

#### Photo Summary of the Roland Eötvös Commemorative Year

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December 5, 2019

# Eötvös Loránd

1848-1919

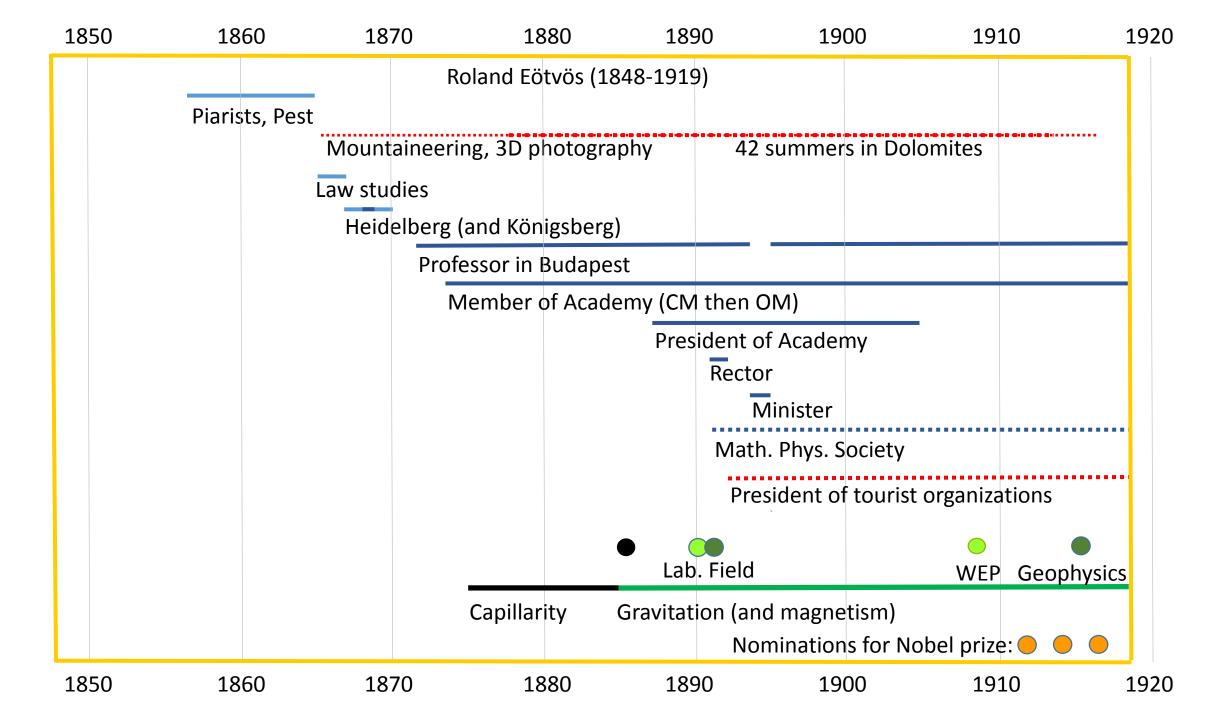
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United Nations Educational, Scientific and Cultural Organization

Egyesült Nemzetek Nevelésügyi, Tudományos és Kulturális Szervezete 100th anniversary of Roland Eötvös (1848-1919), physicist, geophysicist, and innovator of higher education Commemorated in association with UNESCO

Eötvös Loránd (1848-1919) fizikus, geofizikus és a felsőoktatás megújítójának 100. évfordulója Az UNESCO-val közösen emlékezve



### SCIENTIFIC CONCEPTS AND TERMS NAMED AFTER ROLAND EÖTVÖS

**Capillarity (surface tension of liquids):** 

Eötvös rule (Eötvös law)

**Eötvös constant** 

Eötvös number

Weak equivalence principle (inertial/gravitational mass proportionality):

Eötvös experiment

(EPF or Eötvös-type experiment)

**Eötvös parameter** 

**Laboratory and field instrument:** 

**Eötvös torsion balance** 

(Eötvös pendulum)

**Geodesy:** 

**Eötvös tensor** 

**Gravitation on a rotating planet:** 

**Eötvös effect** 

**Eötvös correction** 

**Gravity and magnetism:** 

Eötvös law of magnetism (the Poisson-Eötvös relationship)

1 eötvös = 1E: physical unit  $(10^{-9} s^{-2})$ 

| Physical unit |  | eötvös (unit) |
|---------------|--|---------------|
|               |  |               |

The eötvös (or eotvos, E): unit of acceleration divided by distance. 1 eötvös =  $1E=10^{-9}$  s<sup>-2</sup>

#### Nature forms named after Roland Eötvös

Mineral Lorándite

Lorándite is a mineral (thallium arsenic sulfosalt, 1894), being used for detection of solar neutrino

Mountain peak

Eötvös Peak (Cima di Eötvös, Eötvösspitze)

The Eötvös Peak is the second highest, or south-western Cadin peak in the Dolomites (2837 m)

Routes, caves etc.

Via Eötvös (≠Via Eötvös Dimai)

First climbing route of Croda da Lago. (Via Eötvös Dimai is named after his daughters.)

Eötvös-út (Eötvös Loránd-turistaút, Etveska, Eötvösova cesta)

A hiking trail above Banska Stiavnica (Selmecbánya, Schemnitz), named after Roland Eötvös (1896)

**Eötvös caves** 

Aggtelek Karstic Mts and Krecsunesd / Crăciunești (Şura de Sus)

**Moon crater** 

Eötvös crater

The Eötvös crater is the remains of a lunar impact crater on the far side of the Moon. It lies to the north-northwest of the walled plain Roche, and east-southeast of the equally ruined Bolyai.

**Asteroid** 

**12301 Eötvös** 

12301 Eötvös is a main belt asteroid with an orbital period of 3.65 years (1991).

### Significance of Eötvös in 2019

For physicists: The Eötvös experiments are of crucial importance in modern theoretical (gravitational) physics.

For earth scientists: Roland Eötvös represents a cohesion force in the Carpathian Basin.

For the general public: He deserves to be a role model.

The Eötvös 100 Commemorative Year is realized by the Association of Hungarian Geophysicists, Eötvös Loránd Physical Society, Eötvös Loránd University, Hungarian Academy of Sciences, Hungarian National Commission for UNESCO, and many other organizations, coordinated by the "Eötvös 100" Coordinating Team.

Support: Ministry for Innovation and Technology, Ministry for Human Resources, National Cultural Fund of Hungary, National Research and Development Office





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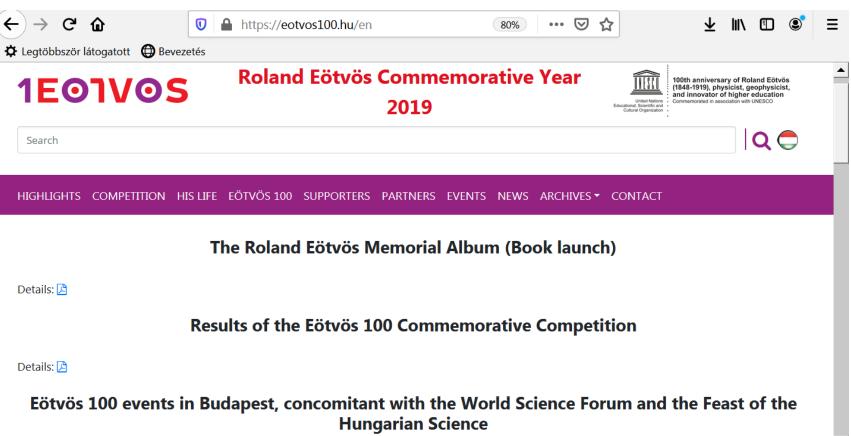
Commemorated in association with UNESCO

Eötvös Loránd (1848-1919) fizikus, geofizikus és a felsőoktatás megújítójának 100. évfordulója Az UNESCO-val közösen emlékezve

More than 100 (even more than 122) events through 2019, Hungary and abroad.

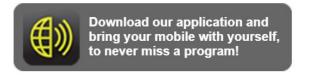
#### The Eötvös 100 website

(SZTAKI and MTA KIK):

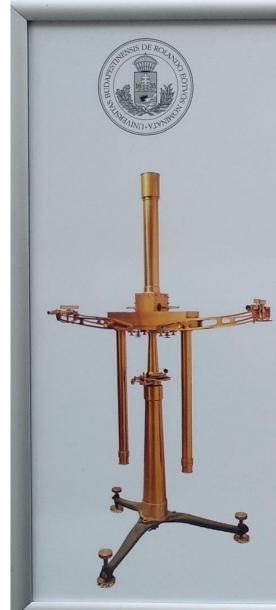








Smart phone application: EVENT@HAND Eötvös100



## EUROPEAN PHYSICAL SOCIETY — EPS HISTORIC SITE

THE FORMER PHYSICS BUILDING OF BUDAPEST UNIVERSITY SITE OF THE EÖTVÖS EXPERIMENTS

THIS BUILDING WAS CONSTRUCTED FROM 1883 TO 1886 TO BE THE PHYSICS BUILDING OF THE UNIVERSITY OF BUDAPEST ACCORDING TO THE DESIGN CONCEPT OF BARON ROLAND EÖTVÖS. HE WAS PROFESSOR OF PHYSICS OF THE UNIVERSITY FROM 1871 TO 1919. IT IS IN THIS VERY BUILDING THAT HE CONDUCTED HIS SERIES OF EXPERIMENTS IN 1889 AND FROM 1906 TO 1909, DEMONSTRATING TO AN EXTRAORDINARY DEGREE OF ACCURACY (1:200 000 000) THE PROPORTIONALITY OF INERTIAL AND GRAVITATIONAL MASS. THESE FUNDAMENTAL EXPERIMENTS PROVIDED EMPIRICAL SUPPORT TO THE EQUIVALENCE PRINCIPLE, THE BASIC CONCEPT OF ALBERT EINSTEIN'S GENERAL THEORY OF RELATIVITY.

#### EURÓPAI FIZIKAI TÁRSULAT — EPS FIZIKATÖRTÉNETI EMLÉKHELY

A PESTI EGYETEM FIZIKAI INTÉZETE AZ EÖTVÖS-KÍSÉRLET HELYSZÍNE

Ez az épület báró Eötvös Loránd elképzelései szerint épült 1883 és 86 között a pesti egyetem fizikai intézete számára. Eötvös Loránd, aki 1871-től 1919-ig volt a fizikatanára, ebben az épületben hajtotta végre 1889-ben, majd 1906 és 1909 között a súlyos és tehetetlen tömeg arányosságát rendkívüli pontossággal (1:200 000 000) igazoló alapvető méréssorozatot. Ez a kísérlet szilárd tapasztalati alapot nyújtott Einstein általános relativitáselmélete kiindulási pontjának, az ekvivalenciaelvnek.



Information table of the European Physical Society in front of the university building in Budapest, where the Eötvös experiments had been carried out. Inauguration: 12.10.2018

### Eötvös 100 Honorary Board Members

ADELBERGER Eric, COLOMBO Oscar L., DOMOKOS Gábor, FISCHBACH Ephraim, von FRESE Ralph, GOMBOSI Tamás, MÉSZÁROS Péter, MÉTRIS Gilles, MILGROM Mordehai, MILYUKOV Vadim, NAGY F. András, University of Michigan, RODRIGUES Manuel, TOUBOUL Pierre, VERLINDE Erik, WEISS Rainer, WETTERICH Cristoph, WILL Clifford M. etc. physicists,

BEER Tom, BERNABINI Marcello, BIELIK Miroslav, BRIMICH Ladislav, CLOETINGH Sierd, DOGLIONI Carlo, GRAFAREND Erik W., GROTEN Erwin, HAJNAL Zoltán, HIRT Christian, HOLOTA Petr, KALAB Zdenek, KAUTZLEBEN Heinz, LÜHR Hermann, MARKOVIČ Slobodan, MEURERS Bruno, MOCANU Victor, MORITZ Helmut, MUELLER Ivan, MÜLLER Jürgen, NAGY Dezső, PASTEKA Roman, EGLI Ramon, RUMMEL Reiner, RYBACH Ladislaus, SANSÓ Fernandó, SCHUH Harald, SIDERIS Michael, SNEEUW Nico, TORGE Wolfgang, VANÍČEK Petr, WHALER Kathy etc. earth scientists.





Digitally converted 3D anaglyph photo

Fruska Gora

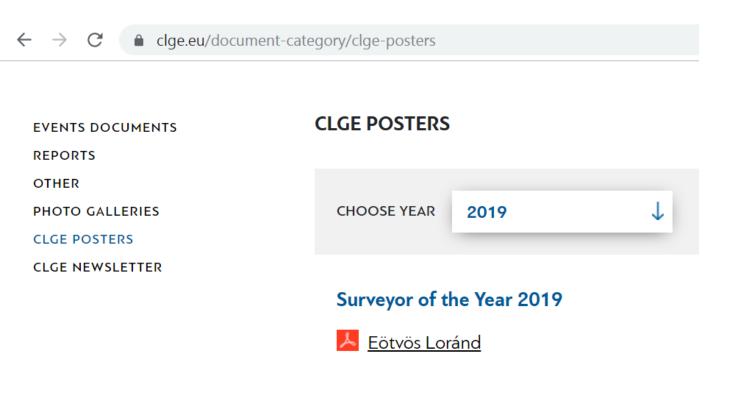
Conversion: Zsolt Regály Konkoly Observatory



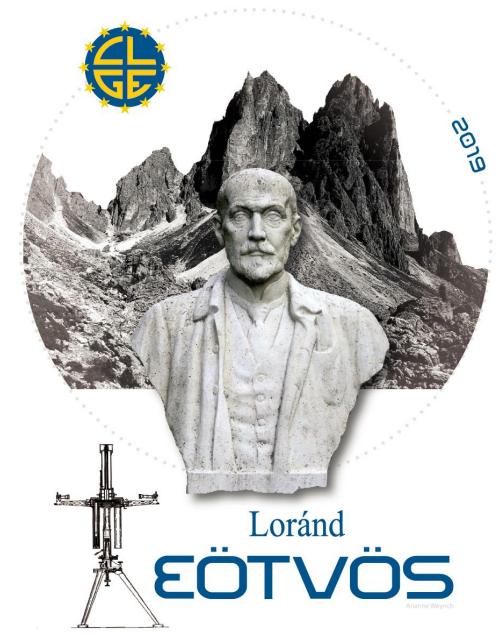




# THE COUNCIL OF EUROPEAN GEODETIC SURVEYORS COMITÉ DE LIAISON DES GÉOMÈTRES EUROPÉENS



CLGE declared Eötvös Loránd (Roland Eötvös) as "Surveyor of the Year 2019" Sofia, 21.03.2019



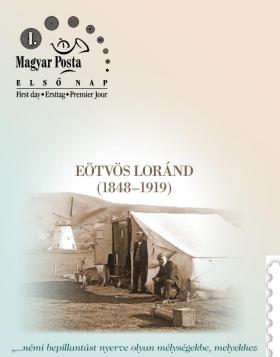


### 08.04.2019 Issue of commemorative stamp and commemorative coins



(Kg-Ka) 1200

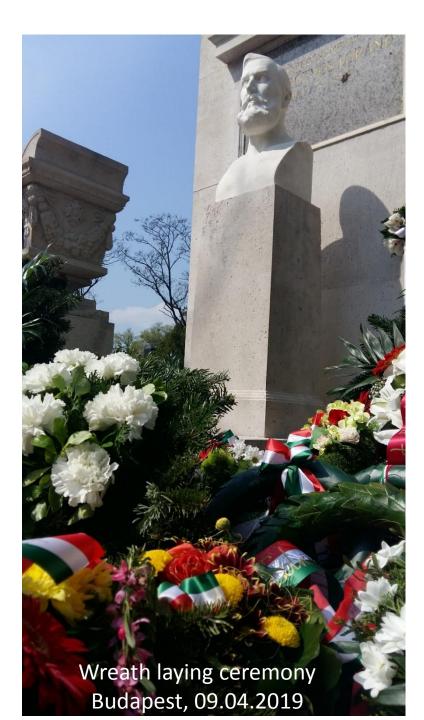
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szemünk egyáltalában nem hatolhat és fúróink el nem érnek."



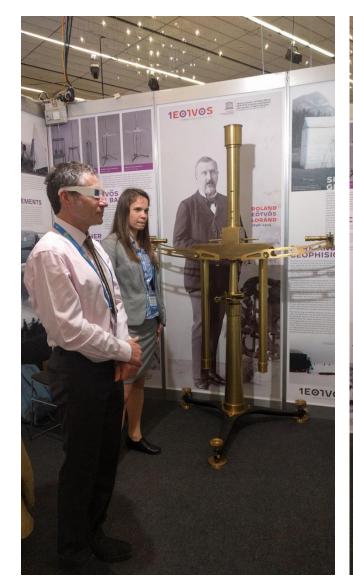








# Eötvös 100 exhibition at the EGU 2019 in Vienna (April 8-13, 2019) (with 3D stereoscopic photos by Eötvös and the "doubled" torsion balance)







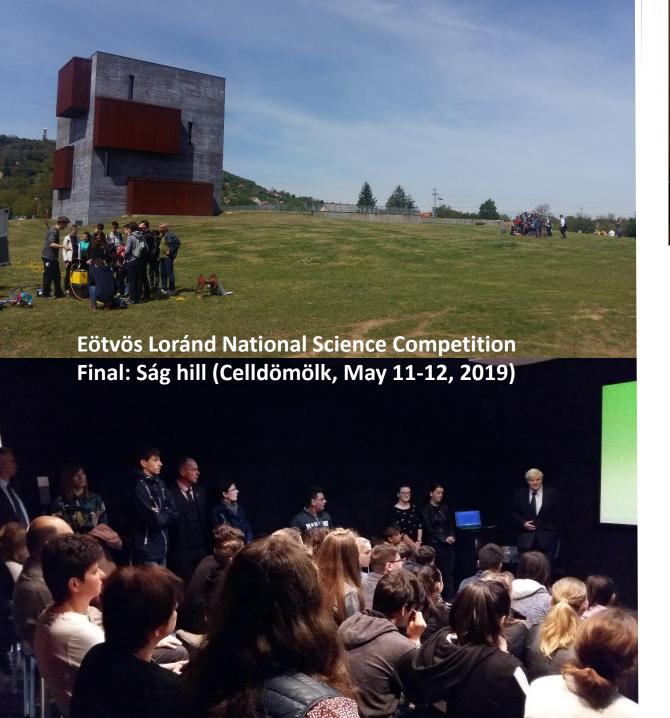


Jonathan Bamber President, EGU

Sierd Cloetingh President, AE

Robin Elisabeth Bell President, AGU

Alik Ismail-Zadeh SG, IUGG







Modern theories in gravitation (Mordehai Milgrom)

# International Conference on Precision Physics and Fundamental Physical Constants Tihany

Programme on June 13:



#### Ephraim Fischbach:

The Enduring Significance of Eötvös' Most Famous Experiment 09:00

James E. Faller:

My time with Bob Dicke; the beginning of experimental gravitational physics in university research 09:30 Lajos Völgyesi:

Torsion Balance and Remeasurement of the Eötvös Experiment 10:00

Gyula Tóth:

Remeasurement of the Eötvös experiment - status and first results 10:55

Kasey Wagoner:

**GEE Lab's Equivalence Principle Experiment** 11:20

Peter Ván:

**Gravitational waves and the Einstein Telescope** 11:50

Vadim Milyukov:

**Newtonian Gravitation Constant: History of Measurement and New Results** 14:00

Qing Li:

Determination of G with time-of-swing method by using high-Q silica fibers 14:30 including Chao Xue: Determination of G with Angular-Acceleration-Feedback Method





Eötvös 100
at the international
physics teacher
conference,
in the lobby of the
Budapest
Technical University (BME)

(+five Eötvös 100 lectures)



IUGG Montreal, July 8-18, 2019



Demonstration of the Eötvös torsion balance at the annual meeting of the Eötvös Loránd Physical Society

(Sopron, 22.08.2019)



Exhibition of stereographic photos made by Eötvös in South Tyrol. Toblach/Dobbiaco 09.08.2019





Eötvös 100 (Kiscell Museum, 08.09.2019) Lake reconstruction (Eötvös Collegium 09.09.2019).

The Eötvös József Collegium was initiated by Roland Eötvös, son of József.





# Cent'anni fa moriva Eötvös

## L'Ungheria e il Comune di Dobbiaco onorano il Barone

A un secolo dalla scomparsa, l'Ungheria e il Comune di Dobbiaco onorano il Barone Lorànd Eötvös, scienziato e alpinista, con una mostra fotografica a ricordo dei suoi soggiorni dolomitici.

Fino alla Prima Guerra

Mone

Land

(1848-1919), Ministro della pubblica istruzione, docente di fisica e Rettore dell'Università di Budapest, che dal 1950 è intitolata a lui.

Dal 1875 la famiglia di Eötvös frequentò la Val Pusteria in entrambe le stagioni, fermandosi all'Hotel

scalate, distinguendosi in una quindicina di prime, tra le quali, il 19 luglio 1884, quella della Croda da Lago a Cortina.

In coincidenza con il centenario della morte dell'insigne conterraneo, l'Ungheria ha promosso

> menvita e

aco si

# Auf den Spuren von Roland Eötvös

GEDENKEN: Mitglieder des Ungarischen Touristenvereins auf Gedächtnistour in den Dolomiten – Gedenktafel und Gipfelbuch für die Cima Eötvös

d'est: TOBLACH/AURONZO (ru). In seiner Heimat Ungarn ist der di sp große Physiker Roland Eötvös part (1848–1919) unvergessen. Anlässlich seines Todesjahres, class das sich heuer zum 100. Mal jährt, wird nicht nur an seine regna wissenschaftlichen, sondern litici, auch an seine alpiniotice.
Leistungen erinnert. Im Seple pe tember begab sich eine Delegation des Ungarischen Toucarat ristenvereins auf eine Gedächtnistour in die Dolomiten, del B um die Berge kennenzulernen, die Eötvös so sehr geliebt und von denen er einige der Gipfel

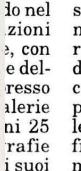
als Erster bestiegen hat.

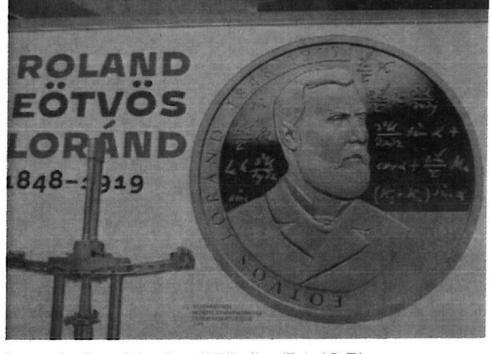


Vertreter der AVS-Ortsstelle Toblach mit dessen Leiter Lois Watschinger (Erster von links in der vorderen Reihe) und Vertreter der Cai-Sektion Auronzo mit deren Vizepräsident Massimo Casagrande (Fünfter von links in der hinteren Reihe) überreichten dem Präsidenten der ungarischen Delegation Laszló Schönviszky (Sechster von links in der hinteren Reihe) ein Gipfelbuch für die Cima Eötvös.



3 Alpinisten der ungarischen Delegation brachten am 11. September an der Cima Eötvös eine 4sprachige Gedenktafel an.





La medaglia celebrativa di Eötvös. (Foto I.D.F.)

soggiorni montani. Le immagini, riprodotte in stereoscopia, costituiscono documenti di storia spesso commoventi, e svelano un panorama molto ampio sulle escursioni e le visite del fisico magiaro e dei suoi familiari durante le vacanze

ai confini dell'Impero.

La mostra è stata aperta il 9 agosto al cospetto di una delegazione ungherese e del Presidente del Comitato «Eötvös 100» Laszlo Szarka, e rimarrà aperta fino al 21 settembre.

E.M.



Eötvös 100 Emlékmaraton

Benne "5vös 5km" futóverseny



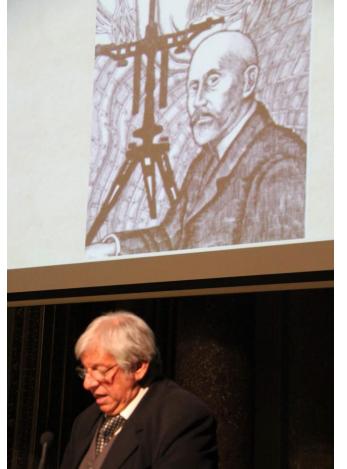
# At the Roland Roland Eötvös plaque in Heidelberg

17.09.2019



#### 21.09.2019

### The Hungarian Heritage Prize





### Ceremony at MOM (The Süss Works)









Újvidék/Novi Sad, Európa Kollégium, 29.11.2019



Eötvös 100 lecture at the Novi Sad Branch of the Serbian Academy of Sciences 30.10.2019

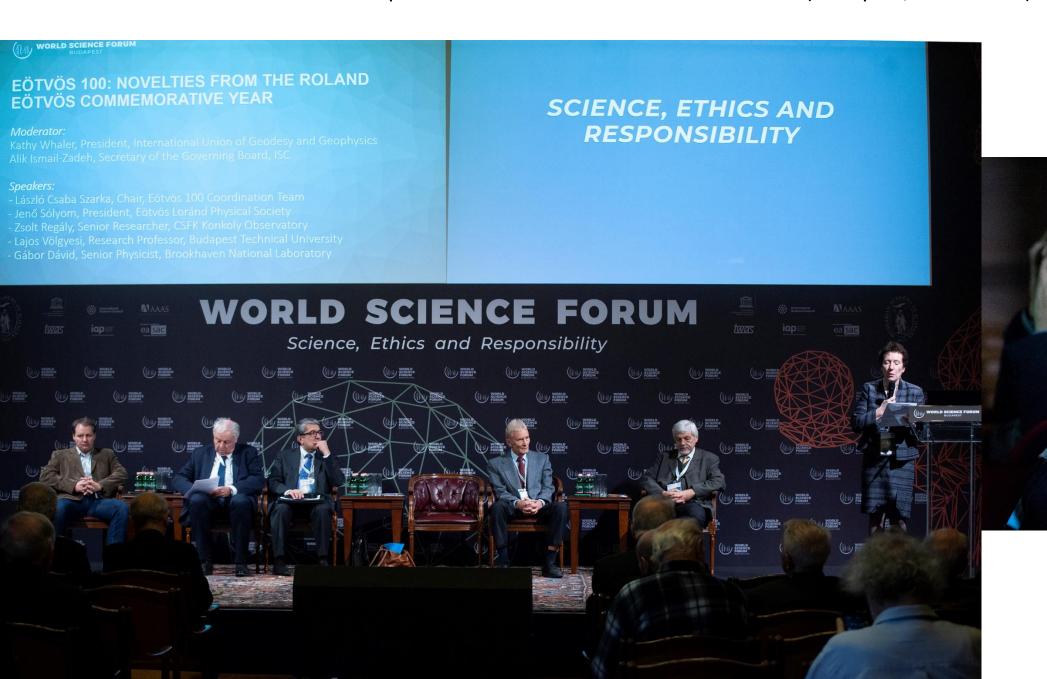


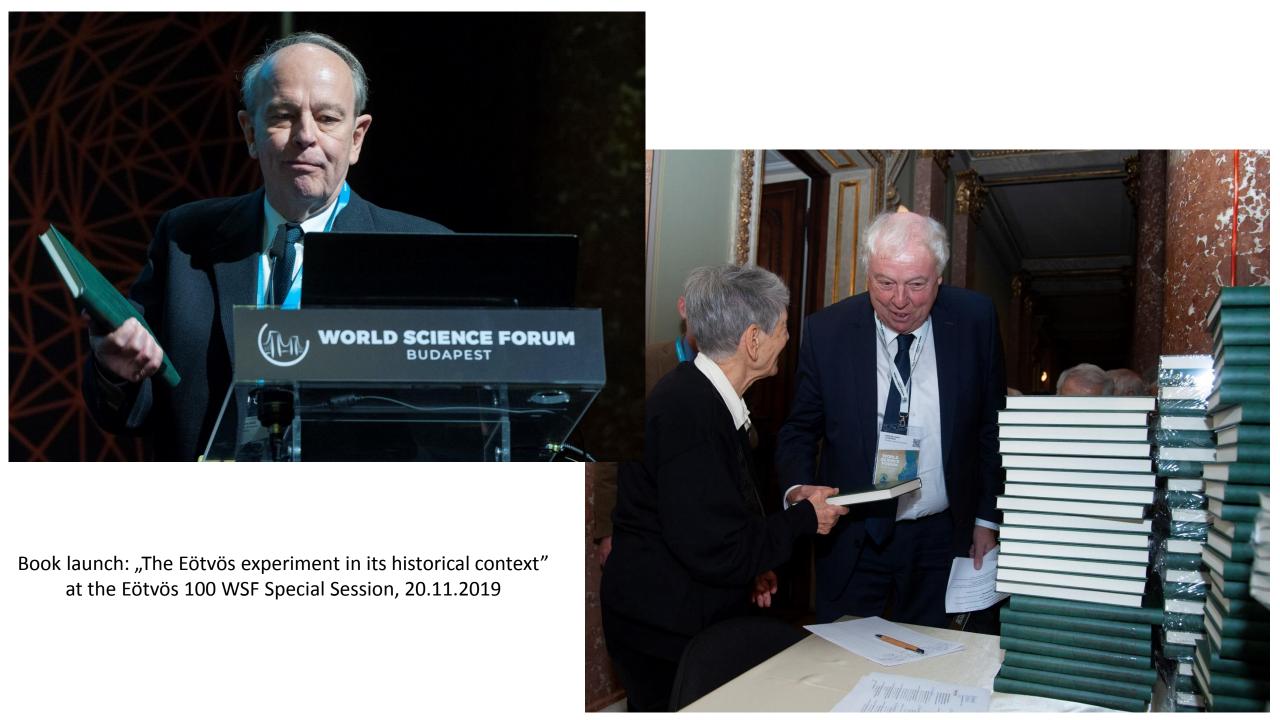


From Eötvös to Eötvös (Conference at ELTE BTK)

2019.11.19.





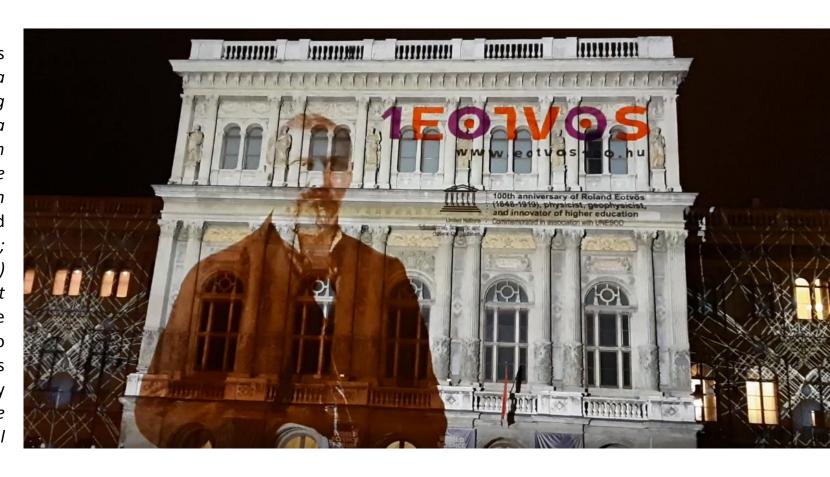


### Opening Ceremony of the World Science Forum (Budapest, 20.11.2019)

János Áder, President of Hungary, started and ended his opening address with Roland Eötvös. It has been a hundred years since Roland Eötvös, the outstanding physicist, died. He was not only a great scientist, but also a first-rate leader, the legendary president of the Hungarian Academy of Sciences. When he became President of the Academy 130 years ago in 1889, he told in his first speech that science was a common building. János Áder quoted Roland Eötvös: "Nations do not work in different sciences; they are all working on building the same structure (...) What one begins, the other continues, and the end result belongs to all those who contributed to its creation." In the end of his speech, wishing inspiring discussions, taboo issues, and effective conference to all participants at this year's World Science Forum, President of Hungary concluded: let us make sure that the "building" of science that Roland Eötvös talks about is not just a wonderful monument of human performance, but a common refuge.



János Áder



Eötvös 100 "Son et Lumière" on the facade of the Academy Palace. Budapest, November 20-23, 2019 (on the occasion of the WSF held in Budapest)











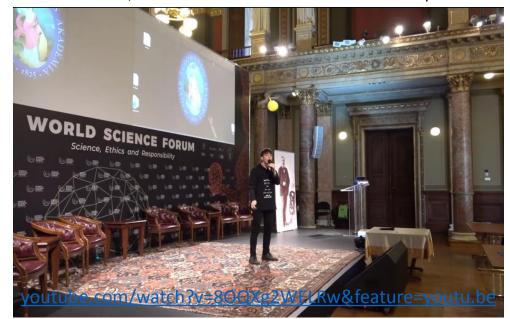
Eötvös Loránd Commemorative Competition Finals, 2019.11.23.

Péter Pácsonyi, member of the winner team Trivialischfrom Zalaegerszeg



https://www.youtube.com/watch?v=PsHbVPlkbiU

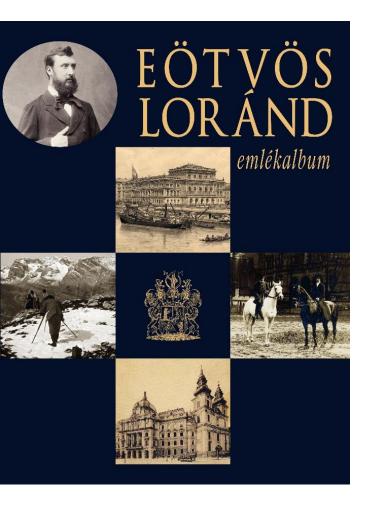
Viktor Csimma, member of the team FifikusFizikusok from Győr



The two best student talks are directly available on internet



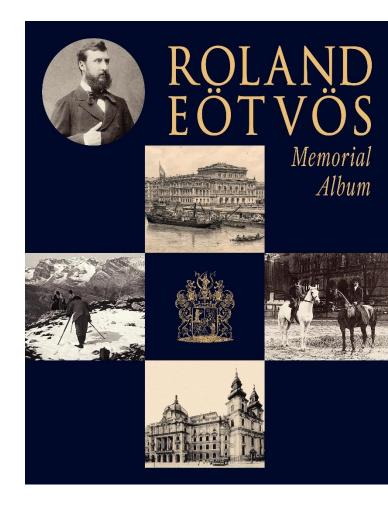
An Eötvös 100 greeting to the participants of the finals from Cluj / Kolozsvár



Book launch: The Eötvös Loránd Memorial Album 26.11.2019

| LÁSZLÓ LOVÁSZ<br>Lectori salutem!  | 5  | CSABA BORSODI<br>Roland Eötvös, university rector   | 91   |
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| Society  | 77 | 5 to 520  | 1000 |





The editors (A Patkós, J Estók, G Gyáni, T Dobszay) and the promoters (M Réthelyi, L Lovász, L Borhy)





28.11.2019

"High school students at the Academy", 28.11.2019



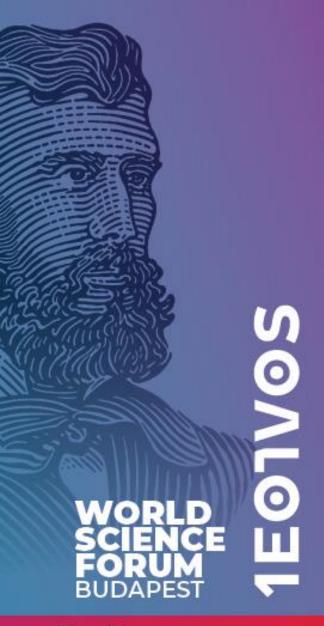


The Eötvös Day (as Day of Science and Technology) of the Czeglédi Péter Reformed High School Levice/Léva, 29.11.2019









#### **EÖTVÖS 100 EVENTS**

in Budapest, concomitant with the World Science Forum and the Feast of the Hungarian Science

#### Roland Eötvös

COMMEMMORATIVE YEAR 2019



EÖTVÖS 100 EVENTS IN
BUDAPEST, CONCOMITANT
WITH THE WORLD SCIENCE
FORUM AND THE FEAST
OF THE HUNGARIAN SCIENCE

#### 20 November wednesday:

Eötvös 100 Special Session at the World Science Forum (in English, Ceremony Hall, Hungarian Academy of Sciences, 1051 Bp., Széchenyi tér 9.)

11:00-12:30 "Eötvös 100": Outcomes of the Eötvös 100 Commemorative

> Year. Moderators: Kathryn Whaler, President of the International Union of Geodesy and Geophysics, and Alik Ismail-Zadeh, Secretary of the International Science Council

11:00-11:10 The Eötvös 100 Commemorative

Year László Szarka, Chair of the Eötvös 100 Coordination Team

44:40-44:30 Stereoscopic photos by Roland Eötvös and their digital conversion

> Zsolt Regály, CSFK Konkoly Observatory

11:30-11:50 Experiences and results from re-running the Eötvös experiment

Lajos Völgyesi, BME

11:50-12:00 Discussion

2:00–42:30 Book launch: The Eötvös experiment in its historical framework Gábor Dávid, Stony

> Brook University, and Jenő Sólyom, President of the Eötvös Loránd Physical Society. Complimentary copies of the English version will be made available to participants of the Eötvös 100 Special Session.

#### 22 November FRIDAY:

"Eötvös 100": A Temporary Exhibition (ELTE University Library, 1053 Budapest, Ferenciek tere 6.)

13:00-14:00 Opening Ceremony of the Eötvös 100 Exhibition (in Hungarian)

Open on

22 November: 14:00-18:00, 23 November: 11:00-18:00, 25-29 November: 10:00-18:00

#### 23 November saturday:

Finals of the "Roland Eötvös Commemorative Competition" for high schools (Ceremony Hall, Hungarian Academy of Sciences,

1051 Budapest, Széchenyi tér 9.)

40:00–46:00 Invited guests only (in Hungarian)

#### 26 November tuesday:

The Roland Eötvös Memorial Album (MTA Reading Room, 1051 Budapest, Széchenyi tér 9.)

41:00–12:00 Book Launch: The Roland Eötvös Memorial Album

(ceremony: in Hungarian)

44:00-44:05 Welcome by László Szarka, Chair, Eötvös 100 Coordination Team

44:05-44:35 Presentation of the album Gábor Gyáni and András Patkós co-editors

#### PATRONS OF THE COMMEMORATIVE YEAR:

44:35-

44:55-

28

10:00

10:00-

10:15-

10:30-

10:45

11:00-

44:45-

44:30-

I9

Peri

László Borhy Rector of Eötvös Loránd University

Miklós Kásler Minister of Human Capacities

László Lovász President of the Hungarian Academy of Sciences

László Palkovics Minister of Innovation and Technology









PROJECT FINANCED FROM THE NRDI FUND



100th anniversary of Roland Eötvös (1848-1919), physicist, geophysicist, and innovator of higher education Commenceted in association with UNESCO

Eötvös 100 design: Márton Juhász (jmtypography), Sopron 1E07V0S

#### Further Eötvös 100 outcomes:

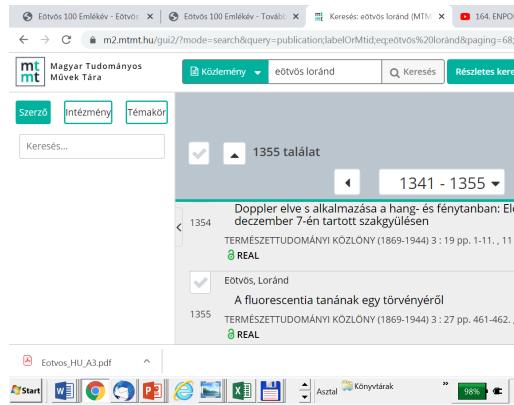
## Digital conversion of 450 stereoscopic photos made by Roland Eötvös (MTA CSFK) 1E01V0S

#### Re-running the Eötvös experiment (Wigner FK, BME)



The Eötvös experiment is one of the most important methods in searching new fundamental interactions

## Publications by Eötvös and about Eötvös in MTMT (Hungarian Scientific Bibliography Database) (MTA KIK)





"As Baron Eötvös' truths on gravitational force and surface tension will remain in a thousand years as true and valuable they are today, even when our actual concepts for the gravitation and for the smallest parts of the matter would happen to be disappeared."

Sándor Mikola, 1929





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"So, finally, we must rest assured that science does not give the true explanation of natural phenomena, but only leads to the border where the elusive begins."

Eötvös, 1877

# 1E01V05 www.eotvosioo.hu





United Nations .
Educational, Scientific and .
Cultural Organization .

Egyesült Nemzetek Nevelésügyi, Tudományos és Kulturális Szervezete 100th anniversary of Roland Eötvös (1848-1919), physicist, geophysicist, and innovator of higher education

Commemorated in association with UNESCO

Eötvös Loránd (1848-1919) fizikus, geofizikus és a felsőoktatás megújítójának 100. évfordulója

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