



**ELKH** | Eötvös Loránd  
Research Network

2020



**ELKH**

Eötvös Loránd  
Research Network

# Who we are

Building the future –  
driven by heritage

The **Eötvös Loránd Research Network (ELKH) Secretariat** is an independent nonprofit public budgetary organization established on August 1, 2019. The ELKH Secretariat is under the supervision of the National Assembly, led by a 13-member independent Governing Body devoted exclusively to scientific research excellence while safeguarding academic freedom. The function of the Governing Body is supported by a Scientific Council and an International Advisory Board.

The **ELKH Secretariat** maintains the expansive research network funded from the central budget for purposes of carrying out scientific research.

The **ELKH Secretariat** builds on the rich legacy of Eötvös Loránd in articulating the multifaceted character of the collective wealth of knowledge accumulated in the research network over several decades.



In 1891, Eötvös Loránd and his colleagues founded the Hungarian Society for Mathematics and Physics

The newly formed organization was named after **Eötvös Loránd** (Baron Roland von Eötvös) (1848-1919) the preeminent Hungarian researcher and multidisciplinary scientist; physicist, geophysicist. He was the founding father of modern Hungarian science and research development policy who established conditions for the development of university-based innovations and technical education.

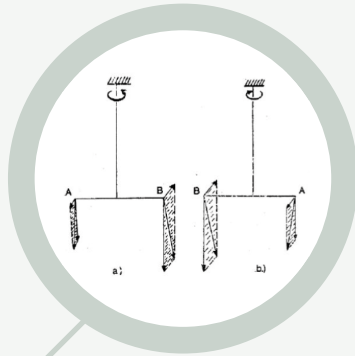
Eötvös Loránd is commemorated for his work on gravitation, his study of the equivalence of gravitational and inertial mass; the gravitational gradient on the Earth's surface; the surface tension of liquids, and the invention of the highly accurate torsion balance or Eötvös pendulum for gravimetry.

*“So, finally, we must be 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*

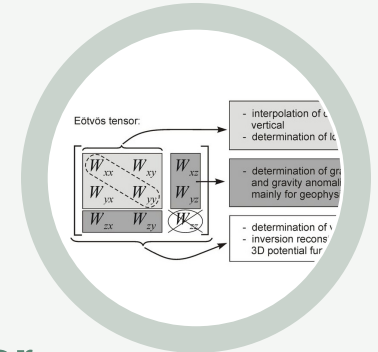
## Eötvös unit

a unit for expressing horizontal gradients of gravity (geophysical prospecting) equal to  $10^{-9}$  gal per horizontal centimeter. The symbol of the eötvös unit is E.



## Eötvös parameter

is used to quantify a deviation from the Weak Equivalence Principle of two test bodies with different compositions (A and B), inertial mass  $m_i$  and gravitational mass  $m_g$ . The term is derived from the acclaimed Eötvös experiment



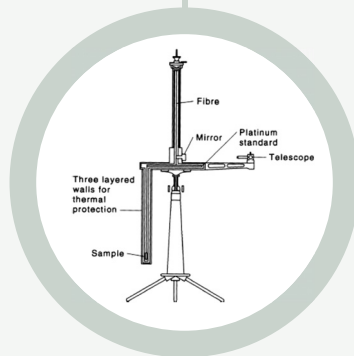
## Eötvös-tensor

(gravity gradient tensor) measures the rate of change of the gravity vector in three perpendicular directions

## Eötvös rule

or Law (capillarity) for the temperature dependence of a surface tension, where  $k$  is the Eötvös constant

$$\left(\frac{M}{d}\right)^{\frac{2}{3}} \gamma = k(t_c - t - 6)$$



## Eötvös torsion balance

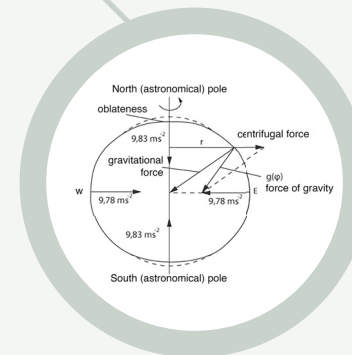
The device measures the direction of force of gravity and the change in the force of gravity's extent in the horizontal plane

## Eötvös effect

is the change in perceived gravitational force caused by the change in centrifugal force resulting from eastbound or westbound velocity

## Eötvös number

or Bond number characterizes the ratio of gravitational forces to the surface forces



# Mission & Vision

## Science is at the heart of our policy process

### **ELKH's vision**

To endow ELKH as a forthcoming network of 'think tanks' for policymakers, addressing sustainable transformation while contributing to Hungary's prosperity.

### **ELKH's mission**

- to acknowledge, foster and protect scientific freedom and promote research ethics and research integrity
- to strive for scientific excellence in basic and applied research in natural and life sciences, social sciences, and the humanities
- to efficiently operate the publicly funded research institute network with diversity, inclusivity and by equal opportunity
- to be at the forefront of scientific innovation that generates impact in key strategic and global sustainable areas
- to develop innovative and targeted research programs and policy
- to foster and advance partnerships internationally and regionally
- to strengthen synergies between education and research
- to evolve as a progressive, open and inspiring organization

# Key Facts

## **ELKH** | Eötvös Loránd Research Network

**16**

Main Research  
Network

10 Research Centre(s)  
5 Research Institutes  
1 Office

**39**

Research  
Institutes

Research Institutes  
correlating to the  
10 Research Centre(s)

**150+**

Research  
Groups

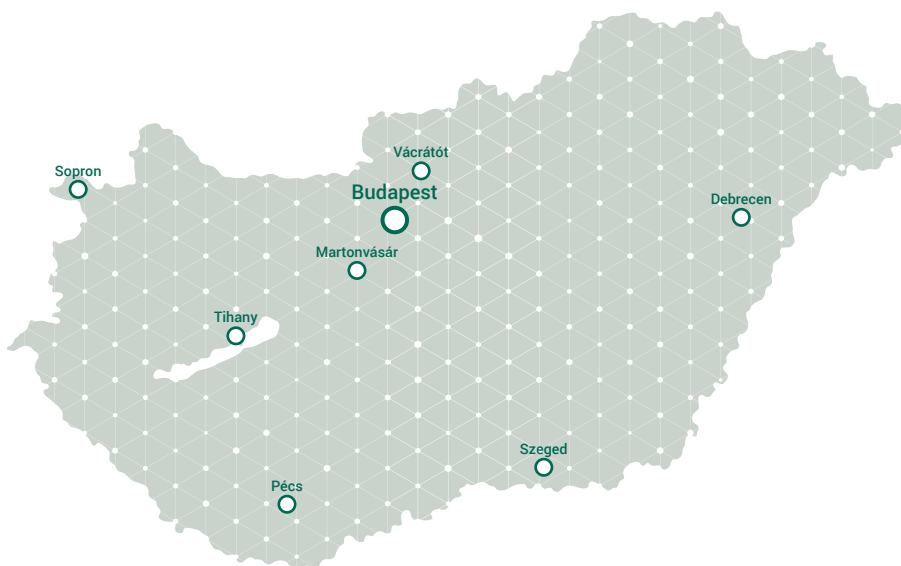
Research Groups affiliated  
with Universities or Public  
Institutions

- **220** patents
- **7 841** Scientific and Educational publications (2019)
- **19** Spin-offs
- **142** ongoing HORIZON 2020 Grants Awarded
- **57.71 M €** Annual Turnover (est. in 2020)
- **65-110** Employees at the ELKH Secretariat
- **4 872** Employees (3 033 Scientific Researchers) (2019)

# What we do

## Research for the challenges of our time

- Strengthening capacity, efficiency and linkages
- Interdisciplinary, international collaborations and projects
- Utilization of research results
- Facilitate scientific career building and future challenges of mobility for young researchers
- Effective R+I readiness for future crisis management – *in line with sustainable green recovery (EU Green Deal)*



## 5 Research Institutes & 1 Office

|   |          |
|---|----------|
| <b>Institute for Nuclear Research (ATOMKI)</b>  | Debrecen |
| <b>Institute of Experimental Medicine (KOKI)</b>  | Budapest |
| <b>Research Institute for Linguistics (NYTI)</b>  | Budapest |
| <b>Alfréd Rényi Institute of Mathematics (RI)</b>                                       | Budapest |
| <b>Institute for Computer Science &amp; Control (SZTAKI)</b>                            | Budapest |
| <b>Office for Research Groups Attached to Universities and Other Institutions (TKI)</b> | Budapest |



# 10 Research Centre(s) & 39 Research Institutes

|   |   |
|---|---|
| <b>Centre for Agricultural Research (ATK)</b><br>Martonvásár / Budapest | Institute for Veterinary Medical Research             |
|   | Agricultural Institute                                |
|   | Plant Protection Institute                            |
|   | Institute for Soil Science and Agricultural Chemistry |

|   |                                |
|---|--------------------------------|
| <b>Research Centre for the Humanities (BTK)</b><br>Budapest | Institute of Philosophy        |
|   | Institute for Literary Studies |
|   | Institute of Art History       |
|   | Institute of Ethnology         |
|   | Institute of Archaeology       |
|   | Institute of History           |
| Institute of Musicology                                     |                                |

|   |   |
|---|---|
| <b>Research Centre for Astronomy &amp; Earth Sciences (CSFK)</b><br>Sopron / Budapest | Geographical Institute of Research                |
|   | Institute for Geological and Geochemical Research |
|   | Geodetic and Geophysical Institute                |
|   | Konkoly Thege Miklós Astronomical Institute       |

|  |  |
|--|--|
| <b>Centre for Energy Research (EK)</b><br>Budapest | Institute for Atomic Energy Research                   |
|  | Institute for Energy Security and Environmental Safety |
|  | Institute for Technical Physics and Materials Science  |

|   |                                |
|---|--------------------------------|
| <b>Centre for Economic &amp; Regional Studies (KRTK)</b><br>Budapest / Pécs | Institute for Economics        |
|   | Institute for Regional Studies |
|   | Institute of World Economics   |

|   |                                 |
|---|---------------------------------|
| <b>Centre for Ecological Research (ÖK)</b><br>Tihany / Vácraátót / Budapest | Balaton Limnological Institute  |
|   | Danube Research Institute       |
|   | Institute of Ecology and Botany |
|   | Institute of Evolution          |

|  |                            |
|--|----------------------------|
| <b>Biological Research Centre (SZBK)</b><br>Szeged | Institute of Biophysics    |
|  | Institute of Biochemistry  |
|  | Institute of Genetics      |
|  | Institute of Plant Biology |

|  |                                 |
|--|---------------------------------|
| <b>Centre for Social Sciences (TK)</b><br>Budapest | Institute for Legal Studies     |
|  | Institute for Minority Studies  |
|  | Institute for Political Science |
|  | Institute for Sociology         |

|   |  |
|---|--|
| <b>Research Centre for Natural Sciences (TTK)</b><br>Budapest | Institute of Materials and Environmental Chemistry |
|   | Institute of Enzymology                            |
|   | Institute of Cognitive Neuroscience and Psychology |
|   | Institute of Organic Chemistry                     |
|   | <i>Brain Imaging Center</i>                        |

|   |  |
|---|--|
| <b>Wigner Research Centre for Physics (WIGNER FK)</b><br>Budapest | Institute for Particle and Nuclear Physics   |
|   | Institute for Solid State Physics and Optics |



## Mathematics & Natural Sciences

**Natural Sciences:** Mathematics; Computer and Information Sciences (AI, AV); Physical Sciences (Physics, Chemistry); Astronomy and Earth Sciences; Nuclear Physics and Atomic Energy Sciences; Materials Sciences; Biological Sciences; Biochemistry and Enzymology

## Life Sciences

**Environmental and Life Sciences:** (Limnology, Ecology, Botany, Zoology, Virology); Agriculture Sciences (Chemistry); Plant Sciences; Soil Sciences; Crop Sciences; Atmospheric Sciences; Geo Sciences; Animal Sciences; Veterinary Sciences (Emerging Zoonotic Diseases)

## Medical and Health Sciences:

Cognitive Science; Neuroscience; Pharmacology; Experimental Medicine; Veterinary Medicine; Biomedical Sciences; Medical Genetics; Nanotechnology; Biomedical; Telemedicine; Microbiology

## Social Sciences & the Humanities

**Social Sciences:** Economics; Philosophy; Sociology, Law; Political Sciences; Literary Studies; Art History; Ethnology; Archaeology; History, Musicology; Linguistics



**Environment  
(Sustainability) & Safety**



**Materials & Energy**



**Human Health**



**Human Resources**



**Industry & Digitalization**

HEALTH-RELATED DRUG RESEARCH AND DEVELOPMENT; MOLECULAR BIOLOGY; NEUROBIOLOGY; PSYCHOLOGY; ECOLOGY; CLIMATE CHANGE; AGRICULTURE; WASTE MANAGEMENT; ECONOMICS; HISTORY; THE HUMANITIES; LANGUAGE; ADVANCED STRUCTURAL MATERIALS; ENERGY; SPACE; QUANTUM SCIENCE AND NANOTECHNOLOGIES; DIGITALIZATION OF MANAGEMENT PROCESSES; MATHEMATICS; AI; MACHINE LEARNING; BIG DATA ANALYTICS; INTELLIGENT SYSTEMS; AVIATION INNOVATION AND HYDROGEN

# Impact

## International Rankings

1 April, 2019 – 31 March, 2020

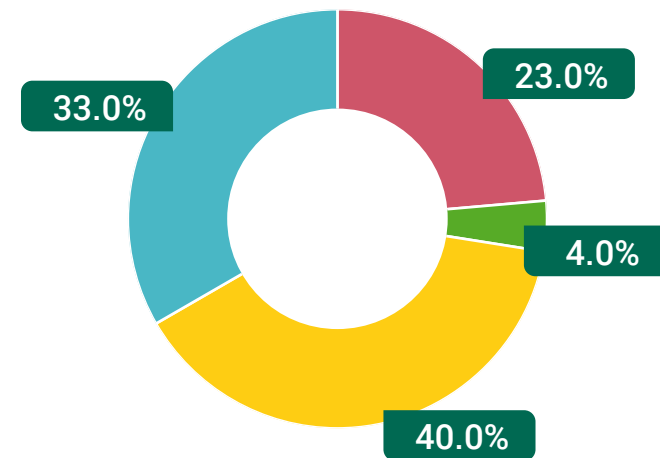
- Placed 395<sup>th</sup> in 2019
- Hungarian Academy of Sciences (HAS);  
Eötvös Loránd Research Network (ELKH)

| Region: Global             | Count | Share |
|----------------------------|-------|-------|
| Subject/Journal group: all | 296   | 38.01 |

| Subject                          | Count | Share |
|----------------------------------|-------|-------|
| ● Chemistry                      | 51    | 9.66  |
| ● Physical Sciences              | 189   | 13.76 |
| ● Earth & Environmental Sciences | 14    | 1.46  |
| ● Life Sciences                  | 66    | 16.45 |

Outputs by subject (Share)



source: Nature Index





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[www.elkh.org](http://www.elkh.org)

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