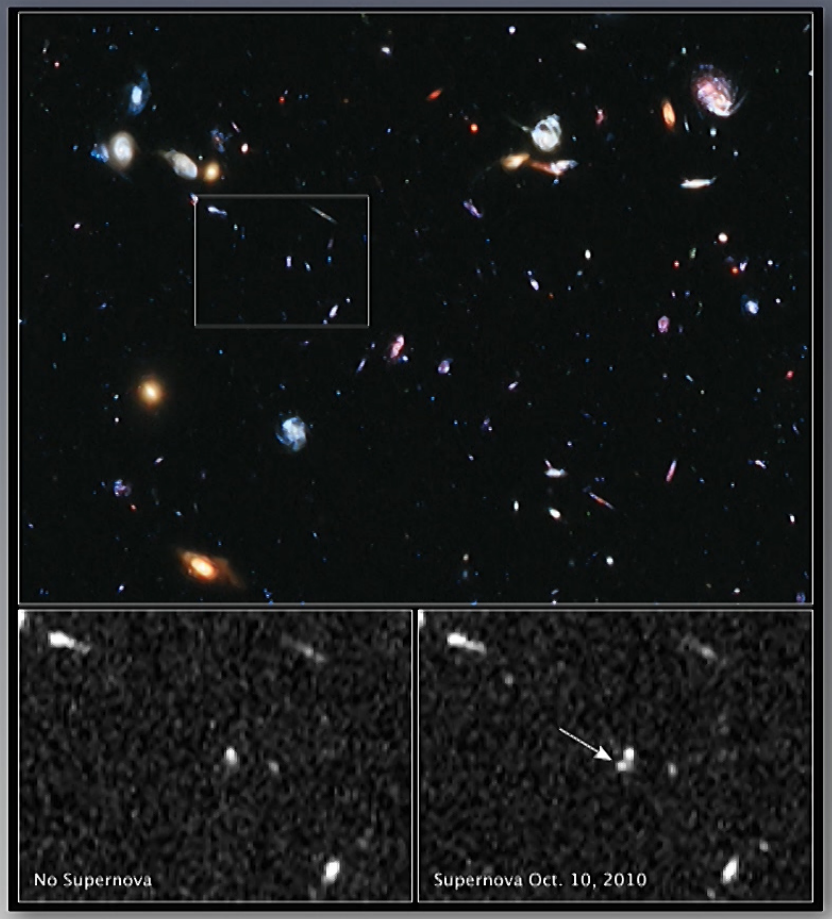
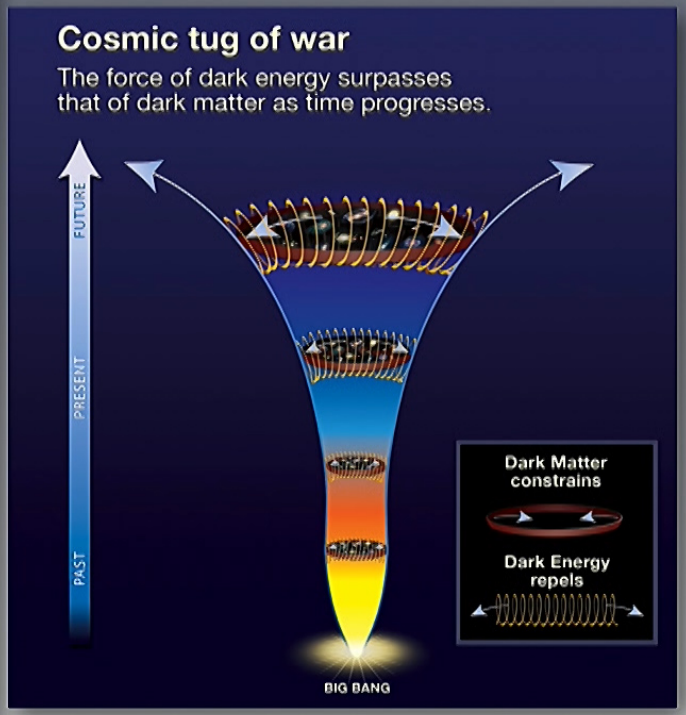


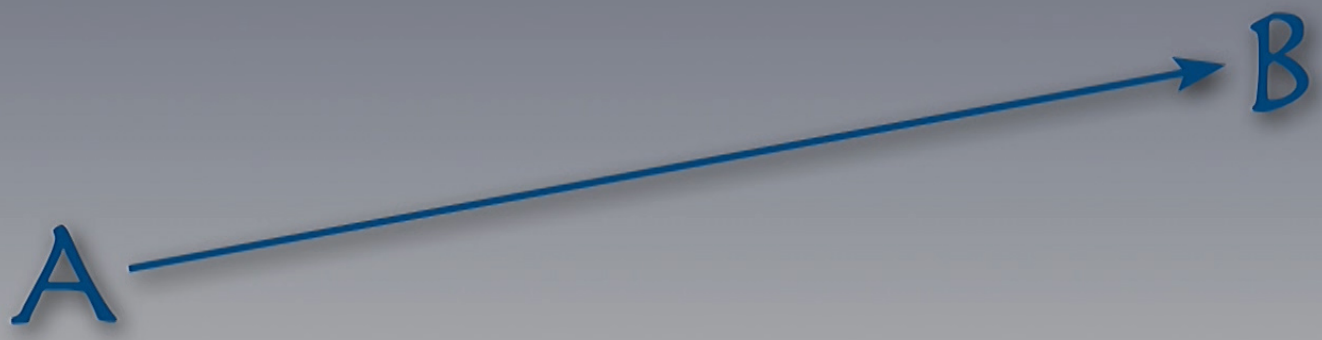
FIGURE 1

The accelerating universe

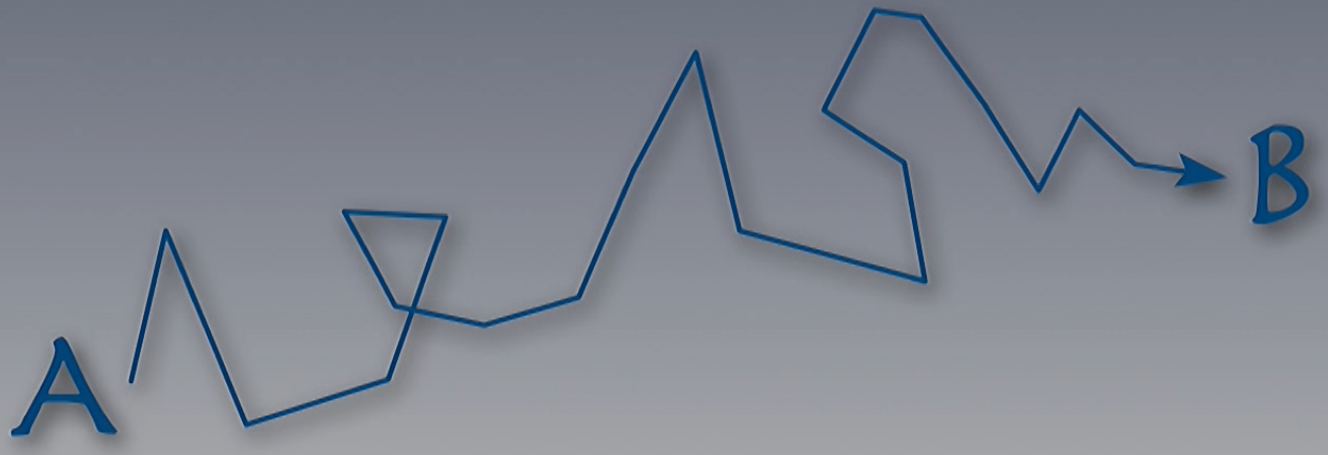




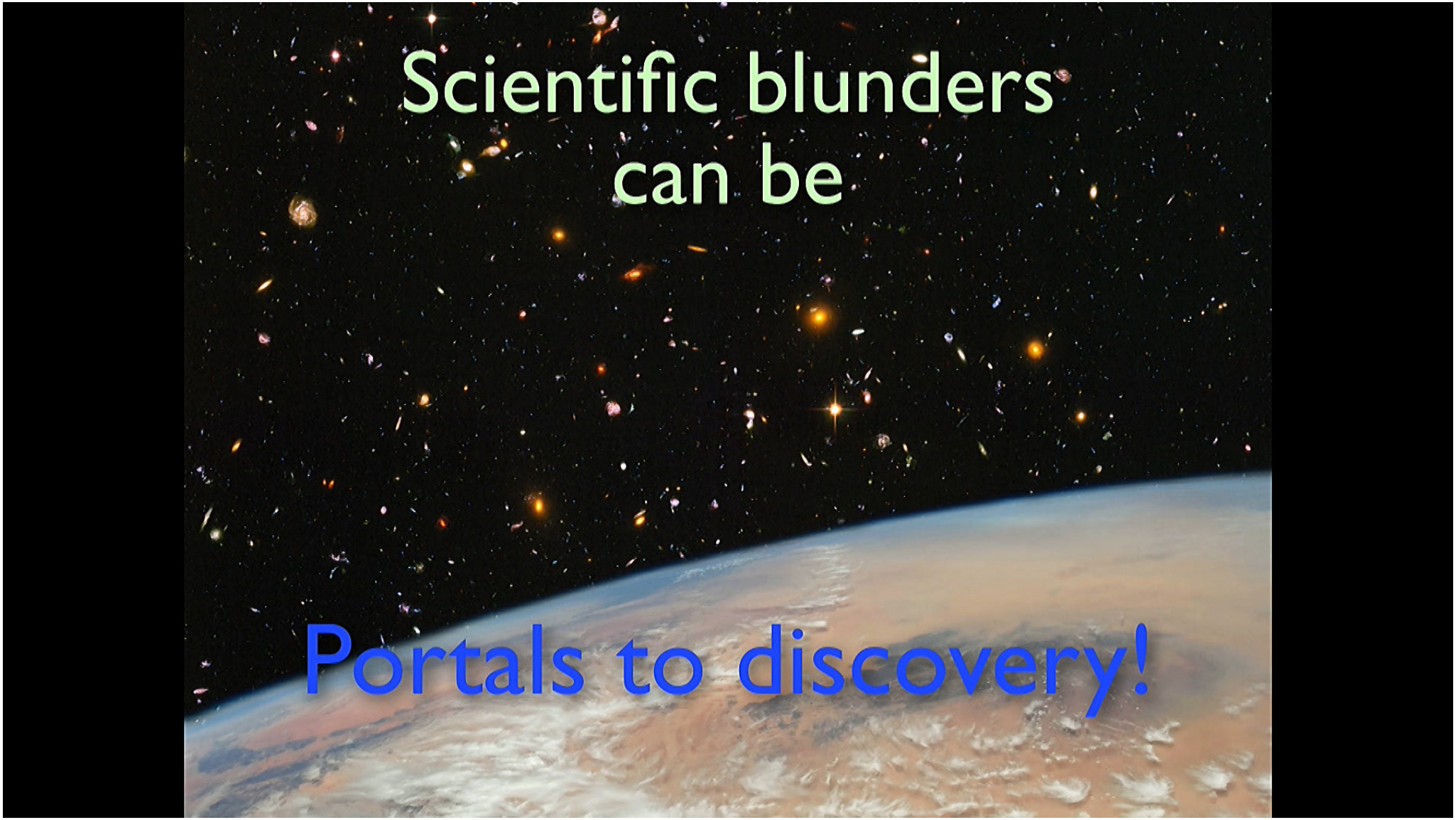
Progress in science



Progress in science




Scientific blunders
can be


Scientific blunders
can be
Portals to discovery!