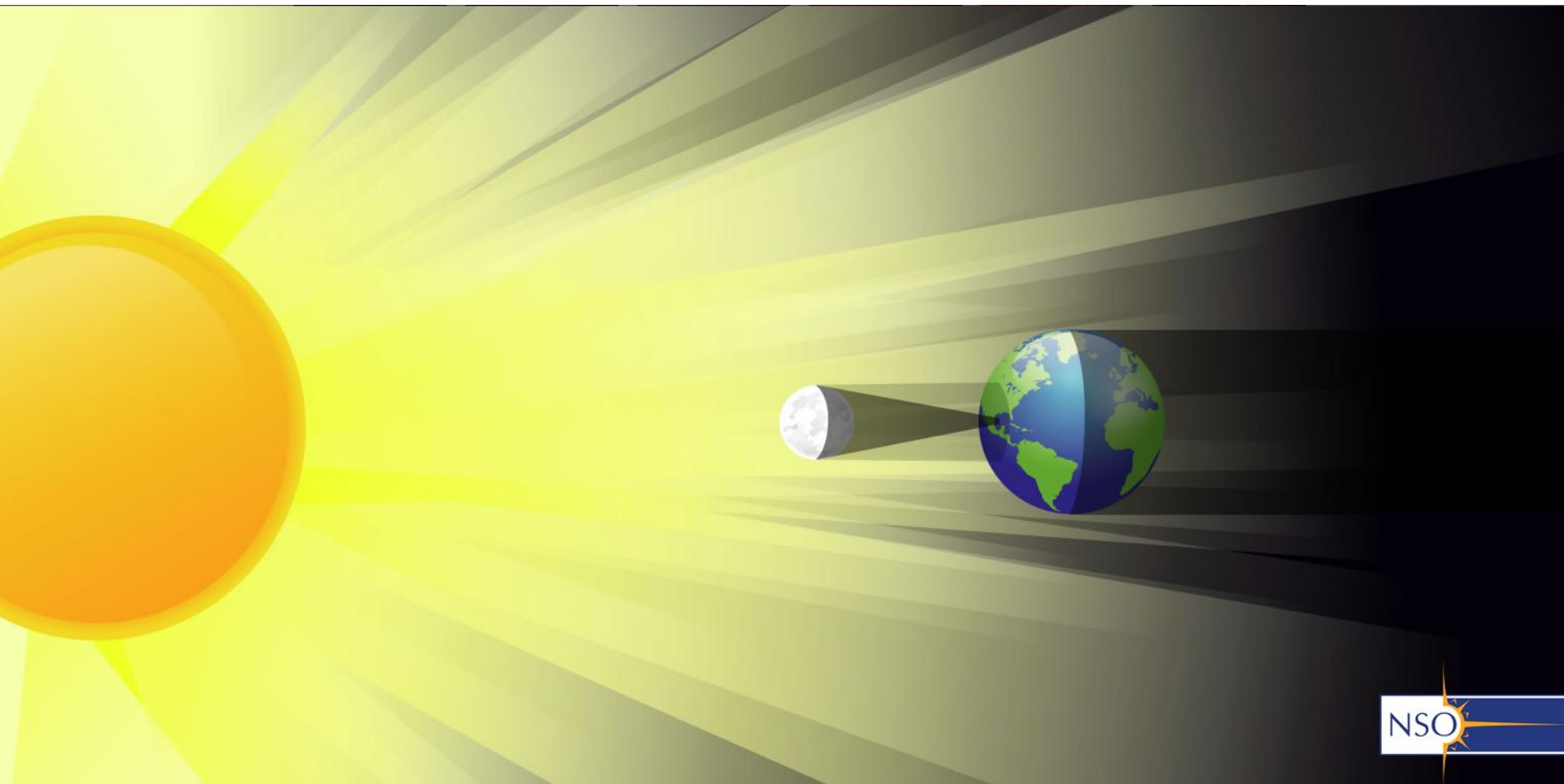


Jak zaćmienie Słońca uczyniło Einsteina celebrytą



Marek Demiański
Wydział Fizyki UW





	Księżyc		Słońce	
	w perygeum (najbliżej)	w apogeum (najdalej)	w perihelium (najbliżej)	w aphelium (najdalej)
średni promień	1737,10 km		696000 km	
odległość	363104 km	405696 km	147098070 km	152097700 km
średnica kątowa ^[10]	33' 30" (0.5583°)	29' 26" (0.4905°)	32' 42" (0.5450°)	31' 36" (0.5267°)
wielkość pozorna (z zachowaniem skali)				
malejąca kolejność wielkości pozornej	1.	4.	2.	3.

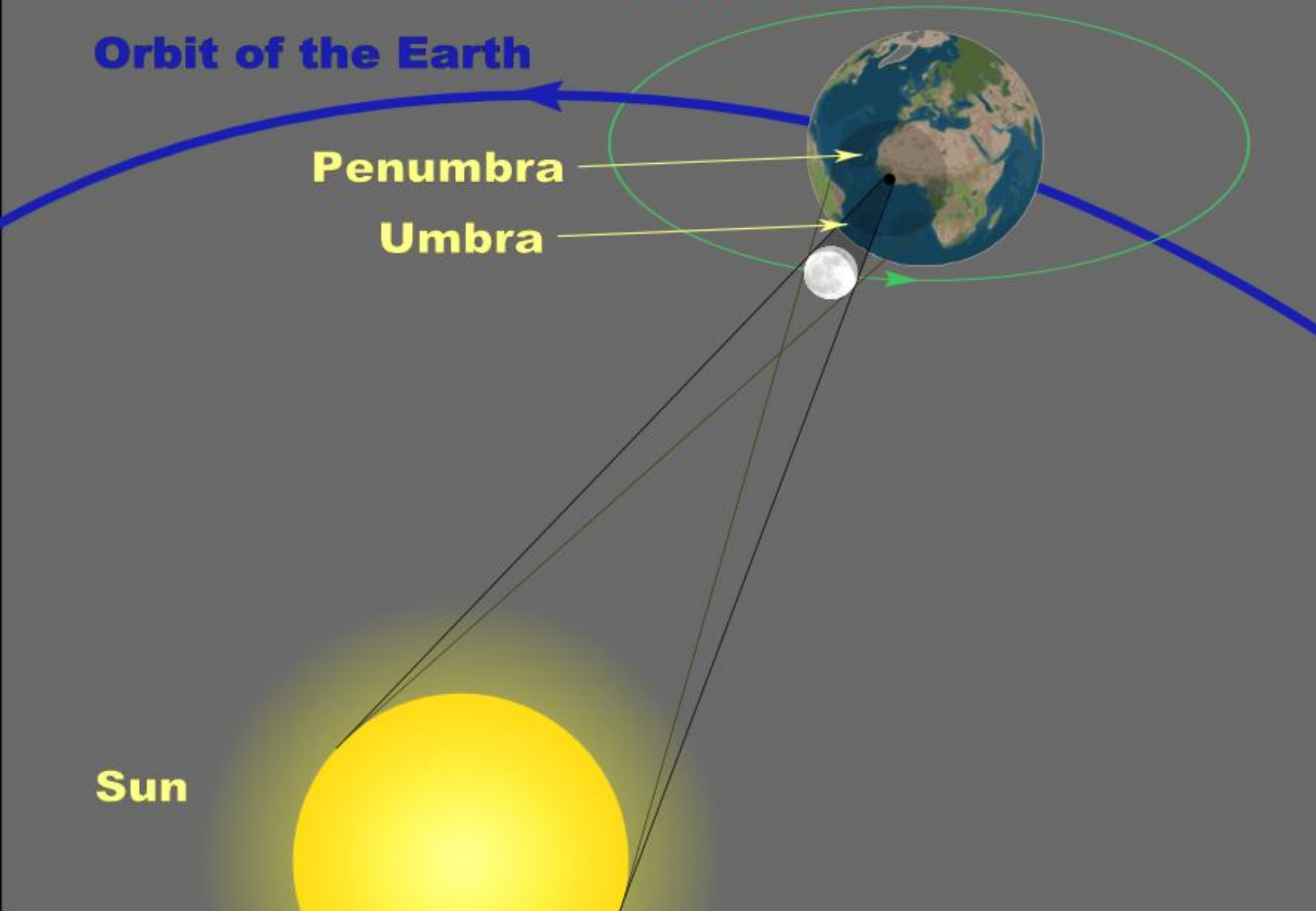
Orbit of the Moon

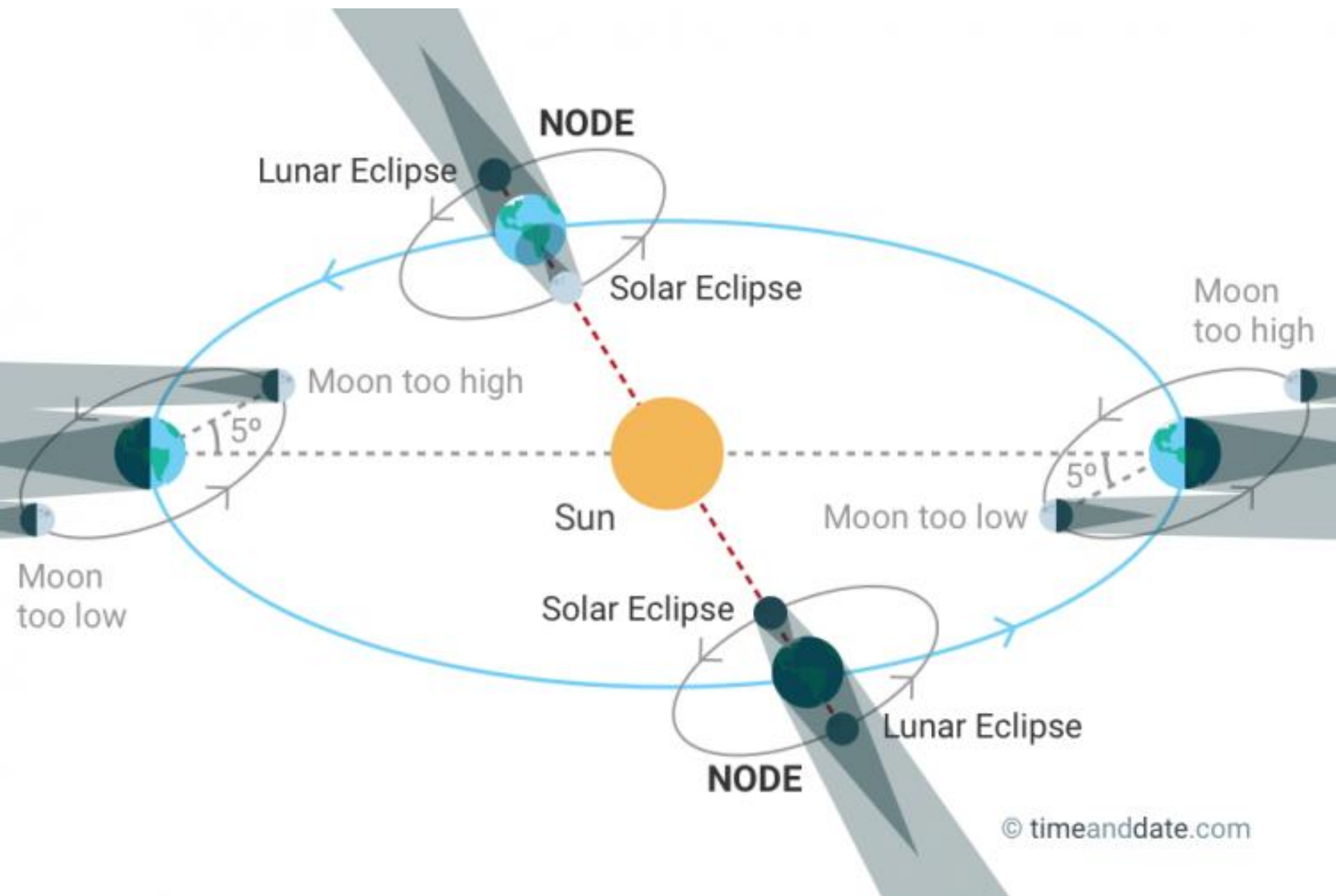
Orbit of the Earth

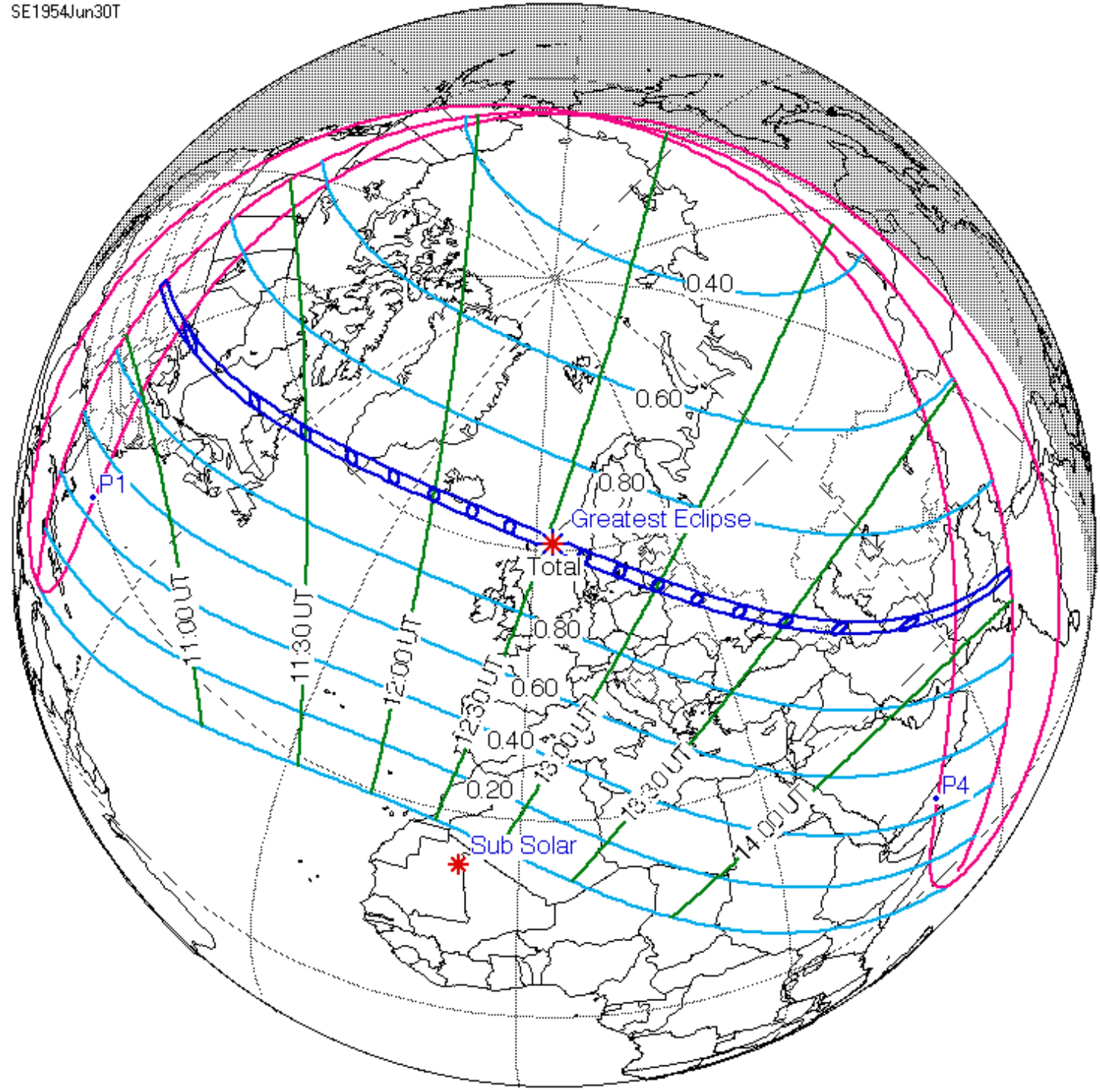
Penumbra

Umbra

Sun







Zaćmienia Słońca widoczne w Polsce:

Częściowe 16 stycznia 2035r

Obrączkowe 13 lipca 2075r

Całkowite 7 października 2135r

WELCOME

to

Râmnicu Vâlcea



THE TOWN OF THE LATEST

ECLIPSE

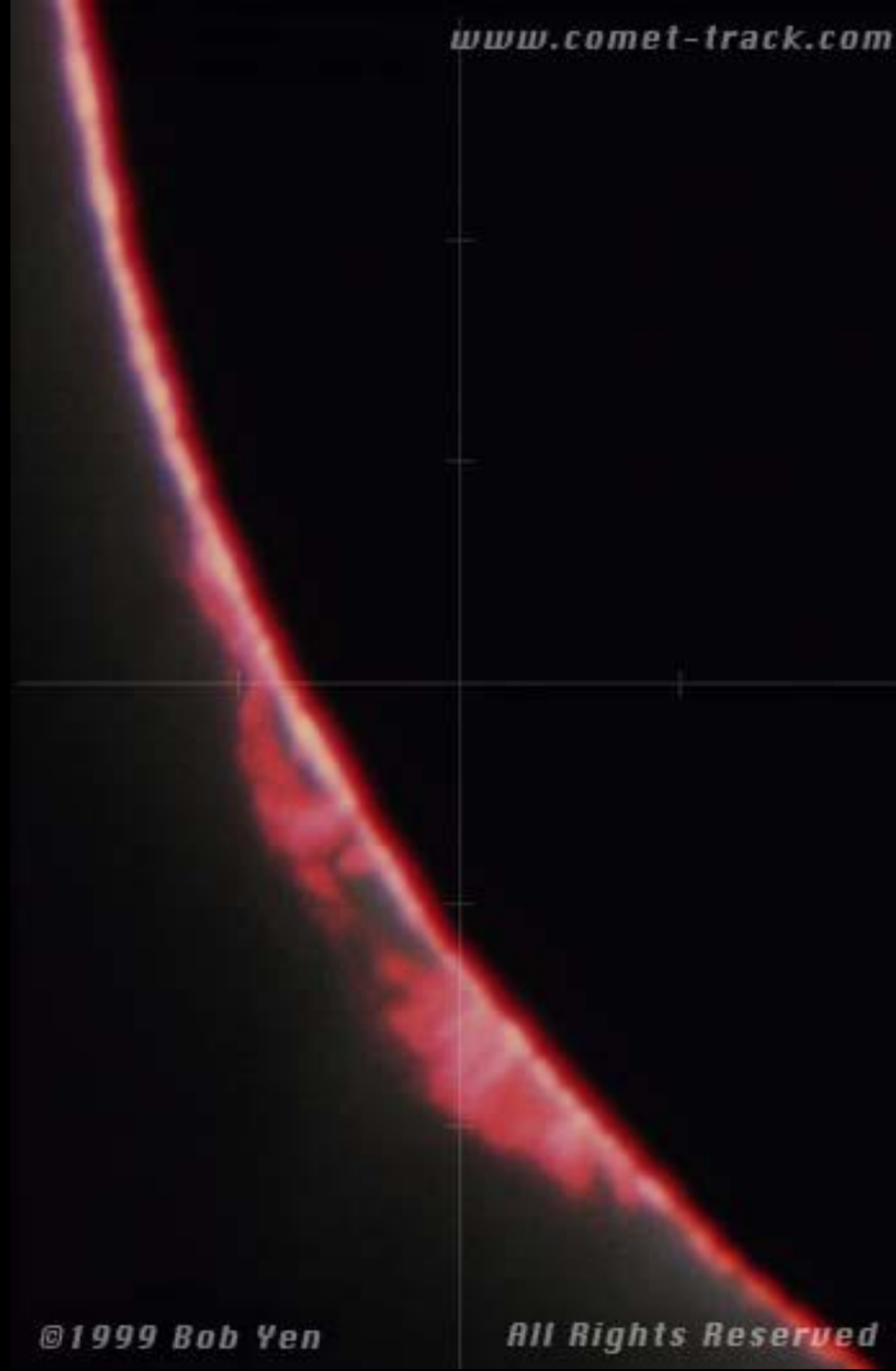


of this Millennium



















Банк ВЕФ



ПОЛНОЕ СОЛНЕЧНОЕ ЗАТМЕНИЕ

01.08.2008

НОВОСИБИРСК

НАЧАЛО ЧАСТНОЙ ФАЗЫ (ПЕРВЫЙ КОНТАКТ)	в 16 час. 41 мин.
НАЧАЛО ПОЛНОЙ ФАЗЫ	в 17 час. 43 мин. 59 с.
КОНЕЦ ПОЛНОЙ ФАЗЫ	в 17 час. 46 мин. 20 с.
ПРОДОЛЖИТЕЛЬНОСТЬ ПОЛНОЙ ФАЗЫ	2 мин. 21 сек.
ОКОНЧАНИЕ ЧАСТНОЙ ФАЗЫ (ПОСЛЕДНИЙ КОНТАКТ)	18 час. 45 мин.

Дизайнмастер.

ПОЛНОЕ СОЛНЕЧНОЕ ЗАТМЕНИЕ

СОСТОИТСЯ
1 АВГУСТА 2008 ГОДА
В ГОРОДЕ НОВОСИБИРСКЕ.

НАЧАЛО ЗАТМЕНИЯ - 16.41
ОКОНЧАНИЕ ЗАТМЕНИЯ - 18.45



TOTAL SOLAR ECLIPSE

AUGUST 1, 2008 CITY OF
NOVOSIBIRSK

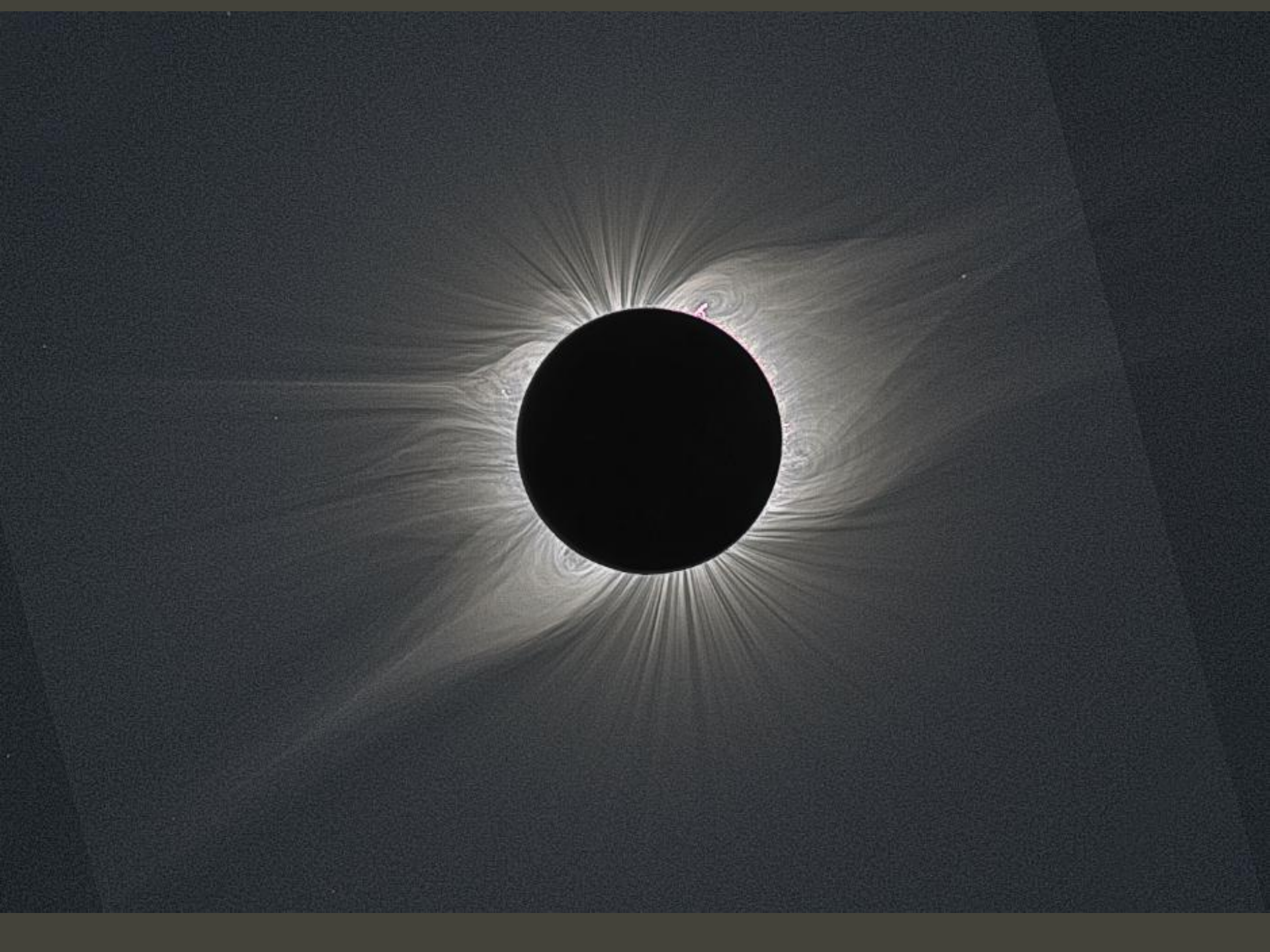
BEGINNING OF THE ECLIPSE - 4.41 P.M.
END OF THE ECLIPSE - 6.45 P.M.

МЕСТА РАСПОЛОЖЕНИЯ СМОТРОВЫХ ПЛОЩАДОК: LOCATION OF THE OBSERVATION SITES:

















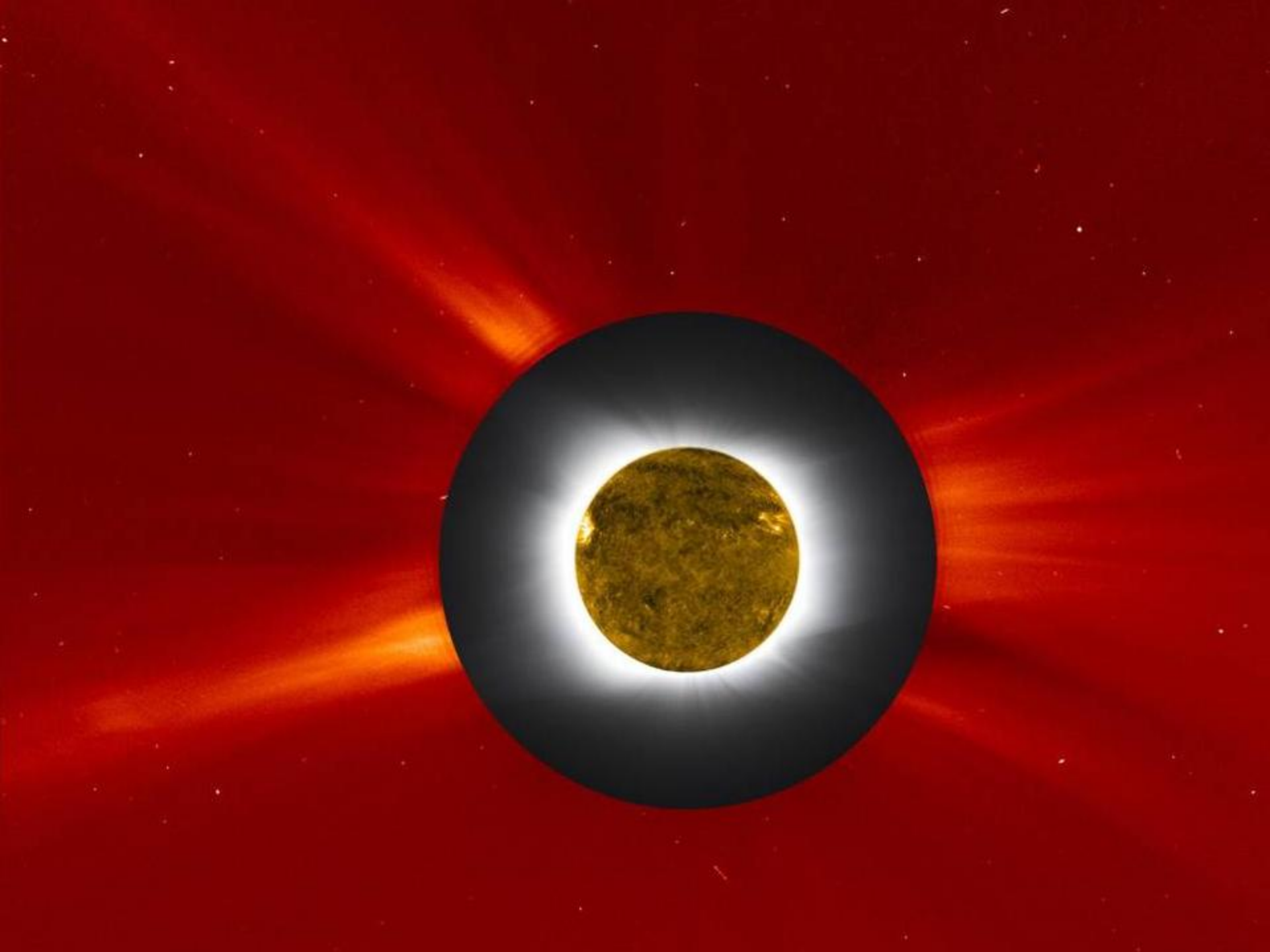
EASTER ISLAND ECLIPSE EXPEDITION

WILLIAMS COLLEGE

JULY 11, 2010

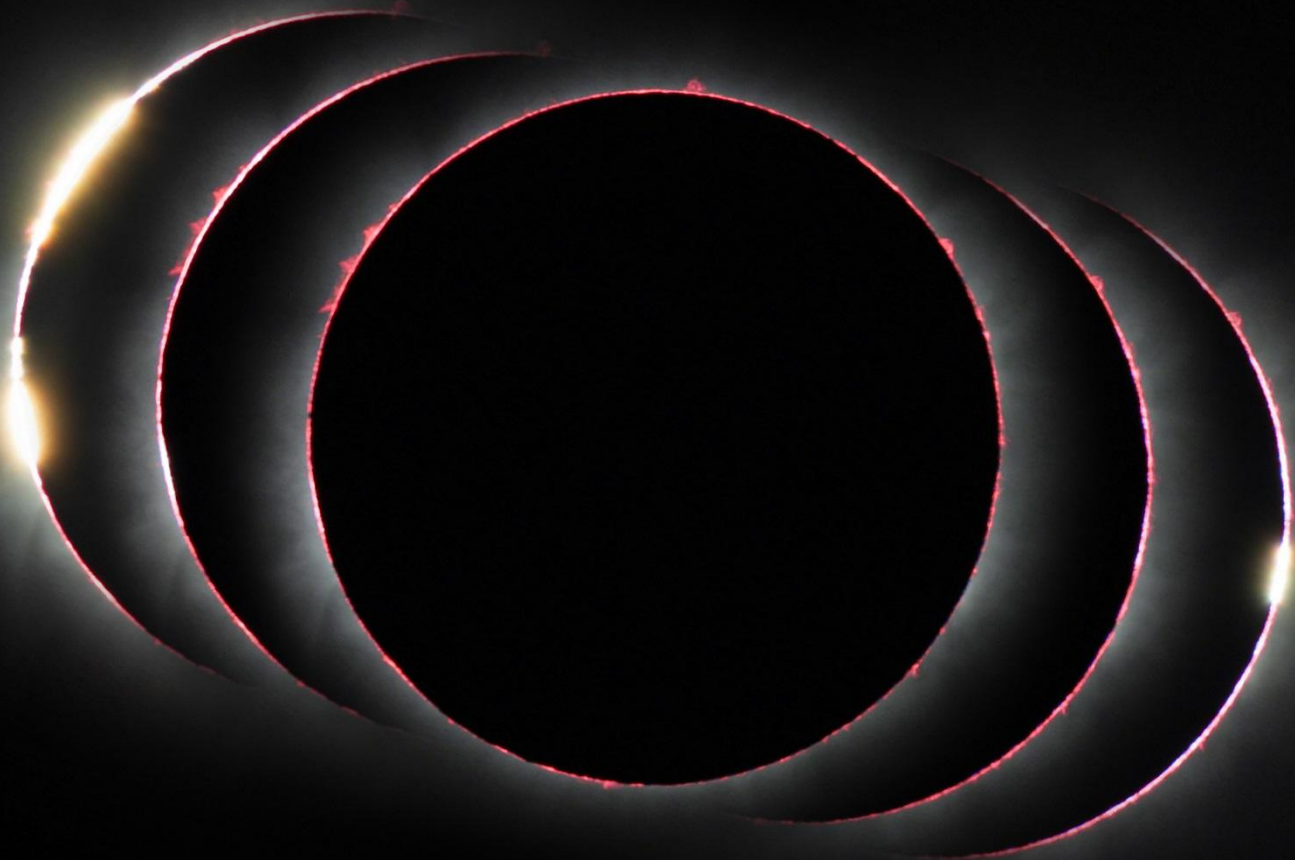














Kyle Adler
KYLE ADLER PHOTOGRAPHY



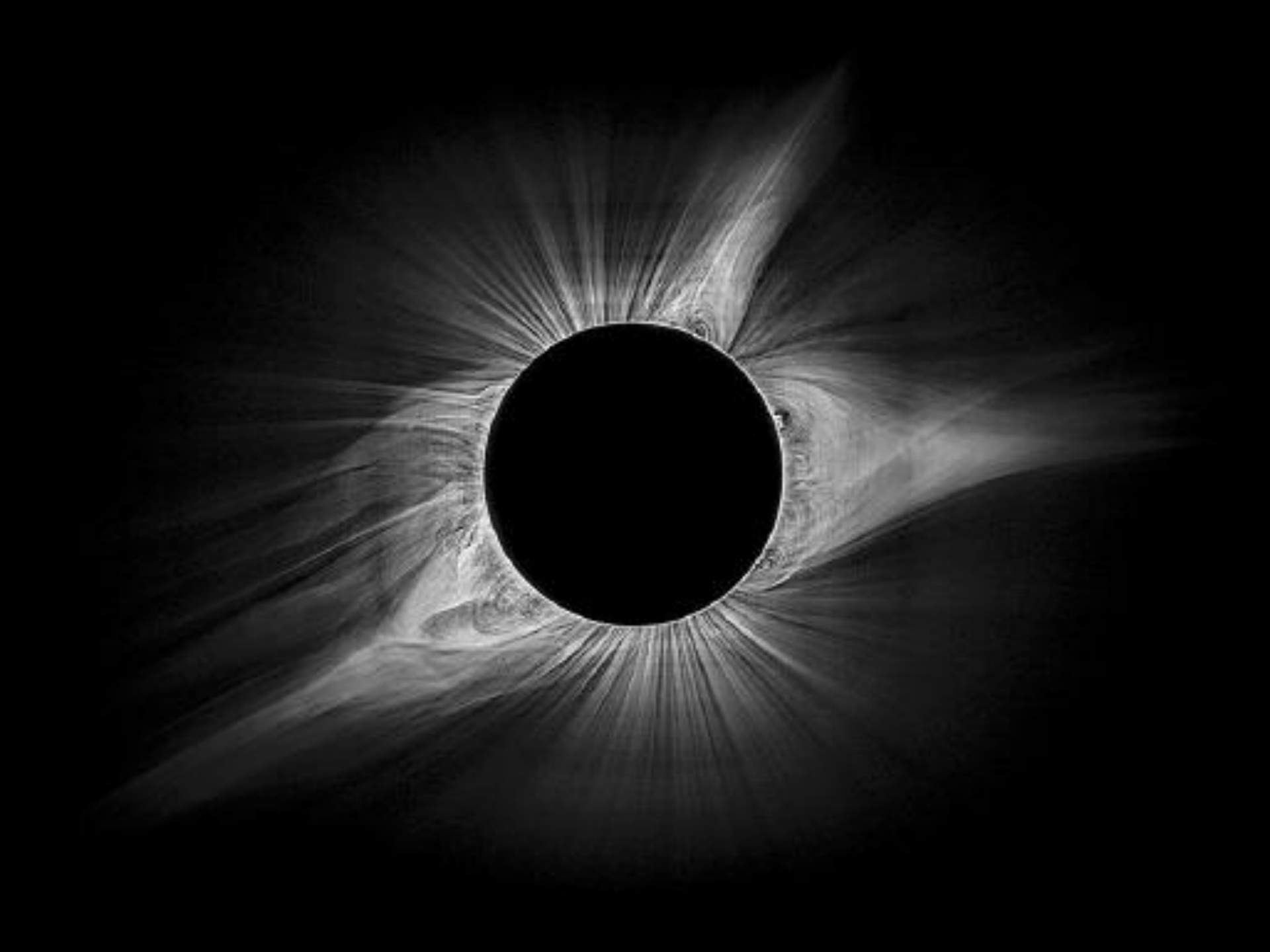
The Great American Eclipse 2017

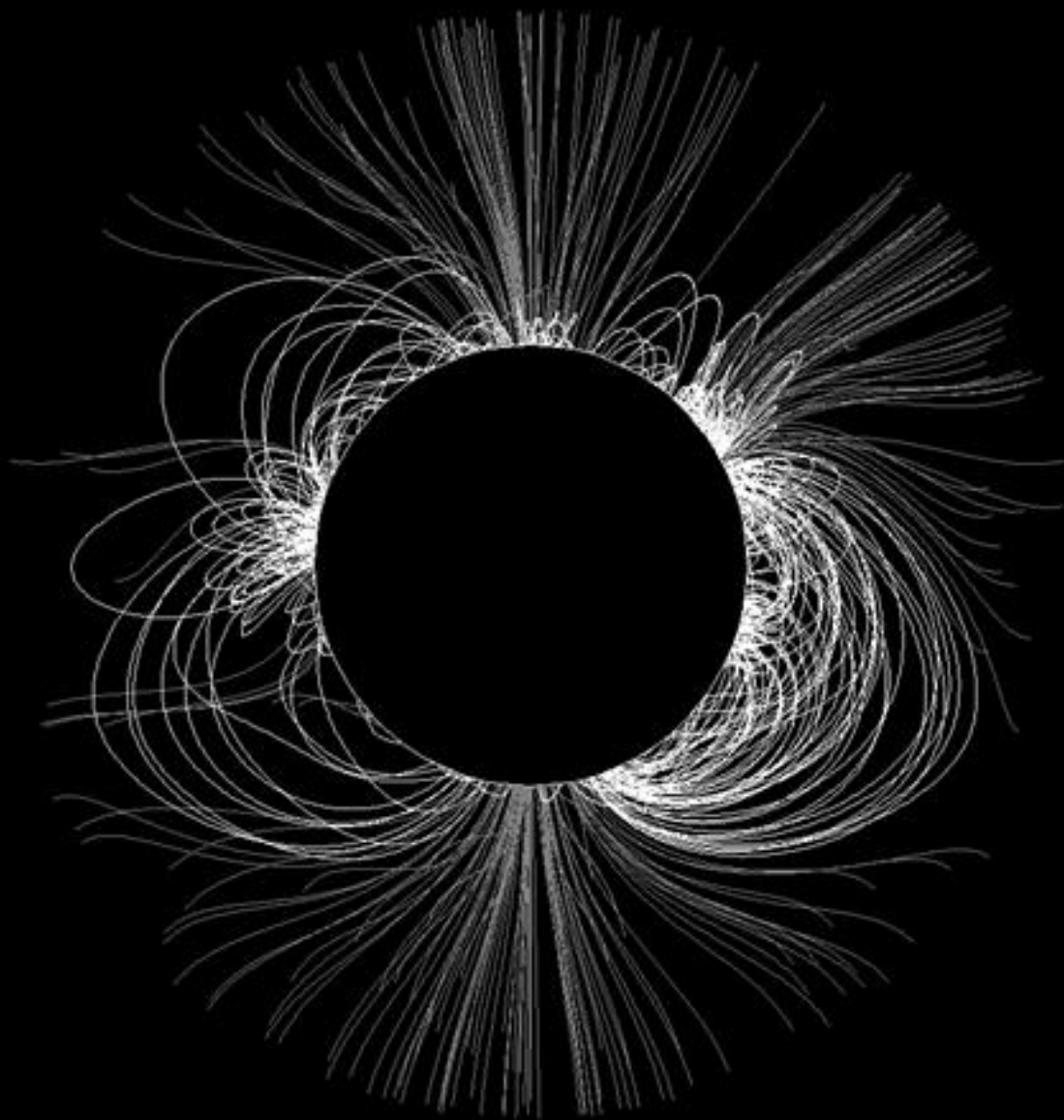


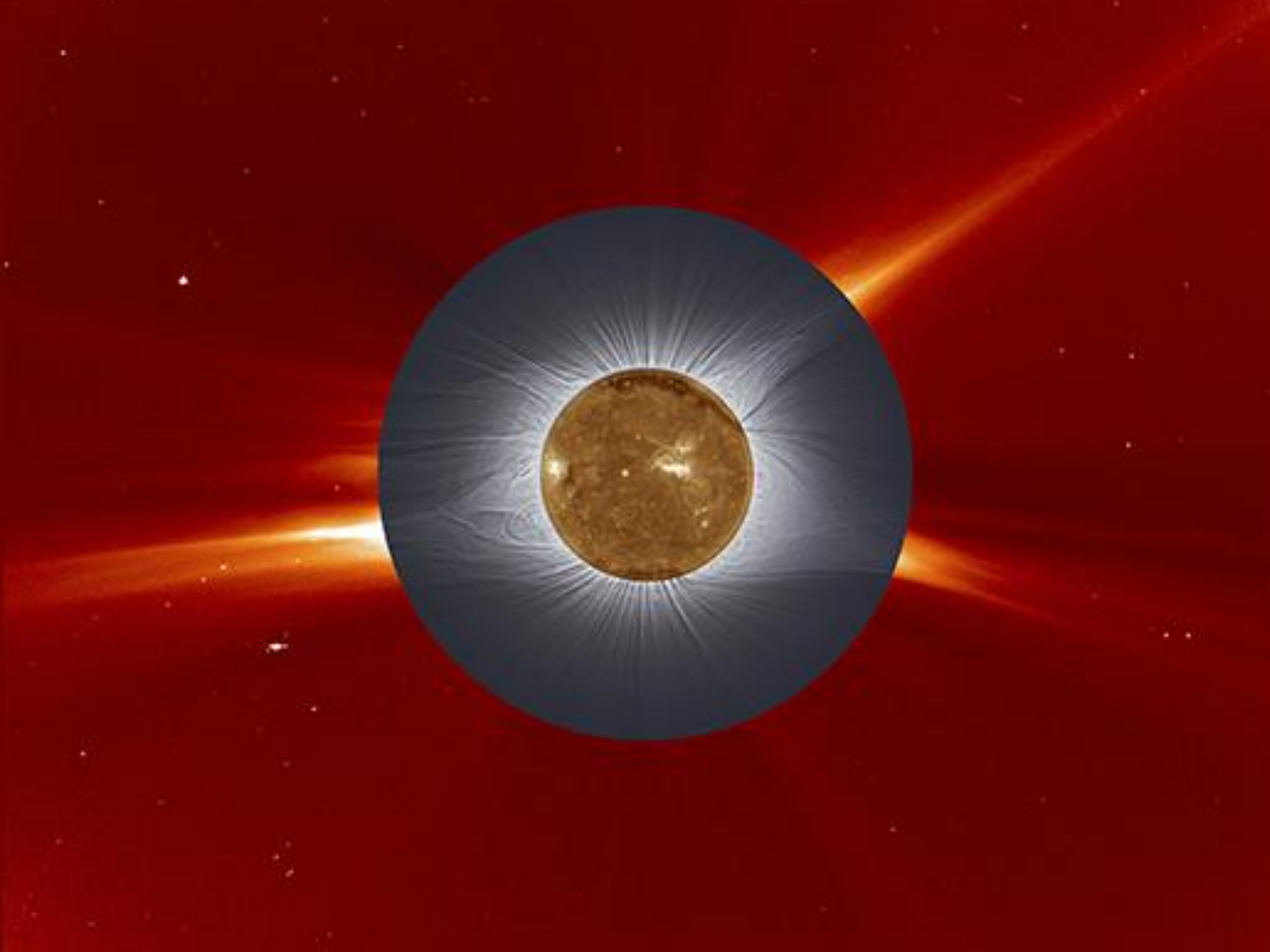










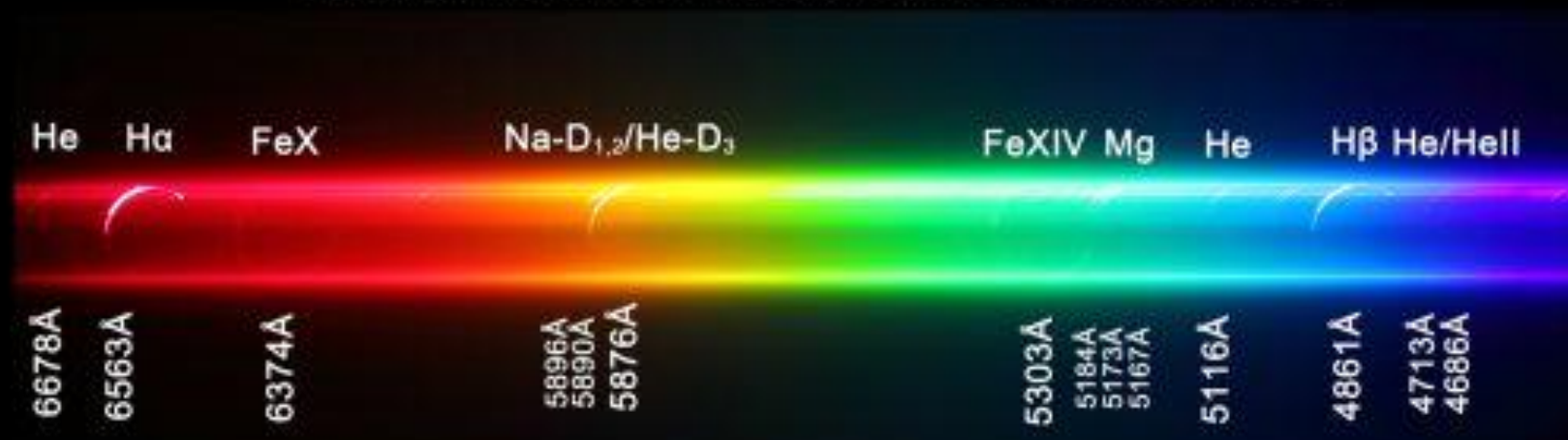


TOTAL SOLAR ECLIPSE 21TH AUGUST 2017 (Salem, OR)

Spectroscopic Observations via Slitless Spectrograph

Hellenic Expedition in cooperation with Williams College, MA

Flash Spectrum on 3rd contact
Chromospheric and Coronal emission lines



ICARUS Low Dispersion Slitless Spectrograph
design, construction and imaging
by Aristeidis Voulgaris

TOTAL SOLAR ECLIPSE 21TH AUGUST 2017 (Salem, OR)

Hellenic Expedition in cooperation with Williams College, MA

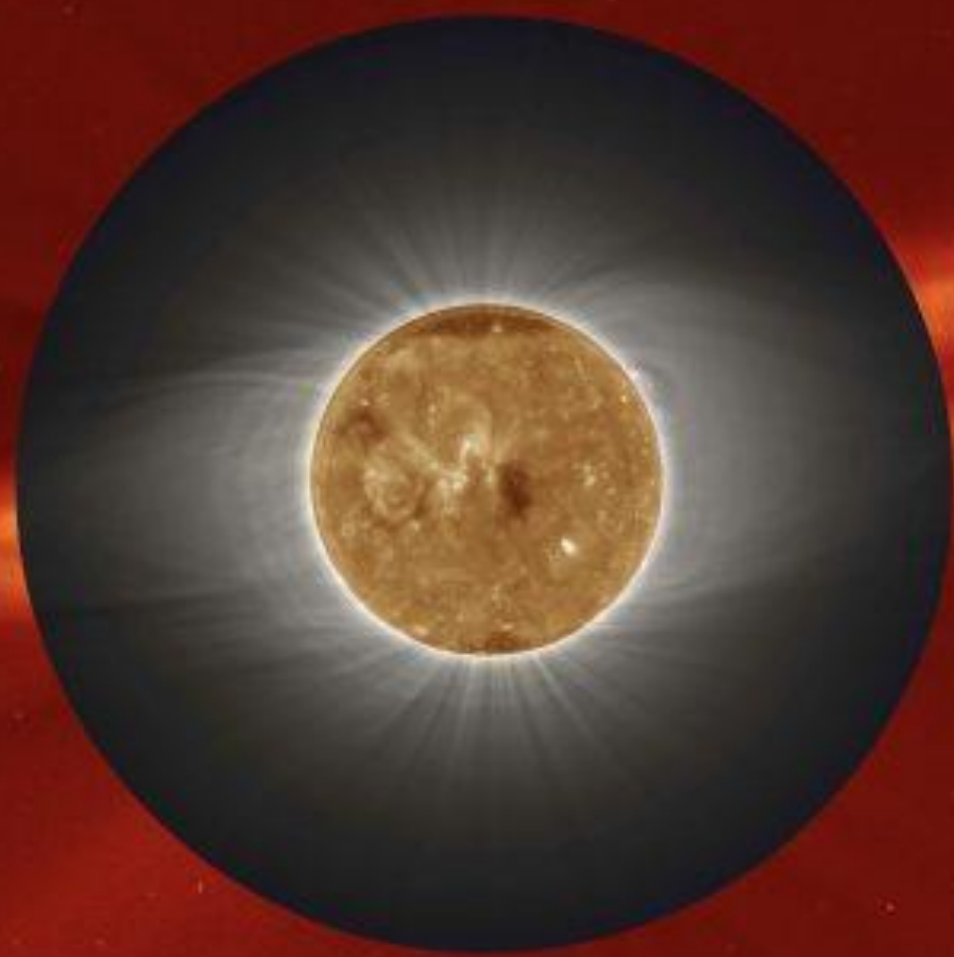
FeXIV 5302.8Å and FeX 6374Å Coronal emission lines imaging via Lyot Filters



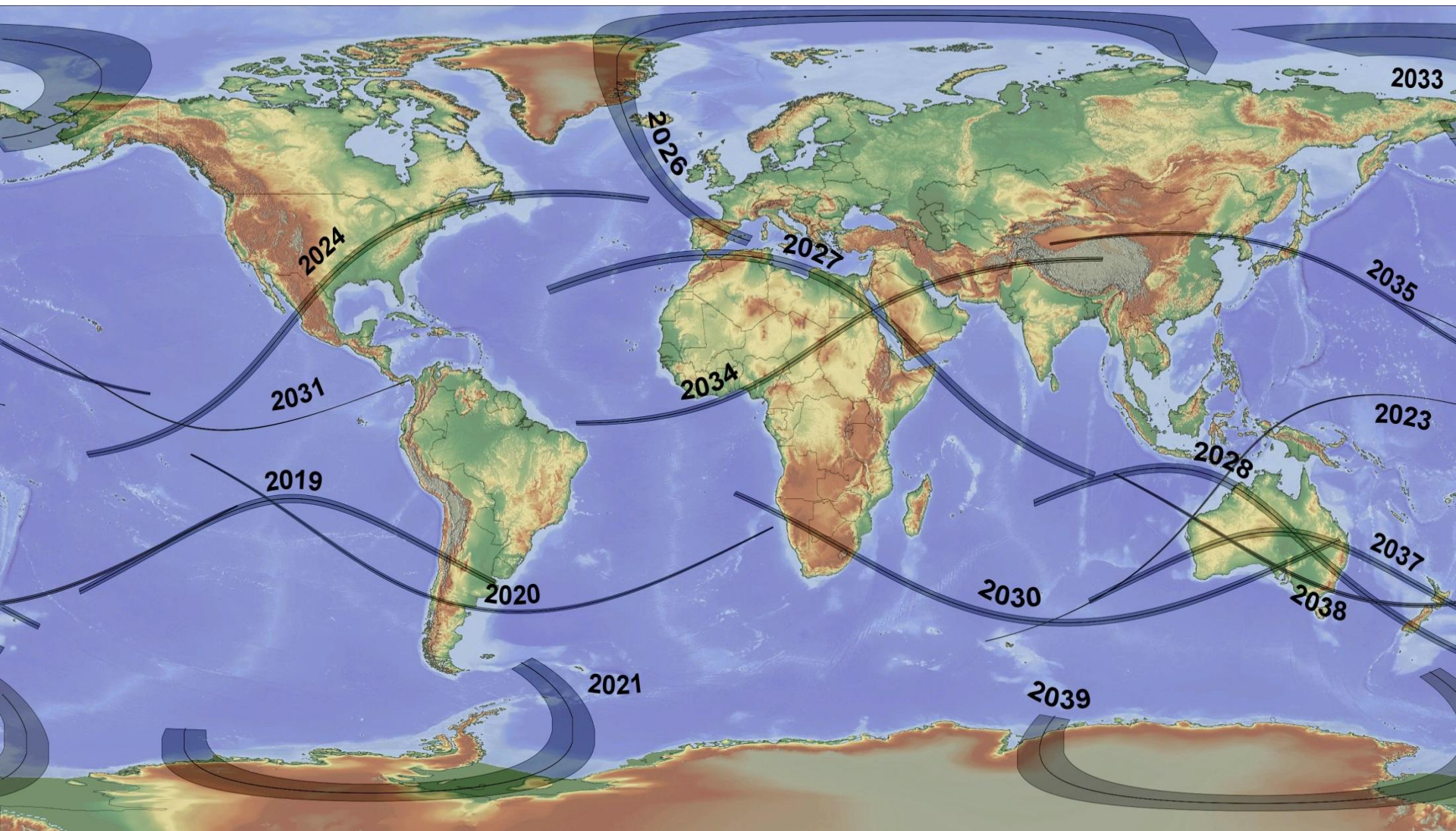
Icarus Lyot Filters, Coelostat, optical bench
design, construction and imaging
by Aristeidis Voulgaris





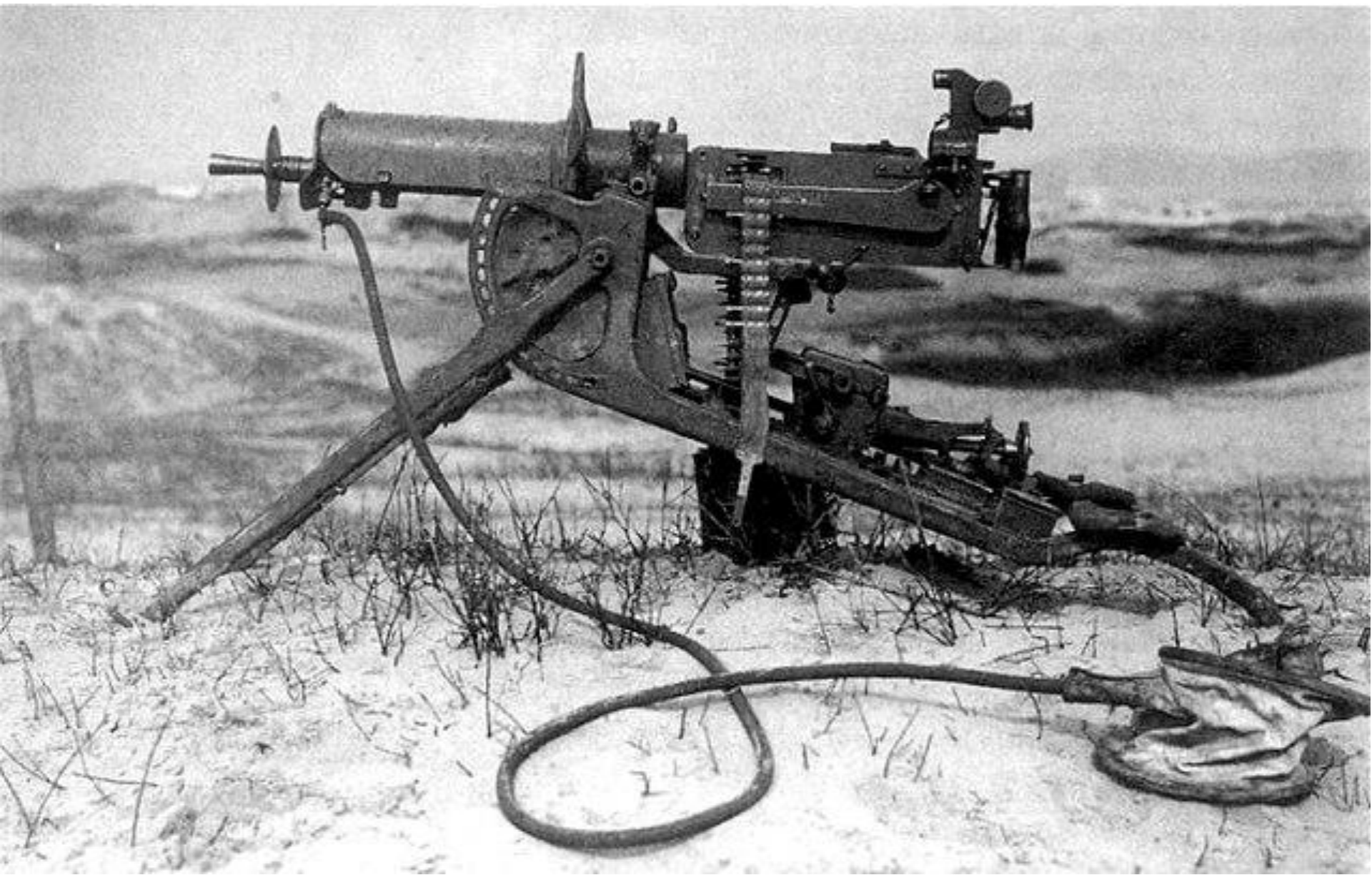


SOHO/LASCO C2 - Eclipse - GOES-16/SUVI 195 Å, Fe XII, 1.5×10^6 K









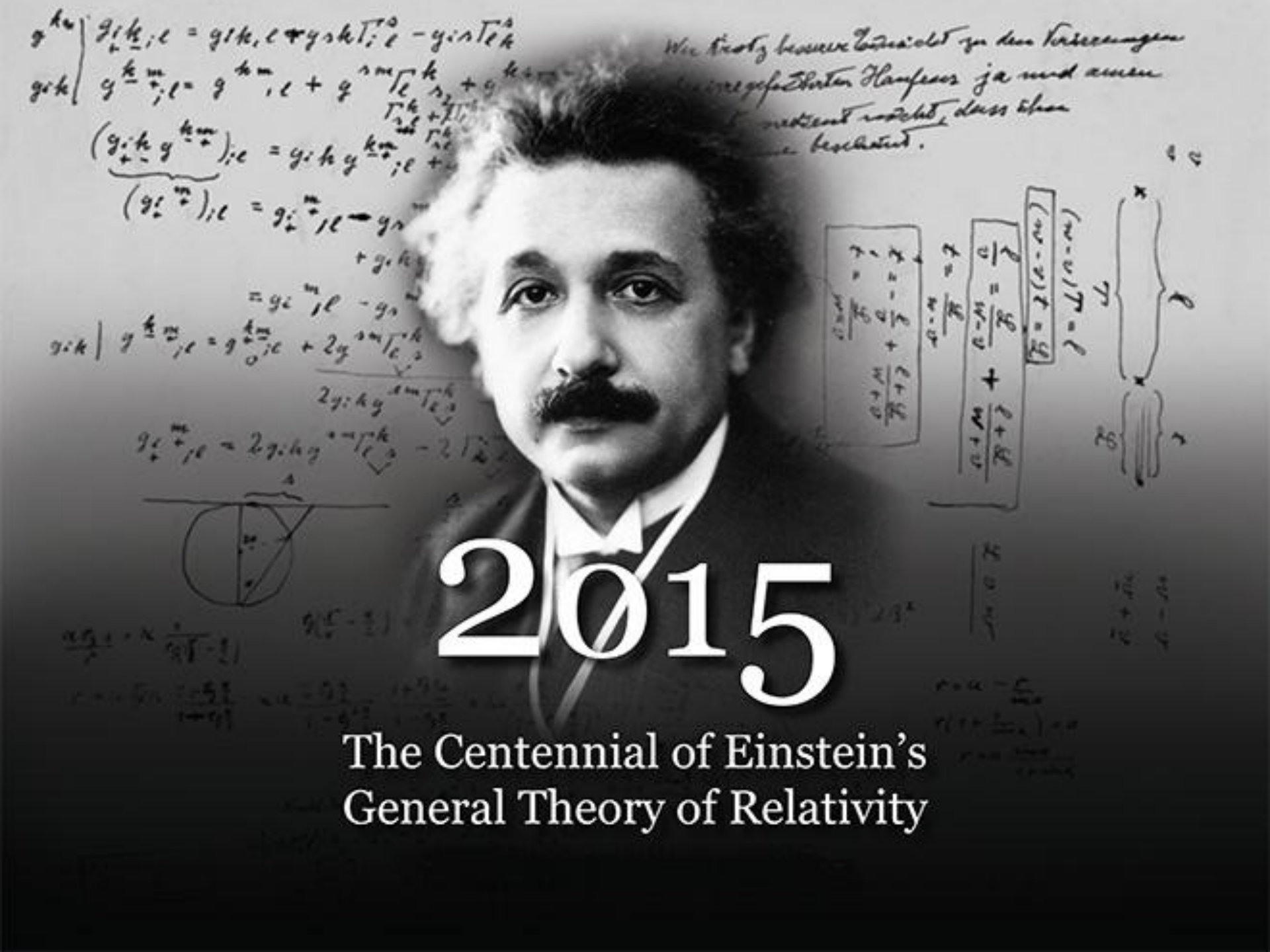
[karabin maszynowy](#)











2015

The Centennial of Einstein's
General Theory of Relativity

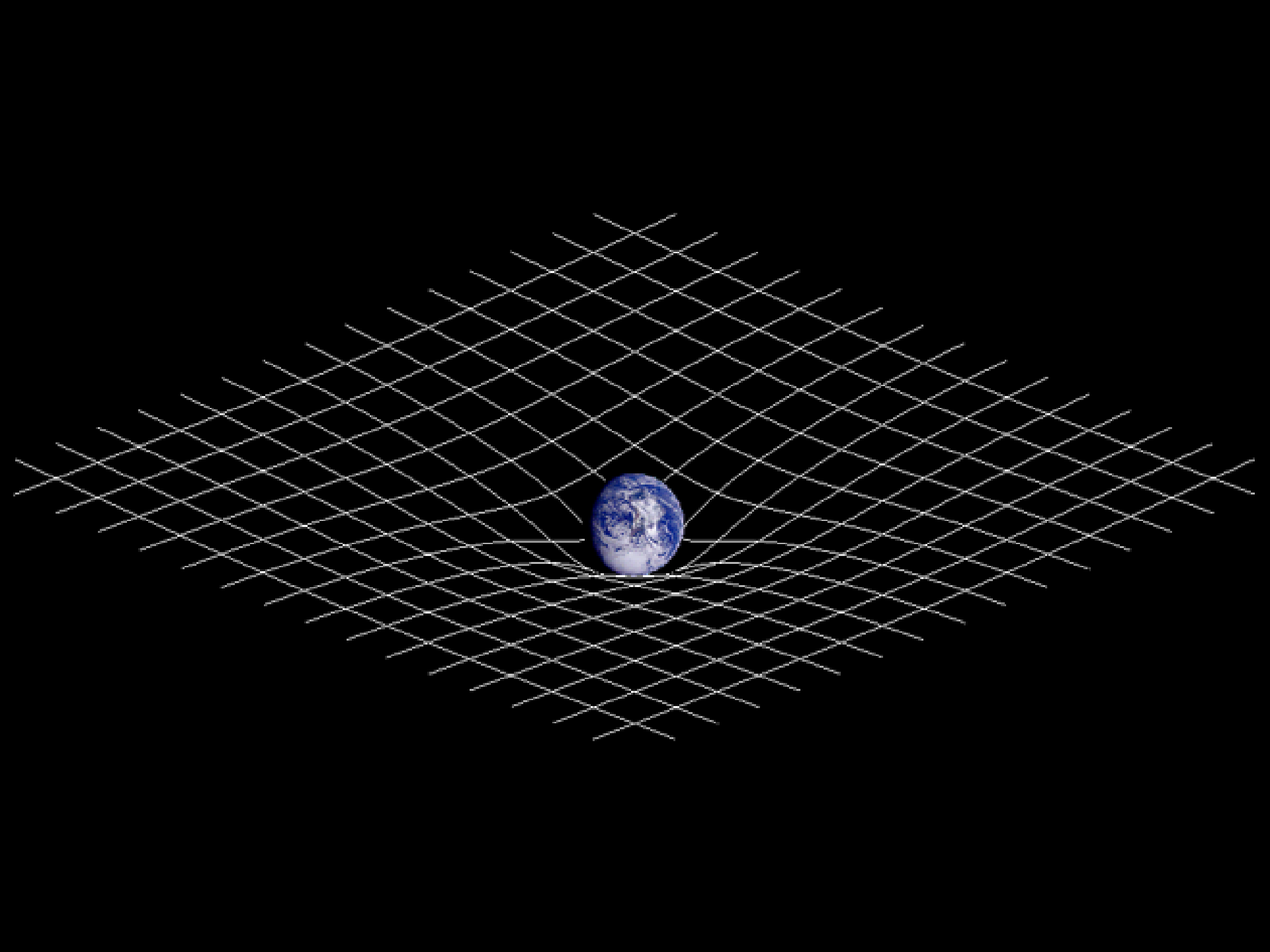
Die Grundlage der allgemeinen Relativitätstheorie

von

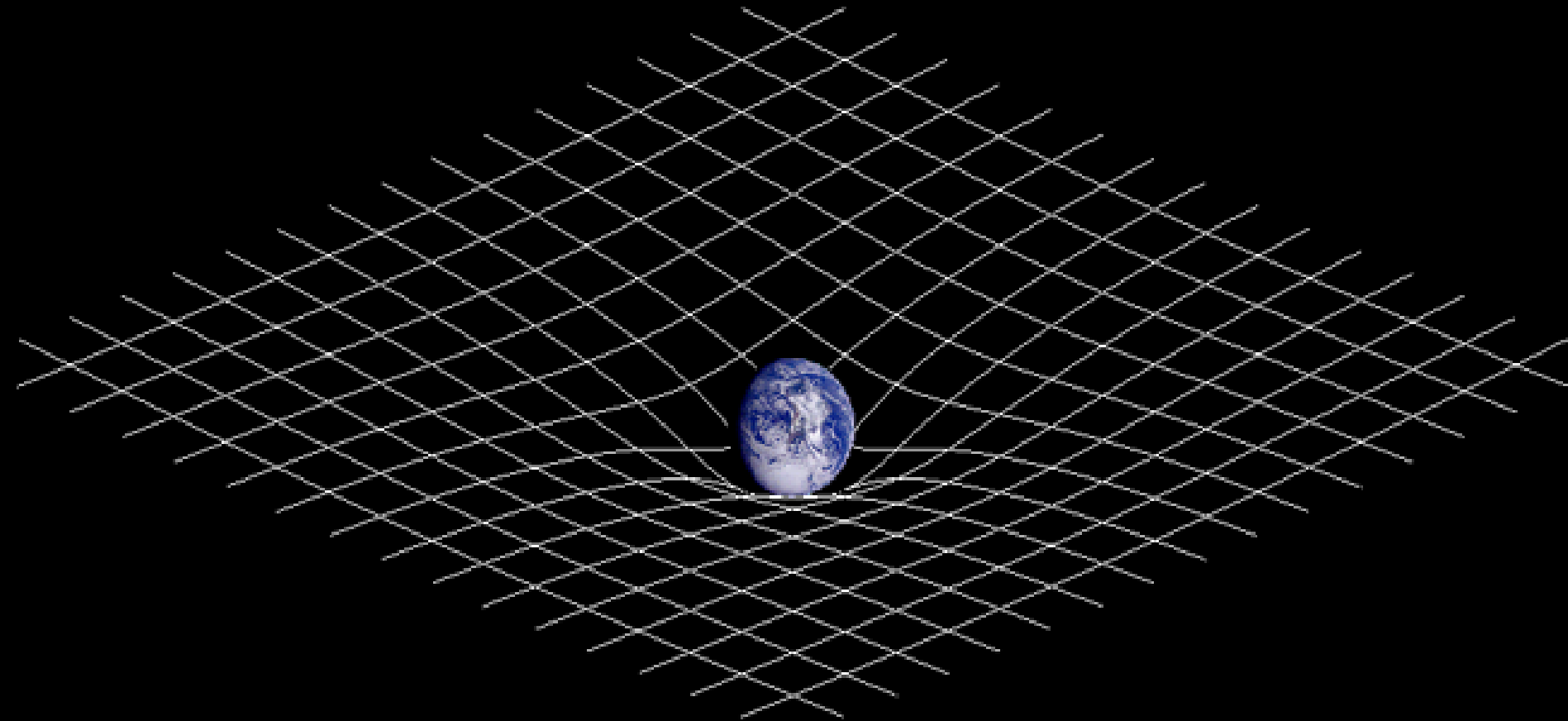
A. Einstein

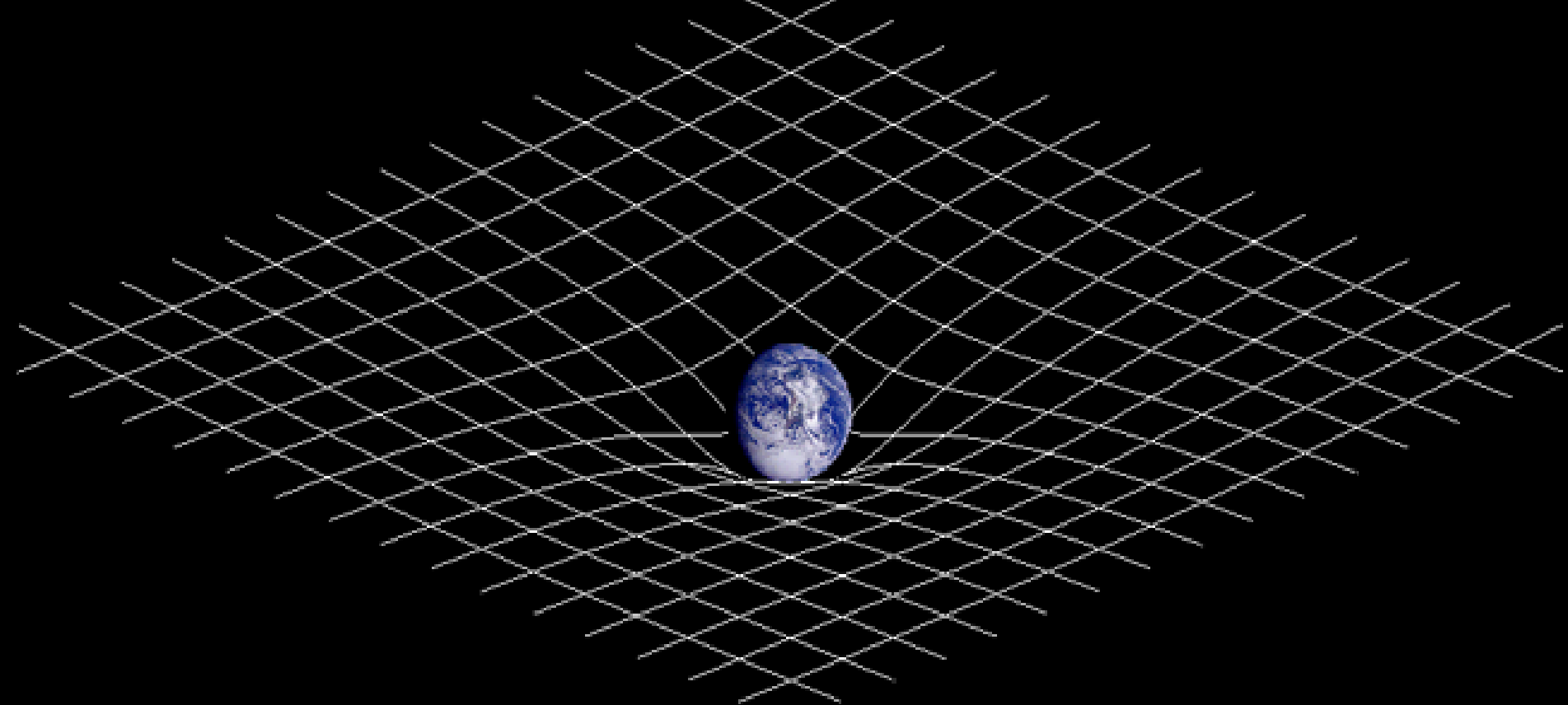


Leipzig :: Verlag von Johann Ambrosius Barth :: 1916



John Archibald Wheeler
Matter tells spacetime how to curve.
Spacetime tells matter how to move.

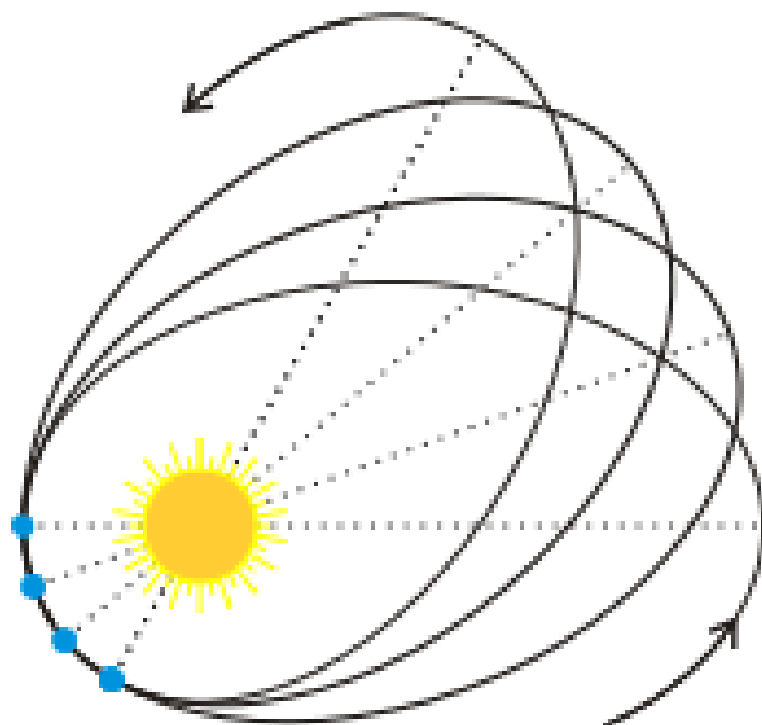




Równania Einsteina

Geometria czasoprzestrzeni $\leftrightarrow$ rozkład materii

Stała sprzężenia = $2,1 \cdot 10^{-43}$ w układzie SI

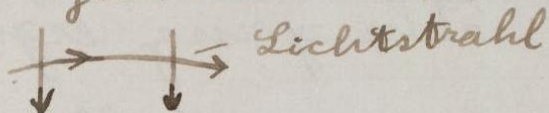


Zürich. 14. X. 13.

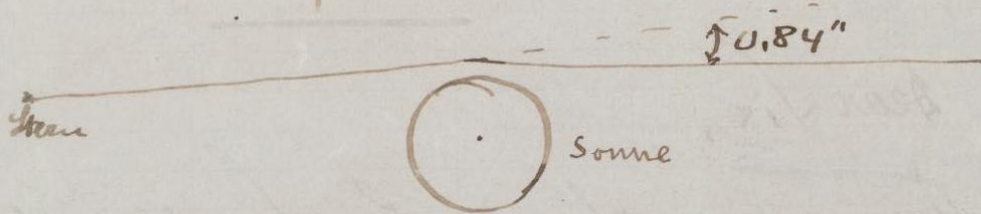
Aus

Hoch geehrter Herr Kollege!

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

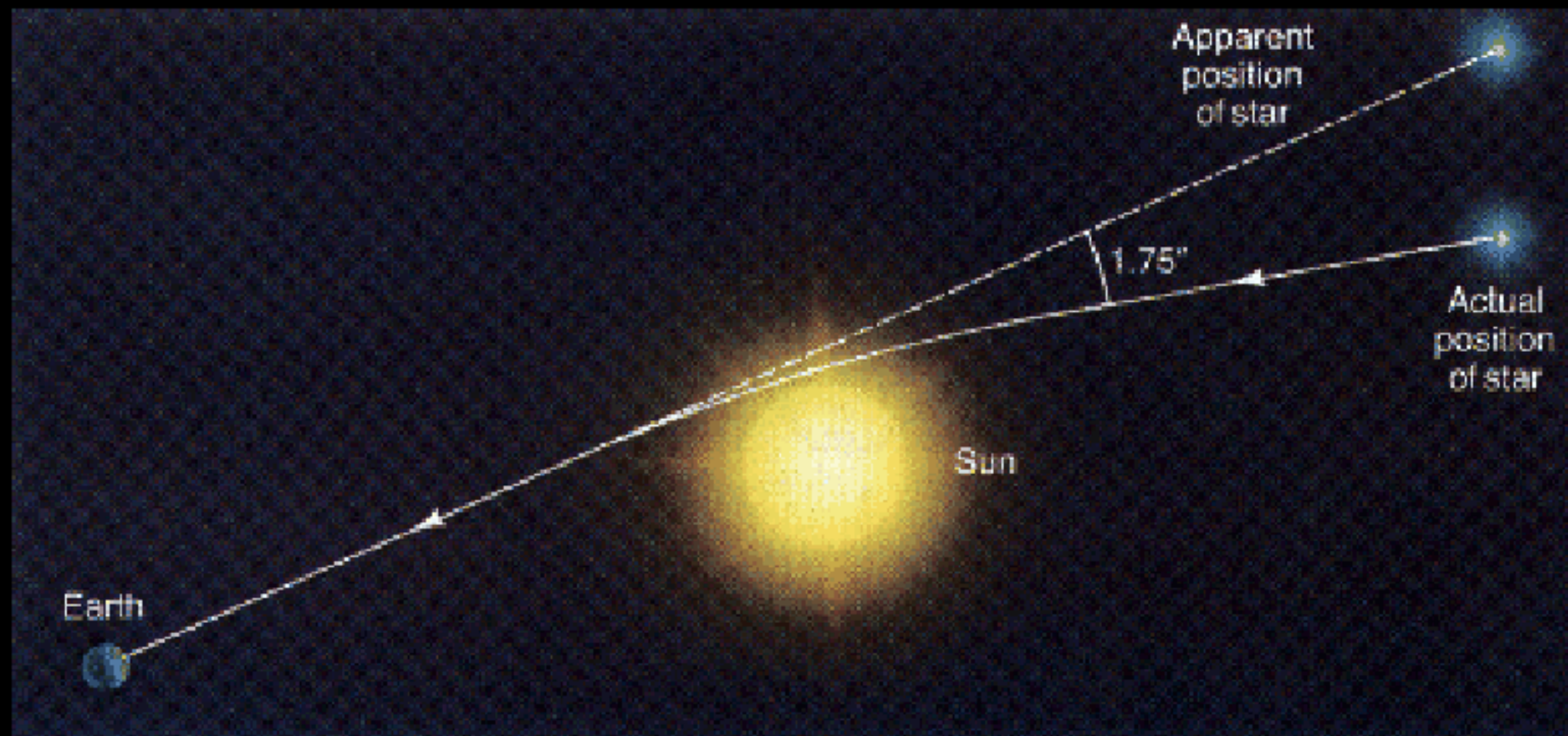


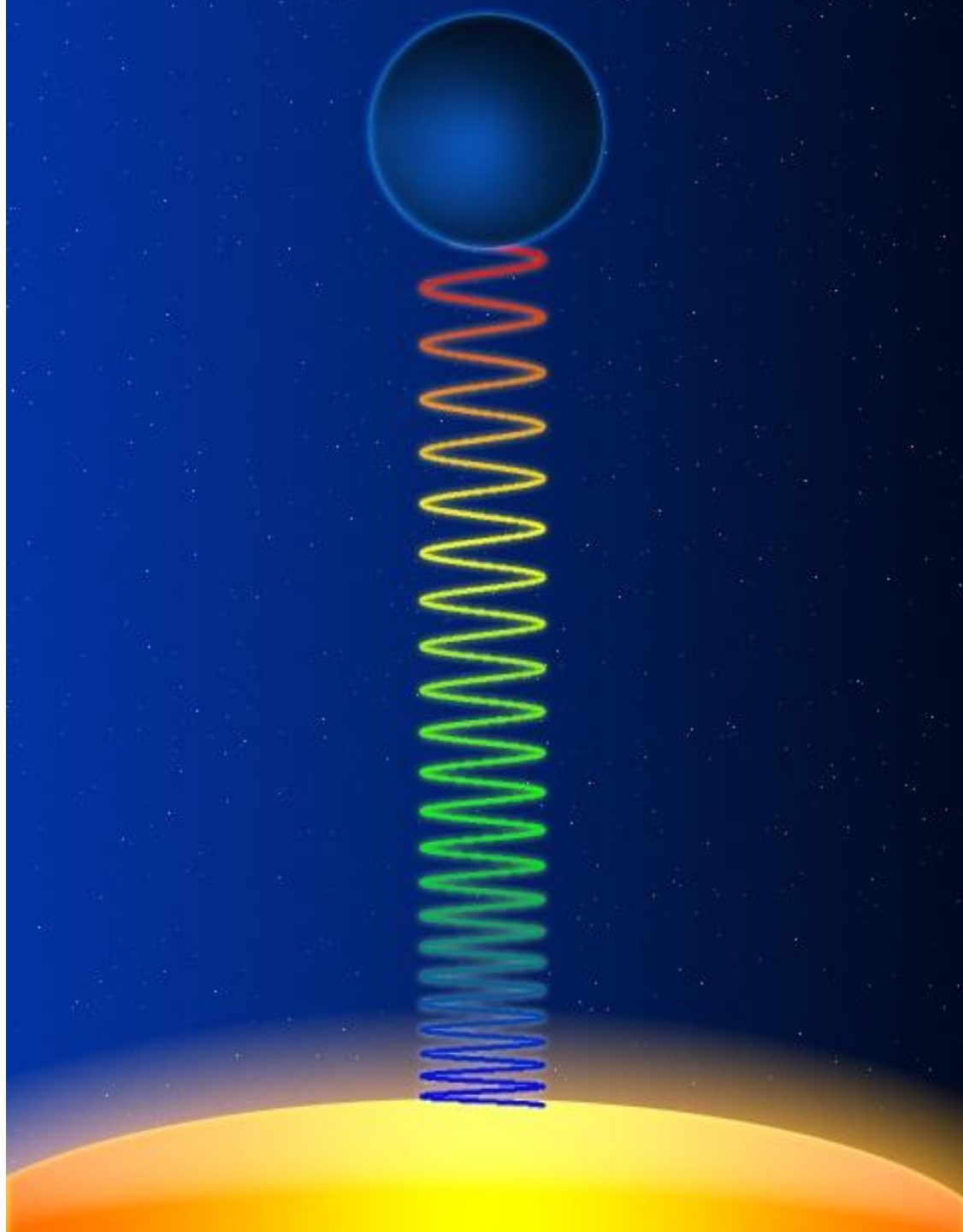
Am Sonnenrande müsste diese Ablenkung $0,84''$ betragen und wie $\frac{1}{R}$ abnehmen
($R =$ Entfernung vom Sonnen-Mittelpunkt).
($R =$ Sonnenradius).



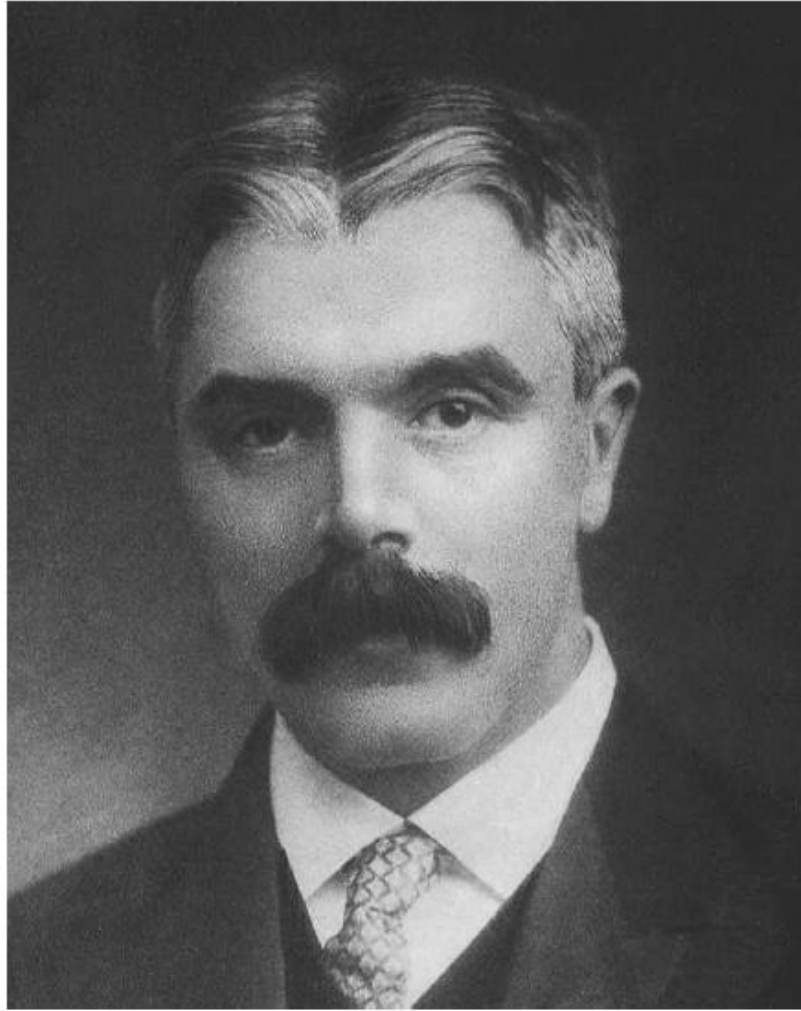
Es wäre deshalb von grösstem Interesse, bis zu wie grossen Sonnen-

The Bending of Light





Sir Frank Watson Dyson

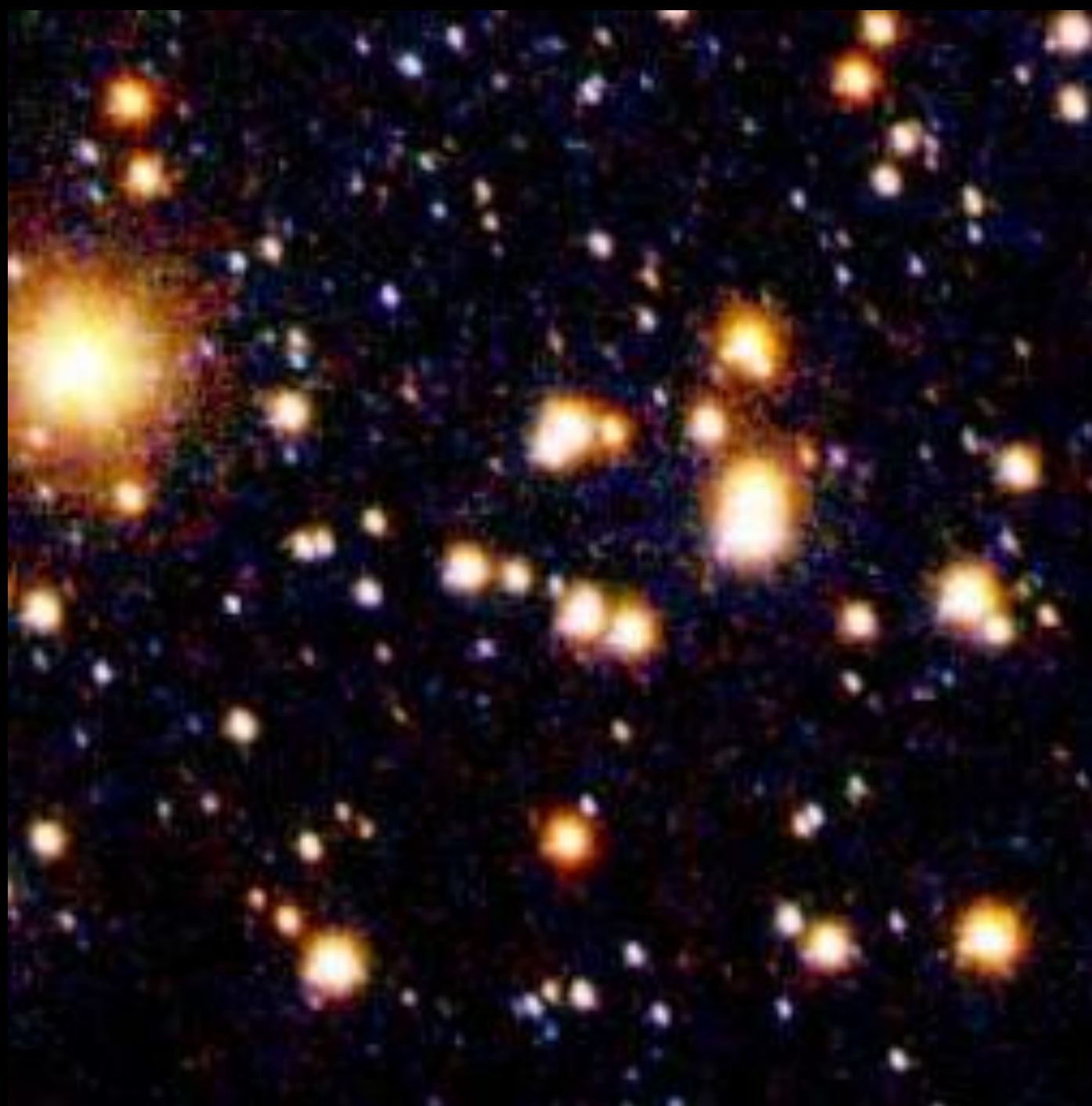


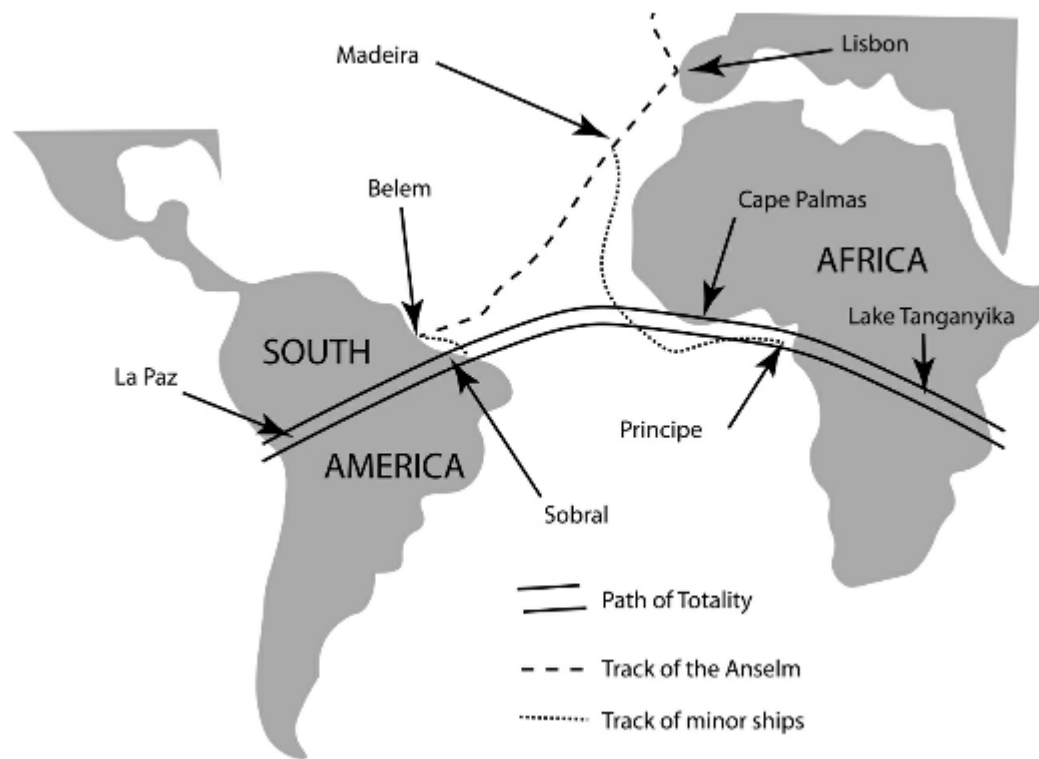
Arthur Stanley Eddington



Rozważano trzy możliwości:

1. Pole grawitacyjne nie wpływa na bieg promieni świetlnych
2. Promienie świetlne zakrzywiają się zgodnie z zasadą równoważności
3. Promienie świetlne zakrzywiają się zgodnie z teorią Einsteina







BOOTH LINE

R.M.S. ANSELM

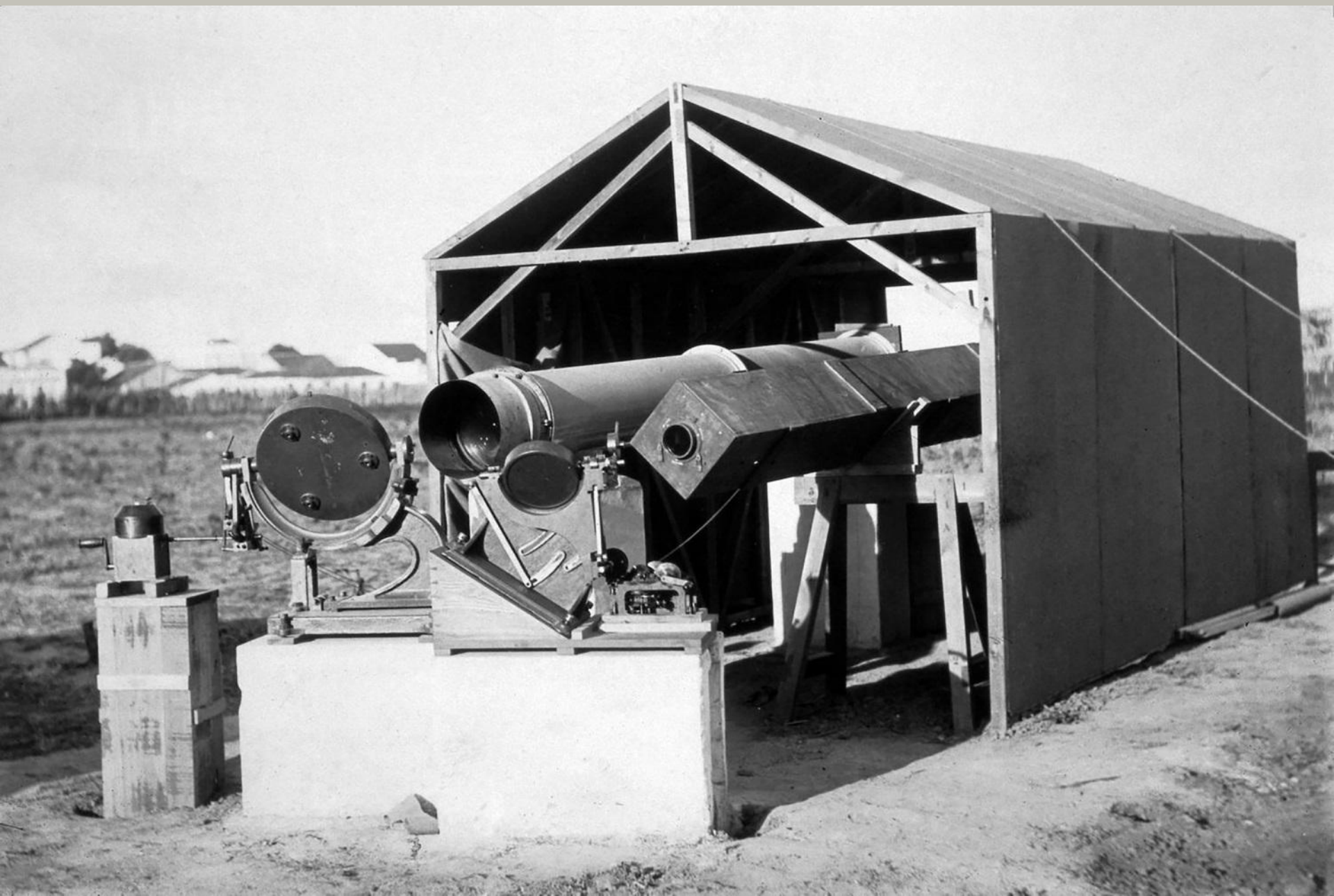


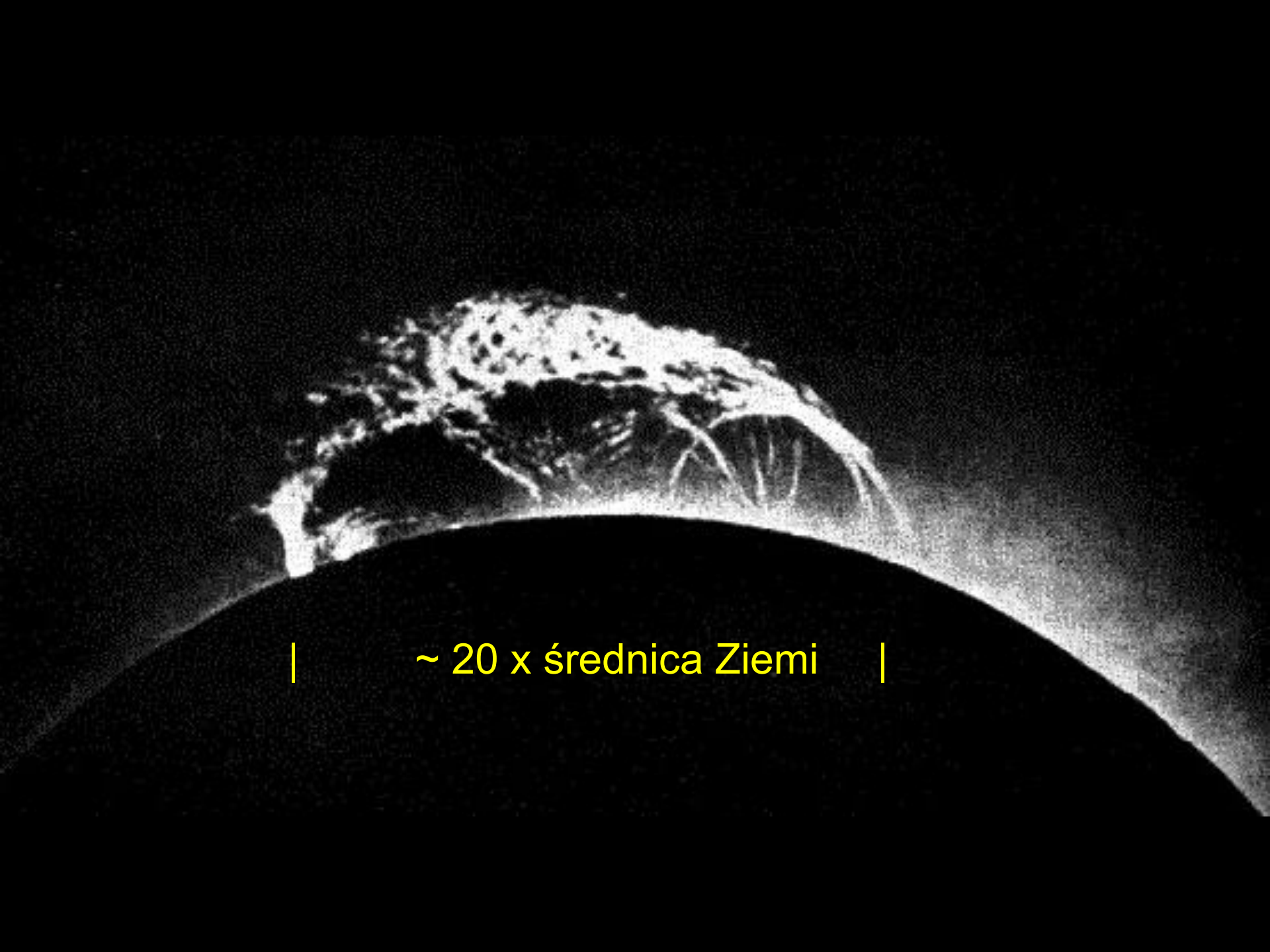
Charles Davidson

Andrew Crommelin

Henrique Morize







| ~ 20 x średnica Ziemi |

HR1375

HR1403

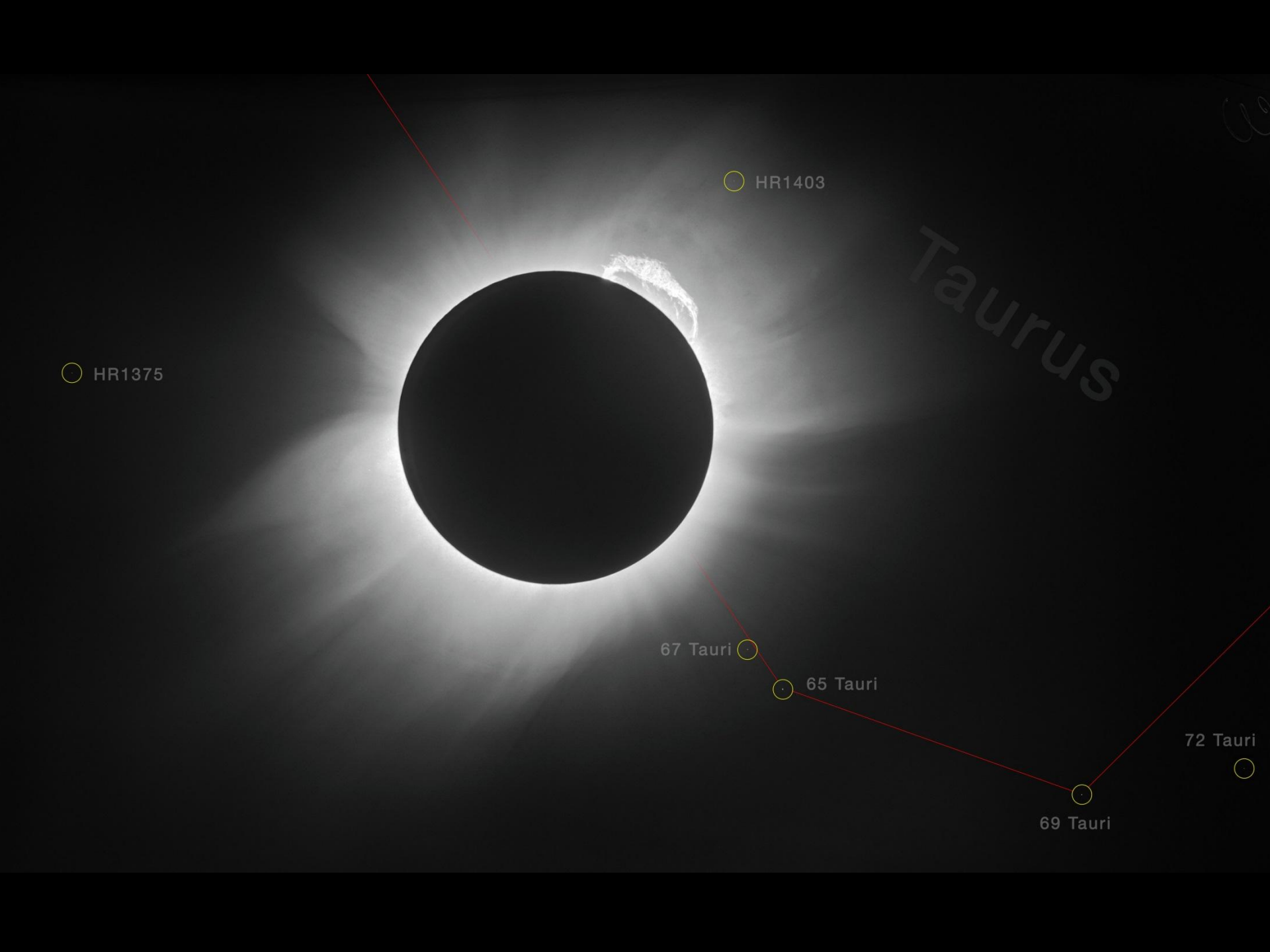
Taurus

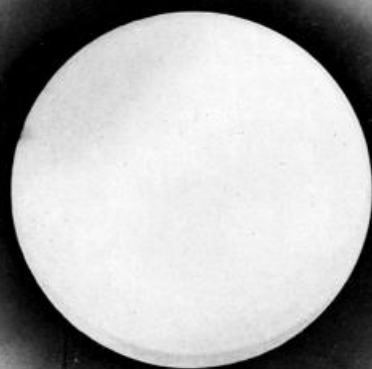
67 Tauri

65 Tauri

69 Tauri

72 Tauri

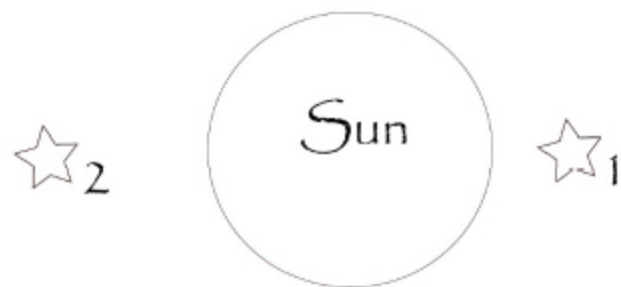




72 Tauri  10

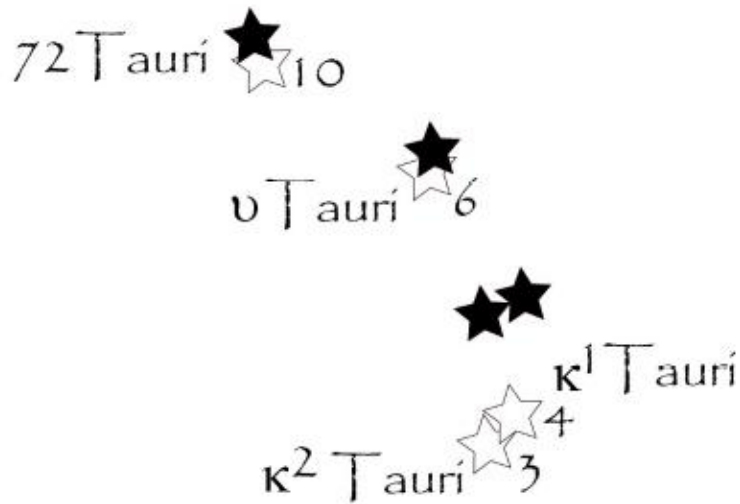
υ Tauri  6

κ^2 Tauri  3  4 κ^1 Tauri

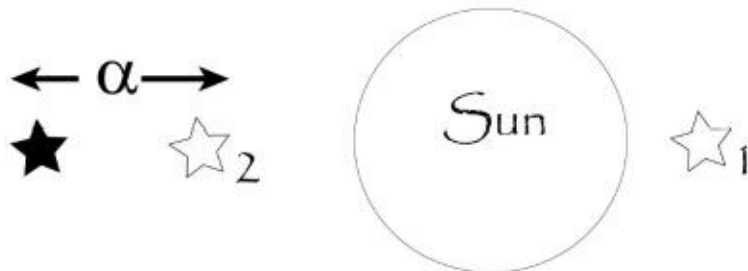


11  66 Tauri

 Actual position of star on a comparison plate



Star 11 (known as 66 Tauri) is far from the Sun and a small light deflection shift.



Star 2 is close to the Sun and has a large shift due to light deflection (α).



Actual position of star on a comparison plate



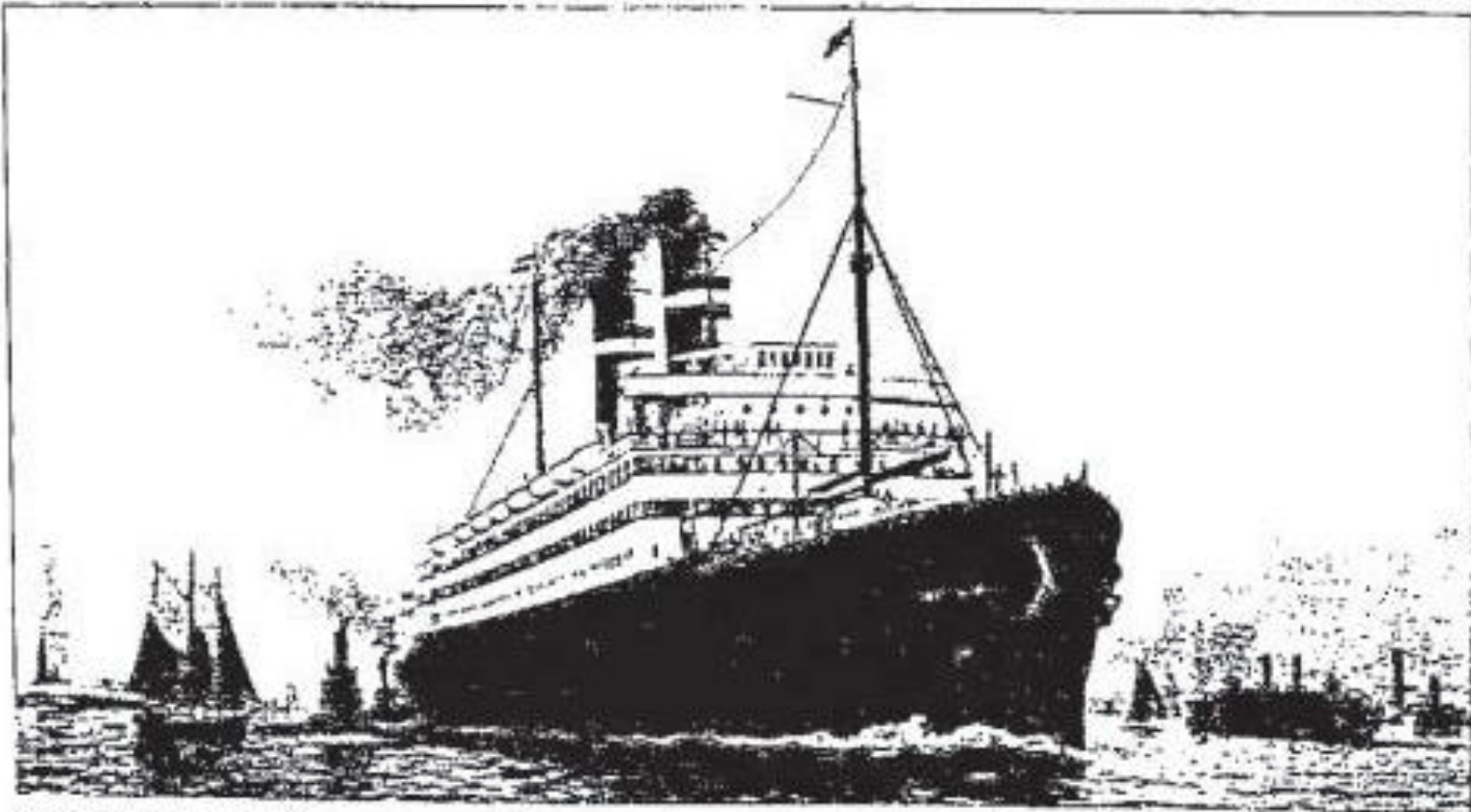
Star position shifted by light deflection caused by the Sun's gravitational field

TABLE 1. Gravitational Displacement at the Sun's Limb in Seconds of Arc

Determination	Displacement
Predicted from Einstein's theory	1.75
Four-inch plates reduced by Dyson, Eddington, and Davidson (1920)	1.98 ± 0.18
Four-inch plates measured on the Zeiss	1.90 ± 0.11
Astrographic plates reduced by Dyson, Eddington, and Davidson (1920)	0.93
Astrographic plates measured on the Zeiss	1.55 ± 0.34

HOLLAND-AMERICA LINE

ROTTERDAM-NEW YORK



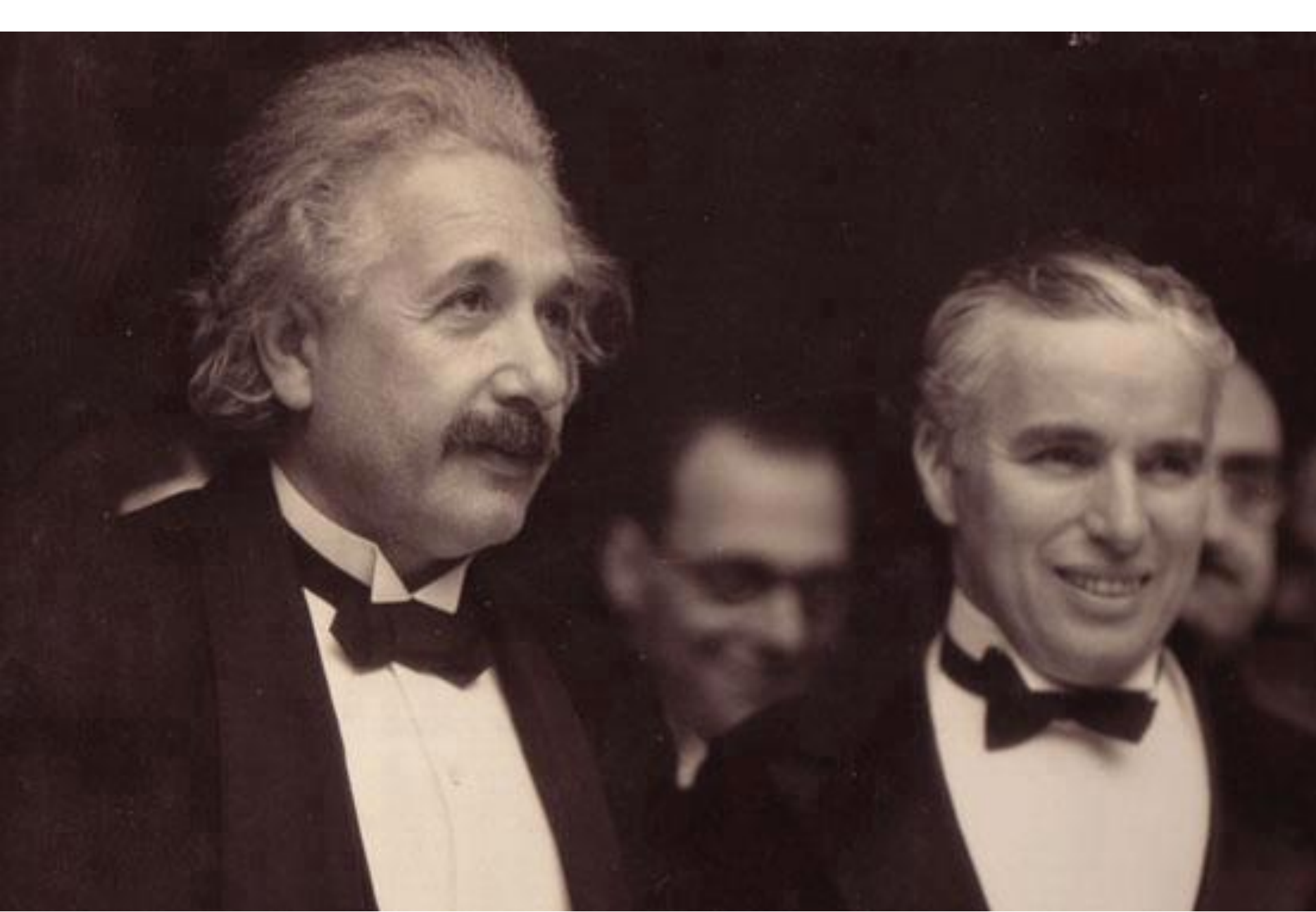
2470 Tons Register

"T. S. S. ROTTERDAM."

3700 Tons Displacement.









ESPACO
SU

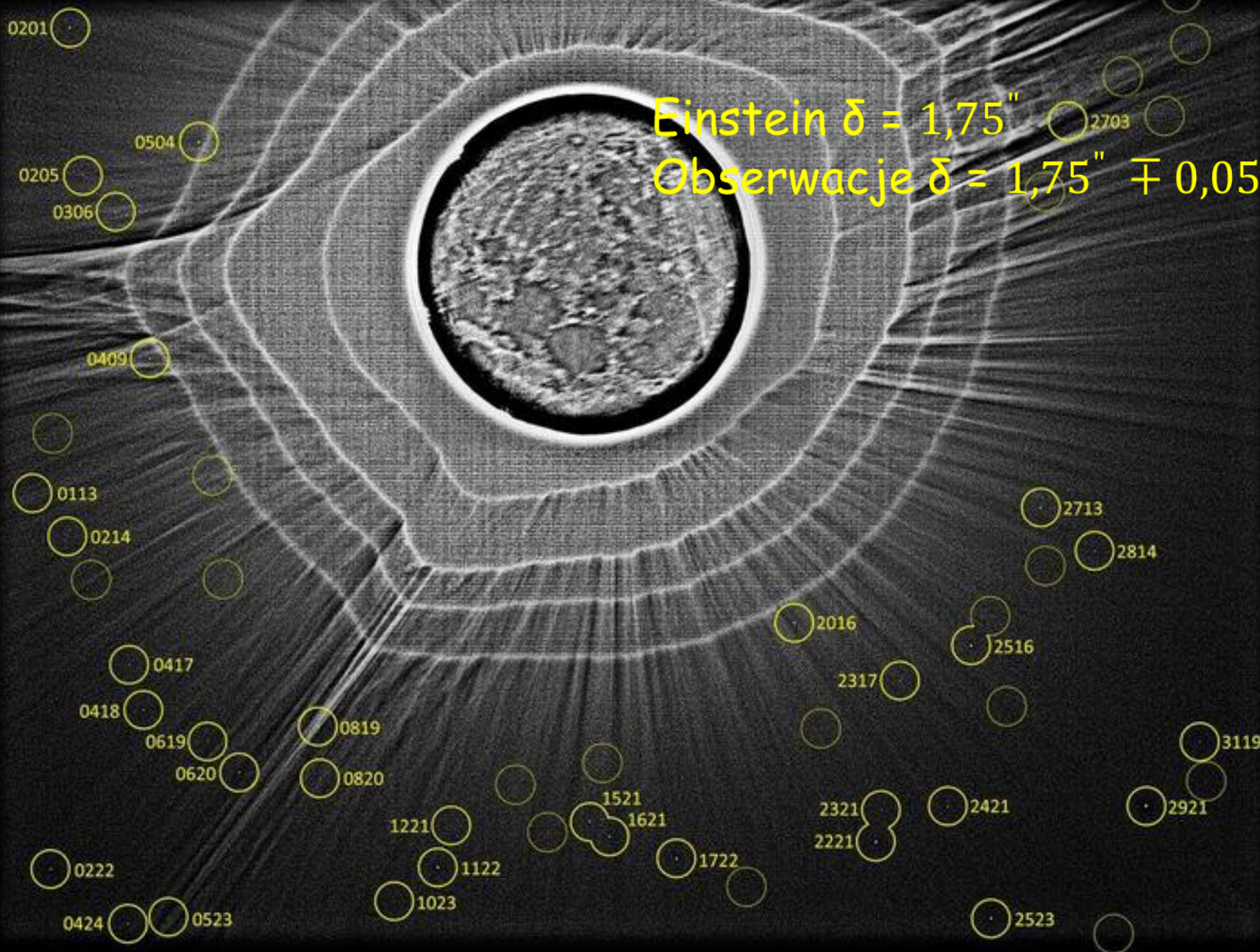


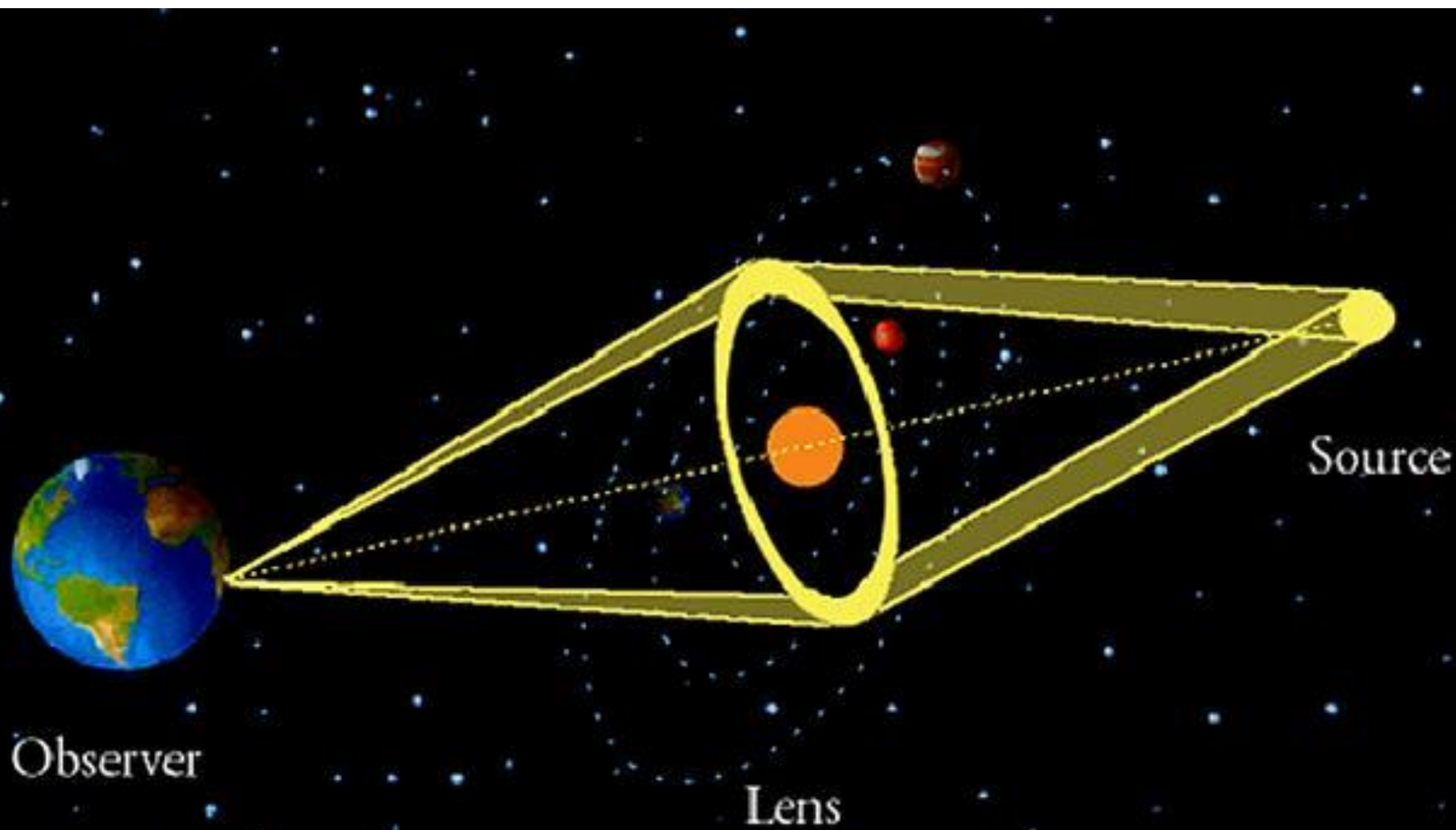
EINSTEIN
EDDINGTON
ECLIPSE
1919 2019

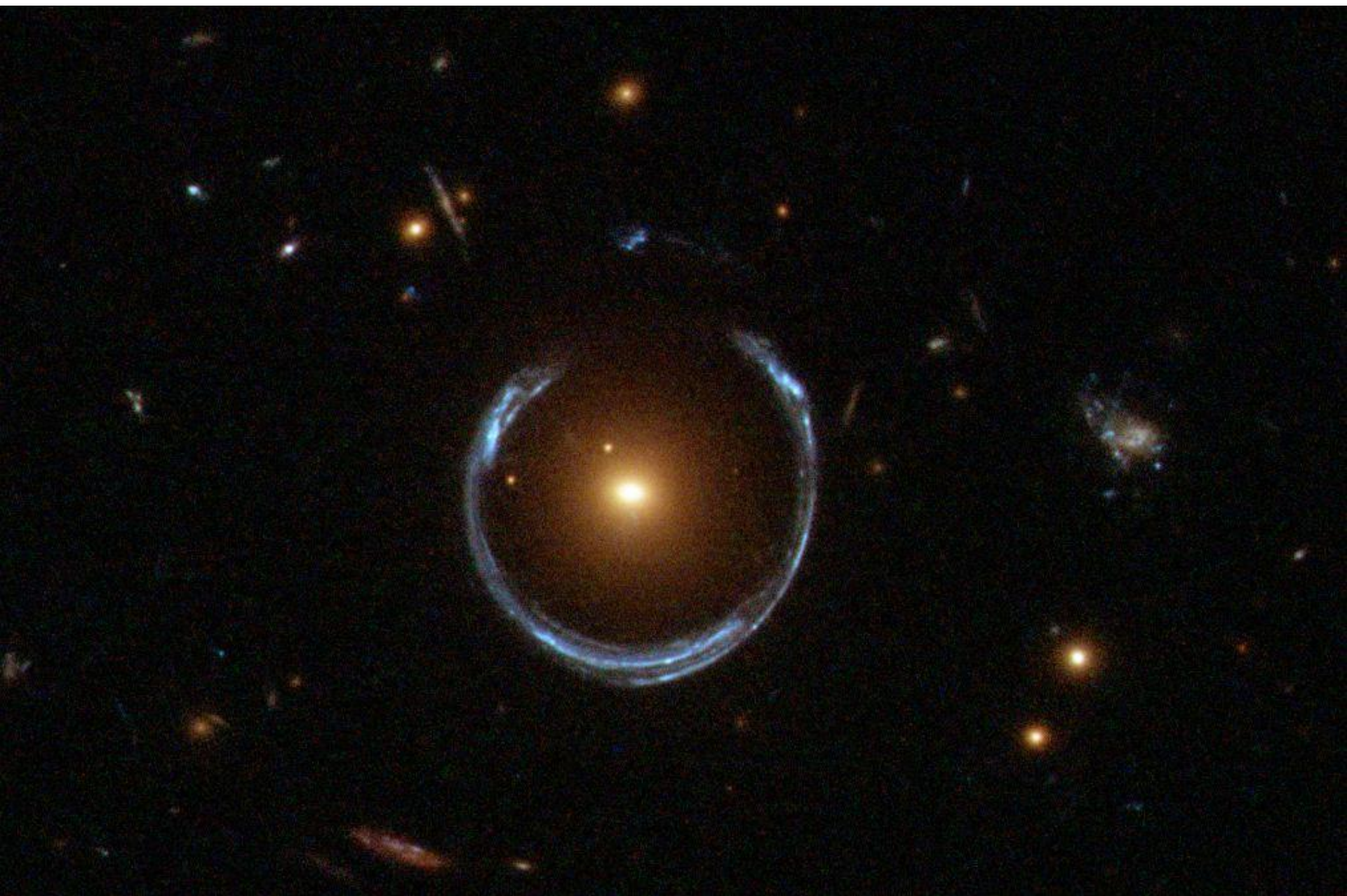


Einstein $\delta = 1,75''$

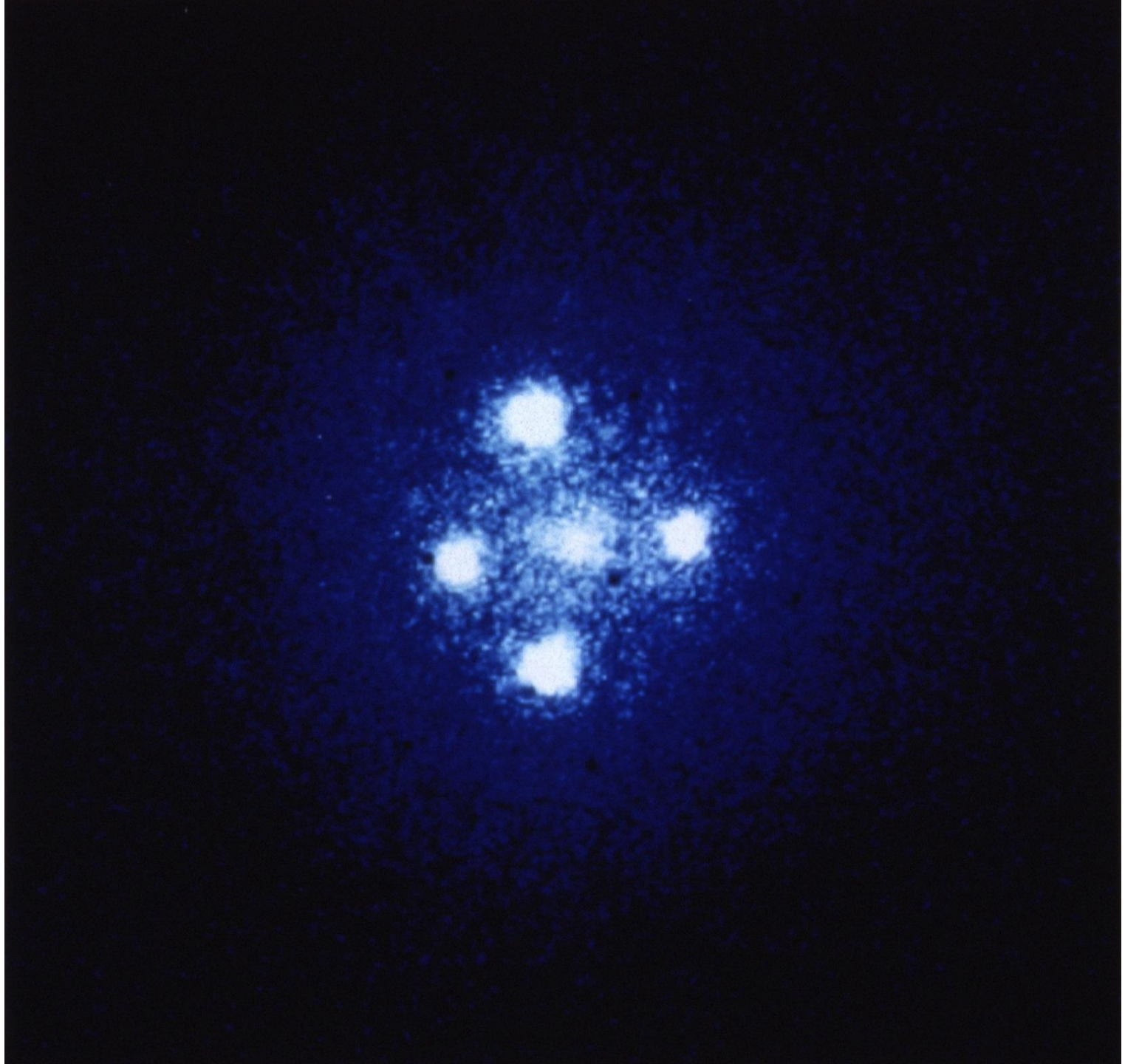
Obserwacje $\delta = 1,75'' \pm 0,05''$











What's News

Definition of Elements

Ultimate standing for a while, then to the standing rifle at a range of 100M. Gains, while growing, appear, now, as they left, another in the early days of standing on a stable position. 44

■ **Both officials agreed:** anyone convicted in their country last month that they didn't testify in court or reveal what he knew.

■ **Simplex method** uses the first constraint from below to drive up the objective's value, assuming it has optimal solution. 37

* The toxicity of some of the agents (P. 33, 34) tested correlated with the amount of drug applied, suggesting a dose-response relationship. However, the toxicity of some of the agents was not observed during the acute phase of the study.

■ **Shelley**, poet (1797–1822). Regarded as the leading radical amongst the so-called Romantic writers, he favoured the use of metaphorical language to express his views on the human condition. He was a close friend of Byron and Keats, and was a member of the "Byronic School" of writers. He was also a member of the "Percy Bysshe Shelley Society" and the "Shelley Society".

■ **U.S. firms are expanding**
big contracts in other
world markets, especially in
Asia, with the caveat that
the dollar remains stable. ■

• The National Highway Traffic Safety Administration (NHTSA) is reviewing a rule on the standard proposed federal...

- **5.5. gross-up** - changed

• **Threat: Shading coefficients**

First Image Illuminates a Black Hole



TABLE 10. A person involved with any kind of network of religious groups in the first stage of a life cycle of religious behaviour was 100% more likely to be involved in a second stage of religious behaviour than someone who was not involved in a network of religious groups in the first stage.

European Union Gives U.K. More Time to Resolve Brexit

Barr to Probe 'Spying' on Trump Aides

Investigation to review whether surveillance in 2006 was 'adequately prioritised,' he says.

RESEARCH QUESTION—Should we control welfare state with a social safety system to improve the quality of a firm's economic performance? Investigation that examines the effect of welfare state on economic performance.

By design, the
small format and
large format

"spiral" on people affiliated with the Trump campaign, a Democratic-leaning poll will not provide sufficient evidence to suggest the president's long-standing interest in the Justice Department's ethics rules.

On 2 January, meeting in Washington, DC, staff and the board decided on a plan to fulfill the Federal Bureau of Investigation's promise of the Trading Partnership's plan (see the Box on Select Outpatient Arrangements and Services below) and to appoint Robert M. Davis.

"I think staying in a position, especially if it is long term," he says, "and accepting Vietnam as a challenge, allows you to be a participant in solving problems, and to learn to work with your superiors. Spending too much time questioning authority is not a healthy situation."

Amendments 1 through 100, for political and organizational reasons. Long offered that his committee would attempt to report on amendments, and that committee is in the future. *University of Washington*, 4.

Uber Pursues Lower Valuation After Lyft

In: *Marketing (Finance)*

more in the offering.

That, nevertheless, he is looking for a contribution to the ongoing social justice efforts in as much as this nation, he has personal experiences of value being compared with his, attention to the ways that of reading in a public square.

The report also says that the company's management has been conducting the plan to "open" the mine for years, the large majority of workers and community members in the region said.

providing, in addition, up to 10% of the maximum yield that can be obtained from a given area of land. In the case of the 10% yield, the maximum yield is 10% of the maximum yield that can be obtained from a given area of land.

THE *Journal of Management Education*

