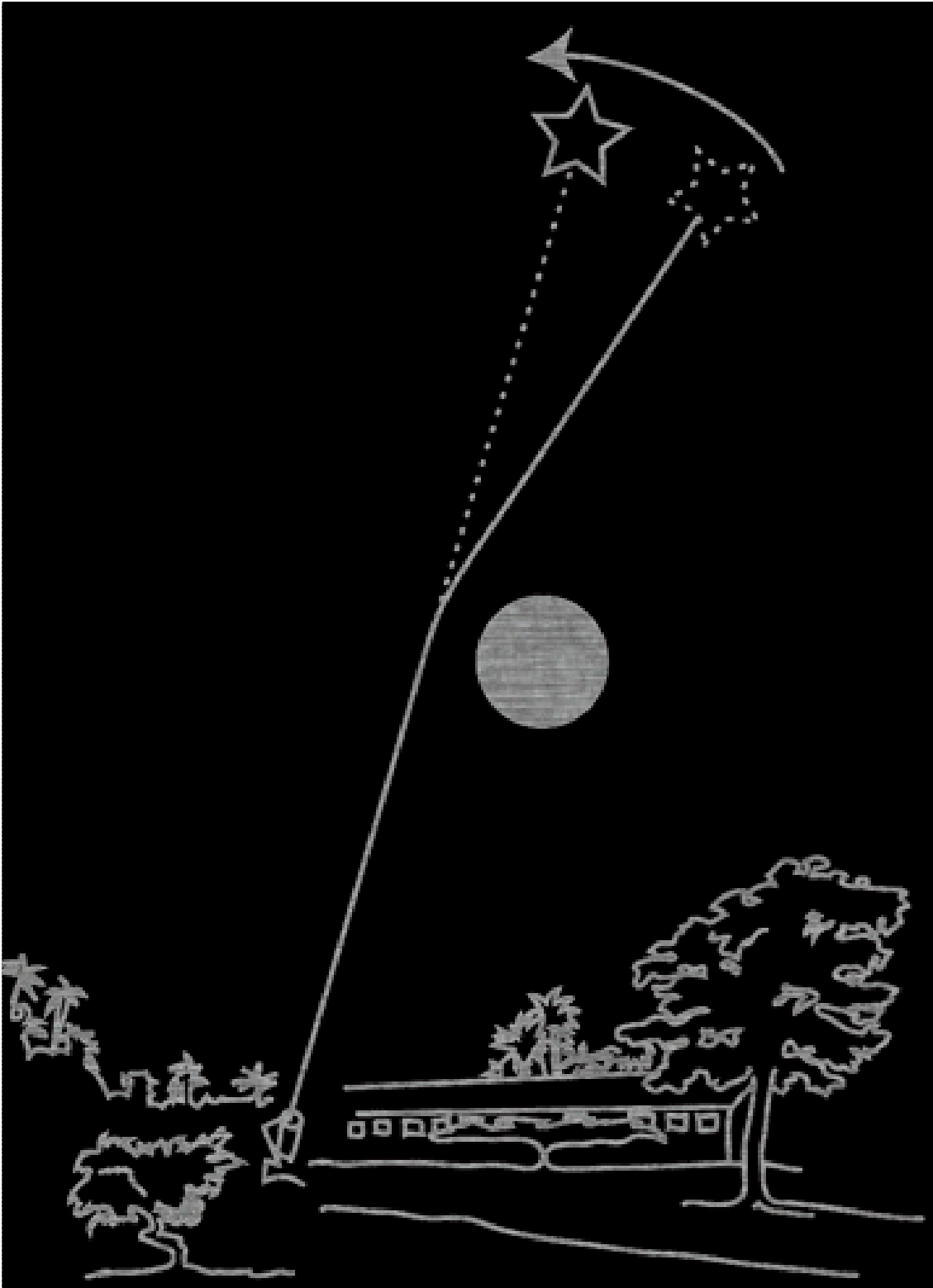


Nine decades of gravitational lensing

Richard Massey
Royal Observatory Edinburgh

- Isaac Newton (1704) –
"Do not Bodies act upon Light at a distance, and by their action bend its Rays; and is not this action strongest at the least distance?"

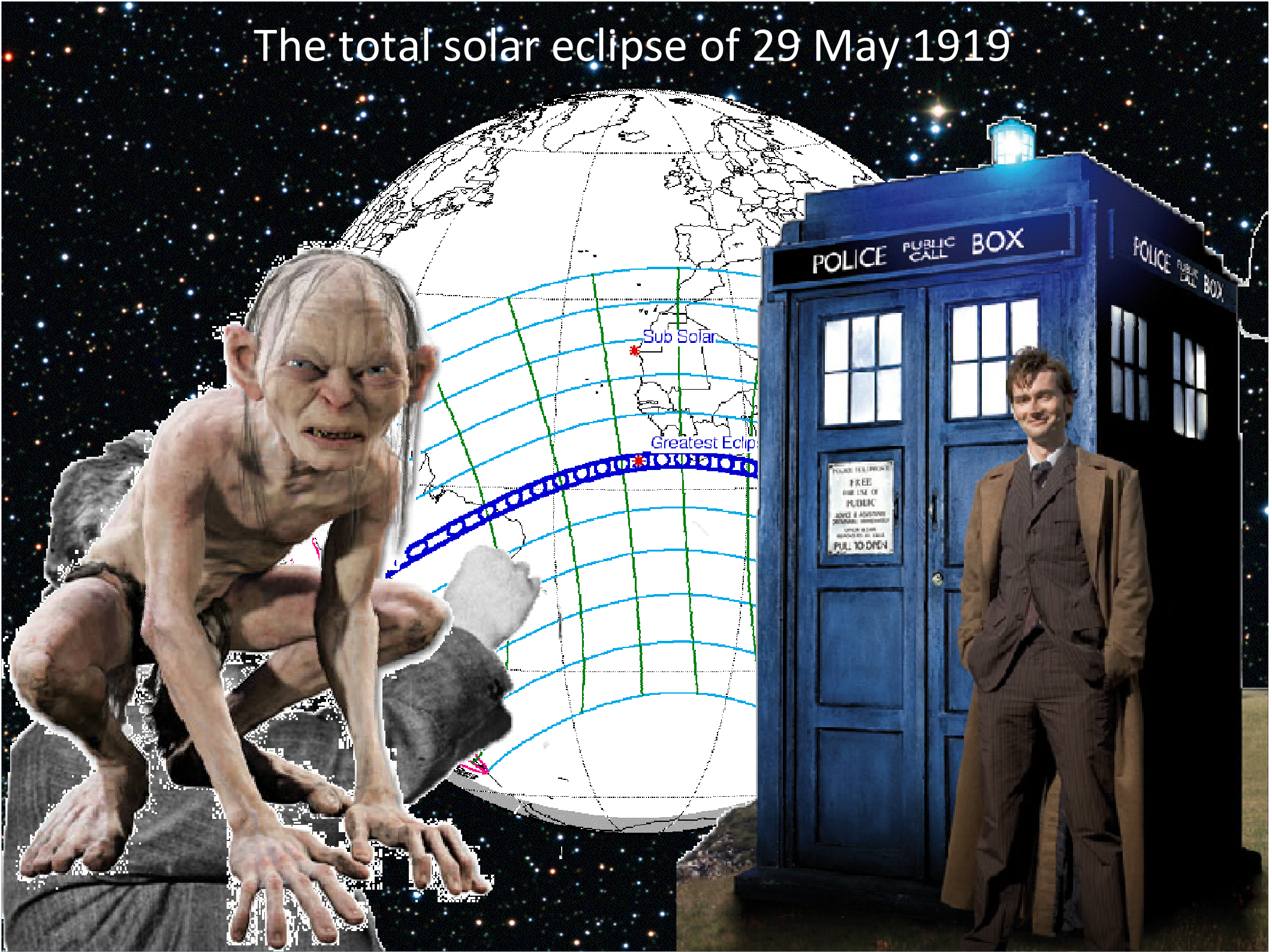
- Henry Cavendish (1784, unpublished) –
Calculates deflection of a hyperbolic trajectory assuming light is corpuscular.

- Johann von Soldner (1804) –
Publishes same calculation, derives 0.84".

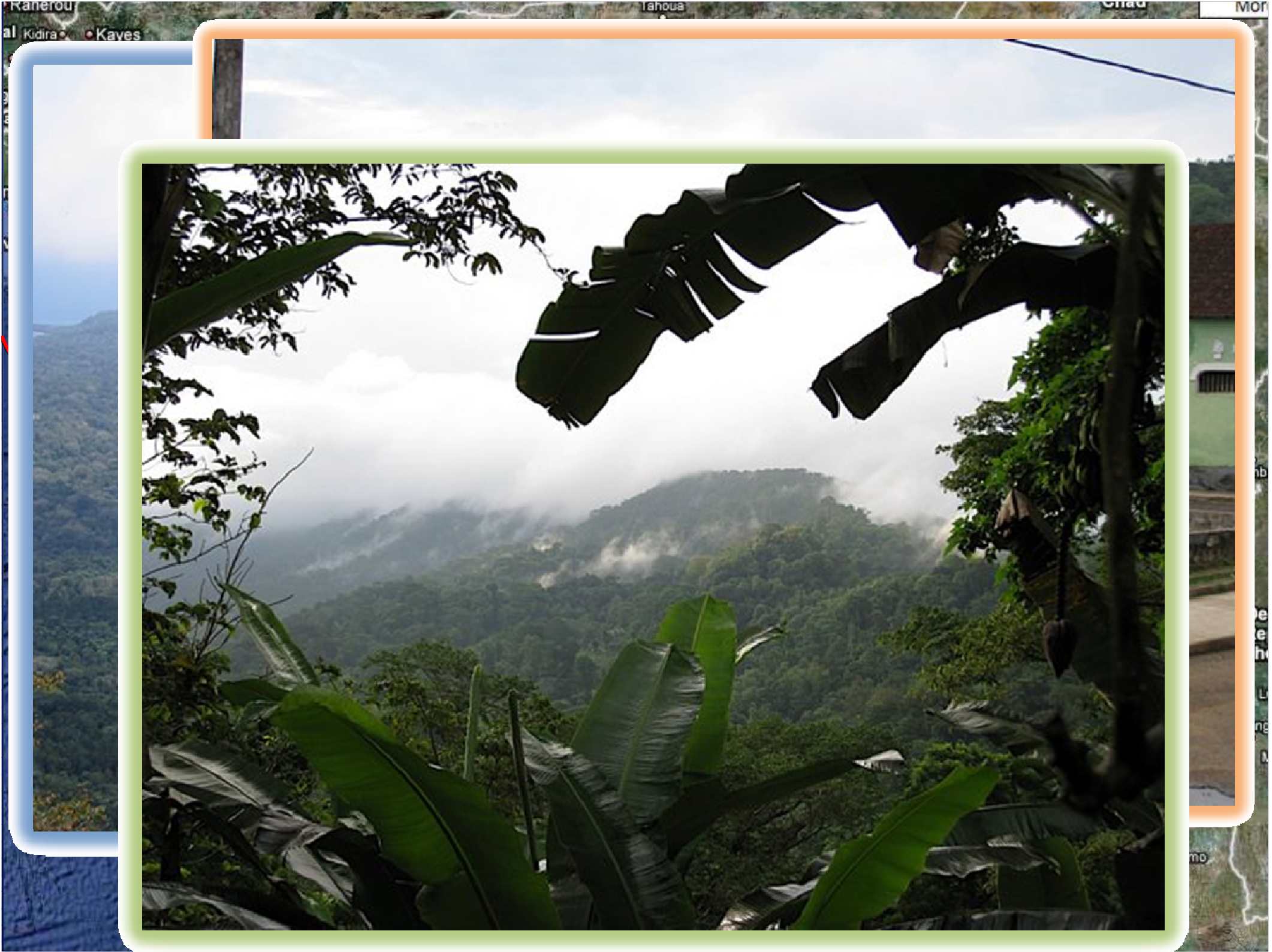
- Einstein (1911) –
Relativistic version of Newtonian deflection 0.875" (classical result assumed light can be accelerated/decelerated like matter).

- Einstein (1915) –
GR version includes curvature of space, 1.75".

The total solar eclipse of 29 May 1919

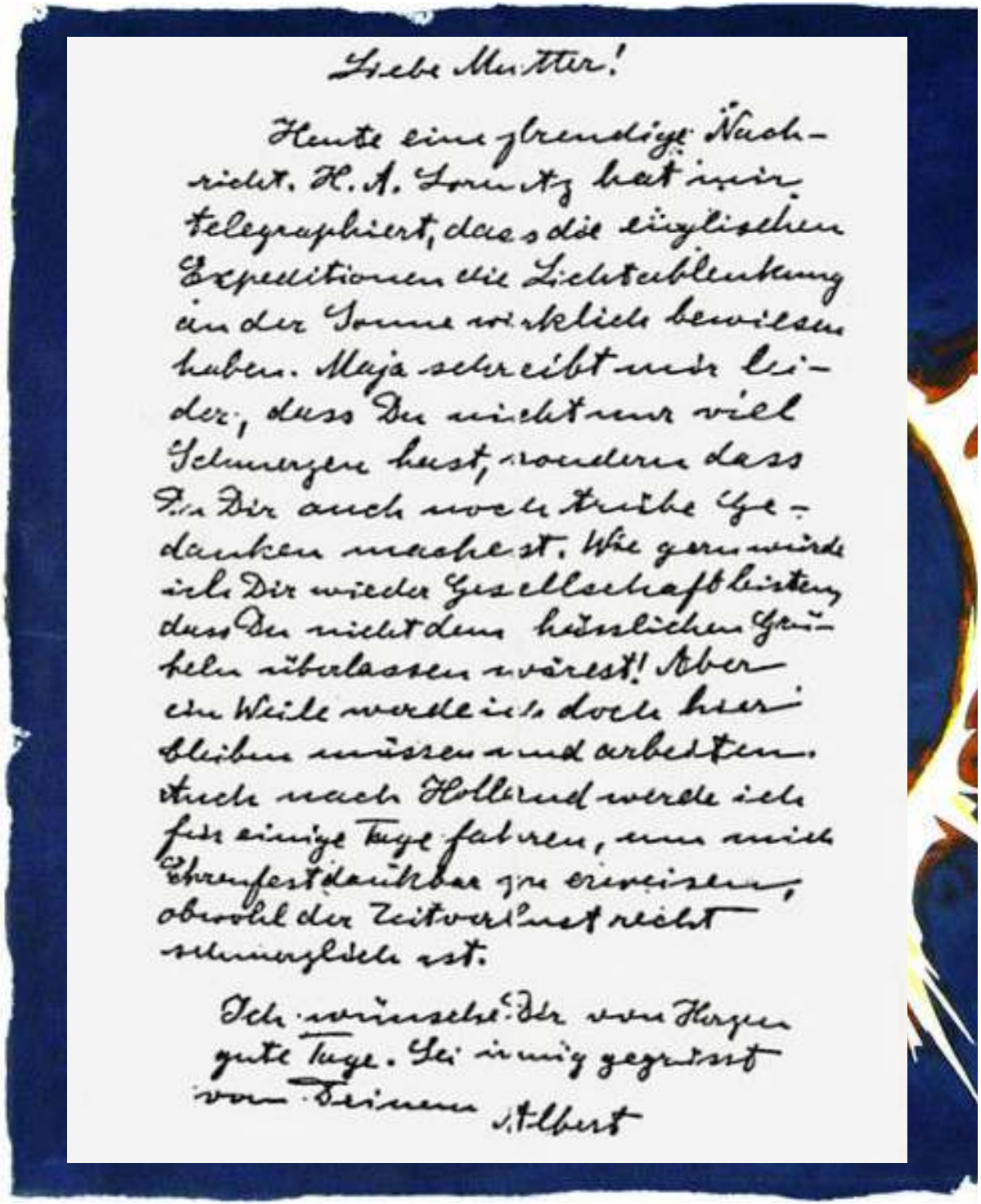


Dublin
Ireland
Manchester
Birmingham
Cardiff
London
Bremen
Hamburg
Szczecin
Berlin
Poznań
Nederland
Netherlands
Hannover
Беларусь
Belarus
Polska
Poland
Warszawa
Homyel
België
Belgique
Belgium
Deutschland
Germany
Wrocław
Київ
Kraków
Lviv
Le Havre
Paris
Reims
Frankfurt am Main
Česká Rep
Czech Rep
Ostrava
Україна
Ukraine
Rennes
München
Wien
Slovensko
Slovakia
Moldova
Chişinău
Odesa
Magyarország
Romania
București
Istanbul
Bursa
İzmir
Antalya
Bur Sa'id
Al Qahirah
Libya
Egypt
Mauritania
Nouakchott
Richard-toll
Thieogni
Kébémer
Dakar
Senegal
Kayes
Mali
Niger
Chad
Sudan
Niamey
The Gambia
Ziguinchor
Bamako
Burkina Faso
Kano
N'Djamena


Kidira
Kayes
Tahoua

Kidira
Kayes
Tambacounda
Bamako
Kédougou
Guinea
Sierra
Leone

Abéché
Central African
Republic
Bambari



Liebe Mutter!

Heute eine erfreuliche Nachricht. H. A. Lorentz hat mir telegraphiert, dass die englischen Expeditionen die Lichtablenkung an der Sonne wirklich bewiesen haben. Maja schreibt mir leider, dass Du nicht nur viel Schmerzen hast, sondern dass Du Dir auch noch trübe Gedanken machst. Wie gern würde ich Dir wieder Gesellschaft leisten, dass Du nicht dem häuslichen Grübeln überlassen wärest! Aber eine Weile werde ich doch hier bleiben müssen und arbeiten. Auch nach Holland werde ich für einige Tage fahren, um mich Ehrenfest dankbar zu erweisen, obwohl der Zeitverlust recht schmerzlich ist.

Ich wünsche Dir von Herzen gute Tage. Sei innig gegrüsst von Deinem Albert

LIGHTS ALL ASKEW IN THE HEAVENS

Men of Science More or Less Agog Over Results of Eclipse Observations.

EINSTEIN THEORY TRIUMPHS

Stars Not Where They Seemed or Were Calculated to be, but Nobody Need Worry.

A BOOK FOR 12 WISE MEN

No More in All the World Could Comprehend It, Said Einstein When His Daring Publishers Accepted It.

A BRIEF HISTORY OF TIME
FROM THE BIG BANG TO BLACK HOLES
STEPHEN HAWKING
WITH AN INTRODUCTION BY CARL SAGAN

IYA2009 90th anniversary celebration

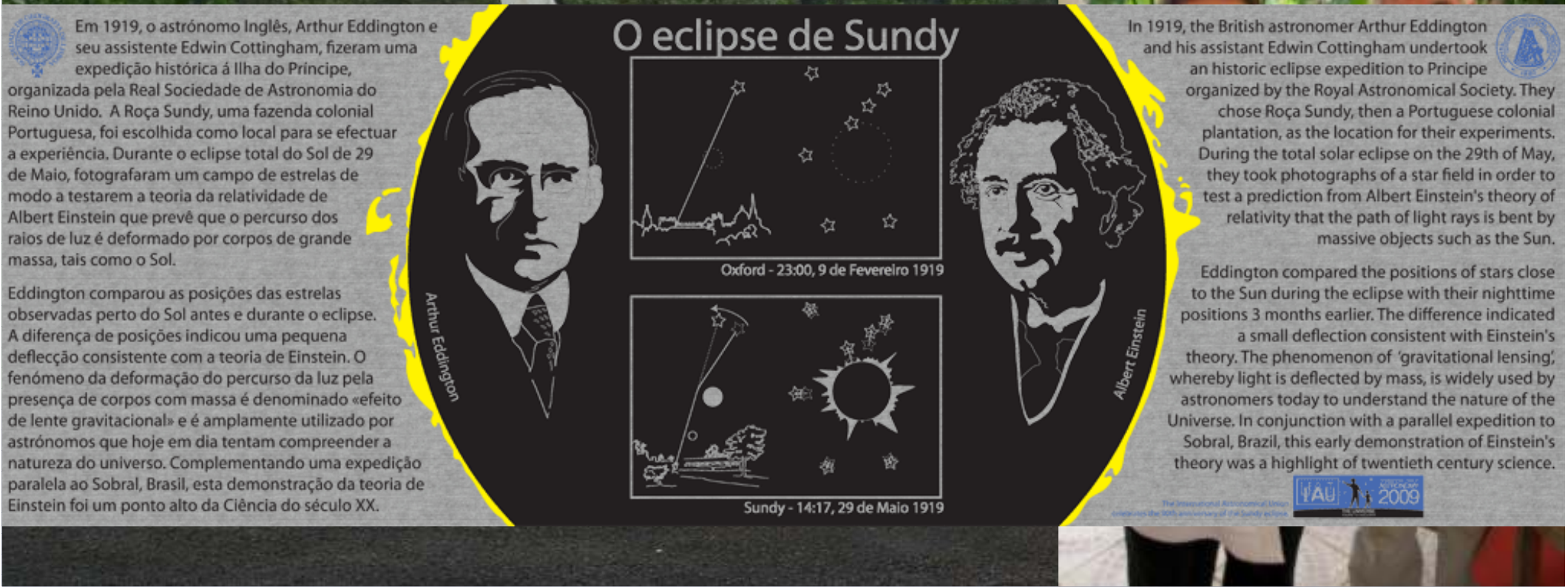
(www.1919eclipse.org)

Return expedition:

- Installing a commemorative plaque
- Public lectures
- Exhibition on the history of lensing

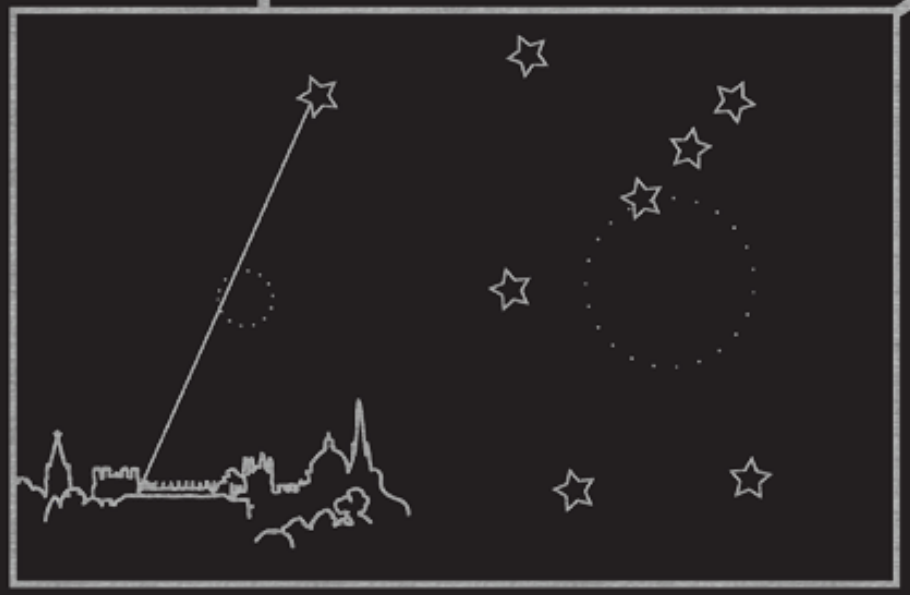
Sponsors:

RAS, IAU, Gulbenkian foundation, Portuguese ministry of science

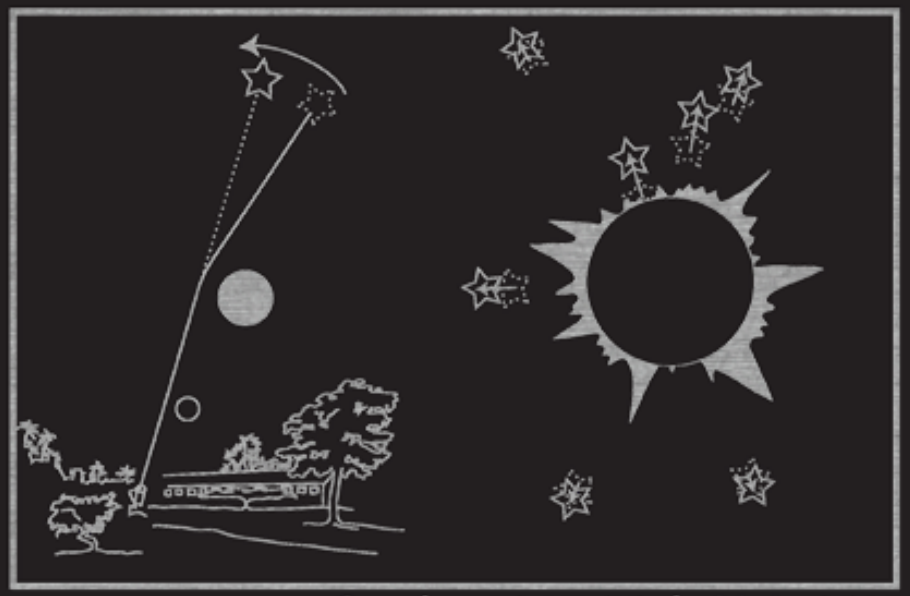


Arthur Eddington
a small deflection
light is deflected by mass
a highlight of twentieth
IAU
2009
THE UNIVERSE
O eclipse de Sundy
23:00, 9 de Fevereiro 1919

O eclipse de Sundy

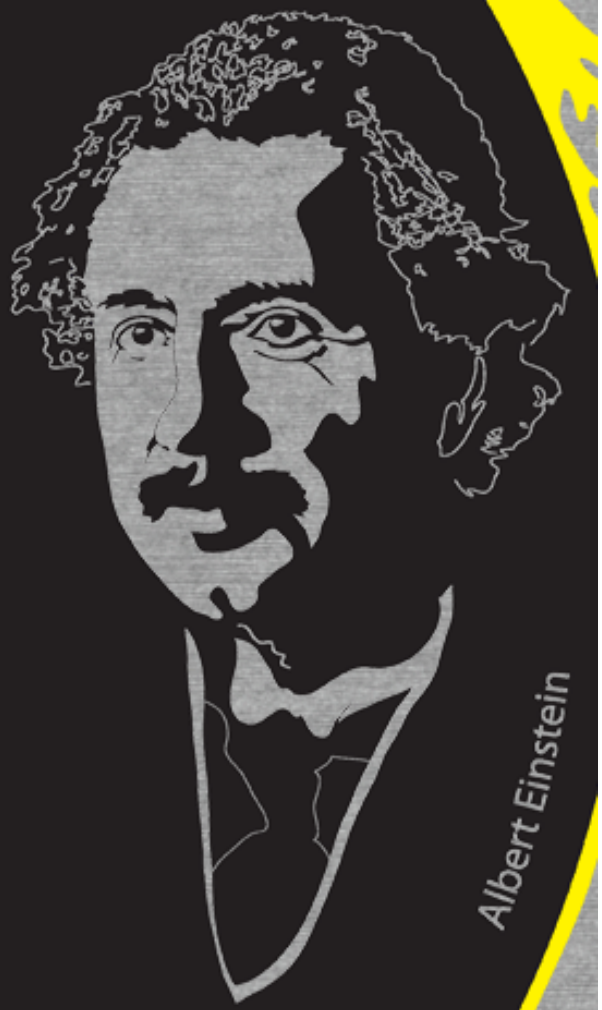


Oxford - 23:00, 9 de Fevereiro 1919



Sundy - 14:17, 29 de Maio 1919

Arthur Eddington



Albert Einstein