

# 7. EUROPEAN PHYSICS OLYMPIAD LEIBNIZ NEWS

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## Welcome to Hanover !



EuPhO Merchandise

### The 7th European Physics Olympiad commences today.

As the delegations across Europe and beyond arrive in Hanover, there is a palpable excitement in the air for this Olympiad. For some students, it is a new experience, while some have a feeling of déjà vu and a warm eagerness to meet their old friends.

About 181 students from 38 countries are participating in the 7<sup>th</sup> European Physics Olympiad.

The kits are ready to be handed out at the registration desks. The EuPhO merchandise comprises of a shirt, water bottle, notepad, ruler, and pencil enclosed in a black bag.

The first EuPhO was held in Tallinn, Estonia in 2017, the second in Moscow, Russia in 2018, and the third in Riga, Latvia in 2019. The fourth EuPhO was supposed to be held in Sato Mare, Romania in 2020, but was cancelled due to the global health situation and the Covid 19 crisis.

Instead, the Olympiad was organised online and was conducted with great success, much to the delight of all 257 participants from the 54 participating countries. The continued Covid crisis led to another online EuPhO in 2021. Slovenia conducted the first physical post-Covid EuPhO in 2022.

With Covid officially over, Leibniz University greets all the arriving delegations with open arms and a very warm welcome.

**We wish the students all the very best at EuPhO 2023 !**

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Team Singapore arriving at Leibniz University



Registrations

## Hello, Hanover!

A beautiful city of Hanover is the capital of the state of Lower Saxony. Located on the southern edge of the North German lowlands on the Leine and the Ihme, the town was first mentioned in 1150 and received city rights in 1241. The city and the former district are combined to form a special kind of municipal association called as the Hannover region, which belongs to the Hannover-Brunswick- Göttingen-Wolfsburg metropolitan region.



*The New Town Hall, Hanover*

Hanover is home to fifteen universities and several libraries. The correspondence of Gottfried Wilhelm Leibniz and the Golden Letter, preserved in the Gottfried Wilhelm Leibniz Library, are part of the UNESCO World Document Heritage. Hanover is an important research and business location as well as a nationally important shopping city. The cultural scene is diverse with numerous theatres, museums and international theatre, music and dance festivals. Hanover is a major sports city and also a UNESCO City of Music since 2014.



*The Golden Gate in the Herrenhausen Gardens, Hanover*



*Maschsee, Hanover*

The cityscape is characterized by numerous public green spaces, a high density of street art, and numerous monuments, including representative buildings of the North German Brick Gothic, the Hanover School of Architecture, Brick Expressionism and Classicism. The Hannover adventure zoo, the Maschsee lake, and the Herrenhausen Gardens with the Herrenhausen Palace are known nationally, and the arched elevator in the New Town Hall is a worldwide rarity.



*Exhibition Center, Hanover*

With the second largest exhibition center in the world and numerous world-leading trade fairs, Hanover is one of the leading trade fair cities in Europe. The Maschsee Festival is the largest lake festival in Germany.

## Hanover's Old Town Area

Hanover's popular and large old town at the city centre is dominated by narrow lanes and many half-timbered ancient buildings from the Middle Ages. Pack a sandwich and a fruit juice when you take a walk around Hanover's old town and explore the quaint shops in the area. Alternatively, you can also book a walking tour and see the places in Hanover's old town area with your friends and colleagues.



Map of Hanover City Center

The old town of Hanover extended from Steintor to Aegidientorplatz and is today recognizable only by its elliptical shape. The old main streets like Burgstraße, Schmiedestraße, Knochenhauerstraße, Osterstraße, and Leinestraße and a few others are linked by many lanes. They join again at the old gates, as was common in the settlements of German merchants in the Middle Ages.



Markt Kirche and the old town hall, Hanover

The Kreuzkirche is the oldest church in Hanover which was built in 1333. The interior of this church was destroyed in the Second World War. The Altar, designed by Lucas Cranach the Elder, comes from a church in Einbeck. The Duvkapelle, adjacent to the Kreuzkirche, was built in 1655 and contains the family vault of the Duve family, a prosperous merchant family.

Along Kreuzstraße, the path leads to the Ballhofplatz. The Ballhof, built in 1649-64, used to be a sports hall, designed for ball games out of the wind and rain. Later, it was used as an assembly hall and eventually became a theatre. The Ballhofplatz was only created in the thirties when during a redevelopment process many old buildings in that area were demolished.

The Leineschloss, is a reconstructed Neoclassical palace which now serves as the place of the Lower Saxony parliament.



Old Town Area, Hanover



Leibniz University (summer), Hanover

## Leibniz University

Leibniz University gets its name from Gottfried Wilhelm Leibniz. It is only befitting that a University in Hanover is named after him. It is a public research university and is a member of TU9, an association of the nine leading Institutes of Technology in Germany. Leibniz University is also a member of the Conference of European Schools for Advanced Engineering Education and Research, a non-profit association of leading engineering universities in Europe. The university sponsors the German National Library of Science and Technology, the largest science and technology library in the world.

The university also sponsors the German National Library of Science and Technology. The library was

established on the founding of the Polytechnische Schule in 1831. It expanded into an important collection as the institution evolved from a vocational and technical college into a full university. The removal of the books into storage during the Second World War secured valuable old stocks that became a unique national collection of scientific and technical literature in postwar Germany. This was the basis on which the library of the Institute of Technology was established in 1959. Today, the collection forms the heart of the German National Library of Science and Technology, which is the largest institution of its kind in the world.

Leibniz University has notable faculty such as Konrad Meyer, as well as alumni such as Henrich Focke. While 64 students first attended the Vocational School, today the university has around 25,700 students, more than 2900 academics and scientists, and 160 departments and institutes.



Leibniz University (winter), Hanover

## Gottfried Wilhelm Leibniz

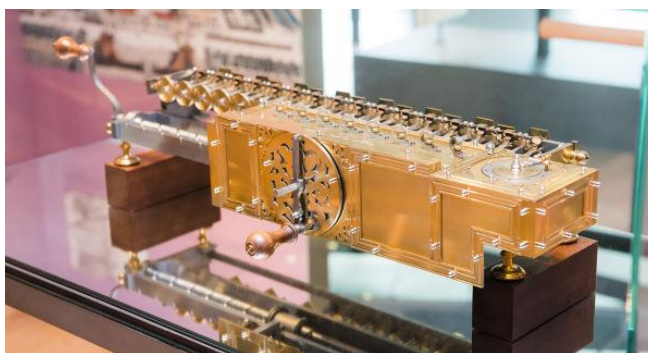


*Gottfried Wilhelm Leibniz*

Gottfried Wilhelm Leibniz was one of the greatest polymaths. He was born on 1 st July 1646 in Leipzig. He knew advance Latin by age 12 and taught himself Greek because he wanted to study the books in his father's library! His father was a professor at the University of Leipzig. At age 16 Leibniz graduated with a Bachelor's degree in philosophy, and by age 18 had attained a Master's degree. At age 20, he earned his doctorate in law.

He was called a universal genius because of his contribution to so many subjects. Some of his contributions are the following:

- He also wrote extensively on Theology, Law, and politics and was a key figure in the development of International law.
  - His concept of Monads in Philosophy has inspired modern theories in physics, psychology, and the philosophy of the mind. He is considered a philosopher of the modern period and is ranked with the likes of Renee Descartes, John Locke, and Emmanuel Kant.
  - He devised a cataloguing system for libraries which was later adapted by many large libraries in Europe.
  - He invented the mechanical calculator and demonstrated it at the Royal Society in London where he was elected a Fellow of the British Royal Society on 19 th April 1673.
  - He was also a diplomat, jurist, and a linguist.
- Leibniz wrote over 50,000 documents in his life and was in contact through letters with over a thousand people. He wrote mostly in Latin and French with a little in German. A compilation of his work was started in early 1900's and will not be finished till the middle of the 21 st Century!
- Leibniz died in Hanover on 14 th November 1716 and was buried in St. Thomas's church in Leipzig where a plaque now marks his grave. The grave had remained unmarked for 50 years. In 1985 the German government instituted the Leibniz prize which is considered the most important prize in Germany for research. It is given annually for scientists working at German Universities and German research Institutes in Germany and abroad.



*Replica of the Leibniz calculating machine*

## German Nobel Prize Winners for Physics

Since the inception of the Nobel prize, 114 German people have received the Nobel Prize in the fields of Science, Arts, and for Peace. Among them, some of the physicists and their discoveries are the following:

| No. | Name                         | Prize Year | Famous for   |
|-----|------------------------------|------------|--|
| 1   | Wilhelm Conrad Röntgen       | 1901       | For discovery of the X rays  |
| 2   | Philipp Lenard               | 1905       | For the invention of the Photoelectric cell  |
| 3   | Karl Ferdinand Braun         | 1909       | For invention of Cathode-ray oscillograph  |
| 4   | Max von Laue                 | 1914       | For diffraction of X-rays on crystals  |
| 5   | Max Karl Ernst Ludwig Planck | 1918       | For invention of the quantum theory  |
| 6   | Johannes Stark               | 1919       | For the Doppler effect in canal rays and splitting of spectral lines in electric fields  |
| 7   | Albert Einstein              | 1921       | For the General theory of relativity published in 1905, Special theory of relativity and more !  |
| 8   | Gustav Ludwig Hertz          | 1925       | For experimentally confirming the quantum theory that atoms can absorb energy only in definite amounts thus confirming the Bohr's model of the electron. |
| 9   | James Franck                 | 1925       | For laws governing the impact of an electron on the atom.  |
| 10  | Werner Karl Heisenberg       | 1932       | For the theory of quantum mechanics published in 1925 when he was only 23 years old!   |
| 11  | Max Born                     | 1954       | For further development of quantum mechanics   |
| 12  | Polykarp Kusch               | 1955       | For innovations in quantum electrodynamics   |
| 13  | Maria Goeppert-Mayer         | 1963       | For discoveries about the shell nuclear model  |
| 14  | J. Hans D. Jensen            | 1963       | For the shell nuclear model (shared prize)   |
| 15  | Klaus von Klitzing           | 1985       | For discovering the quantum Hall effect  |
| 16  | Gerd Binnig                  | 1986       | For inventing the scanning tunneling microscope  |
| 17  | Ernst Ruska                  | 1986       | For developing the first electron microscope   |
| 18  | J. Georg Bednorz             | 1987       | For discovering the high temperature superconductors   |
| 19  | Jack Steinberger             | 1988       | For discovering the muon-neutrino  |
| 20  | Wolfgang Paul                | 1989       | For developing a method to trap charged atoms  |
| 21  | Horst L. Störmer             | 1998       | For discovering of Fractional quantum Hall effect  |
| 22  | Theodor W. Hänsch            | 2005       | For contribution in Laser-spectroscopy   |
| 23  | Peter Grünberg               | 2007       | For discovery of giant magnetoresistance   |
| 24  | Rainer Weiss                 | 2017       | For LIGO detector and the observation of gravitational waves   |
| 25  | Reinhard Genzel              | 2020       | For refined techniques for studying the movement of stars.   |
| 26  | Klaus Hasselmann             | 2021       | For the physical modeling of earth's climate   |

Maria Goeppert-Mayer was the only woman Physicist. Many physicists were born in Germany but later settled in other countries.

## People's Specials



Bruno Wetton, Student from Team Switzerland

### Bruno Wetton, Student from Team Switzerland

"I would love to explore Hanover, get to know the region, the people, and the participants of this Olympiad, because this is a lifetime chance. These are the things that might define the future, from a point of view of the year 2050. I think this is a wonderful chance to get to know the people who may change and shape the future. So all in all, I really want to get to know as many people as I can and also do some great physics while I'm at it! It's a collective passion here."

### Savankumar Hirpara, Marker

"This is a nice experience for me. I chose to volunteer as a marker, because I wanted to interact with the students. I am a physics student as well, and I wanted to know the creativity, the approach, and how they try to solve the problems. This is my first time as a marker, so I am very excited. I'm sure it is going to be a wonderful experience."



Savankumar Hirpara, Marker

## EVENT SCHEDULE

### June 17

#### Students' program

|               |   |
|---------------|---|
| 7:00 - 7:45   | Breakfast and packing of lunch  |
| 7:45 - 8:45   | Meet in Lobby and transfer with guides  |
| 9:00 - 14:00  | Experimental Exam   |
| 14:00 - 14:30 | Packed Lunch  |
| 14:30 - 15:15 | Transfer by public transport with guides  |
| 15:30 - 17:30 | Excursion Hannover Zoo ( <a href="http://www.zoo-hannover.de/en">www.zoo-hannover.de/en</a> ) |
| 17:45 - 18:30 | Transfer by public transport with guides  |
| 18:30 - 19:30 | Dinner  |

#### Program Leaders and Observers

|               |  |
|---------------|--|
| 5:00 - 8:00   | Translation of Experimental Exam                     |
| 8:00 - 10:00  | Breakfast  |
| 10:00 - 12:30 | Free Time  |
| 12:30 - 13:30 | Lunch  |
| 14:00 - 14:30 | Introduction to City Tour (Building 1507 / Room 002) |
| 15:00 - 18:00 | Walking City Tour in 4 groups                        |
| 18:00 - 20:00 | Dinner (Brauhaus Ernst August, Schmiedestraße 13)    |

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