February 13, 2026
PVA EXPO PRAGUE

Guidebook

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Fyziklani2026

Dear participants of Fyziklani 2026!

I am delighted to welcome you to the jubilee **20th edition** of Fyziklani. When 104 students in 21 teams gathered in 2006 in a single room at the Faculty of Mathematics and Physics of Charles University, few could have imagined how far Fyziklani would come. Today, we meet at an event that has grown into an international competition, regularly bringing to Prague **more than a thousand contestants** and standing on the tremendous work of a community of volunteers.

Over two decades, much has changed: the venue, the breadth of the accompanying program, the event's technical setup, and the number of countries involved. Over the years, my colleagues and I have faced many challenges – whether it was the capacity of the premises, the online edition during the coronavirus pandemic, or funding issues. Yet we have always managed to overcome them, and thanks to that, Fyziklani has kept moving forward. And the most important thing has remained almost unchanged throughout – **the joy of physics and the competitive spirit**.

In this booklet you will find all essential information about the competition itself, the accompanying program, and accommodation. You will also find information about the organizers and partners, without whose work and support Fyziklani could not operate on such a scale.

Before I wish you the best of luck, allow me a brief personal note. This year's Fyziklani is my last edition in the role of Head Organizer. I would therefore like to sincerely wish good luck to the colleagues who will take over this role after me – and to Fyziklani itself: may it continue to grow while preserving what makes it so special.

I hope that this year's edition will be a true celebration of physics for you – and that you will remember it not only for the results, but above all for the atmosphere we will create here together. ◡̈

Vojtěch David
Head organizer of Fyziklani

Contents

Game Schedule

08:45 – 09:45 **Team Arrival at PVA EXPO**
Presence of Teams before the competition.
Please arrive on time to speed up the process.

10:00 – 10:25 **Opening Ceremony**
Explanation of the rules and course of competition. Opening.

10:30 – 13:30 **Competition**
Participants compete for 3 hours. During the competition, a program is prepared for the accompaniment.

14:00 – 14:45 **Announcement of Results**
Presentation of valuable prizes for the winning teams and awarding diplomas. The end of the contest.

14:45 – 14:50 **Joint Photo Shoot of the Winners**
Ceremonial immortalization of the competition winners.

Useful Contacts

Name	Role	Phone number
Monika Drexlerová	Head of the Competition Registration	+420 730 578 739
Matyáš Beran	Accompanying Program	+420 773 275 599
Petr Kahan	Accompanying Program	+420 720 260 115
Simona Švecová	Accommodation (Hotel Duo)	+421 918 751 873
Denisa Zdvořilá	Accommodation (Hotel PULSE8)	+420 722 018 074
Vojtěch David	Head Organizer of Fyziklani	+420 730 974 923

For problems concerning arrival to the accommodation contact Simona Švecová (Hotel Duo) or Denisa Zdvořilá (Hotel PULSE8), in case of delays or problems with travel on the day of the contest, contact Monika Drexlerová. In case of complications during the accompanying program, please contact Matyáš Beran or Petr Kahan. Only call Vojtěch David when absolutely necessary.

You can also contact us by email at **fyziklani@fykos.org**.

Accommodation

Hotel Duo is a four-star hotel. It is located near the metro station Střížkov. Besides 654 rooms, Hotel Duo also offers many high-quality services for leisure time and business affairs. The hotel address is **Teplická 492, 190 00, Prague 9, Czech Republic**.

Some participants will also be accommodated at Hotel PULSE8, which is located a short walk from the Křižíkova metro station. You can find its location at **Sokolovská 54/112, 186 00 Prague, Czech Republic**.

Check-In, Check-Out

You can **check in from 15:00**. On the departure day, please leave your room, take all your belongings, and **check out before 10:00**.

Fees and Deposits

Please note that the participants of age 18 years or older will need to pay the city tax of approx. €2 (50 CZK) per night at the arrival to the hotel. All participants under the age of 18 will pay a refundable deposit of approx. €30 (750 CZK) on check-in.

Venues and Maps

PVA EXPO PRAGUE

The competition takes place at PVA EXPO PRAGUE at **Beranových 667, 199 00 Prague 9, Czech Republic**, specifically in the Hall 1. To enter the hall, you must use the (rear/side) Entrance Hall I.

Other Venues

The accompanying program of the competition will take place mainly at the following locations.

Troja Campus V Holešovičkách 2/747, 180 00 Prague 8
The campus of CUNI MFF, which mostly houses the departments of the physics section. The program will take place in the modern IMPAKT Pavilion (lecture hall **N1**), located on a hill next to the road, and in the T Lecture Rooms (lecture halls **T1** and **T2**), located immediately next to the highest building in the area.

Malá Strana Campus Malostranské náměstí 2/25, 118 00 Prague 1
The Profesní dům is a historic building with a rich past and is now home to the Computer Science Section of CUNI MFF. The program will take place on the 1st floor (lecture hall **S9** and the Refectory) and on the 3rd floor (lecture hall **S3**). The building can be entered directly from the Malostranské náměstí square.

Transportation

To get to the **competition venue**, take metro line C (red, goes from the **Hlavní nádraží** station or the **Florenc** bus station in the Letňany direction) – get off at **Letňany** (terminus). Then walk for about 5 minutes to get to the **PVA EXPO building**. **To enter the hall you must approach from the side, see the map**.

From **Hotel Duo**, you can reach metro station Střížkov within a 5-minute walk. Then, metro line C (red) will get you both to Letňany, and to **Nádraží Holešovice**, from where you can get to **Campus Troja** (V Holešovičkách 2) within a 10-minute walk. Alternatively, you can take the bus 201 from the stops Střížkov or Nádraží Holešovice to the stop Kuchyňka.

From **Hotel PULSE8**, you can walk to the **Křižíkova** stop. From there, you can take metro line B or a tram to Florenc, from where you can continue by metro line C (as described above) to Letňany or to Nádraží Holešovice.

For getting to Problem Analysis and Buffet, we recommend taking metro line A (if you're coming from line C, transfer to line A at **Muzeum**) to **Malostranská** station, then continue on foot or by tram (lines 12, 15, 20, or 22) to the **Malostranské náměstí** stop.

Recommended Apps

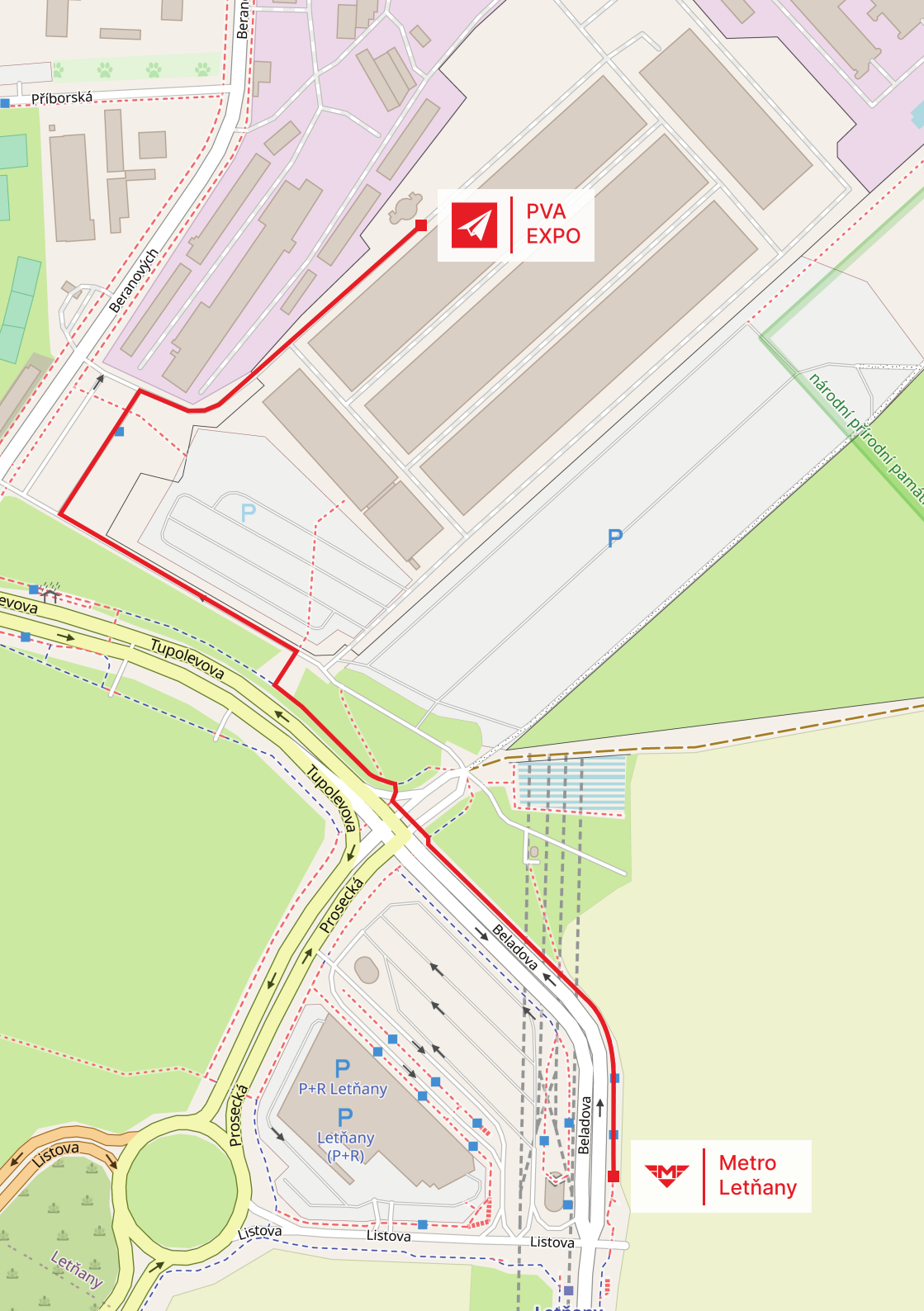
For easy orientation during Fyziklani, you can use Mapy.cz app, which enables users to download map of Prague that works even in offline mode.

Prague has a well-developed public transportation. To search for connections, or to buy tickets with a card, we recommend using the official app PID Lítačka.

You can download both apps here (works for Android and iOS).

Mapy.cz app

PID Lítačka app


PVA
EXPO
Příborská
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Listova
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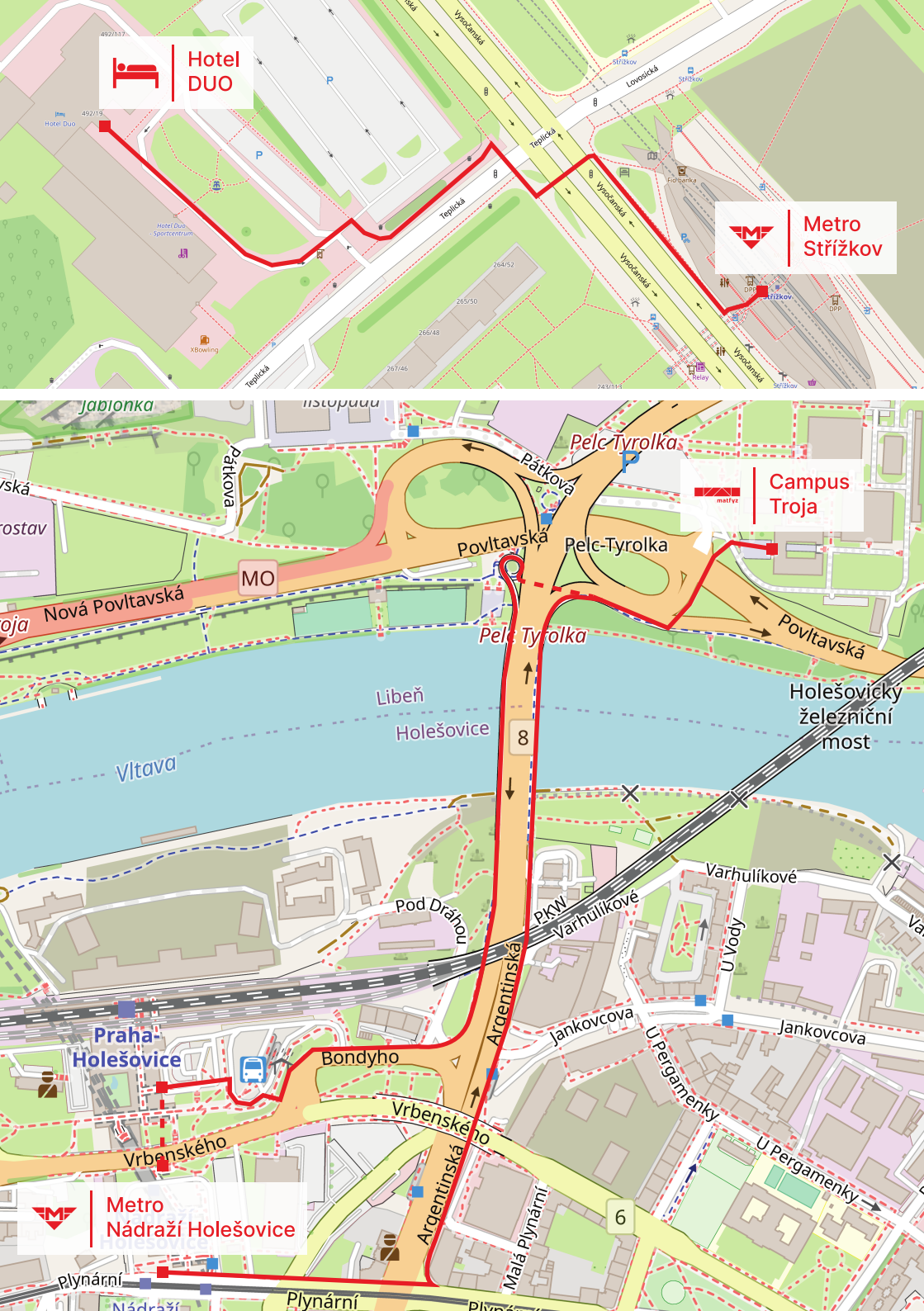
Letňany
národní přírodní památ
Metro
Letňany


Hotel DUO
Metro Střížkov
Campus Troja
Metro Nádraží Holešovice
Pelc Tyrolka
Pátková
Povltavská
Pelc-Tyrolka
Nová Povltavská
MO
Libeň
Holešovice
Vltava
8
Holešovický železniční most
Pod Dráhou
PKW
Varhulíkové
Argentinská
Jankovcova
U Vody
U Pergamenky
Praha-Holešovice
Bondyho
Vrbenského
Malá Plynární
6
Plynární
Lovosická
Teplická
Vysočanská

Accompanying Program

Tuesday Feb 10

19:00 – 23:00 **Night Tour of Prague**

Tour of Prague in a unique evening atmosphere

Wednesday Feb 11

10:00 – 12:15 **Morning with Astronomy**

Two interactive astronomy-focused lectures

14:40 – 16:30 **Planetarium**

Tour of the newly renovated Planetarium Prague

17:00 – 22:00 **Nations' Evening**

An evening dedicated to presenting the cultures of the teams' countries

Thursday Feb 12

09:00 – 15:00 **One Day with Physics**

A day full of lectures and lab tours at CUNI MFF

19:00 – 21:00 **Panel Discussion with Scientists**

Discussion with Czech scientists about physics and their work

Friday Feb 13

08:45 – 15:00 **Fyziklani**

Competition

17:00 – 18:30 **Problem Analysis**

Presentation and analysis of the authors' solutions to this year's Fyziklani problems

18:30 – 22:00 **Buffet + 20th Anniversary Celebration**

Ceremonial dinner with other contestants and the organizers

Saturday Feb 14

09:30 – 12:00 **Lectures**

Lectures by leading Czech scientists

14:00 – 16:00 **Round Tables**

Come and talk with scientists about physics and beyond.

18:30 – 23:59 **Board Games Evening**

Informal gathering with organizers and contestants over board games

Tuesday

Evening Tour of Prague **Tuesday 19:00 – 23:00**

The tour will be divided into four routes, and you will be able to choose one of them in the registration form. **The meeting point for everyone is at 19:00 in front of Hotel Duo**, where you will split into groups and be taken over by your guides. The expected return to the hotel is at 22:00, except for the Letná route, which is planned to end at approximately 23:00.

If you're staying at the PULSE8 hotel, you'll receive meeting point details in a separate email.

Vyšehrad

Discover the beauty of Vyšehrad and its unique views over Prague. At Vyšehrad, we'll stop by the Basilica of St. Peter and St. Paul, and enjoy several viewpoints overlooking the Vltava River. Then we'll set off for a calm (and, if you like, even romantic) walk along the river embankment all the way to the Dancing House.

Old Town

A packed evening tour of Prague's historic center, where you'll see the city's most famous landmarks as well as lesser-known corners. Expect striking night panoramas of the Old Town and Lesser Town. The program is flexible — depending on the group's pace and your preferences, the route can be shortened or adjusted.

Vítkov

Žižkov and Karlín — two neighborhoods connected by a single tunnel, places every local knows, but most tourist guides won't take you to. After a look at the Church of Sts. Cyril and Methodius, a beautiful and somewhat underrated Gothic building, we'll begin a gentle climb through the city bustle toward Jan Žižka of Trocnov — the monumental statue watching over Žižkov. From there we'll walk through the park on Vítkov all the way to Vítkov Hill itself. Through Žižkov and the Žižkov Tunnel, a big-city underground gem, we'll then make our way back at an easy pace.

Letná

A longer walk featuring Prague's evening viewpoints. We'll cross Letná Plain to reach Prague Castle and Petřín, then finish by descending to Lesser Town and crossing Charles Bridge into the Old Town. If you're interested and the weather is good, we can also stop by Strahov Stadium along the way.

Wednesday

Morning with Astronomy

Introduction to the Czech Rocket Society Wednesday 10:00 – 11:00
CRS Team – N1
Introducing the world of amateur and student rocketry through the activities of the Czech Rocket Society. Participants will learn what it takes to design, build, and successfully launch a functional rocket; from the initial idea, through the basic principles of rocket propulsion, aerodynamics, and structural design, to testing, safety, and teamwork. The lecture shows that building a rocket is not only about physics and calculations, but also about project management, creativity, and perseverance. The goal is to provide a clear introduction to rocket engineering and to motivate students to get involved in technical and scientific projects.

IAP in Space Wednesday 11:15 – 12:15
RNDr. David Píša, Ph.D. – N1
The Department of Space Physics at the IAP CAS is involved in some of the most ambitious missions of the European Space Agency (ESA). This lecture will introduce flagship projects exploring the physics of the Sun (Solar Orbiter), the icy moons of Jupiter (JUICE), and upcoming missions targeting comets and Mars. Students will gain insight into the physical principles behind these measurements and the engineering challenges of operating in extreme deep-space environments. Join us to discover how local research contributes to global discoveries across our Solar System.

Afternoon Program

Tour of the Planetarium Prague Wednesday 14:40 – 16:30
Tour of the newly renovated Planetarium Prague. You can look forward to a "stargazing" show of the projected night sky in the planetarium dome, followed by a short film. After the program ends at 16:00, you can stay in the planetarium to explore its exhibitions.

Arrive no later than 14:40 at the tram stop Výstaviště (do not confuse it with the stop Výstaviště Letňany).

Nations' Evening Wednesday 17:00 – 22:00
The Nations' evening will be an opportunity for all foreign participants to get to know each other's cultures and learn something new about them. Each team

will prepare a small introduction to their country, which may include food, clothing, songs, dances, or other cultural enrichment.

The program will take place in the Impakt Pavilion in the Troja Campus; participants have received detailed information by email.

Thursday

Lab tours – Campus Troja Thursday 08:45 – 11:30

Please arrive no later than 8:45 at the Troja Campus at the Lecture Hall Building auditorium.

For more information visit
`https://fyziklani.org/schedule/detail#820`

Afternoon lecture

The lecture will take place at the Troja Campus.

Heisenberg's Magic Insight into the Breakdown of Classical Mechanics at the Microscale [EN]

doc. Mgr. Tomáš Mančal, Ph.D. – N1 Thursday 14:00 – 15:00

In the early summer of 1925, Werner Heisenberg discovered mathematical laws governing observable quantities in the microworld and formulated the first complete version of what later became quantum mechanics. We will revisit the historical context of this discovery and explain the key elements of Heisenberg's reasoning. This will provide relatively simple tools to demonstrate the crucial differences between classical and quantum mechanics, and to explain how the two theories come to agree as we approach the realm of macroscopic objects.

Evening Program

Panel Discussion Thursday 19:00 – 21:00

During the panel discussion on the topic **Czechs in Large-Scale Projects**, several leading scientists will share their experience from international collaborations — how Czech teams get involved, what it takes to work with massive infrastructure, and what opportunities and challenges such projects bring. The panel will feature:

RNDr. Martina Boháčová, Ph.D.
An astroparticle physicist at the Institute of Physics of the Czech Academy of Sciences. She focuses on developing and testing detectors for major international cosmic-ray observatories and is involved in the **Pierre Auger Observatory** project.

Mgr. Martin Rybář, Ph.D.
An experimental particle physicist at the Faculty of Mathematics and Physics, Charles University. His research focuses on the **ATLAS experiment at the LHC (CERN)**. He is also a prominent science communicator and takes part in public outreach events.

doc. Petr Kabáth, Dr. rer. nat.
An astronomer at the Astronomical Institute of the Czech Academy of Sciences specializing in exoplanets. He is a member of the **PLATO** (ESA) Mission Board and also leads the **PLATOSpec** spectrograph project (ESO, La Silla) for the discovery and characterization of exoplanets.

Ing. Jan Souček, Ph.D.
A scientist at the Institute of Atmospheric Physics of the Czech Academy of Sciences involved in ESA space missions. He works on plasma and radio-wave measurements and instrumentation for missions such as **Solar Orbiter**, **LISA**, and **Athena**.

The discussion will be moderated by **Marek Milička**, a theoretical physics student at the Faculty of Mathematics and Physics, Charles University, and a longtime FYKOS organizer.

The discussion will take place in lecture hall N1 at the Troja Campus.

Friday

Problem Analysis Friday 17:00 – 18:30
Analysis of competition problems with some of their authors. The program will take place in lecture hall **S9** in the Malá Strana Campus.

Buffet + 20th Anniversary Friday 18:30 – 22:00
After Friday's competition, you will have the opportunity to meet all participants staying in Prague at a festive reception and celebrate 20 years of Fyziklani together with us.

The reception will be held at the **Refectory** on the first floor of the Malá Strana Campus. The venue will open to participants at 18:30, followed by the ceremonial opening at 19:00.

Saturday

Lectures

The lectures will take place at the Troja Campus.

First Block Saturday 09:30 – 10:30

Nuclear Fusion and Its Research [CS]
Mgr. Aleš Podolník, Ph.D. – N1
This lecture is held in Czech.

Watching Metals Deform: What happens inside? [EN]
Mgr. Lucia Bajtošová – T1
What really happens inside a metal when we try to pull it apart? With electron microscopes, we can watch metals deform from the inside, at a scale where atoms rearrange. Why are some metals stronger than others, and just how close can electrons let us see? In this talk, we'll zoom into matter using transmission electron microscopy and explore what we actually see when we look really, really close.

Second Block Saturday 10:50 – 11:50

The Hitchhiker's Guide to Exoplanets [CS/SK]
Mgr. Daniel Dupkala – N1
This lecture is held in Slovak.

Operando Techniques for Green Hydrogen: Understanding Catalysts under Operation [EN]
RNDr. Tomáš Hrbek, Ph.D. – T1
Hydrogen is a promising energy carrier for large-scale storage of renewable electricity, with proton exchange membrane water electrolysis (PEM-WE) being among the most efficient production technologies. Its major limitation is the reliance on scarce and expensive iridium-based catalysts that must operate under harsh electrochemical conditions.

This lecture focuses on why catalysts cannot be reliably understood solely through ex situ experiments and why operando techniques are essential. It introduces operando methods that allow direct observation of chemical and structural changes during electrolysis. Using examples of bimetallic catalysts such as Ir–Ru, the lecture shows how dynamic surface transformations and nanoscale structure enable significant reductions in iridium loading without sacrificing performance or stability.

The talk highlights how combining electrochemistry with surface-sensitive physics provides the insight needed to rationally design catalysts for green hydrogen technologies.

Afternoon Program

Round Tables Saturday 14:00 – 16:00

Come meet scientists and other experts in person and chat with them about their work, studies, science, and anything else you're curious about. Our invitation was accepted by:

Mgr. Daniel Dupkala
Conducts exoplanet research at Trinity College Dublin and has long been involved in organizing the FYKOS and Fyziklani competitions.

RNDr. Tomáš Hrbek, Ph.D.
Works at the Faculty of Mathematics and Physics, Charles University, at the Department of Surface and Plasma Physics within the Nanomaterials Group, focusing on applied research for hydrogen technologies.

Mgr. Vojtěch Pleskot, Ph.D.
Works at the Institute of Particle and Nuclear Physics, is also involved in the ATLAS experiment at CERN, and is active in particle physics outreach and science communication.

doc. Mgr. Jan Hanuš, Ph.D.
An associate professor at the Faculty of Mathematics and Physics, Charles University, in the Department of Macromolecular Physics. He focuses in particular on preparing nanoclusters and nanoparticles and on developing nanoparticle sources.

doc. RNDr. Martin Kozák, Ph.D.
An associate professor at the Faculty of Mathematics and Physics, Charles University, in the Department of Chemical Physics and Optics. His research focuses on advanced and ultrafast electron microscopy.

RNDr. Klára Uhlířová, Ph.D.
Works at the Faculty of Mathematics and Physics, Charles University, in the Department of Condensed Matter Physics in a group focused on the magnetic properties of materials.

doc. RNDr. Karel Houfek, Ph.D.
Head of the Institute of Theoretical Physics at the Faculty of Mathematics and Physics, Charles University. He works in theoretical atomic and molecular physics and is also involved in faculty governance, for example through the Academic Senate.

The program will take place in the Impakt Pavilion at the Troja Campus.

Board Games Evening Saturday 18:30 – 23:59
The accompanying program of Fyziklani started in 2012 as an informal post-competition gathering focused on board games. Come meet other participants and organizers, play a variety of board games, and enjoy a relaxed evening, possibly with additional activities.

The program will take place in the first floor of the Lecture Hall Building in the Troja Campus.

Experience Prague

If you want to experience Prague even more, we encourage you to tour the city and discover its hidden gems either by participating in our City Rally or entirely by yourself. We highly recommend the YouTube channel HONEST GUIDE (see for example `https://www.youtube.com/watch?v=fta6FjsqV2I`) which neatly showcases what to try (and what to avoid). You may, perhaps, also visit the following museums, each of which is unique in its own way.

National Museum Václavské náměstí 68, Prague 1
The largest museum in the Czech Republic with 25 expositions mostly related to history of Czech Republic. If you would like to know more about country hosting Fyziklani, you should definitely visit it.

The National Museum houses nearly 14 million items from the areas of natural history, history, arts, music and librarianship, thus offering something for everyone.

`https://www.nm.cz/en`

Visitor Center of Czech National Bank Na Příkopě 28, Prague 1
An exciting place in the center of Prague where you can learn something about the Czech currency and the basics of economy. You can also get some free Czech crowns or simply stop inflation by riding a bike.

`https://nc.cnb.cz/pub/en/`

Franz Kafka Museum Cihelná 2b, Prague 1

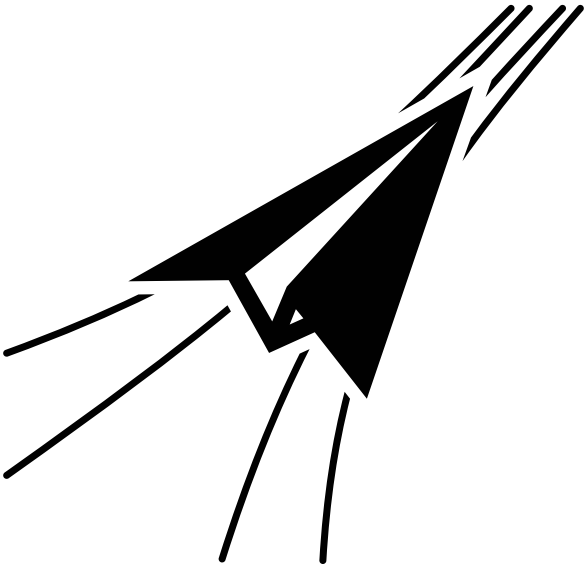
The long-term exhibition offers a glimpse into the world of the famous Prague native Franz Kafka, one of the most important figures of 20th century world literature.

`https://kafkamuseum.cz/en/`

The Museum of Decorative Arts in Prague 17. listopadu 2, Prague 1

A museum featuring interesting art-related exhibitions for anyone who wants to relax and ponder after the exhausting week.

`https://www.upm.cz/en/`



Patronage

Besides the main organizers and the partners, several important public figures significantly contributed and offered their patronage to the competition. We would like to thank them here.

The patronage of this year's event was taken over by **RNDr. Miloš Vystrčil**, President of the Senate of the Parliament of the Czech Republic, Czech politician and pedagogue. After graduating in mathematics-physics at the Faculty of Science of Masaryk University, he worked as a teacher at the Otokar Březina Grammar School, where he also served as deputy headmaster. In his rich political history, he served as the Governor of the Vysočina Region and as the Mayor of Telč. He is currently a Senator for District 52 – Jihlava and since 2020 the President of the Senate of the Parliament of the Czech Republic.

The competition is also held under the patronage of **prof. RNDr. Radomír Pánek, Ph.D.**, President of the Czech Academy of Sciences (CAS), and a prominent Czech scientist specializing in plasma physics and nuclear fusion. He studied theoretical physics at the Faculty of Mathematics and Physics, Charles University, earning his Mgr. degree in 1998, followed by a Ph.D. and the RNDr. degree in 2002. From 2000, he worked at the Institute of Plasma Physics of the CAS, where he held several senior roles, including Director of the institute (since 2015) and Director of the COMPASS-U project (since 2018). His research focuses on tokamak plasma physics, magnetic confinement, plasma instabilities, and advanced fusion technologies, and he is active in international committees, including the European fusion consortium EUROfusion and EURATOM committees.

Miloš Vystrčil

Radomír Pánek

Organizers

Vojtěch David (Head Organizer of Fyziklani)
Studies 2nd year of MSc. Mathematical Structures at CUNI MFF.

Michal Červeňák (IT, Management of Fyziklani)
Works at the Academy of Sciences of the Czech Republic.

Kateřina Rosická (Consultant of Fyziklani, Accommodation)
Studies 2nd year of Ph.D. Physics of Plasmas and Ionized Media at CUNI MFF and Institute of Atmospheric Physics CAS.

Adam Krška (IT, Typography, TeX)
Studies 1st year of MSc. Information Systems and Databases at FIT BUT.

Elena Chochoľaková (Consultant of Fyziklani, Accompanying Program, HR)
Studies 1st year of MSc. Physics of Condensed Matter and Materials at CUNI MFF.

Petr Sacher (Deputy Head Organizer of FYKOS, Treasurer)
Studies 3rd year of BSc. Physics at CUNI MFF.

David Škrob (Head Organizer of FYKOS)
Studies 3rd year of BSc. Physics at CUNI MFF.

Lukáš Létal (Accompanying Program)
Studies 3rd year of BSc. Physics at CUNI MFF.

Matyáš Beran (Accompanying Program)
Studies 1st year of BSc. Physics at CUNI MFF.

Petr Kahan (Accompanying Program)
Studies 1st year of MSc. Solid State Engineering at FNSPE CTU.

Vladimír Slanina (Problem Selection Supervisor)
Studies 1st year of BSc. Computer Science at CUNI MFF.

Tomáš Kubrický (Problem Selection Supervisor)
Studies 1st year of BSc. Computer Science at CUNI MFF.

Monika Drexlerová (Partners of Fyziklani)
Studies 2nd year of BSc. Physics at CUNI MFF.

Pavel Tesařík (Accompanying Program, Partners of Fyziklani)
Studies 1st year of BSc. Physics and Mathematics for Teacher Education at CUNI MFF.

Simona Švecová (Accompanying Program)
Studies 3rd year of BSc. Dental hygiene at PU Prešov.

Radomír Mielec (Accompanying Program, Communication with Participants)
Studies 1st year of MSc. Biophysics and Chemical Physics at CUNI MFF.

Veronika Hendrychová (Communication with Participants)
Graduated in Ing. Mathematical Computer Science at FNSPE CTU.

Petr Brettschneider (Communication with Participants)
Studies 1st year of BSc. Mechanical Engineering at FME VSB-TUO.

David Ševčík (Marketing, PR)
Studies 2nd year of BSc. Physics at CUNI MFF.

Sofie Klepková (PR, Socials)
Studies 1st year of BSc. Physics at CUNI MFF.

Soňa Husáková (Graphic Designer)
Works at ÚDiF Physics Theatre.

Tomáš Červeň (Graphic Designer)
Graduated in MSc. Theoretical Physics at CUNI MFF.

Daniel Dupkala (Consultant of Fyziklani)
An IRC Government of Ireland Scholar conducting postgraduate research of exoplanets at Trinity College Dublin.

Martin Vaněk (Consultant of Fyziklani)
Graduated in MSc. Theoretical Physics at CUNI MFF.

Luboš Veverka (Operational Support for Fyziklani)
Manages the Department of Promotion and Media Communication at CUNI MFF.

Anna Kotěšovcová (Operational Support for Fyziklani)
Works at the Department of Promotion and Media Communication at CUNI MFF.

Michaela Němcová (Operational Support for Fyziklani)
Works at the Department of Promotion and Media Communication at CUNI MFF.

Participated in the preparation of problems, reviews, and translations:
Matyáš Beran, Petr Brettschneider, Dávid Brodňanský, Šimon Brožek, Vojtěch David, Monika Drexlerová, Daniela Dupkalová, Jaroslav Herman, Ivan Hudák, Jindřich Jelínek, Jakub Kliment, Dominik Klimsza, Karel Kolář, Ján Kolesár, Ján Kovačovský, Adam Krška, Tomáš Kubrický, Marek Milička, Júlia Mnichová, Šimon Pajger, Patrik Prítrský, Kateřina Rosická, Petr Sacher, Maxmilián Ladislav Skuda, Vladimír Slanina, Patrik Stercz, Jiří Sýkora, Jakub Šafin, David Škrob, Pavel Tesařík, Mário Tlamka, Josef Trojan, Tomáš Tuleja, Tereza Voltrová

FYKOS

Fyziklani is organized by FYKOS – a group with the aim of inspiring and educating high-school students in physics and related fields. FYKOS is under the patronage of CUNI MFF and has a rich 39-year history of organizing educational events.

The keystone activity of FYKOS is a correspondence competition of the same name. It is open to all high-school students with an interest in physics. We publish eight new problems six times a year. Participants have about a month to solve these problems and submit their solutions, which we mark and send back with comments and helpful feedback.

The best contestants of FYKOS can attend week-long camps in spring and fall focused on physics education, including lectures or experiments, but also offer plenty of engaging games and leisure activities. Along with Fyziklani, FYKOS organizes an online version of the competition – Physics Brawl Online, which is held every year in late November – and also many other events, such as the Day with Experimental Physics.

You can learn more about the activities of FYKOS and how to take part in them at `https://fykos.org`.

Faculty of Mathematics and Physics, Charles University

FYKOS and Fyziklani 2026 are under the auspices of the Faculty of Mathematics and Physics at Charles University (CUNI MFF). You can find more information at `https://mff.cuni.cz/en/`.

The Charles University is the oldest university in Central and Eastern Europe and it is the best-ranked university in said region (e.g. in the Academic Ranking of World Universities). It was founded in the year 1348 by Charles IV. The CUNI MFF was founded in 1952.

The Ministry of Education, Youth and Sports of the Czech Republic

The Ministry of Education, Youth and Sports of the Czech Republic (MEYS) annually lists Fyziklani among the official competitions maintained by MEYS.

MEYS is responsible for public administration in education, for developing educational, youth and sport policies and international cooperation in these fields.

General Partner

CEZ Group

Although CEZ Group is based in the Czech Republic, its energy activities span across multiple European countries, making it one of the largest energy companies in Europe.

We lead by example, driving innovations and implementing modern technologies to transform the energy sector into a more sustainable, environmentally friendly, and socially responsible industry. One of CEZ's key strategic priorities is to achieve climate neutrality by 2040.

We are passionate about energy and love to share its magic with others. That's why we support and organize various events for high school and university students with a passion for technical fields—because physics is at the core of how all our power plants and distribution networks operate.

We wish all participants of Fyziklani 2026 an unforgettable experience and the best of luck in the competition.

If you'd like to join one of our initiatives, check `https://kdejinde.jobs.cz/studenti-a-absolventi`. And for those eager to dive deeper into the fascinating world of energy, visit our website `https://www.svetenergie.cz`.

kdejinde.cz

svetenergie.cz

SKUPINA ČEZ
GENERÁLNÍ PARTNER

Main Partner

Qminers is a Czech technology company specializing in algorithmic trading software. Our autonomous trading algorithms operate in financial markets worldwide, utilizing advanced mathematical models and data analysis. Since our founding in 2012, Qminers has been continuously growing-driven by a rigorous scientific approach and an exceptional team of experts.

Our team consists of top specialists from various fields—including probability, mathematical statistics, cybernetics, and software engineering. We thrive on intelligence, diversity, and collaboration, which not only fuel our business success but also push the boundaries of innovation. We enjoy solving problems no one has solved before and continuously expanding what is possible.

At Qminers, we take a responsible approach. We avoid "toxic" financial products such as cryptocurrency trading and focus on projects that bring real societal benefits. Through our foundation, we support education every year—for example, through the Matika Česku initiative-because we believe that investing in education is investing in the future.

We support events like Fyziklani because we know that passion, dedication, and ambition are born where young people are given the opportunity to develop their talents.

Find out more about us at `https://qminers.com/`.

Gold Partners

Wube Software | Factorio

Prague-based Wube Software is a team of passionate professionals who have long been dedicated to creating exceptional games. What began as a small "garage" project by a handful of people has gradually grown into a studio of roughly three dozen in-house team members and collaborators from around the world.

Their best-known title is Factorio – a game focused on building and maintaining factories. Players mine resources, research technologies, build infrastructure, and, above all, automate production in order to manufacture increasingly complex products. An important part of the experience is also defending against local enemies, who generally don't take kindly to your industry.

Factorio has earned a reputation as a thoughtful, technically polished game that leaves plenty of room for creativity and "engineering-style" thinking – from the first conveyor belts to complex production chains and large-scale logistics systems.

Kalabria

KARÁSKOVY LIMONÁDY A SIRUPY

The Kalabria company was founded in 1911 and made its breakthrough by producing Calabria lemon juice from lemons imported from the Calabria region in South Italy – hence the name. Nowadays, it produces several kinds of soft drinks and syrups in typical local flavors – in some cases innovated for the 21st century. The authentic taste of their craft soda is guaranteed by the use of the highest quality ingredients and experienced manufacturing processes.

The Kalabria company supported Fyziklani by gifting 1 800 bottles of Karáskova limonáda, which were given to participants to stay hydrated.

CSG Aerospace

CSG Aerospace is a division of the Czechoslovak Group that brings together several Czech companies operating in the aviation industry. Their products and services complement one another, enabling them to cover a wide range of customer demand across both the civilian and security sectors.

Thanks to a diversified product portfolio, synergies among the companies, close cooperation, and high flexibility – rooted in the ability to tailor products to specific customer requirements – the companies within the division have built a strong position in the aviation industry not only in the Czech Republic, but worldwide.

CSG Aerospace manufactures and sells aviation equipment, onboard and communications systems, air-defense and air-traffic-control radars, develops air-traffic-management software, and provides aircraft maintenance and repair services.

Silver Partners

Casio

Casio is one of the leading manufacturers of calculators, which are an essential tool for learning mathematics and physics in schools worldwide. Thanks to a combination of innovation, reliability, and practical design, Casio calculators support effective education for students of all levels.

From basic models for elementary schools to advanced scientific and graphing calculators, Casio offers solutions for every need. Key advantages include intuitive interfaces, long lifespan, support for complex calculations, and an eco-friendly design.

Casio is a symbol of quality and a trusted partner in education, making even the most challenging scientific concepts easier to understand.

The company has donated 15 scientific and 5 graphing calculators for the competition winners.

ELKAN | Wolfram Research

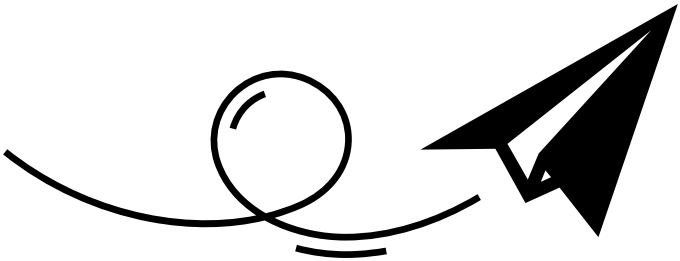
ELKAN, spol. s. r. o. is a Czech company that has been the exclusive distributor of Wolfram Research products for the Czech and Slovak Republics for over 30 years. It specializes in deploying the **Mathematica** software tool for solving complex problems across various fields, spanning both industrial and academic sectors.

The company provides expert consulting, implementation support, and educational activities focused on machine learning, image processing, and the application of advanced mathematical methods.

ESERO Czech Republic | Planetum

ESERO Czech Republic (European Space Education Resource Office) is an education office of the European Space Agency (ESA), whose mission is to support primary and secondary education in Europe. The office in the Czech Republic organizes many programs and competitions for high school students, such as Astro Pi or Mission to Mars.

Planetum operates three Prague-based astronomical institutions, including the Prague Planetarium in Holešovice, which after an extensive modernization can boast a dome that is among the largest in the world. In cooperation with ESERO Czech Republic and Planetum, 100 Fyziklani participants had the opportunity to visit this planetarium.



Partners

Humusoft | MathWorks

Humusoft s.r.o. is a Czech company that since its foundation has divided its efforts equally between the production and sale of instrumentation and software. It is the exclusive representative of the American company MathWorks, Inc. for the Czech Republic and Slovakia. HUMUSOFT s.r.o. also participates in the development of MATLAB® / Simulink® system superstructures. They provided 10 MATLAB® & SIMULINK® Student Suite licenses and other donations for the competition.

Escape Point

"Intelligent entertainment" – an escape game that makes you think. Escape point provides eight unique games with adjustable difficulty, but beware, the clock is ticking. They donated 5 vouchers for a game of one's choice for the best teams.

Prometheus

Prometheus, spol. s r. o. publishes textbooks, collections, and other literature dealing with physics and mathematics. Their physics tables are known to everyone in the Czech Republic. Most of the books are intended for primary and secondary school students and their teachers, but they also offer titles dealing with history and important people contributing to mathematics and physics.

Prometheus has supplied book prizes for the winners.

Merkur

The Merkur construction sets from Merkurtoys have been successfully fostering creativity and technical thinking in children and adults for more than 100 years. With an emphasis on both tradition and innovation, we continually modernize our production to ensure the highest quality and safety for our youngest builders. Merkur is regularly showcased at international exhibitions and actively collaborates with leading Czech designers, helping it remain timeless and appealing while inspiring future generations.

RadiaCode

Radiacode – scientific gadgets for curious minds. The world's first series of pocket-sized radiation detectors and spectrometers, engineered for all natural science enthusiasts.

Brief Rules

- Fyziklani is a three-hour-long team competition taking place in Prague, Czech Republic.
- The competition is held for teams of up to 5 high-school students, who attend two different high schools at most.
- At any instance, every team should have 7 tasks accessible. Solutions of the tasks should be written on the paper that states the problem and delivered to the judges. In the case of a correct solution, the team earns points and gets a new task straight away. In case of an incorrect solution, the team gets the task back to correct their answer.
- Every problem solved on the first try is awarded 5 points, on the second try with 3 points, on the third try with 2 points and with 1 point otherwise.
- The only way to get a new problem is to solve another one correctly; you can't skip problems. In an exceptional case the judge can ask how the team found the solution.
- Solutions are accepted in standard form, i.e., with correct units. Fractions should be simplified. You should use constants like π and round the numbers correctly.
- It is allowed to use any written or printed materials. Electronic gadgets are strictly forbidden (except for calculators).

Full Rules of Fyziklani

Participation in the Competition

- To participate in the competition, pre-registration is required at `https://fyziklani.org/`.
- By registering for the competition, each team agrees to follow the Organizational Regulations and these Rules of Fyziklani and confirms they have made themselves acquainted with them.
- A team consists of 1–5 competitors.
- All team members must be high-school students, primary school students, or their respective equivalents.
- A team must not consist of students from more than two schools.

- Students from one school may participate in at most four different teams. In the case of vacant places in the competition, or under other circumstances, the organizers reserve the right to grant an exception to this rule.
- The team name must not spread political or religious views, be offensive, or otherwise inappropriate. The appropriateness of a team name is judged by the head organizer, who has the right to change the name of such a team, censor it, or disqualify the team from the competition.
- By registering in the competition, the team members agree to the publication of their results in the form of basic information (your name, surname, category, school, and points) in the results list in both print and digital outputs.

Designation into Categories

- The competition is divided into three categories. Teams are placed into these categories based on the following algorithm.
- Each contestant is assigned a coefficient based on the expected year of high school graduation. A contestant who is in the final, i.e., graduating, year of secondary education at the time of the competition (specifically, a school corresponding to level 3 of the ISCED 2011 classification) is assigned a coefficient of 4. A contestant in the penultimate year is assigned a coefficient of 3, and so on. The lowest possible coefficient is 0 (this is assigned to pupils of primary schools, etc.). The head organizer may determine the coefficient of a participant in ambiguous cases.
- The team coefficient is calculated as the arithmetic mean of the coefficients of individual competitors (they are added together and divided by the number of competitors).
- The team is assigned the lowest category whose conditions it satisfies:
  - category A: team coefficient ≤ 4,
  - category B: team coefficient ≤ 3 and maximum of two competitors have a coefficient of 4,
  - category C: team coefficient ≤ 2, no member has a coefficient 4, and a maximum of two competitors have a coefficient of 3.
- The team coefficient reflects the actual composition of the team during the competition.
- All categories share the same set of problems.
- Each category of the competition has its own results list.

Arrival to the Competition

- Teams are obliged to arrive on time. The organizers reserve the right to refuse late-arriving teams entry to the competition.
- Upon arrival, teams are obliged to report to the registration desk and provide accurate information about their members (grade, school, etc.). Teams are obliged to notify the organizers of any changes in their composition.
- Each team will receive an envelope containing the statements of the first seven problems. It is forbidden to open this envelope before a clear instruction is given by the head organizer or an organizer authorized by them.

The Competition System and Awarding of Points

- The competition lasts 3 hours.
- At the beginning of the competition, each team receives 7 problems, which they try to solve.
- If the team believes it has arrived at the correct solution to a problem, it sends one of its members to one of the examiners, who will inform the competitor whether the solution is correct or incorrect. The designated team member must present the problem sheet with the problem and the final answer clearly marked on the paper.
- The examiner has the right to require the competitors to explain the solution procedure.
- The representative must choose the correct examiner based on the marking of the problem they are solving. The precise algorithm for determining the examiner will be explained before the competition.
- If the answer is incorrect, the examiner will mark this on the problem sheet, and the representative returns to their team to continue solving.
- If the answer is correct, the examiner will record the number of points awarded on the problem sheet and send the representative with the sheet to the distributor, from whom they will receive a new problem.
- The problems are scored based on the number of attempts needed to solve them, as follows: one attempt – 5 points, two attempts – 3 points, three attempts – 2 points, and four or more attempts – 1 point.
- The team aims to receive as many points as possible.

- The live results of all teams are displayed during the competition. However, they will be hidden 20 minutes before the end of the competition.
- If a serious issue is discovered with a competition problem, organizers reserve the right to modify or eliminate it without compensation.
- During the competition, all competitors are allowed to communicate only with their team members or the organizers. Any interaction with teachers, other teams, etc. is strictly forbidden.

Forbidden and permitted aids

- Teams are allowed to use any printed literature. During the competition, the use of any device with internet access is forbidden. Calculators and writing or drafting supplies are permitted. A calculator must not allow access to the internet or any form of communication (devices such as mobile phones, tablets, laptops, smartwatches, etc. are therefore in no case allowed as calculators).
- Any aids that the competitors use or have accessible near their table during the competition may be subject to inspection by the organizers.
- Before the start of the competition, team members are required to set aside and seal their mobile phones and all other "smart" devices capable of communication or connecting to the internet in the provided security envelopes.
- Throughout the competition, it is forbidden to open the envelope or use these devices. Breach of this rule may result in a penalty for the team or disqualification from the competition.
- In exceptional situations (e.g., an urgent call, an emergency), team members may ask an authorized organizer for permission to use the device. The device may be used only with their permission, under their supervision, and only for the strictly necessary time; afterwards, the device must be sealed in the envelope again without delay.
- If it is necessary to keep a device accessible for medical or other serious reasons, team members are required to contact the organizers in advance, before the start of the competition, and follow their instructions.

Conclusion of the Competition and Announcement of Winners

- The end of the competition is clearly announced by the head organizer or an organizer authorized by them.

- After the end of the competition is announced, no team may send a representative to the examiners. If a team member was already standing in the queue before the announcement of the end, they may stay, and their problem will be corrected, but they are no longer allowed to use writing tools.
- If two or more teams have the same number of points in the results list, the ranking will be determined using the following criteria, listed in order: higher average point gain per problem, higher number of problems solved for 5 points, higher number of problems solved for 3 points, lower team coefficient, earlier date and time of registration in the competition, and a random draw.

Breach of Rules

- In the case of a reasonable suspicion of a breach of the Competition Rules or the Organizational Regulations, the head organizer has the right to take special measures to confirm or rebut the suspicion and to prevent the continuation of disallowed conduct.
- If a team violates any of the Competition Rules or the Organizational Regulations, the head organizer or a designated committee will determine the appropriate consequences for the team.
- In the case of a less serious breach of the competition rules, the head organizer or a committee authorized by the head organizer can decide on the removal of a certain number of points from a team based on the severity of the breach.
- Organizers may disqualify a team that commits a severe breach of rules.
- In the case of an extremely severe breach of the Competition Rules or the Organizational Regulations, the Central Committee of the competition may decide to ban participation in the competition in the subsequent years or impose other sanctions on the competitors and/or on the schools they come from. The organizer also reserves the right to share information about rule violations with the organizers of other competitions and activities organized or promoted by the CUNI MFF, as well as with representatives of the competitors' schools.
- Particularly serious breaches include any intentional attempt to obtain the problems or their solutions before the competition, their publication, or disclosure to anybody outside their team. Any intentional attempts to impede the smooth running of the competition to the other participants or the organizers, or an attack on the competition server are also understood as extremely severe breaches of rules.

Final Remarks

- Organizers reserve the right to make minor changes in the rules before the start of the competition.
- Resolution of any potential conflicts or issues not covered by these rules is decided by the head organizer or an organizer authorized by them. The team will be informed of these decisions at the email addresses provided in the application form.
- If a team disagrees with a decision made by the head organizer, they have the right to appeal within 14 days of the decision being made. The Central Committee of the competition will process the appeal and decide within 30 days of its submission.
- These rules were ratified by the Central Committee of the competition Fyziklani on January 14, 2026.
- These rules replace the previous version and come into effect on January 14, 2026.

You can find full Organizational Regulations of Fyziklani at:
`https://fyziklani.org/rules/organizational-regulations`.

A Brief History of Fyziklani

Fyziklani (originally "FYKOSí Fyziklání") was founded in 2006 as the Czech counterpart of the Slovak Náboj Physics. From the very beginning, it has been organized by FYKOS volunteers, mostly students of the Faculty of Mathematics and Physics of Charles University, under whose auspices the competition is held. In the first edition, 104 high school students competed in 21 teams in a single room at CUNI MFF (Karlov) – back then, it was an intimate event whose core consisted (and still consists) of original physics problems solved in teams.

As participation gradually grew, Fyziklani expanded and refined its rules: in 2013, three categories by grade (A/B/C) were introduced, making comparisons between teams fairer. Having outgrown its lecture halls, the competition relocated several times between 2013–2020 – to Malá Strana, then to Hotel Duo, and later to Top Hotel Praha. Over the same period, the competition increasingly opened up to international teams, and an English version of the competition was established so schools from across Europe and beyond could join. Since 2012, the event has also featured a weekend accompanying program.

In 2021, the pandemic pushed Fyziklani fully online, attracting more than 1,900 high school students from 36 countries. After returning to an in-person format, Fyziklani has been hosted at PVA Expo Praha since 2022 and has grown into a multi-day "celebration of physics" with a rich accompanying program. Today, it features talks spanning many areas of physics, opportunities to meet inspiring guests, and plenty of room for informal discussions where participants can broaden their horizons and share experiences across schools and countries. Since 2023, the competition has regularly welcomed more than a thousand participants. Its international reach has been further supported by supporting projects (Fyziklani International under Erasmus+ and a follow-up scholarship program), which have helped dozens of teams travel to Prague, firmly placing the competition among Europe's largest team physics events of its kind.

Organizers of the 3rd edition (2009)

Organizers of the 19th edition (2025)

1st edition (2006)

4th edition (2010)

8th edition (2014)

11th edition (2017)

13th edition (2019)

16th edition (2022)

19th edition (2025)

List of Constants

Fundamental Physical Constants

speed of light in vacuum	c	$2.998 \cdot 10^{8}\,\mathrm{m{\cdot}s^{-1}}$
permittivity of free space	ε_0	$8.854 \cdot 10^{-12}\,\mathrm{F{\cdot}m^{-1}}$
permeability of free space	μ_0	$1.257 \cdot 10^{-6}\,\mathrm{H{\cdot}m^{-1}}$
gravitational constant	G	$6.674 \cdot 10^{-11}\,\mathrm{m^3{\cdot}kg^{-1}{\cdot}s^{-2}}$
Planck constant	h	$6.626 \cdot 10^{-34}\,\mathrm{J{\cdot}s}$
reduced Planck constant	$\hbar$	$1.055 \cdot 10^{-34}\,\mathrm{J{\cdot}s}$
elementary charge	e	$1.602 \cdot 10^{-19}\,\mathrm{C}$
electron mass	m_e	$9.109 \cdot 10^{-31}\,\mathrm{kg}$
proton mass	m_p	$1.673 \cdot 10^{-27}\,\mathrm{kg}$
atomic mass unit	u	$1.661 \cdot 10^{-27}\,\mathrm{kg}$
Avogadro constant	N_A	$6.022 \cdot 10^{23}\,\mathrm{mol^{-1}}$
Boltzmann constant	k_B	$1.381 \cdot 10^{-23}\,\mathrm{J{\cdot}K^{-1}}$
molar gas constant	R	$8.314\,\mathrm{J{\cdot}mol^{-1}{\cdot}K^{-1}}$
Stefan-Boltzmann constant	σ	$5.670 \cdot 10^{-8}\,\mathrm{W{\cdot}m^{-2}{\cdot}K^{-4}}$

Astronomical Constants

mass of Earth	$M_\oplus$	$5.974 \cdot 10^{24}\,\mathrm{kg}$
mass of Sun	$M_\odot$	$1.989 \cdot 10^{30}\,\mathrm{kg}$
equatorial radius of Earth	$R_\oplus$	$6.378 \cdot 10^{6}\,\mathrm{m}$
equatorial radius of Sun	$R_\odot$	$6.957 \cdot 10^{8}\,\mathrm{m}$
nominal solar luminosity	$L_\odot$	$3.828 \cdot 10^{26}\,\mathrm{W}$
sidereal day	T_sid	$23.9344\,\mathrm{h}$
astronomical unit	au	$1.496 \cdot 10^{11}\,\mathrm{m}$

Other Useful Constants

gravity of Earth	g	$9.81\,\mathrm{m{\cdot}s^{-2}}$
normal pressure	p_a	$101.325\,\mathrm{kPa}$
normal temperature	t	$20\,^\circ\mathrm{C}$
density of ice	ρ_I	$917\,\mathrm{kg{\cdot}m^{-3}}$
air density[1]	ρ_air	$1.20\,\mathrm{kg{\cdot}m^{-3}}$
molar mass of air	M_air	$28.96\,\mathrm{g{\cdot}mol^{-1}}$
speed of sound in air[1]	c_s	$343\,\mathrm{m{\cdot}s^{-1}}$
Zero-point of Celsius scale		$0\,^\circ\mathrm{C}$ $273.15\,\mathrm{K}$

Properties of Water[1]

specific latent heat of vaporization	l_v	$2.26 \cdot 10^{6}\,\mathrm{J{\cdot}kg^{-1}}$
specific latent heat of fusion	l_t	$3.34 \cdot 10^{5}\,\mathrm{J{\cdot}kg^{-1}}$
heat capacity	c	$4\,184\,\mathrm{J{\cdot}kg^{-1}{\cdot}K^{-1}}$
molar mass	$M_{\mathrm{H_2O}}$	$18.02\,\mathrm{g{\cdot}mol^{-1}}$
index of refraction	n	1.333
density	ρ	$998\,\mathrm{kg{\cdot}m^{-3}}$
dynamic viscosity	μ	$1.005 \cdot 10^{-3}\,\mathrm{Pa{\cdot}s}$
surface tension	σ	$7.27 \cdot 10^{-2}\,\mathrm{N{\cdot}m^{-1}}$

[1] Under normal conditions.

Organized by

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