A 2025-ös Fizikai Áttörési Díj

Csörgő Tamás [1,2]

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[2] MATE Műszaki Intézet, KRC, Gyöngyös

70(+1) éves a CERN, az Európai Nukleáris Kutatási Szervezet
Alapítás, motiváció
Első sikerek
Tudomány és technológia

Tudományos áttörési díj
Példa egy tudományos áttörésre
Az áttörési díjak rendszere
A 2025-ös fizikai tudományos áttörési díj

Prof. L. Musa at ICNFP'24 előadása alapján (Kolymbari, Kréta, Görögország, 2024 augusztusa)
Magyar fűszerezéssel a 24. Zimányi Nehézionfizikai Téli Iskolára: Cs.T.
https://indico.cern.ch/event/1307446/contributions/6112042/

MOTIVÁCIÓ

BÉKÉS TUDOMÁNYOS EGYÜTTMŰKÖDÉS EURÓPA ROMJAIN

Peaceful scientific collaboration: a vision takes shape

1945: Europe is in ruins after World War II

1946: French proposal to the United Nations

1949: European Cultural Conference, Lausanne

TUDÓSOK ÉS POLITIKUSOK KÖZÖS LÁTOMÁSA

AZ ELSŐ JAVASLÓ: LOUIS DE BROGLIE (NOBEL-DÍJAS)

1940s: first prop

Louis de Broglie propose

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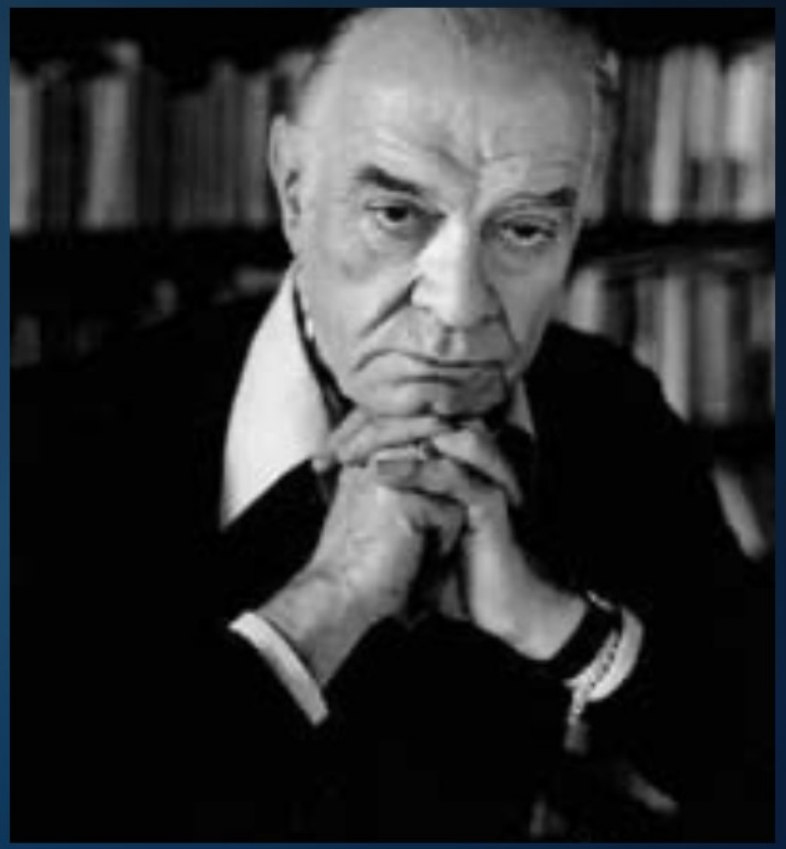
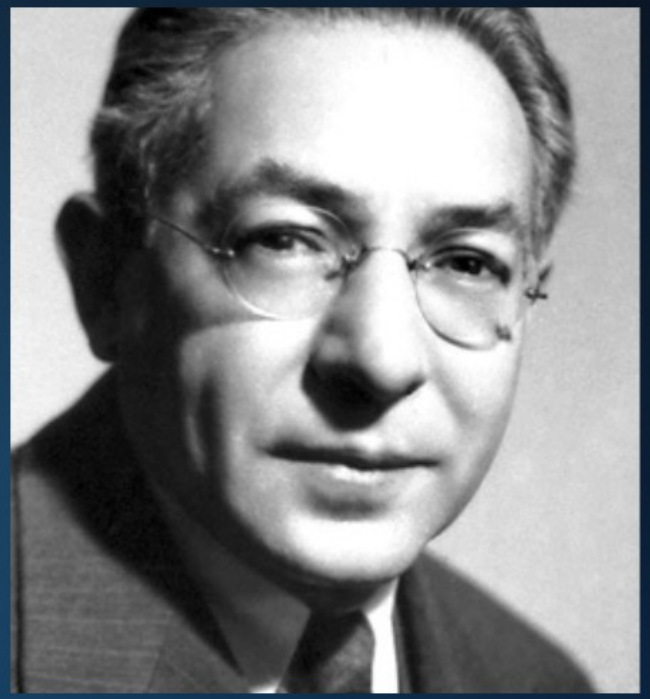


1950-51: ALAKULÁS, LÉTREJŐ A CERN MOZAIKSZÓ

1950: UNESCO Conference

US Nobel laureate Isidor Rabi tables a resolution authorising UNESCO to:

"assist and encourage the formation of regional research laboratories in order to increase international scientific collaboration…"



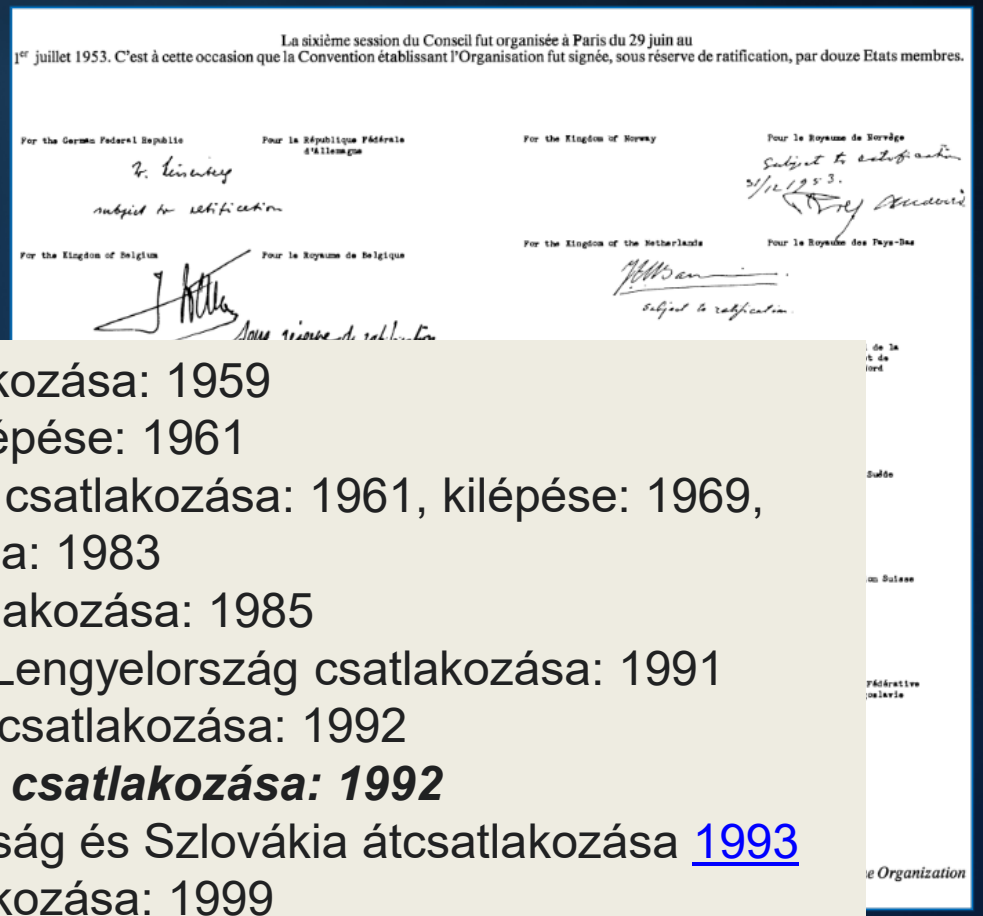
1951: UNESCO Resolution

- At a meeting of UNESCO in Paris in December 1951, the first resolution concerning the establishment of a European Council for Nuclear Research was adopted.
- Two months later, 11 countries signed an agreement establishing the provisional Council – **the acronym CERN was born**.

1954. szeptember 29.: Megszületik a CERN

1954: CERN is born

- The CERN Convention, established in July 1953, was ratified by 12 founding Member States: Belgium, Denmark, France, the Federal Republic of Germany, **Greece**, Italy, the Netherlands, Norway, Sweden, Switzer the UK, and Yugoslavia.
- On 29 September 1954, the European Organization for Nuclear Research offi came into being.
- CERN was dissolved but the acronym


La sixième session du Conseil fut organisée à Paris du 29 juin au 1er juillet 1953. C'est à cette occasion que la Convention établissant l'Organisation fut signée, sous réserve de ratification, par douze Etats membres.

For the German Federal Republic — Pour la République Fédérale d'Allemagne
For the Kingdom of Norway — Pour le Royaume de Norvège
For the Kingdom of Belgium — Pour le Royaume de Belgique
For the Kingdom of the Netherlands — Pour le Royaume des Pays-Bas

- Ausztria csatlakozása: 1959
- Jugoszlávia kilépése: 1961
- Spanyolország csatlakozása: 1961, kilépése: 1969, újra csatlakozása: 1983
- Portugália csatlakozása: 1985
- Finnország és Lengyelország csatlakozása: 1991
- Csehszlovákia csatlakozása: 1992
- ***Magyarország csatlakozása: 1992***
- Cseh Köztársaság és Szlovákia átcsatlakozása 1993
- Bulgária csatlakozása: 1999
- Románia csatlakozása: 2015
- Szerbia csatlakozása: 2018
- Szlovénia csatlakozása: 2024

MAI GLOBÁLIS EGYÜTTMŰKÖDÉS: 25 TAGÁLLAM, 8 TÁRSULT TAGÁLLAM …

From founders' vision to today's global collaboration

24 Member States
Austria – Belgium – Bulgaria – Czech Republic
Denmark – Estonia – Finland – France – Germany
Greece – Hungary – Israel – Italy – Netherlands – Norway
Poland – Portugal – Romania – Serbia – Slovakia Spain
Sweden – Switzerland – United Kingdom

2 Associate Member States
in the pre-stage to membership
Cyprus – Slovenia

8 Associate Member States
Brazil – Croatia – India – Latvia – Lithuania – Pakistan
Türkiye – Ukraine

6 Observers
Japan – Russia (suspended) – USA
European Union – JINR (suspended) – UNESCO

As of 31 December 2023
Employees:
2666 staff, **1002** graduates
Associates:
12 370 users, **1513** others

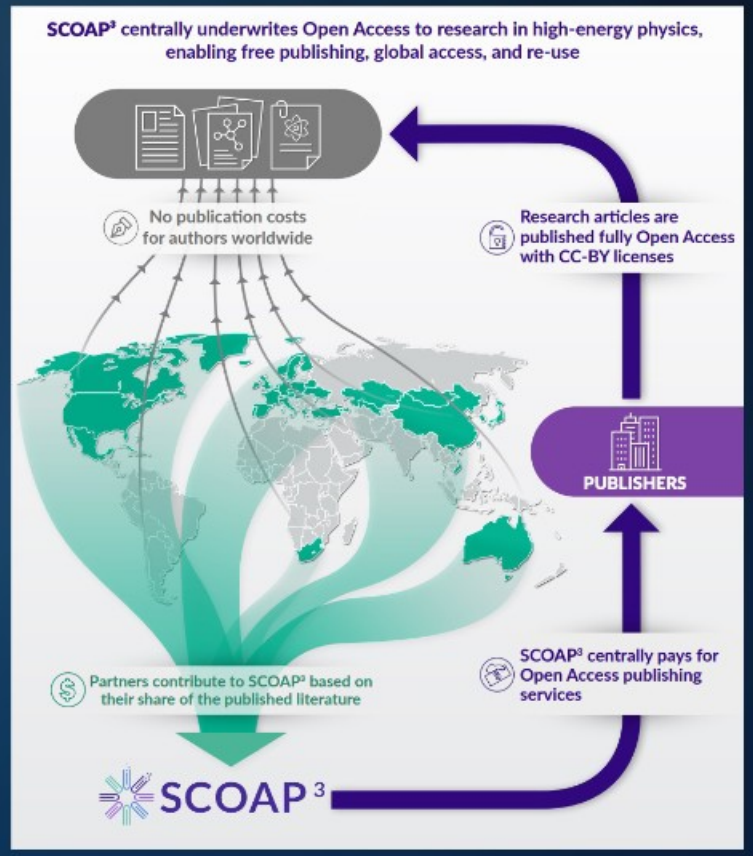
Around 50 Cooperation Agreements
with non-Member States and Territories
Albania – Algeria – Argentina – Armenia – Australia – Azerbaijan – Bangladesh – Belarus – Bolivia
Bosnia and Herzegovina – Canada – Chile – Colombia – Costa Rica – Ecuador – Egypt – Georgia – Honduras
Iceland – Iran – Jordan – Kazakhstan – Lebanon – Malta – Mexico – Mongolia – Montenegro – Morocco – Nepal
New Zealand – North Macedonia – Palestine – Paraguay – People's Republic of China – Peru – Philippines – Qatar
Republic of Korea – Saudi Arabia – Sri Lanka – South Africa – Thailand – Tunisia – United Arab Emirates – Vietnam

NYÍLT (NEM TITKOSÍTOTT) TUDOMÁNY

Core value underlying the collaboration: Open Science

CERN Convention Art. II.1.: *The Organization shall have no concern with work for military requirements, and* ***the results of its experimental and theoretical work shall be published or otherwise made generally available***

- **Open Access Policy (2014)**
  - >90% of research produced at CERN published OA (CC-BY licenses)
  - Sponsoring Consortium for Open Access Publishing in Particle Physics - SCOAP^3 (44 countries)
  - Inspired major global OA initiatives: PlanS, OA2020, etc.
- **LHC Open Data Policy (2020)**
  - LHC experiments release experimental data and associated analysis tools for diverse scientific and educational uses
- **CERN Open Science Policy (2022)**
  - Policy broadened to explicitly include open software, hardware, research integrity and assessment, education, training and outreach, citizen science



TUDOMÁNYOS MÉRFÖLDKÖVEK

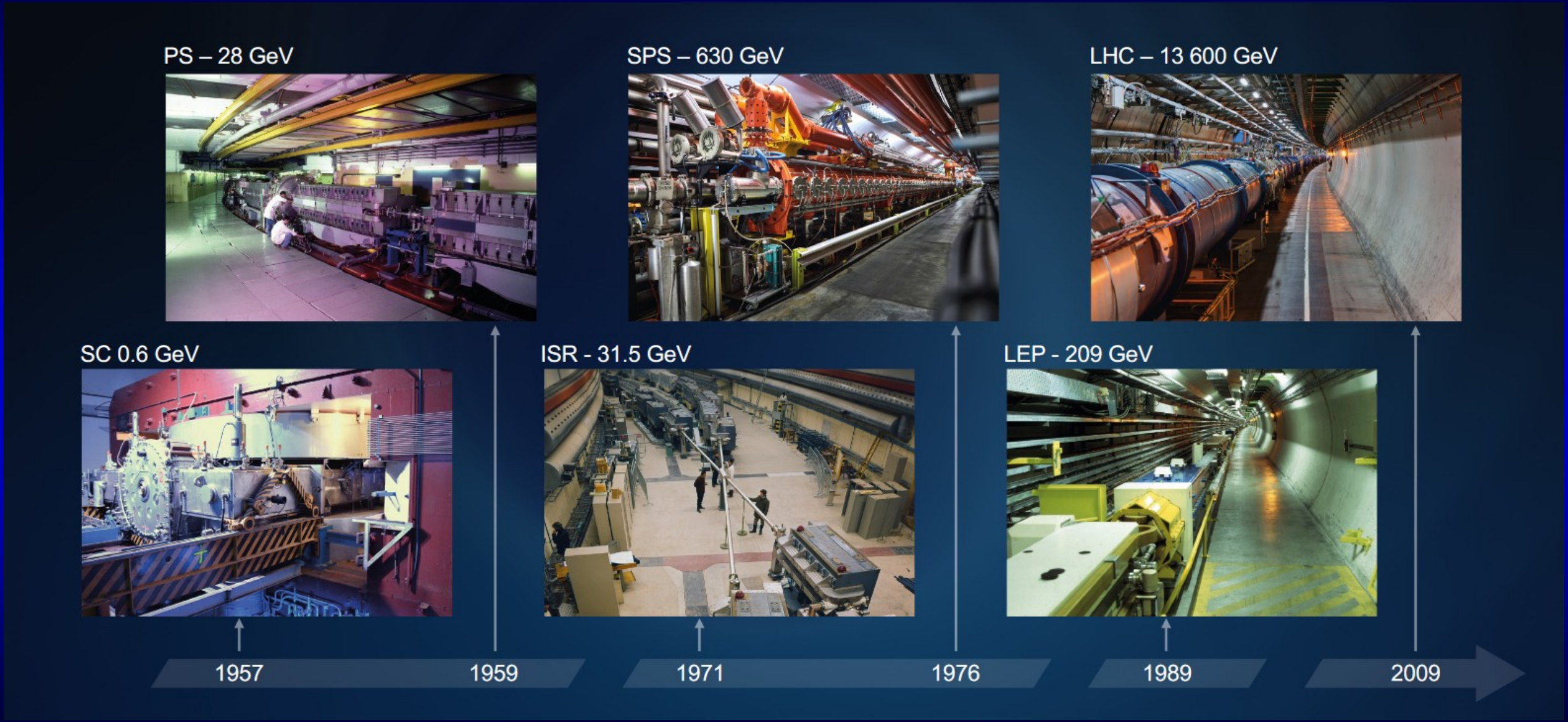
1957: ÉRKEZIK AZ ELSŐ GYORSÍTÓ A CERN-BE

1957: first accelerator

The **Synchrocyclotron**

MOTTÓ: „GYORSÍTUNK”

ÚJ MÉRFÖLDKÖVEK: ÚJ GYORSÍTÓK



1958 - 62: AZ ELSŐ FELFEDEZÉS A CERN-BEN

1958: CERN's first discovery

1957: the **Synchrocyclotron is** CERN's first accelerator to begin operation (600 MeV proton beam)

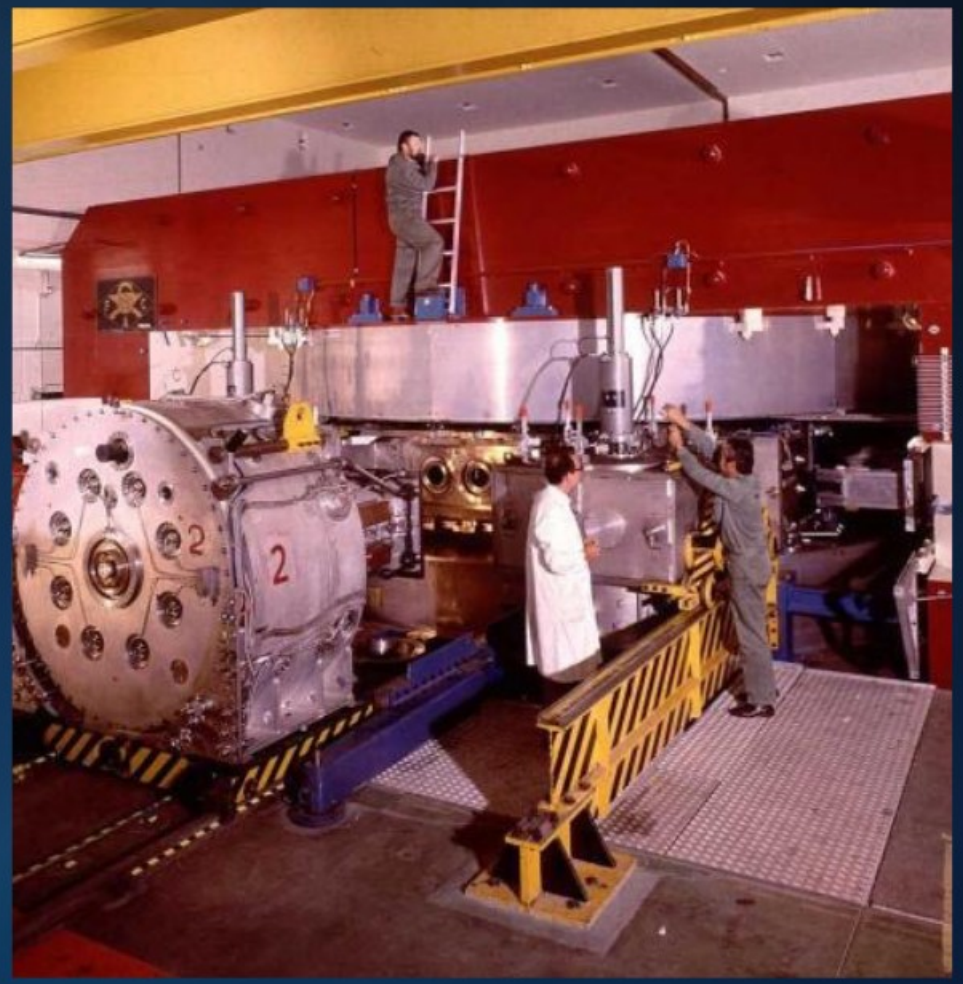
Discovery of "rare pion decays" 1958-1962

$$R = \frac{\Gamma(\pi \to e\upsilon_e)}{\Gamma(\pi \to \mu\upsilon_\mu)} = (1.22 \pm 0.30) \times 10^{-4}$$

G. Fidecaro et al.

Crucial verification of a universal "weak" force with a Vector - Axial coupling

A turning point for the emerging electroweak theory

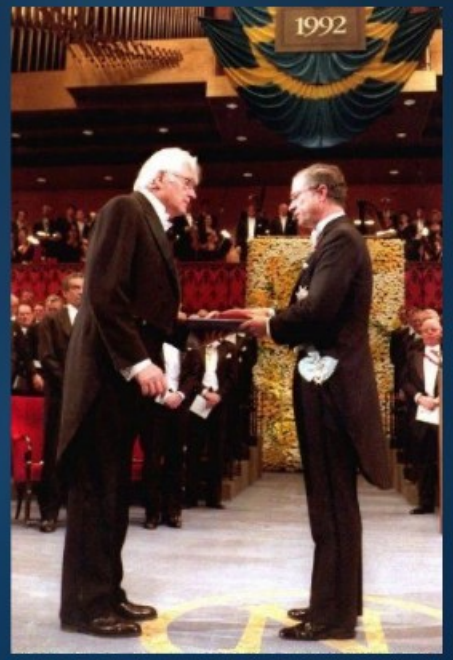


1971-72: MWPC FEJLESZTÉS, 1992: CHARPAK NOBEL-DÍJA

Georges Charpak: Revolutionizing particle detection

from “visual detectors” to “electronic detectors”

1971-1972 – Large-size Multiwire Proportional Chamber

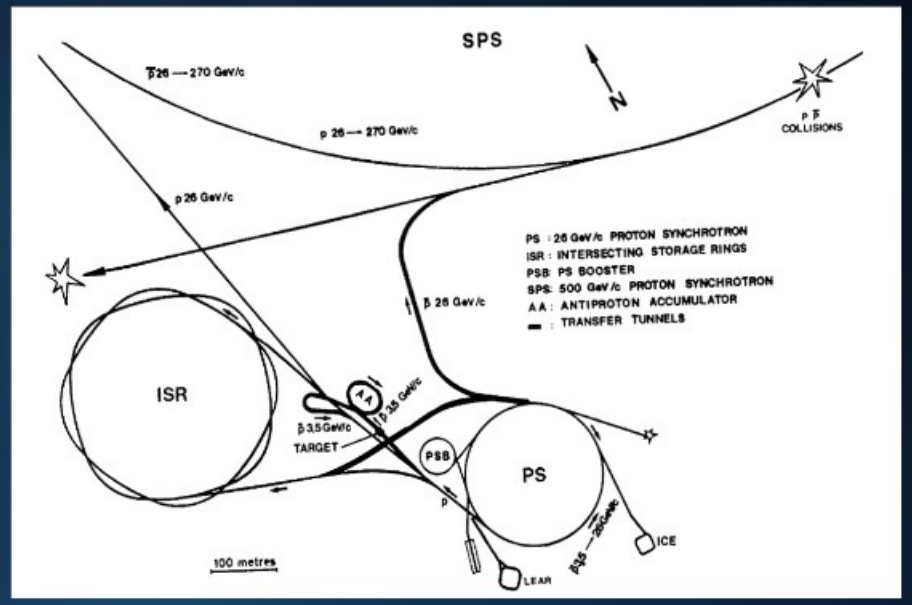


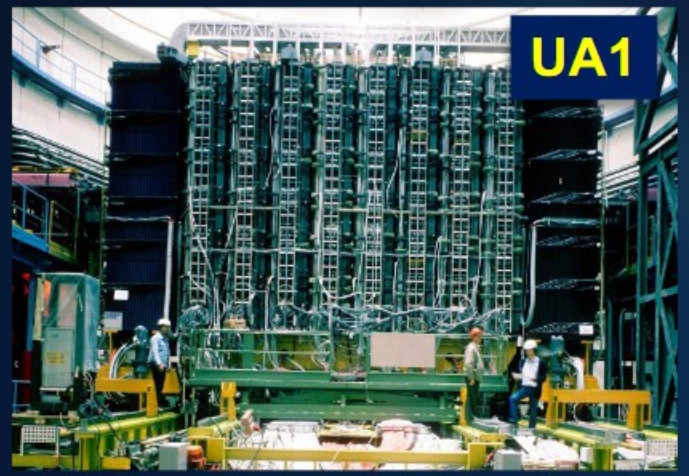
1992 Nobel award ceremony

1976 - 1983: A GYENGE ÁRAMOK FELFEDEZÉSE: W ÉS Z

1983: discovery of the W and Z

- Gargamelle and the discovery of neutral currents guided the search: look in the region 60-90 GeV
- In 1976 Rubbia proposes to modify the SpS into a collider of protons and antiprotons
- First collisions at sqrt(s)=540 GeV were obtained in 1981



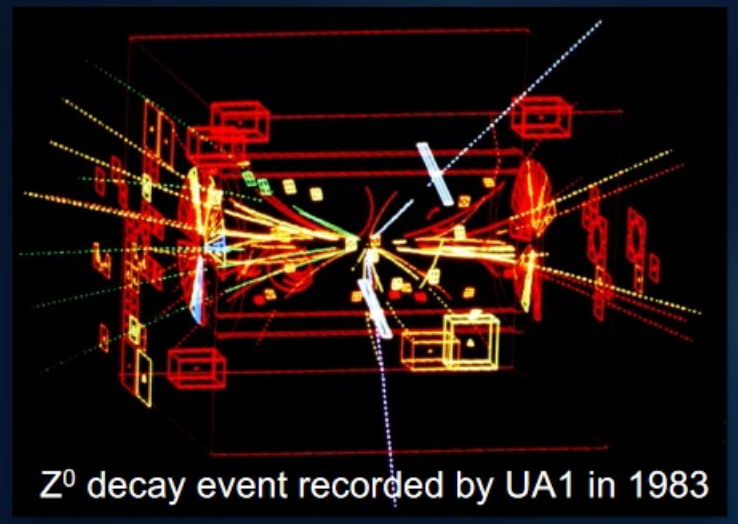


Two multipurpose detectors UA1 and UA2 were built to detect the elusive W and Z in their decays to leptons.

1984: RUBBIA ÉS VAN DER MEER FIZIKAI NOBEL-DÍJA

1983: discovery of the W and Z

- UA1 and UA2 presented the first results (in two separate seminars) at CERN on 20 and 21 **January 1983**
- 6 candidates for both experiments with high energy electrons and high missing energy (i.e. neutrinos).
- **The quest for the W boson was over!**



Z^0 decay event recorded by UA1 in 1983

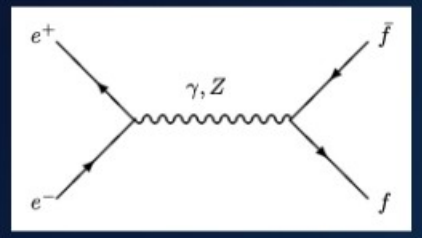
In **July 1983**, **clear evidence of the Z boson** was also presented.

Carlo Rubbia and Simon van der Meer were awarded the 1984 Nobel prize

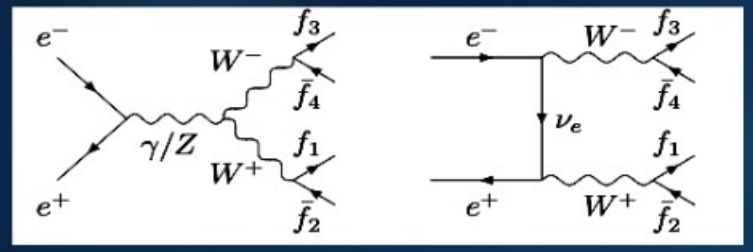
1987 – A LEP KORSZAKA

LEP era

- First beams in LEP: 15 July 1989
- LEP 1: center of mass energy around the mass of the Z boson (91 GeV) for 7 years. LEP was a Z-factory with millions of produced Z bosons.



- LEP 2: starting in 1996, energy reached and surpassed the threshold for production of 2 W boson (160 GeV). Max energy reached 209 GeV.

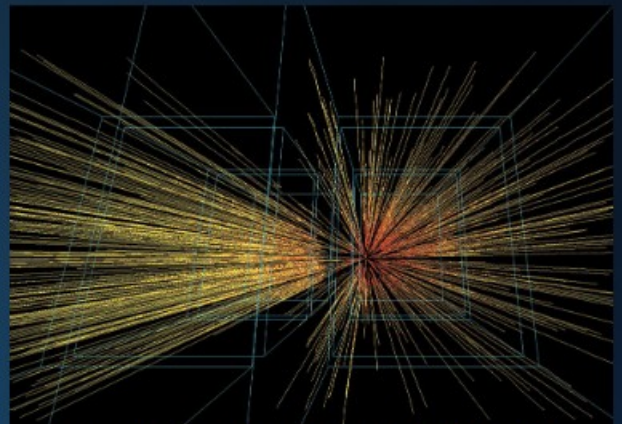


2000 - QGP BEJELENTÉSE – CERN SAJTÓTÁJÉKOZTATÓN

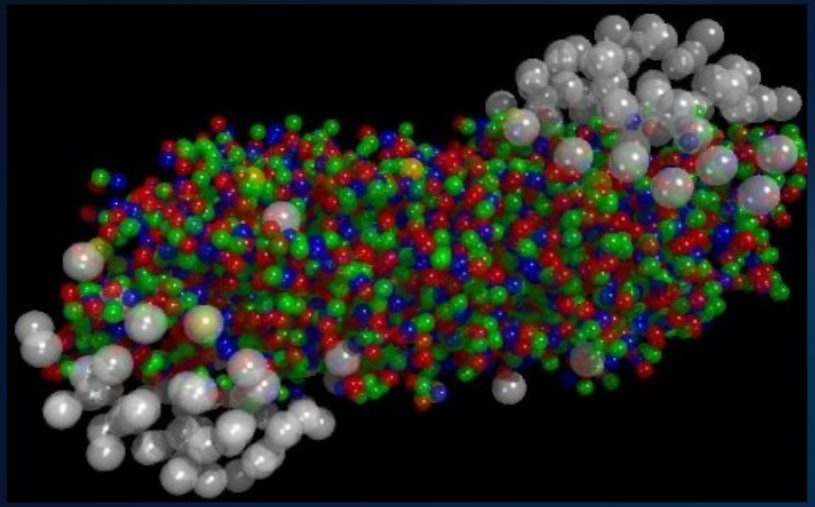
AZ ANYAG ÚJ ÁLLAPOTA, LÉTREHOZVA A CERN-BEN (?)

CERN, February 2000: first evidence of a new state of matter, the quark-gluon plasma

- Combined data from the 7 experiments on CERN's HI programme
- Proves an important prediction of the QCD theory. An important step forward in the understanding of the early evolution of the Universe.

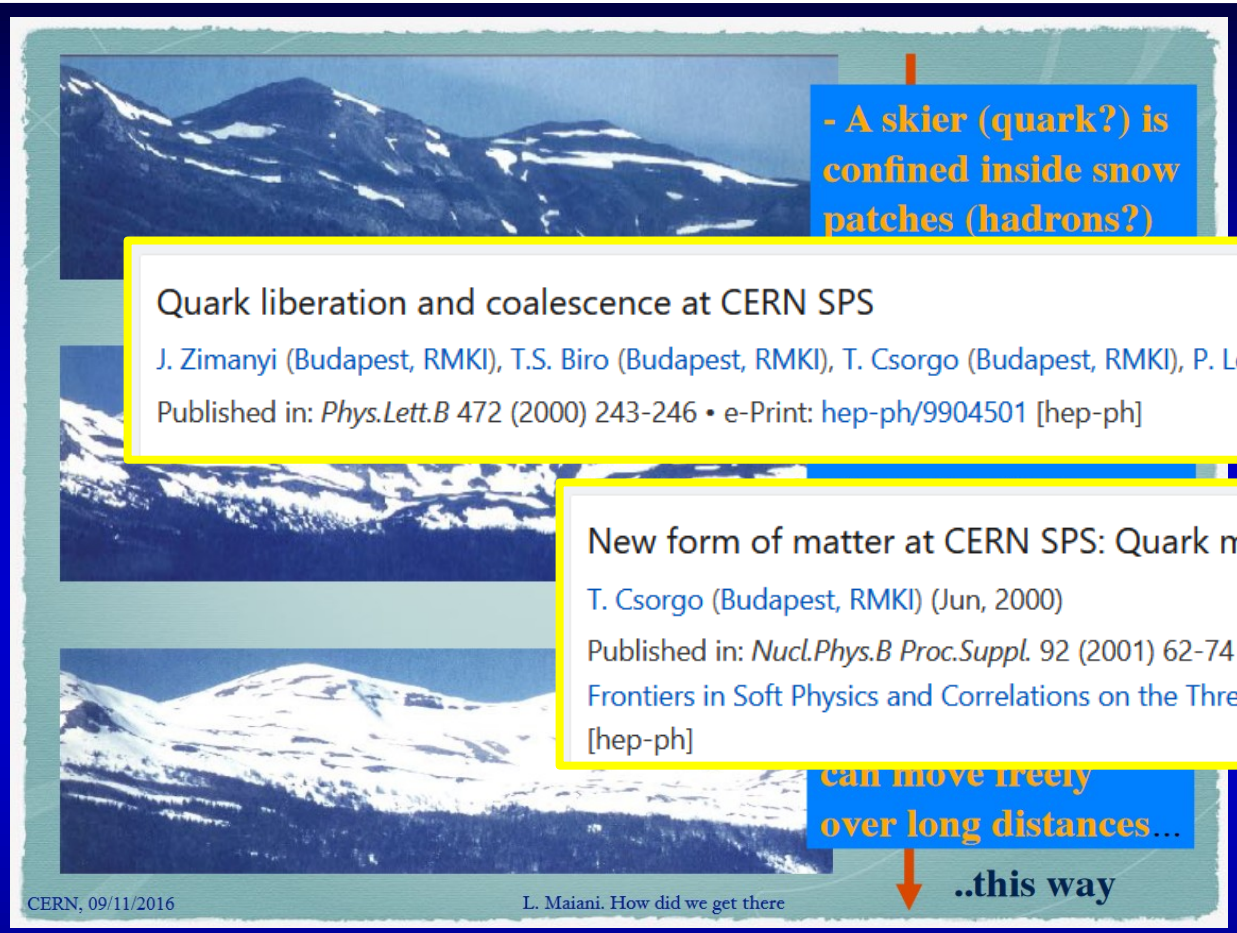


Event recorded by NA49 at SPS



Luciano Maiani (CERN DG): "… We now have evidence of a new state of matter where quarks and gluons are not confined. … There is still an entirely new territory to be explored concerning the physical properties of quark-gluon matter. The challenge now passes to RHIC at BNL and later to the LHC."

2000 – MEKKORA IS A KVARKOK SZABAD ÚTHOSSZA ??



Quark liberation and coalescence at CERN SPS #1

J. Zimanyi (Budapest, RMKI), T.S. Biro (Budapest, RMKI), T. Csorgo (Budapest, RMKI), P. Levai (Budapest, RMKI) (Apr, 1999)

Published in: *Phys.Lett.B* 472 (2000) 243-246 • e-Print: hep-ph/9904501 [hep-ph]

New form of matter at CERN SPS: Quark matter but not quark gluon plasma #7

T. Csorgo (Budapest, RMKI) (Jun, 2000)

Published in: *Nucl.Phys.B Proc.Suppl.* 92 (2001) 62-74 • Contribution to: 9th International Workshop on Multiparticle Production: New Frontiers in Soft Physics and Correlations on the Threshold of the New Millenium (Torino 2000), 62-74 • e-Print: hep-ph/0011339 [hep-ph]

In the nonrelativistic region $m_\perp < 2m_0$, on the other, flow does couple to the rest mass: for a linear transverse flow velocity profile and a Gaussian transverse density profile one finds exactly [16,17]

$$T_{\rm slope} = T_{\rm f} + \tfrac{1}{2} m_0 \langle v_\perp \rangle^2 \,. \qquad (4)$$

s dependence is indeed observed. Figure 3 shows
tive flow component; inverse slopes of 300 MeV
n obviously not be interpreted as hadronic tem-
is some scatter between the data from different

on tends to reduce the size of the regions within
which particles can develop such correlations: thermal motion, controlled by the thermal
ts in the opposite
effective emission
size is controlled
nula [21,16,17]

(5)

16. T. Csörgő, B. Lörstad, Nucl. Phys. A 590 (1995) 465c; Phys. Rev. C 54 (1996) 1390.
17. R. Scheibl and U. Heinz, Phys. Rev. C 59 (1999) 1585.

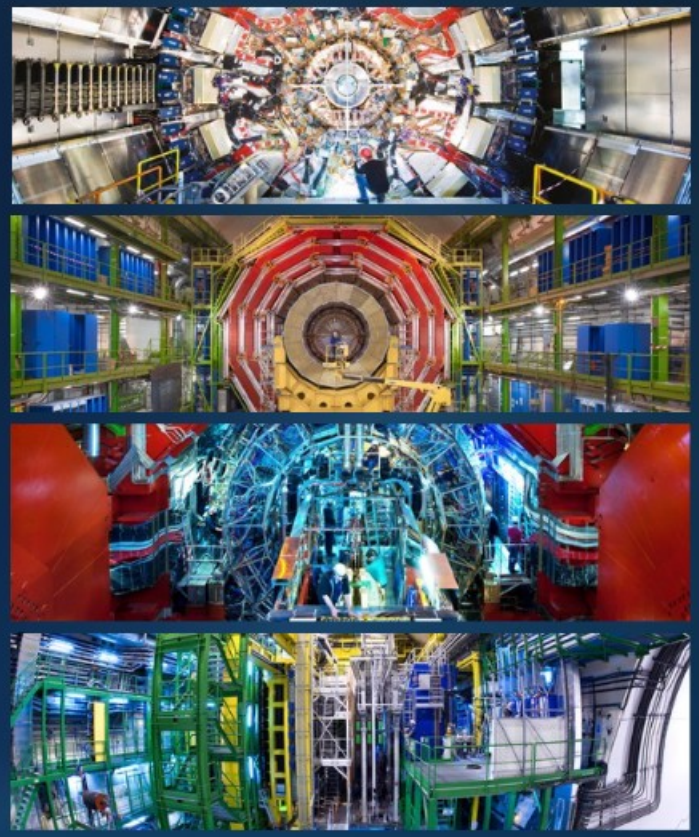
L. Maiani, DG OF CERN :
MEAN FREE PATH OF QUARKS
tends to infinity (macroscopic)

⟷

U. W. Heinz: signs of hydro, it is a fluid,
Mean free path tends to zero,
with references to Hungarian (Buda-Lund) results:
Nucl.Phys.A 685 (2001) 414-431,PRC54 (1996) 1390
Proc. NN2000, e-Print: hep-ph/0009170 [hep-ph]

2008 - INDUL AZ LHC, A NAGY HADRONÜTKÖZTETŐ

The Large Hadron Collider era



ATLAS

CMS

ALICE

LHCb

A 9 LHC KÍSÉRLET: ALICE, ATLAS, CMS, FASER, LHCb, LHCf, MATHLUSA, MILLICAN és TOTEM.

A HIGGS BOZON FELFEDEZÉSE

Higgs discovery … and the SM triumph

July 4th 2012 announcement

F. Englert and P. Higgs

2013 Nobel Prize

ATLAS AND CMS: DÍCSÉRETES EMLÍTÉS A NOBEL-DÍJ INDOKLÁSÁBAN.

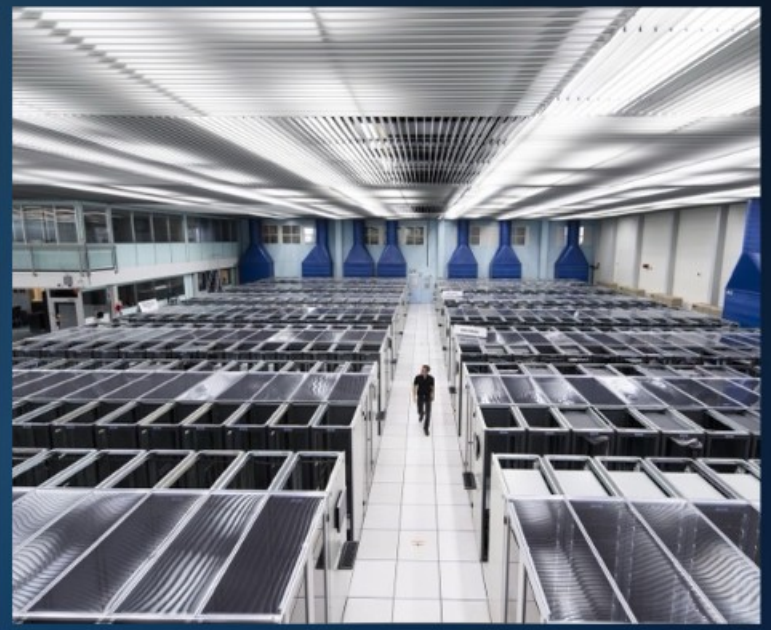
TECHNOLÓGIA FEJLESZTÉS

GYORSÍTÓ, DETEKTOR ÉS SZÁMÍTÁSTECHNIKA

We develop technologies in three key areas

ACCELERATORS

DETECTORS



COMPUTING

1989 - A WEB SZÜLETÉSE A CERN-BEN

The World Wide Web

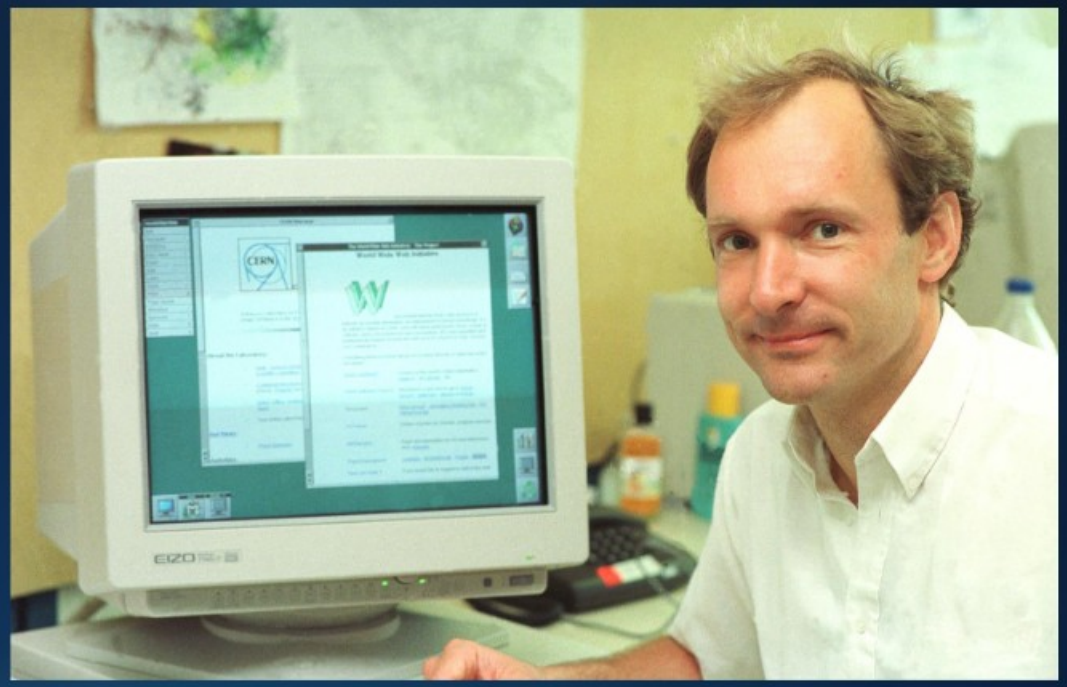
March 1989: Tim Berners Lee submits the first proposal for the World Wide Web

merge data networks and hypertext in an easy-to-use global information system

By the end of 1990, the first Web server and browser is up and running

In 1993, CERN makes the source code of the World Wide Web available on a royalty-free basis

By the end of 1994, the Web already has **10,000 servers** and **10 million users**



Tim Berners Lee displaying some of the first web pages in 1994

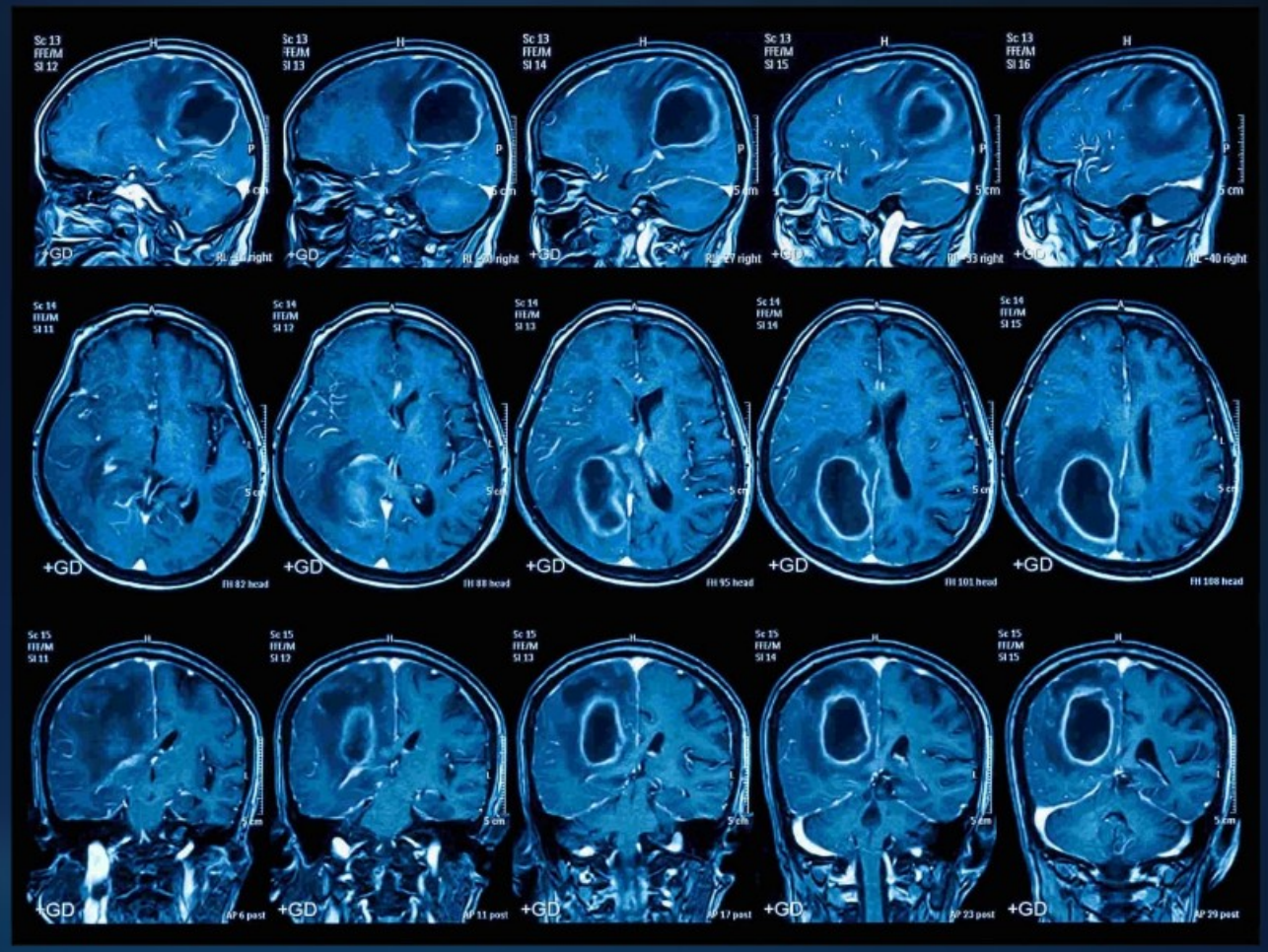
MRI (1971-) ÉS FMRI (1990-)

MRI Magnets

Superconducting magnets in MRI:
Non-invasive 3D anatomical imaging

MRI industry consumes ~4000 tons of Nb-Ti annually

Over 50,000 MRI scanners worldwide

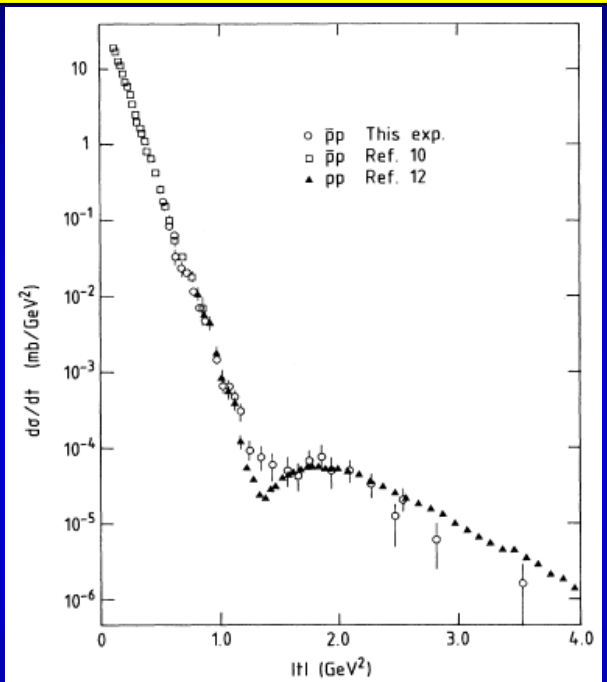


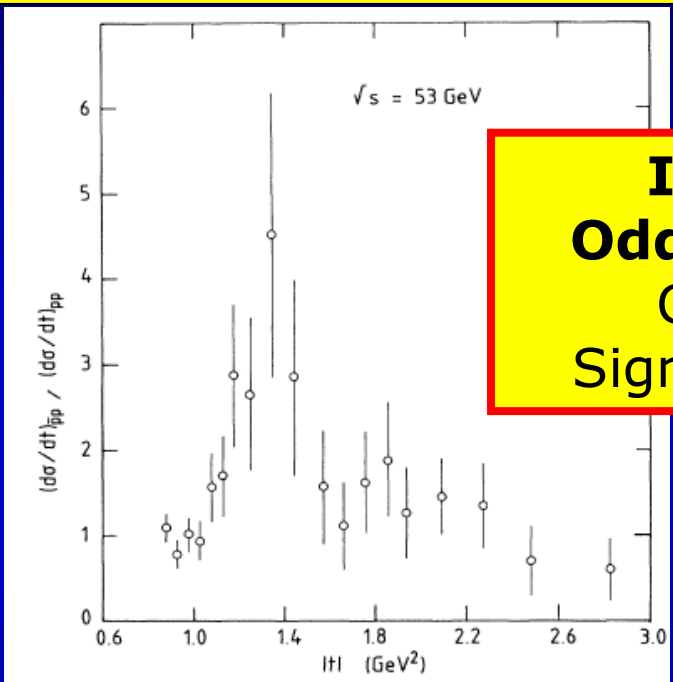
A jövő egyik legérdekesebb iránya

TUDOMÁNYOS ÁTTÖRÉS

ODDERON FELFEDEZÉS: TŰNÉKENY RÉSZECSKE

Odderon search at ISR: indication, but not yet a discovery
Breakstone et al, Phys. Rev. Lett. 54, 2180 (**1985**): CL = 99.9 %





Indication of Odderon-exchange
CL = 99.9 %,
Significance: 3.35 σ

Terminológy:
Agreement: if stat. significance < **3** σ
Indication, signal: if **3** σ ≤ significance < **5** σ
Evidence, or observation: if **5** σ ≤ significance
Discovery if **5** σ ≤ significance, az **for the first time**.
Accepted discovery: Clay Mathematical Institute (CMI) criteria satisfied.
MIScovery: if CMI criteria for Millenium Prize Problems **NOT** satisfied.

Odderon: az első REFERÁLT közlemény, jel > 5 σ

EPJ Web of Conf. (2020) **235**: 06005
https://doi.org/10.1051/epjconf/202023506002

Proton Holography -- Discovering Odderon from Scaling Properties of Elastic Scattering #4

T. Csorgo (Wigner RCP, Budapest and Eszterhazy Karoly U., Eger), T. Novak (EKU KRC, Gyongyos), R. Pasechnik (Lund U. and Rez, Nucl. Phys. Inst.), A. Ster (Wigner RCP, Budapest), I. Szanyi (Wigner RCP, Budapest and Eotvos U.) (Apr 15, 2020)

Published in: *EPJ Web Conf.* 235 (2020) 06002 • Contribution to: ISMD 2019 • e-Print: 2004.07095 [hep-ph]

Első publication, with at least 5.0 σ (6.26 σ) for Odderon-exchange:
Published on: **May 11, 2020**
EPJ Web of Conf. 235 (2020) 06002
Anonymously peer-reviwed, refereed conference proceedings.
(Proc. ISMD 2019, Santa Fe, USA)

DE: *„Never be the first! It is too eary!”*
Prof. P. Carruthers ~ 1990

Odderon: az első REFERÁLT folyóirat cikkek, jel > 5 σ

Evidence of Odderon-exchange from scaling properties of elastic scattering at TeV energies #5

T. Csörgő (Wigner RCP, Budapest and CERN), T. Novak (Unlisted, HU), R. Pasechnik (Lund U., Dept. Theor. Phys.), A. Ster (Wigner RCP, Budapest), I. Szanyi (Wigner RCP, Budapest) (Dec 26, 2019)

Published in: *Eur.Phys.J.C* 81 (2021) 2, 180 • e-Print: 1912.11968 [hep-ph]

Online attention

26 tweeters
15 news outlets
3 Mendeley
4 blogs
4 Wikipedia page
2 Facebook pages

This article is in the 98th percentile (ranked 6,037th) of the 428,075 tracked articles of a similar age in all journals and the 99th percentile (ranked 1st) of the 231 tracked articles of a similar age in *The European Physical Journal C*

Hungarian-Swedish team:
Eur. Phys. J. C (2021) **81**: 180, Published: 23 February 2021
https://doi.org/10.1140/epjc/s10052-021-08867-6

Observation of Odderon effects at LHC energies: a real extended Bialas–Bzdak model study #2

T. Csorgo (Wigner RCP, Budapest and EKU KRC, Gyongyos), I. Szanyi (Eotvos U. and Wigner RCP, Budapest) (May 28, 2020)

Published in: *Eur.Phys.J.C* 81 (2021) 7, 611 • e-Print: 2005.14319 [hep-ph]

Hungarian team, Polish-Hungarian model:
Eur. Phys. J. C (2021) **81**:611 , Published: 13 July 2021
https://doi.org/10.1140/epjc/s10052-021-09381-5

Odderon Exchange from Elastic Scattering Differences between pp and $p\bar{p}$ Data at 1.96 TeV and from pp Forward Scattering Measurements

TOTEM and D0 Collaborations • V.M. Abazov (Dubna, JINR) et al. (Dec 7, 2020)

Published in: *Phys.Rev.Lett.* 127 (2021) 6, 062003 • e-Print: 2012.03981 [hep-ex]

D0 and TOTEM Collaborations:
Phys. Rev. Lett. **127** (2021) 6, 062003, Published: 4 August 2021
https://doi.org/10.1103/PhysRevLett.127.062003

TUDOMÁNYOS ÁTTÖRÉSI DÍJ

A TUDOMÁNYOS ÁTTÖRÉSI DÍJAK RENDSZERE

breakthroughprize.org/Mission

marks | EKE-Femtoszkópia | Sebő | Ai | MATE VPN távoli co... | OneDrive for Busine... | WPCF 2023 - XVI W... | WPCF 2023 - XVI W... | KKP-2023: Cs

BREAKTHROUGH PRIZE

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MISSION

- celebrating *individual* achievement and honoring scientists as *heroes* of our society
- inspiring the *next generation* of scientists
- championing science for the benefit of all as a *global, apolitical* organization

A TUDOMÁNYOS ÁTTÖRÉSI DÍJAK ALAPÍTÓJA

EUREKA MANIFESTO

THE MISSION FOR OUR CIVILIZATION

A book about humanity's place in the Universe and our role in its future by Yuri Milner.

Any organization that is serious about doing something significant has a mission. But human civilization, as a whole, has nothing resembling a shared mission. In the long term, that means we cannot thrive — or probably even survive. But what could such a mission be? People, nations, and cultures vary wildly. Where on Earth do we look for a common goal?

Yuri Milner argues that we should look beyond Earth: in the universal story we are part of — and whose next chapters we can choose to write.

Yuri Milner is the founder of DST Global, one of the leading investment companies focusing on Internet technologies. Yuri and his wife Julia are the founders of the Breakthrough Prize Foundation, which supports researchers in fundamental sciences and mathematics, helps spread scientific ideas, and invests in advanced scientific initiatives.

THIS BOOK CRYSTALLIZED around an idea that first formed in my childhood, when I read Iosif Shklovsky and Carl Sagan's *Intelligent Life in the Universe*. I was fascinated by the possibility that intelligent beings are out there – but also by the thought that they are right here. They are us.

The year I was born, Sagan and the astronomer Frank Drake held the first scientific conference on how our civilization might communicate with others. Later, they used the giant Arecibo radio telescope to search for interstellar messages. In the sixty years since, no such message has arrived. But a few years ago, gazing up at Arecibo alongside Frank, it occurred to me that even while the receiver remained silent, I could at least communicate wit

Our own.

This manifesto is my me

beyond the horizon, to see the ex

we are part of, and there to find

AZ ALAPÍTÓ ÉS TÁRSAI

Anne E. Wojcicki (/wuːˈtʃɪtski/ *woo-CHITS-kee*;[2] born July 28, 1973) is an American entrepreneur. She is known for co-founding the personal genomics company 23andMe.

Mark
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vich (Bentsionovich) Milner[4]
ebrew: יורי מילנר, Russian: Юрий Борисович
енционович) Мильнер; born 11 November
61)[5] is a Soviet-born[1] Israeli
g/; born May
an who co-
cebook and
of which he is
, and
estor in Facebook, Twitter, Airbnb, Spotify,
investor, physicist and
a co-founder and former
ernet company Mail.Ru Group
a founder of investment firm
rough DST Global, Milner is an

Sergey Mikhailovich Brin (Russian: Сергей Михайлович Брин; born August 21, 1973) is an American computer scientist and businessman who co-founded Google with Larry Page. He was the president of Google's parent company, Alphabet Inc., until stepping down from the role

Priscilla Chan (born February 24, 1985)[2] is an American pediatrician and philanthropist.[3] She and her husband, Mark Zuckerberg, a co-founder and CEO of Meta Platforms, established the Chan Zuckerberg Initiative in December 2015 with a pledge to transfer 99 percent of their Facebook shares, then valued at $45 billion. She attended Harvard University and received her medical degree from the University of California, San Francisco.

2025: TUDOMÁNYOS ÁTTÖRÉSI DÍJ

Qubit.

Podcast Live

Több mint 70 magyar kutató is dolgozott azokon a kísérleteken, amelyek most tudományos Oscar-díjat kaptak

Bodnár Zsolt
04.08. · TUDOMÁNY

Qubit.

Podcast

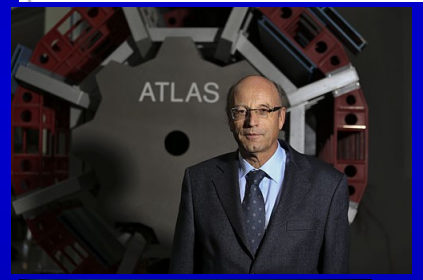
A tudományos Oscarnak is nevezett, 3 millió dolláros jutalommal járó Breakthrough-díjak nyerteseit a hétvégén jelentették be, és a magyar kutatói hálózat közlése szerint a három kategória (élettudományok, matematika, fizika) egyikében számos magyar érintett is volt.

KORÁBBI NEVEZETES DÍJAZOTTAK

LIFE 2022

2022[9]		Katalin Karikó (b. 1955)	Hungary United States	"for engineering modified RNA technology which enabled rapid development of effective COVID-19 vaccines."	BioNTech University of Pennsylvania
		Drew Weissman (b. 1958)	United States		University of Pennsylvania

PHYSICS SPECIAL 2013



2013 (special)	Stephen Hawking	For his discovery of Hawking radiation from black holes, and his deep contributions to quantum gravity and quantum aspects of the early universe.[10]
	Peter Jenni, Fabiola Gianotti (ATLAS), Michel Della Negra, Tejinder Singh Virdee, Guido Tonelli, Joe Incandela (CMS) and Lyn Evans (LHC)	For their leadership role in the scientific endeavour that led to the discovery of the new Higgs-like particle by the ATLAS and CMS collaborations at CERN's Large Hadron Collider.[10]

2025: TUDOMÁNYOS ÁTTÖRÉSI DÍJ ALAPVETŐ FIZIKÁBAN

2025: TUDOMÁNYOS ÁTTÖRÉSI DÍJ

A fizikai áttörésért járó elismerést a svájci CERN Nagy Hadronütköztetőjében végzett kutatásokért több mint 13 ezer kutató kapta, akik a négy nagy helyi kísérleten (ALICE, ATLAS, CMS és LHCb) dolgoztak. Ezt nem úgy kell elképzelni, hogy fejenként kb. kétszáz dollárt kapnak a kutatók – a kísérletek vezetőivel konzultálva a Breakthrough-díjakat kiosztó alapítvány az összeg 100 sz CERN&Society alapítványnak adományozta, amit ösztönd fordítanak. Ahogy a HUN-REN közleménye fogalmaz:

„A díjjal járó összeget az alapítvány arra fogja felhasznál nagy LHC együttműködés tagintézményeinek doktorandu számára ösztöndíjakat ajánljanak fel a CERN-ben töltött kutatási időre, amikor is a fiatalok tapasztalatot szerezhetnek a tudomány élvonalában végzett munkáról, és ezzel újszerű tudást és szakértelmet vihetnek haza országukba és régiójukba a CERN-i tartózkodás befejeztével.”

A díjazott kísérleteken többek között a HUN-REN Wigner FK Részecske- és Magfizikai Intézet, a HUN-REN ATOMKI, az ELTE, a Debreceni Egyetem és a MATE munkatársai is részt vesznek. Az ennek megfelelően díjnyertes magyar, illetve magyar egyetemen vagy intézetben kutatók névsora (egy név több intézmény alatt is szerepelhet):

2025: TUDOMÁNYOS ÁTTÖRÉSI DÍJ

Qubit.

ALICE kísérlet

- HUN-REN Wigner FK (23 fő): Barnaföldi Gergely Gábor, I Gyula, Berényi Dániel, Bíró Gábor, Boldizsár László, Fraj Gyulai László, Hamar Gergő, Kiss Gábor, Lévai Péter, Low Andrew John, Lökös Sándor, Mazzilli Marianna, Mishra A Nath, Molnár Levente, Oláh László, Sona Pochybova, Var Varga Zoltán, Varga-Kőfaragó Mónika, Vargyas Márton, V Róbert, Volpe Giacomo

ATLAS kísérlet

- HUN-REN ATOMKI (1 fő): ifj. Krasznahorkay Attila

CMS kísérlet

- MATE Műszaki Intézet, Femtoszkópia Laboratórium (4 fő): Csörgő Tamás, Nemes Frigyes, Novák Tamás, Szanyi István
- Debreceni Egyetem (5 fő): Oláh László, Raics Péter, Trócsányi Zoltán, Ujvári Balázs, Zilizi Gyula
- HUN-REN ATOMKI (8 fő): Molnár József, Czellár Sándor, Szillási Zoltán, Béni Noémi Tekla, Daniel Teyssier, Bencze György, Makovec Alajos, Karancsi János, Ujvári Balázs
- HUN-REN Wigner FK (17 fő): Balázs Tamás, Bartók Márton, Bencze György, Csörgő Tamás, Fehérkuti Anna, Hajdu Csaba, Hidas Pál, Horváth Dezső, Hunyadi Ádám, Márton Krisztina, Nemes Frigyes, Rádl Attila, Siklér Ferenc, Vámi Tamás Álmos, Veszprémi Viktor, Vesztergombi György, Zsigmond Anna Julia

2025: TUDOMÁNYOS ÁTTÖRÉSI DÍJ

CMS kísérlet

- Eötvös Loránd Tudományegyetem (27 fő): Csanád Máté, Nagy Márton, Pásztor Gabriella, Trócsányi Zoltán, Veres Gábor és Vesztergombi György (†2016) egyetemi oktatók; Ruchi Chudasama, Moisés León Coello, Nicolas Filipovic, Koushik Mandal, Lökös Sándor és Ankita Mehta posztdoktori kutatók; Bartók Márton, Farkas Krisztián, Fehérkuti Anna, Kadlecsik Ármin, Mahmoud Moussa Abdelkhalek Gadallah, Krajczár Krisztián, Major Péter, Rádl Attila, Surányi Olivér és Zsigmond Anna Júlia doktoranduszok; Böttger Rebeka Lilla, Horváth Mátyás, Komjáti Csenge és Kórodi Balázs egyetemi hallgatók

LHCb kísérlet

- Eötvös Loránd Tudományegyetem (4 fő): Biplab Dey egyetemi oktató, Debashis Sahoo posztdoktori kutató, Özgür Durmus doktorandusz, Mrityunjoy Singha egyetemi hallgató

KÖSZÖNÖM A FIGYELMET !

KÉRDÉSEK?