ATOMIC SYSTEMS

PORTFOLIO

PUBLICLY AVAILABLE INTERACTIVE EXHIBITS

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ATOMIC SYSTEMS

OUR SELECTED PROJECTS

and the Institutions We Have Partnered With

Mechanical Theatre (2011-2012)
Designed and developed a robotic exhibition with an electro-pneumatic drive, recreating the tale of the Wawel Dragon. This installation is located in the underground exhibition of the Historical Museum of the City of Krakow.

Ancient Hydraulic Devices (2014)
Engineered and constructed functional hydraulic replicas of ancient devices, including the Ktesibios clock, water forge, and Aeolipile of Heron, for the Hydropolis Water Museum in Wrocław, Poland .

Kepler Science Center (2015-2016)
Developed and built interactive stations illustrating principles of electricity, mechanics, and hydraulics, Zielona Góra.

Maine of Knowledge (2017)
Designed and constructed a series of interactive exhibits showcasing mining and metallurgical processes, ZGH Bolesław, Bukowno, Poland.

Scientific Playground, EC1 (2019)
Created and installed ten interactive stations representing fundamental principles of classical mechanics.Innovative Łudź, Poland.

Seismic Shock Simulator, (2020–2021)
Engineered and developed a platform for earthquake simulations in a controlled environment Silesian Planetarium, Chorzów.
focusing on various scientific disciplines.

Weather Phenomena Column (2022)
Developed an interactive column simulating weather phenomena, including an 8-meter tornado. Silesian Planetarium, Chorzów.

Scxience Center, Metal Inspirations (2022)
Developed exhibition of 3 exhibits on the subject of renewable energy. Wałcz , Poland.

Science Generator GEN (2022-2023)
Designed and constructed a series of 24 interactive exhibits. Jasło, Poland

Subcarpathian Science Center "Łukasiewicz" (2023),
Delivered hands-on stations explaining a.o. hydraulic principles in life. Rzeszów, Poland

Rother's Mills, Science Park, (2024)
Developed interactive exhibits about compressed air experimentation. Bydgoszcz.

Science Center Cogiteon (2024)
Creation of immersive exhibits focusing on various scientific disciplines. Kraków, Poland.

Mokslo Sala "Science Island" (2025)
Designed and built interactive exhibits for the upcoming science center, integrating cutting-edge technology and educational engagement. Kaunas, Lithuania.

Flood of Knowledge Science Center (2025...)
Delivered 4 interactive expositions explaining some new technologies. Nisko, Poland.

Muzeum Historyczne Miasta Krakowa

Our first big project was the robotic exhibition, created in the form of 4 movable puppets equipped with actuator mechanisms, recreates the archetypal version of the **Wawel Dragon Story**. Over 80 PLC control channels for the scenery mechanisms, synchronized with the projection, provide the audience with a breathtaking experience. We developed the Mechanical Theatre in the undergrounds of the Kraków Market Square between 2010 and 2011. Since then, the exhibit has been continuously operational until today.

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HYDROPOLIS

We made working replicas of ancient hydraulic devices according to our own design for the exhibition **History of Water Engineering** in 2014 for the Hydropolis Water Museum in Wrocław. The devices were made from copper, brass, and bronze in line with the style of the era. All devices include water supply systems that are activated interactively.

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The details of the construction of the **Ktesibios Clock**, which we made based on the ancient work by Vitruvius De Architectura for the Hydropolis Museum in Wrocław in 2014. Originally, the clock, which also functions as a calendar, operates by utilizing the difference in level between an aqueduct and a gutter; in the museum setting, it is powered by a pump. The clock indicates twilight and dawn in the ancient "unequal hours" system, and we designed it specifically for the geographic latitude of Wrocław, Poland.

HYDROPOLIS

The **Aeolipile of Heron**, also known as the steam ball, and a model of a forge powered by a water wheel. The Heron's steam ball, which is interactively activated, is safely powered by a pump that simulates the boiling process of the kettle over a fire. However, it operates in accordance with the physical principles of the original. This design and construction were created by us for the Hydropolis Water Museum in Wrocław in 2014.

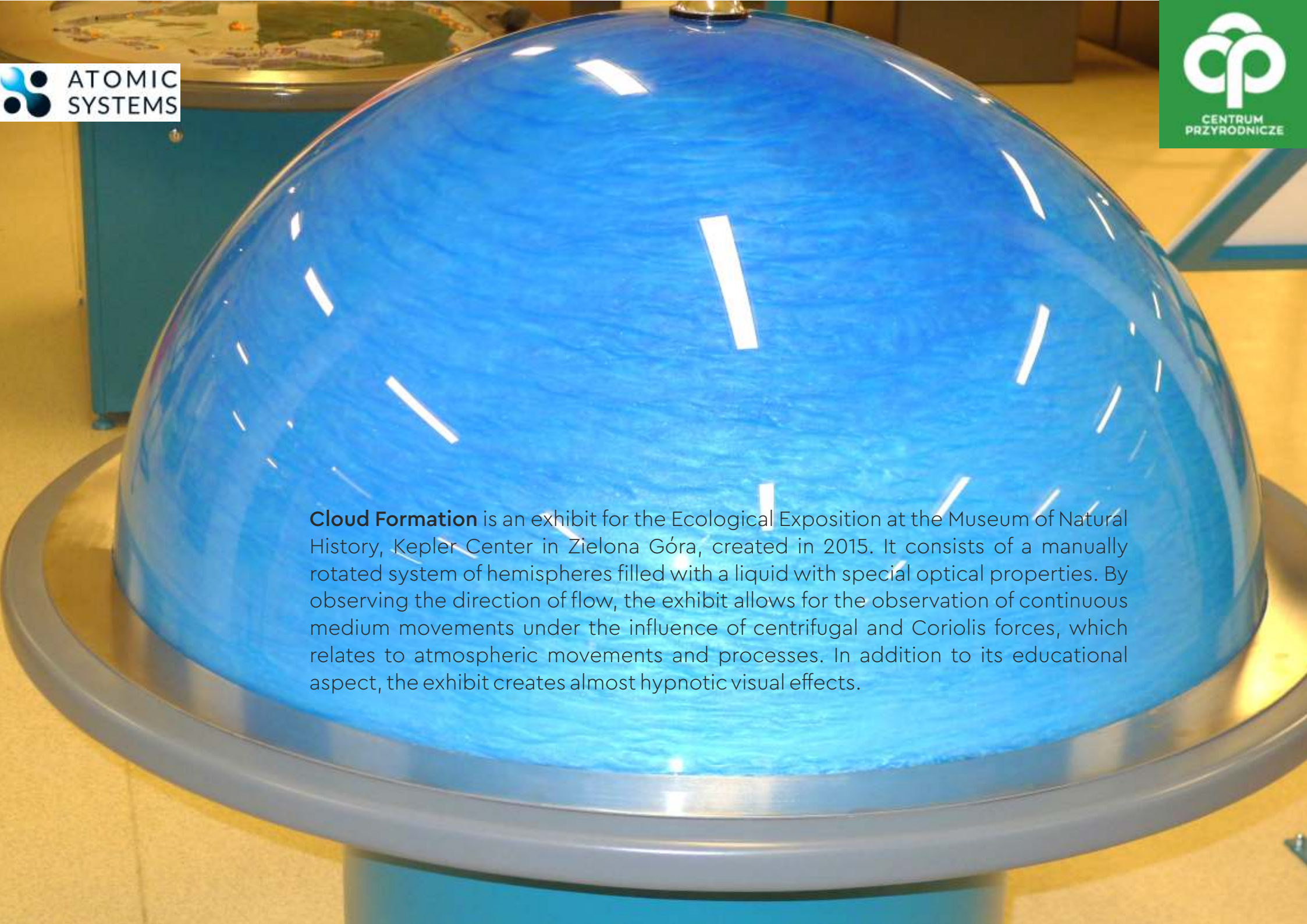
In 2014, we developed and created an exhibition with 14 interactive stations for the Natural History Museum, **Kepler Center** in Zielona Góra in 2015. In the foreground, there is a station for observing the movement of air **Bubbles in Liquids with different dynamic viscosities**. Various silicone oils fill illuminated PMMA cylinders, into which viewers can inject air using hand pumps.

The principle of operation of a **Block and Tackle System** demonstrated through 3 examples. This interactive station was created by us for the Natural History Museum, Kepler Center in Zielona Góra in 2014.

Interactive expositions created for the Natural History Museum, **Kepler Center** in Zielona Góra in 2014, from left to right:**Battery from the hand** – a station for observing the biogalvanic effect. **Resistance measurement** – a station for interactively testing the resistance of different materials. **Maxwell's pendulum** – a vertical pendulum with a flywheel

CENTRUM
PRZYRODNICZE

In 2015, we created exhibits for the **Ecological Exposition** at the Museum of Natural History, Kepler Center in Zielona Góra. The photo shows a wet model visualizing ocean currents powered by a system of six hidden hydraulic pumps. The model allows observing the effect of the formation of a garbage island near Hawaii by observing balls floating on the surface of the oceans in a model covered with a hydrophobic substance.



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CENTRUM PRZYRODNICZE

Cloud Formation is an exhibit for the Ecological Exposition at the Museum of Natural History, Kepler Center in Zielona Góra, created in 2015. It consists of a manually rotated system of hemispheres filled with a liquid with special optical properties. By observing the direction of flow, the exhibit allows for the observation of continuous medium movements under the influence of centrifugal and Coriolis forces, which relates to atmospheric movements and processes. In addition to its educational aspect, the exhibit creates almost hypnotic visual effects.

In 2017, we designed and created a series of interactive exhibits to visualize geological and technological processes in the form of display cases made of Phoenician glass and special effect lighting. We brought mining museum exhibits to life with multimedia effects and surprising interactions. The exhibition is available at the **Knowledge Mine** museum at the ZGH Bolesław zinc mine in Bukowno.

CENTRUM
NAUKI I TECHNIKI

Between 2018 and 2019, we designed and built a series of 10 interactive exhibits showcasing phenomena and processes related to classical mechanics for the "Scientific Playground" exhibition at the EC1 Science and Technology Center in Łódź.

Mechanical Machine – Clock

This is an interactive exhibit for two participants that demonstrates the operation of a pendulum clock with George Graham's escapement mechanism. One participant acts as the pendulum, while the other serves as the working load of the mechanism. The clock's escapement mechanism controls the movement of the gear train with a 1:60 ratio by locking and releasing the escape wheel at a constant angle per unit time, corresponding to one impulse. Each impulse moves the set of three clock hands, demonstrating how clock mechanisms work.

Oblique Throw in Variable Gravity

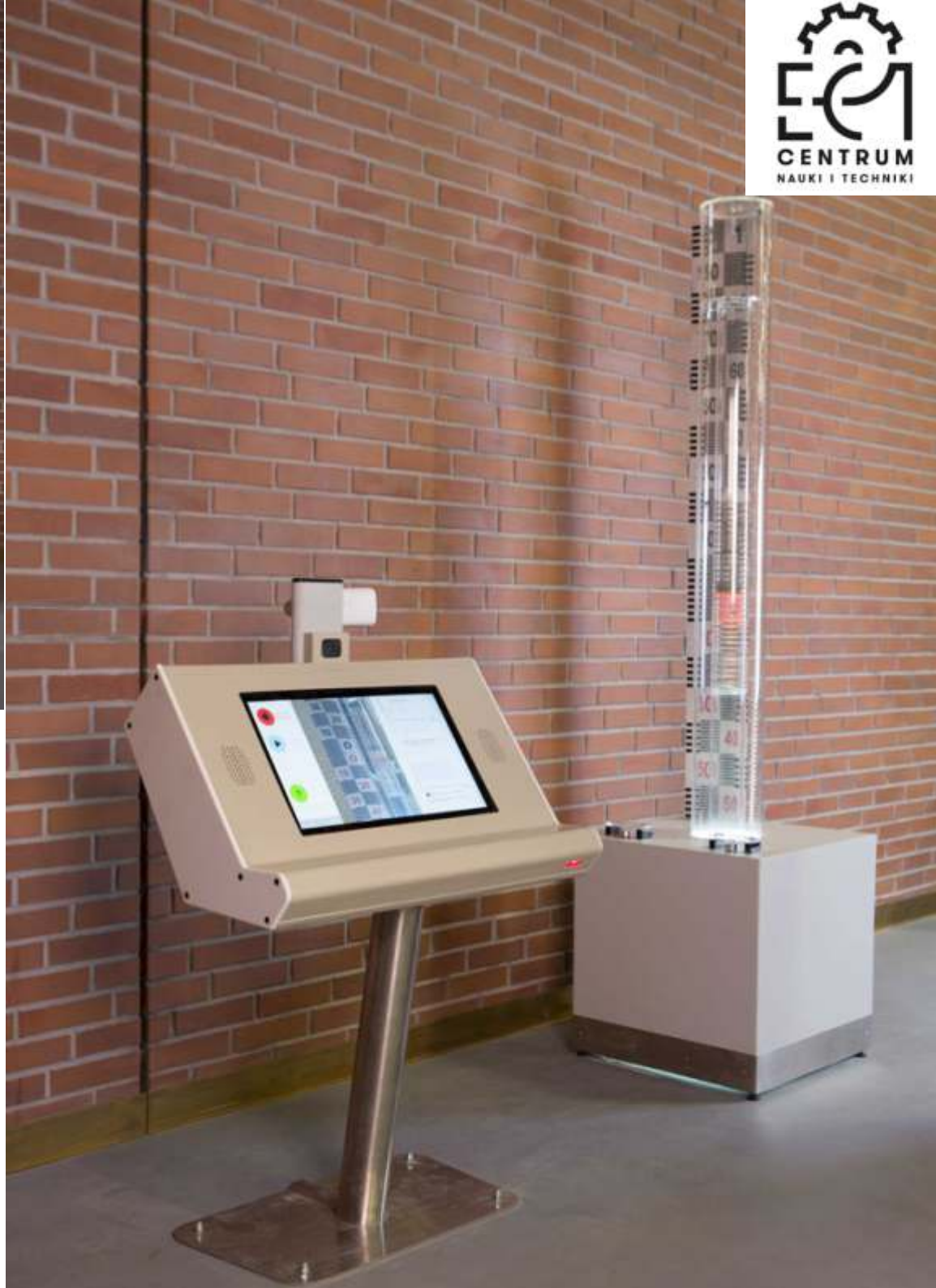
This exhibit consists of a 3-meter-long inclined frame where participants can launch balls at a manually set angle—adjusted in a plane perpendicular to the frame's inclination. The ball's trajectory is observed and recorded by an IP camera, which remains in a fixed relative position to the inclined frame. The frame is made of steel profiles, and its base features a magnetic board that allows easy attachment of obstacles to modify the ball's trajectory.This setup enables the observation of a ball's trajectory under conditions of a changing local force component parallel to the frame's shorter side. Because the observation is conducted via a camera geometrically coupled with the frame, the exhibit effectively simulates an oblique throw under variable gravity.

Gear Puzzle

This interactive exhibit consists of a table with holes that serve as sleeves for the puzzle elements' axles. The table follows the EC1 museum's design aesthetic and includes various components such as rotating shafts, gears, pulleys, drive belts, and connectors for the gear assemblies. The elements are designed to facilitate the easy construction of functional transmission systems. The goal of the activity is to transfer motion from a crank handle to a tubular bell.

Mechanical Resonance

Set of 4 ExhibitsThis set of interactive exhibits illustrates different aspects of forced mechanical vibrations in systems with fixed natural resonance frequencies. The main station is electronically connected to a multimedia kiosk. Its actuator system consists of a long spring with a suspended magnet, which also serves as a mass in a vertical oscillating system. Vibrations are induced by user-controlled, sinusoidally varying magnetic fields, with the induction vector aligned along the spring and magnet axis.



Mad Mechanic's Labyrinth
An interactive transparent labyrinth featuring over 50 interactive elements in the form of various simple machines. The goal is to guide two balls from the start to the finish at the center of the labyrinth.

Multiplying Gear / Dividing Gear
The reduction gear, driven by a crank, has 20 stages with a 2:1 ratio, resulting in a total reduction ratio of 1,048,575:1. On the opposite side of the exhibit, an interactive multiplying gear features six stages, providing a 1:64 ratio. All gears are equipped with counters to track full rotations.

Handcar (Draisine)
This exhibit features a fully functional handcar, built according to pre-World War II plans, which powers a scrolling screen displaying contextual graphics.

Lokalne Centrum Nauki
Metalowe
Inspiracje

In 2022, we created an exhibition consisting of interactive exhibits focused on renewable energy source. These included:

Solar-Powered Airplane, where participants controlled light sources to supply energy to the plane, which had solar panels on its wings. Various types of **Wind Turbines**, powered by an air blower with a controlled Dyson nozzle.

A fully functional model of a **Pumped-Storage Power Plant**, designed for this science center, which was entirely powered by energy generated by the participant.

Between 2020 and 2021, we developed and built a **Platform for Simulating Seismic Shocks**. Currently known as an earthquake simulation platform, our construction was thoroughly tested and then placed in a specially made recess in the floor with a heavy foundation plate at the Silesian Planetarium in Chorzów.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Currently, the interior of the **Seismic Shock Simulation Platform** has a design stylized as an apartment from Polish mining regions of the 1960s.
PLANETARIUM
Śląski Park Nauki

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In 2022, we created an 8-meter-high **Column for Simulating Weather Phenomena** for the Silesian Planetarium in Chorzów. The column allows for the observation of snow, rain, and a spectacular 8m **Tornado**, which is activated at the end of the show.

PLANETARIUM
Śląski Park Nauki

In 2023, we developed and created an exhibition featuring **24 hands-on exhibits**, including **Water turbines**, **Build e Smart City**, **Bicycle on Suspended Line**, **Natural radioactivity**, **Wave and tide energy** and many more, at the Science Center called the **Science Generator GEN** in Jasło.

Generator Nauki

Build a Smart City is an interactive exhibit in the form of a puzzle, where participants place transparent blocks with pictograms representing buildings and institutions on a map of the area. This creates a city map on the floor, which is then analyzed by a camera system and evaluated on a screen.

Generator Nauki

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Bicycle on a Suspended Line
and other outdoor exhibition exhibits

Generator Nauki


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UWAGA


Generator Nauki

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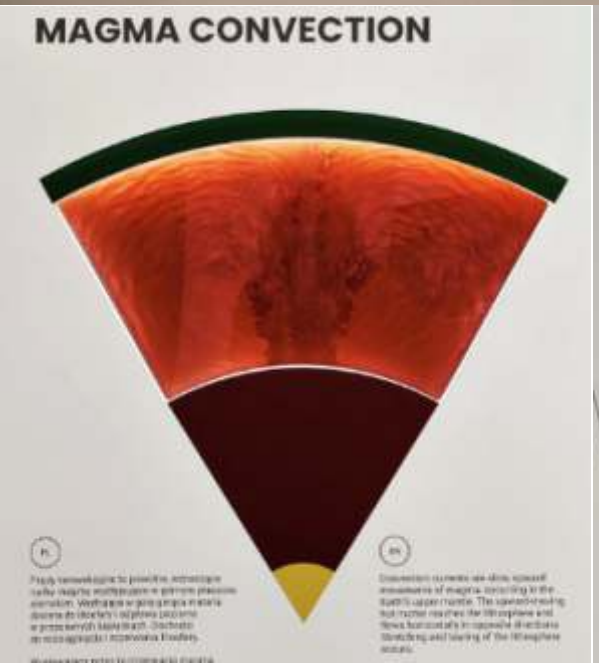
PODKARPACKIE CENTRUM NAUKI
ŁUKASIEWICZ

In 2023, we designed and built a series of interactive exhibits for the Łukasiewicz Science Center
In this project, we created:
Interactive model of a **Hydroelectric Power Plant**.
An interactive model of **Electrostatic Precipitator**.
A visualization of **Convective Magma Movements**.
An interactive model of **Fluid Flow in a Leaf**



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PODKARPACKIE CENTRUM NAUKI
ŁUKASIEWICZ

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In 2024 we developed interactive exhibits mostly about compressed air experimentation and magnetism use in practise. **Rother's Mills, Science Park**, Bydgoszcz.

MŁYNY ROTHERA


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MŁYNY
ROTHERA

In 2024 we designed and built a **series of 16 unique interactive exhibits** for the **Science Center Cogiteon** in Kraków

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An **aerodynamic tunnel** of our production at the Cogiteon Science Center

MAŁOPOLSKIE CENTRUM NAUKI **COGITEON**

In 2025, we completed the production of a series of 16 exhibits for the **Mokslo Sala Science Island in Kaunas, Lithuania**. Above is the **Down by the Flow** exhibit, a pool featuring various functionalities designed to help visitors understand the fundamentals of hydraulics.

Science Island

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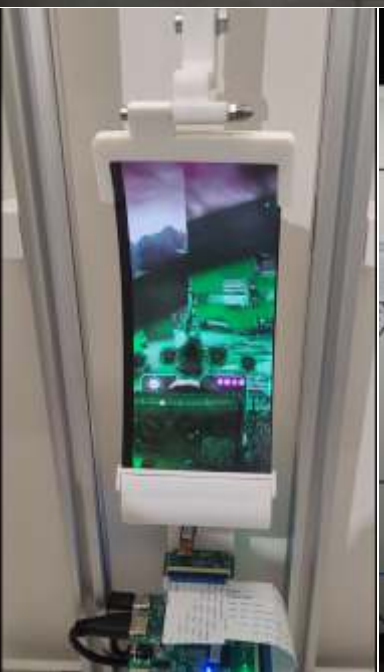
Science Island

Selected exhibits for the **Mokslo Sala Science Island in Kaunas, Lithuania**

Hydrogen Rocket

Hot Air Baloon in the Mokslo Sala in Kaunas



- In 2025, we developed a series of five interactive exhibits demonstrating the following technologies:
- **AM-FM-DAB radio transmission,**
- **the strength of synthetic fibers,**
- **the insulating properties of aerogel,**
- **the electrical conductivity of graphene,**
- **flexible display**.

Science Center Nisko **Flood of Knowledge**, Poland.

The exhibition is not yet open to visitors.

We invite you to cooperate

Much more exciting materials from our current projects can be found on our website: atomicsystems.pl.