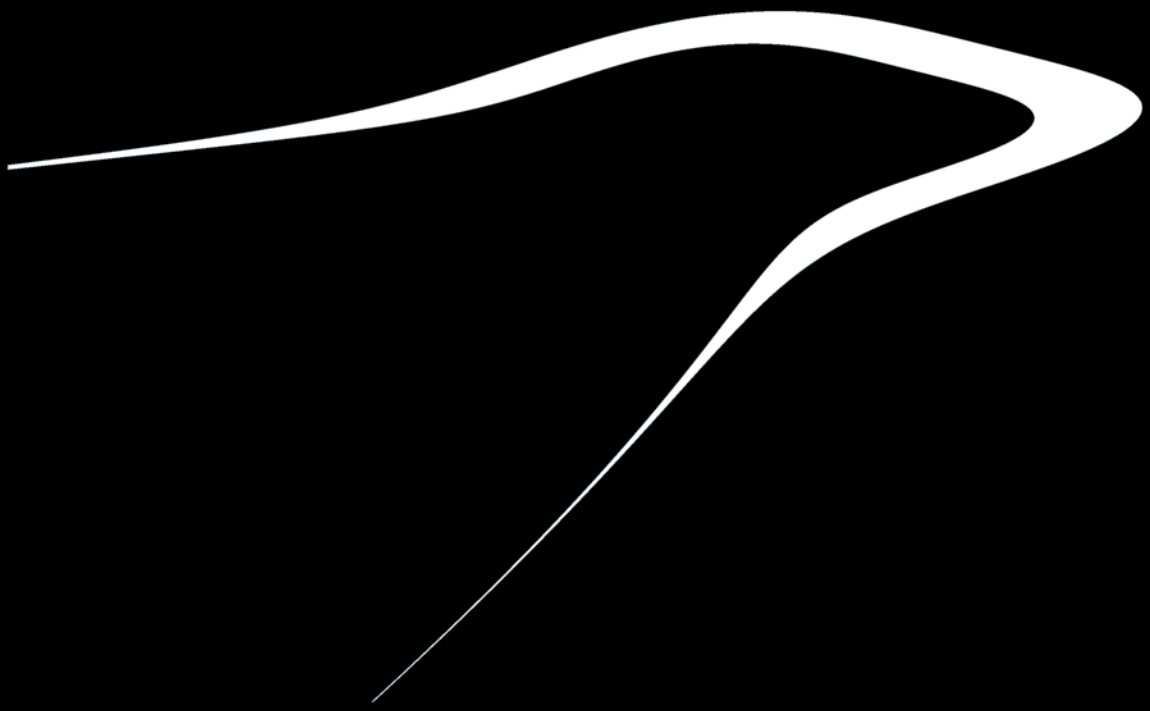
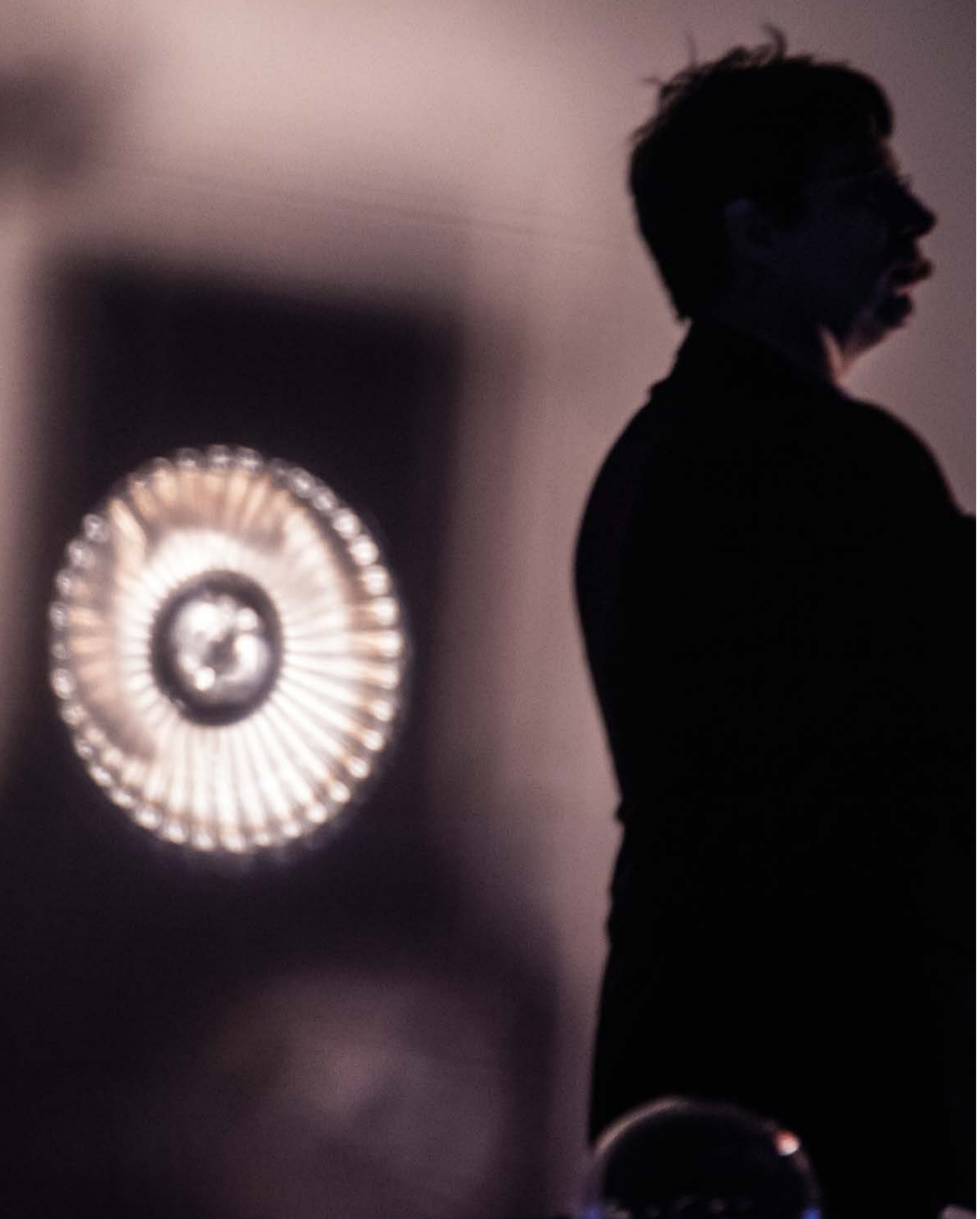
COPERNICUS
SCIENCE CENTRE



Annual Report 2013



Our mission is to encourage personal engagement in discovering and understanding the world, as well as taking responsibility for the changes occurring around us.

For the third year running, the annual number of visitors to the Copernicus Science Centre has exceeded a million. This shows that Copernicus isn't popular simply because of being a novelty, but rather because the Centre accurately recognizes and meets public needs.

So, what are those needs? First and foremost, people's desire to actively discover the world, and to shape it creatively. This attitude is common to us all, regardless of age, gender or education. It lies at the root of innovation, which itself is the key to the future of our society. However, we don't always successfully foster and nurture this instinct, and even go as far as stifling it: students who ask too many questions at school are rarely praised, while employees who suggest unconventional ways of solving problems are frequently regarded as unnecessary troublemakers.

Things are different at Copernicus. Exhibitions, workshops and events held here provide a space for expressing the individual freedom within each and every one of us: the freedom to discover the world, make sense of it, and change it for the better.

Copernicus truly cares about the social and cultural aspects of learning and education. It supports the formation of ecosystems of people, organizations, spaces and contexts that foster collaboration and partnership, communication and civic and social engagement. It helps cultivate the culture of science, since the way in which scientists work (seeking the truth, focusing on facts, respecting others) can and should serve as a reference point not just for contemporary education, but also for the general format of public discourse.

The Copernicus Science Centre's team would not be credible in our fostering of learning, creativity and innovation if we did not strive hard to manifest such traits ourselves. Progress is quite simply written in Copernicus' DNA. Our High Voltage Theatre, the interactive exhibition "Scent – An Invisible Code" and the film "Dream to Fly" made using fulldome technology – awarded the planetarium equivalent of an Oscar – are all innovative elements and also serve as a promise of more novel concepts that will be made real at the Copernicus Science Centre in the near future.

This ongoing development is made possible by our working closely with a wide network of partners: our Organizers, various universities and research institutes, nongovernmental organizations, science centres, schools and companies. Our activities would also not be able to grow were it not for all the creative people who are personally and actively engaged in pursuing our mission: to encourage people to get directly involved in discovering and understanding the world, and to take responsibility for the changes occurring all around us.

– Robert Firmhofer, Director

Visitors

Since the Copernicus Science Centre first opened its doors to the public three years ago, we have welcomed over three million visitors: people of all ages, from all walks of life, with all levels of education and with all kinds of interests. They come to visit us from across Poland and beyond. Our attendance levels continue to be sky-high, year after year. This is testament to the potential inherent in our society, and to the value presented by science. We are proud of the trust we have earned, and we wish to use our experience to help shape a society based on learning and appreciation of knowledge, as well as sowing the seeds of change in Polish education.

Once again, the largest group of our visitors were schoolchildren aged 7–12 (32.4% of all visitors). The age group 13–16 is also well represented (15.7%), as are adults aged 26–35 (12.3%). The majority of school groups come to Copernicus from beyond the Mazowsze Voivodeship (80.5%). For organized groups and individual visitors, 43.4% were from Warsaw and 43.1% from regions other than Mazowsze. Visitors continue to rate their satisfaction with their trip very highly. The vast majority state that their level of knowledge increased following their visit and they feel more interested in science than before.

To make planning visits easier, last year (7 May) Copernicus launched **an online ticket booking system** where guests can select the exhibitions they want to see, including the planetarium, workshops and laboratories. We have also launched **a new website** for Copernicus. More extensive and dynamic, it captures the character of our institution more accurately and allows us to present our activities more effectively. As well as providing information about exhibitions and tickets, we also publish up-to-date multimedia materials and popular science articles.

1,030,617 people visitors in total

781,962 attended exhibitions at the Copernicus Science Centre

195,710 visited the Heavens of Copernicus planetarium

Our three-millionth guest arrived on 28 August: Małgorzata Dębska from Raszyn, with her sons Marcel and Mateusz, were visiting Copernicus for the fourth time.

It’s hard to know where to start, and impossible to leave. Loads of fun for kids and adults!

Brilliant... you can lose yourself and feel like a kid again.

An amazing place, which manages to surprise me every time.

Opinions from the CSC’s Facebook page

Visitors by age

- **11.8%** – 0–6
- **32.4%** – 7–12
- **15.7%** – 13–16
- **7.9%** – 17–19
- **6.2%** – 20–25
- **12.3%** – 26–35
- **10.4%** – 36–45
- **2.1%** – 46–55
- **0.9%** – 56–65
- **0.5%** – over 65 years old

Visitors’ opinions (guests over 15 years old)

Education levels of our visitors

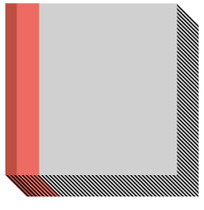
- **64.3%** – primary / middle school level (students in education)
- **0.3%** – vocational
- **0.4%** – college
- **10.3%** – secondary school
- **24.7%** – higher

Visitors by region (individual guests and organized groups)

- **43.4%** – Warsaw
- **13.5%** – Mazowsze (outside Warsaw)
- **43.1%** – other voivodeships

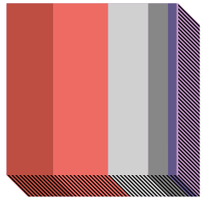
Visitors by region (school trips)

- **6.7%** – Warsaw
- **12.8%** – Mazowsze (outside Warsaw)
- **80.5%** – other voivodeships



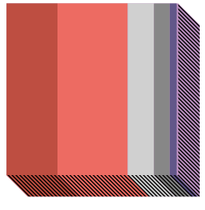
Following your visit, do you feel more interested in science?

- **27.1%** – yes, definitely
- **31.9%** – yes
- **23.5%** – neither yes or no
- **11.4%** – not really
- **5.1%** – definitely not
- **0.9%** – I don’t know



Following your visit to the CSC, do you feel you have a greater understanding of a particular branch of science?

- **29.7%** – yes, definitely
- **40.9%** – yes
- **15.3%** – neither yes or no
- **9.1%** – not really
- **4.1%** – definitely not
- **0.8%** – I don’t know



Are you generally pleased with your visit to the Copernicus Science Centre?

- **79.1%** – yes, definitely
- **18.4%** – yes
- **1.6%** – neither yes or no
- **0.8%** – not really
- **0.2%** – definitely not

Exhibitions

We continue to improve our existing exhibitions and design new ones, and they all fascinate and inspire wonder. We deeply believe that science is a driver for progress, and we strive to present this message through our exhibitions. And we believe all the greatest scientific, technological and social changes start with an individual; with each of us; with an individual sense of responsibility, creativity, courage to ask questions, and capacity for critical thinking.

Our exhibitions evolve with us. We dedicated last year to conducting an in-depth examination of public opinion about our exhibitions, and we are now using this information to formulate plans for the future and develop current exhibits so they can better serve their purpose. We are thrilled that our exhibitions constantly receive rave reviews, and that – in spite of the high visitor numbers – the average rate of exhibits kept in good working order at any particular moment is extremely high, at 97.7%.

The most frequently visited galleries in 2013 – as the year before – were Roots of Civilization, On the Move, and Humans and the Environment. Our guests also frequently participated in short scientific demonstrations and workshops within the exhibition spaces.

We continue to surprise our visitors with our latest displays. In March, we opened a new, electrifying venue at Copernicus: **the High Voltage Theatre**. More on this later on in this report.

We also make sure visitors to Copernicus are kept up-to-date with the latest scientific achievements. Two days after the Nobel Prize was awarded for the discovery of the Higgs boson, visitors were able to take a peek behind the scenes of this momentous discovery at the **"Accelerating Science"** exhibition fresh from CERN. Our next temporary exhibition, **"Scent – An Invisible Code"**, was not only the first of its type in Poland, but it was also a perfect example of successful international collaboration. These exhibitions are described in more detail in further chapters.

The travelling exhibition **"Experiment!"** comprises twenty exhibits constructed at our own workshops. In 2013, the exhibition had 32 outings to Poland's schools, public institutions, commercial companies, sponsors, and – for the first time ever – to shopping centres. We provided access to the exhibition free of charge on eight of those occasions. "Experiment!" was seen by a total of 33,330 people. Additionally, commissioned by the Ministry of Regional Development, we presented 16 external scientific demonstrations, witnessed by around 32,000 people in total.

In 2013, we worked on developing the concept and creating exhibits for **a new travelling exhibition called "Captured Mind"**, which we will roll out in 2014. The exhibition presents how we perceive and discover the world and how we form and develop relationships from the perspective of physiology and psychology. Our brain uses our senses to create an image of the world around us; how do we cope with such vast numbers of stimuli? Is reality in fact as we perceive it? The exhibits are now being tested by our visitors, and we value their impressions and opinions while we continue to perfect the exhibition. We hope that its final form will be a success for us as well as for them.

Which galleries did you visit today?

93.5%
Roots of Civilization

91%
World in Motion

87.7%
Humans and the Environment

66.9%
Light Zone

49.2%
RE: Generation

15.9%
Robotic Theatre

15.7%
Buzzz!

In general, how would you rate each gallery you visited today?

The following were rated as "very interesting":

79.2%
Buzzz!

72.1%
World in Motion

64.4%
RE: Generation

62.1%
Humans and the Environment

58.4%
Light Zone

54%
Robotic Theatre

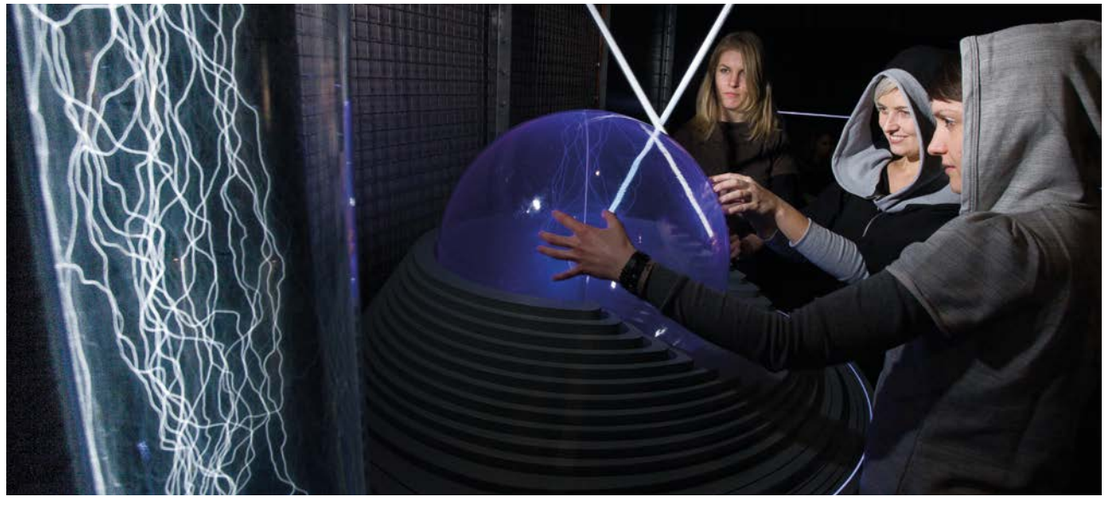
46.5%
Roots of Civilization

High Voltage Theatre

In March 2013, we opened Poland's most highly charged theatre. Although it's safely located in a Faraday cage, you feel electrified with each step!

Inside the gloomy interior stands the gleaming globe of a Van de Graaff generator, and the silence is broken by the zapping sound of electrical discharges. There are plasma exhibits and demonstrations that literally make visitors' hair stand on end. Guests can learn about electrostatic ping-pong, and discover whether electric current flows the same way as water flows through pipes.

The opening of the new space was celebrated during **the High Voltage Weekend (23 and 24 March)**. Top attractions included electricity-related demonstrations, an electric cinema, an electric current discovery alley, and workshops in laboratories.



Accelerating Science

Curiosity takes us to all sorts of unexpected places. One of the more unusual and fascinating, placed 100 meters underground, is the 27 kilometre-long tunnel in Geneva that houses the world's largest particle accelerator. The experiments conducted at the Great Hadron Collider, questions about the origins of the Universe, and mysteries of elementary particles were presented at an visiting exhibition from CERN – the European Organization for Nuclear Research in Geneva.

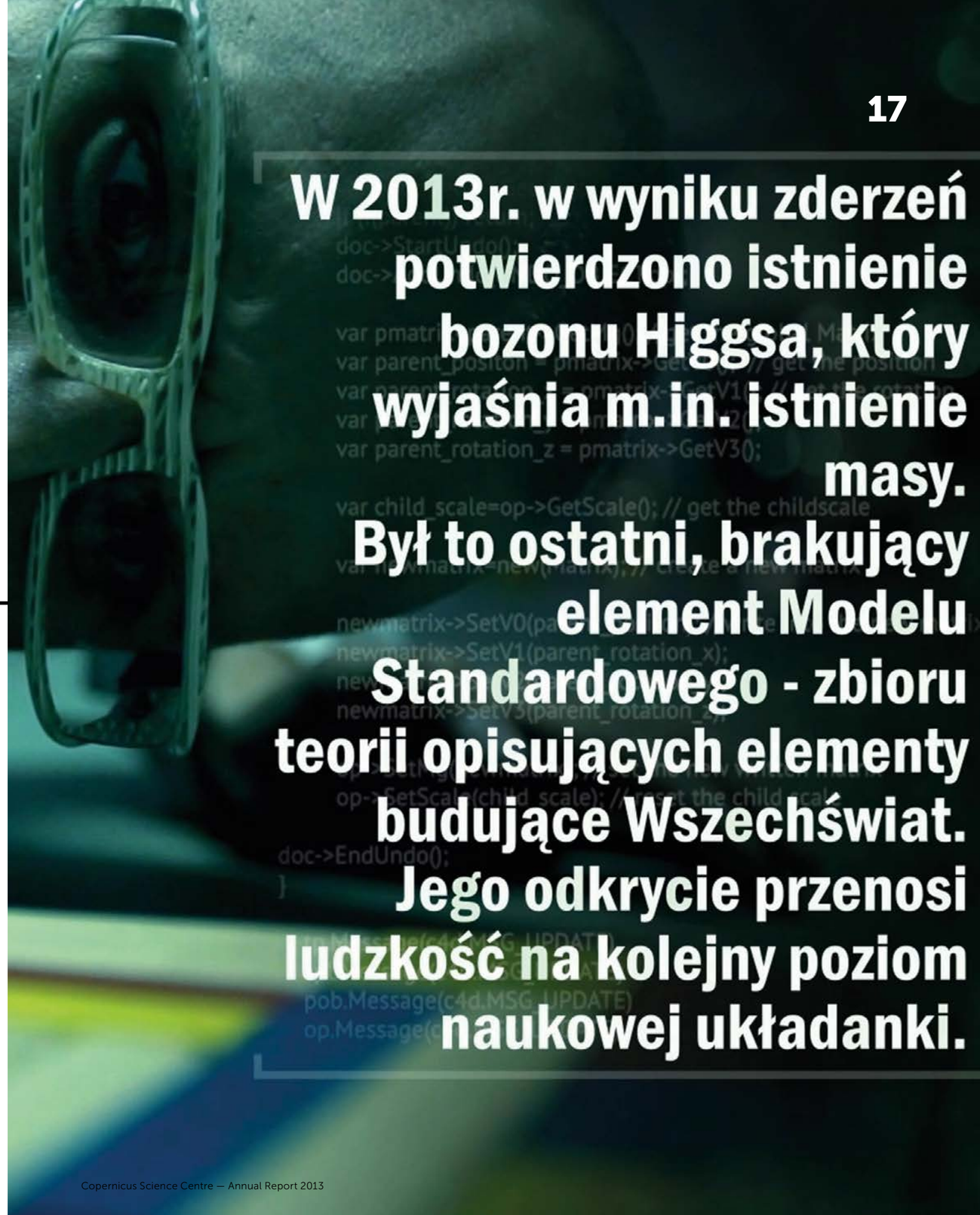
What happened during the first three minutes of the Universe's existence? How do we study the tiniest components of matter? What do we know about them, and what still remains secret? How do they interact? What are their properties and how were they discovered? Visitors were able to trace the evolution of the Universe from the Big Bang as far as the formation of our Solar System. The exhibition introduced the mysteries of the structure of matter, techniques and equipment used in studies of elementary particles, and the links between experiments conducted at CERN and the development of diagnostic medicine and the creation of the internet

Exhibition creators:

European Organization for Nuclear Research (CERN) in collaboration with **the Dudley Wright Foundation**

Duration:
10 Oct 2013 – 30 Mar 14

Two days before the exhibition opened, news broke of the Nobel Prize in Physics being awarded for the theoretical discovery of a mechanism that contributes to our understanding of the origin of mass of subatomic particles. The hunt for the missing particle – one of the many types present throughout our Universe – finally came to a successful conclusion at CERN. Visitors at Copernicus were able to learn more about the Higgs boson at the "Accelerating Universe" exhibition. We wanted to reach out to a broad audience in an new and striking way: **our video** about the Higgs boson (created by the Copernicus Science Centre in collaboration with Łukasz L.U.C. Rostkowski) was viewed by around 30,000 people on YouTube during the first month. One frame from the video is shown on the right.



Elements of popular culture are often useful in portraying complex scientific discoveries and experiments, rendering them easier to understand. What do CERN, piñatas and Angry Birds all have in common? Or, to be more precise, how do these two games relate to the particle collisions that are staged within CERN's LHC? In fact the ideas are strikingly similar: accelerated protons collide at velocities approaching the speed of light, and the resulting collisions cause the formation of vast numbers of entirely new particles – components of matter. Between 4 and 10 October, we held games promoting the opening of the exhibition: participants could win entry tickets by colliding piñata 'particles'.

On 10 October, we held an open meeting with **Prof. Agnieszka Zalewska**, President of CERN Council, and **Dr. Rolf Landua**, Head of Education and Public Outreach at CERN. The visitors – mainly schoolchildren – were especially interested in the operation of the Large Hadron Collider, as well as asking about the centre's funding and future. The participants also took part in a quiz, answering questions about scientific discoveries made as a result of studies carried out by the European Organization for Nuclear Research The meeting was attended by approx. 220 people.

On 17 October, we held an After Hours session promoting the exhibition. This time, the key topic was "Elementary Particles". We constructed fog chambers at the physics laboratory; the overlaps between the worlds of quantum physics and popular culture were introduced by guest scientists including Prof. Andrzej Turos, Dr. Marcin Konecki, Dr. Lech Nowicki, and Maura Malińska. More about the After Hours project on pp. 46–49.

Scent – An Invisible Code

Scents are as unique as fingerprints. Each location has its own specific smell; each memory, a distinctive fragrance note. People have been using scents for thousands of years to nurture, camouflage, beautify, or clothe themselves, or simply to stand out. The history of perfume is long and fascinating – from smoke and incenses, ointments, balsams, oils, to fragranced waters of today. But there is a lot more to scents than just perfumes: smells are also a way of communicating. This extraordinary, fragrant exhibition was the result of a collaboration between partners in Poland, France and Germany: the Copernicus Science Centre, the French Institute in Poland, and the Goethe-Institut.

What did ancient Rome smell like? What were Catherine de'Medici's gloves fragranced with? Using period documents, contemporary perfumers were able to reconstruct these aromas. Colourful stories, anecdotes and unique scents recreated especially for the exhibition were used to introduce visitors to the history of perfumery from the Antiquity until the present day. Guests gathered around a perfumer's table to discover fragrances broken down into their individual components: woody, musky, spicy, citrusy, floral. The latest methods of creating and processing scents allowed us to discover the world through smell on an unprecedented scale. Visitors could study how aromas affect our consciousness, communication, and environment. One of the components of the exhibition was a unique scent city map.

Exhibition creators:

The exhibition was created as a collaborative project between the Copernicus Science Centre, the French Institute in Poland, and the Goethe-Institut. It was executed as part of the German and French cultural fund celebrating the 50th anniversary of the Elysée Treaty.

Curators:

Agnieszka Łukasik (concept) – expert and connoisseur of fragrances, co-founder of one of Poland's first boutique perfumeries.
Annick Le Guerer (history of perfumes) – anthropologist and philosopher, specialist in the history of scents and perfumes, researcher working with the Universite de Bourgogne in Dijon.
Katarzyna Sosenko (historical collection) – art historian, owner of a collection of antique perfume flasks. Author of the "The Scent of Luxury" exhibition on the history of perfumes.
Sissel Tolaas (urban scent map) – one of the best known fragrance artists in the world, an innovator of projects based on molecular analysis of scents.
The project was created in collaboration with experts in fragrance arts: **Dominique Ropion** and **Daniela Andrier**, the designers of perfumes and authors of the historical scents created for the exhibition, as well as Poland's own specialists: **Dr. Władysław Brud** and the **team from Pollena Aroma**.

Duration:
22 Nov 13 – 19 Jan 14

What an amazing exhibition! I'm greatly impressed by it, as well as by this example of outstanding collaboration between three partners. Thank you to everyone involved.
– Rüdiger Freiherr von Fritsch, German Ambassador to Poland

A fascinating exhibition organized as part of the Weimar Triangle. It forms an excellent part of our ongoing co-operation.
– Pierre Buhlere, French Ambassador to Poland

Quote originate from the CSC's guest book.

Scent map of the city – this part of the exhibition was designed by Sissel Tolaas, a biochemist, artist, and fragrance expert. Her works are eccentric and stimulating for the nose and the imagination, and they inspire a fresh look at the world of scents. They have been shown all over the globe, at venues such as the Museum of Modern Art in New York, the Tate Liverpool, and the National Museum in Beijing. Her project illustrates the concept of analysing cities in terms of their scents, and the potential of fragrances as a form of social communication.

(...) The Budzik centre, treating coma-stricken children, soon plans to introduce aromatherapy sessions. The idea came about during the opening of the exhibition "Scent – An Invisible Code" at the Copernicus Science Centre in Warsaw. Many of the exhibits were prepared by experts from the company Pollena Aroma, also in Warsaw.
"We recreated scents such as oil-based Egyptian fragrance stickers that were worn on wigs, or Hungary Water, the first alcohol-based perfume, originally made for Queen Elizabeth of Poland in 1325," says Władysław S. Brud, member of the board at Pollena Aroma.
Following the opening of the exhibition, the company was contacted by representatives of the "Akogo" foundation, Budzik's initiator.
The clinic has already started collecting some of the most popular fragrances among children, such as oranges, mandarins and mint, which are being used by therapists. Representatives of Pollena met with parents of children at the clinic to discuss smells loved or despised by the kids before they became ill. "They included things like their favourite soup, specific brands of chocolate, or mandarins. Some of the kids specifically hated the smell of cigarette smoke," says Dr. Brud.
Perfumers from Pollena are currently doing volunteer work on recreating fragrances for patients at Budzik. They will reach the centre in the new year. (...)
– „Rzeczpospolita" 05.01.2014

The exhibition "Scent – An Invisible Code" was opened on 21 November during an After Hours session "Empire of the Senses". As well as previewing the exhibition, the guests were able to attend lectures and workshops held by fragrance experts, art historians, aromatherapists and producers of perfumes. More about the After Hours project on pp. 46–49.

Our laboratories offer a wide range of classes and workshops for school groups, families with children, teachers, and adults. We present information in an easily accessible way, and encourage visitors to make their own discoveries. The workshops also provide an excellent opportunity for learning about teamwork, practicing critical thinking, formulating the right questions, and drawing conclusions.

2013 was a busy year for our laboratories, bringing many new activities for their visitors. Sessions held during the week for middle- and high-school groups covered subjects in the curriculums of natural science and technical subjects. Minilabs, held at weekends, were aimed at families with children 9 years old and above. Also popular were the open labs during After Hours sessions for adults and the Long Night of Museums.

Teachers were particularly frequent visitors – not only during the "Show and Tell" conference, but also during workshops held as part of the "Copernican Revolution" project supported by the Ministry of National Education. More about this project on p. 64.

Laboratory activities have been held both inside and outside our building. We have participated in municipal events (such as the picnic celebrating International Children's Day, held in the gardens at the Prime Minister's Office, and the municipal picnic in the Bemowo district), the 17th Science Picnic of Polish Radio and the Copernicus Science Centre, the annual Science Festival and competitions such as Robomaticon and PIAP Robot Night, and attended events held abroad (the Science Picnic in Croatia, and Science Days at Europa Park in Germany).

Chemistry laboratory:

6 different class topics

9154 participants

Biology laboratory:

6 different class topics

7862 participants

Physics laboratory:

4 different class topics

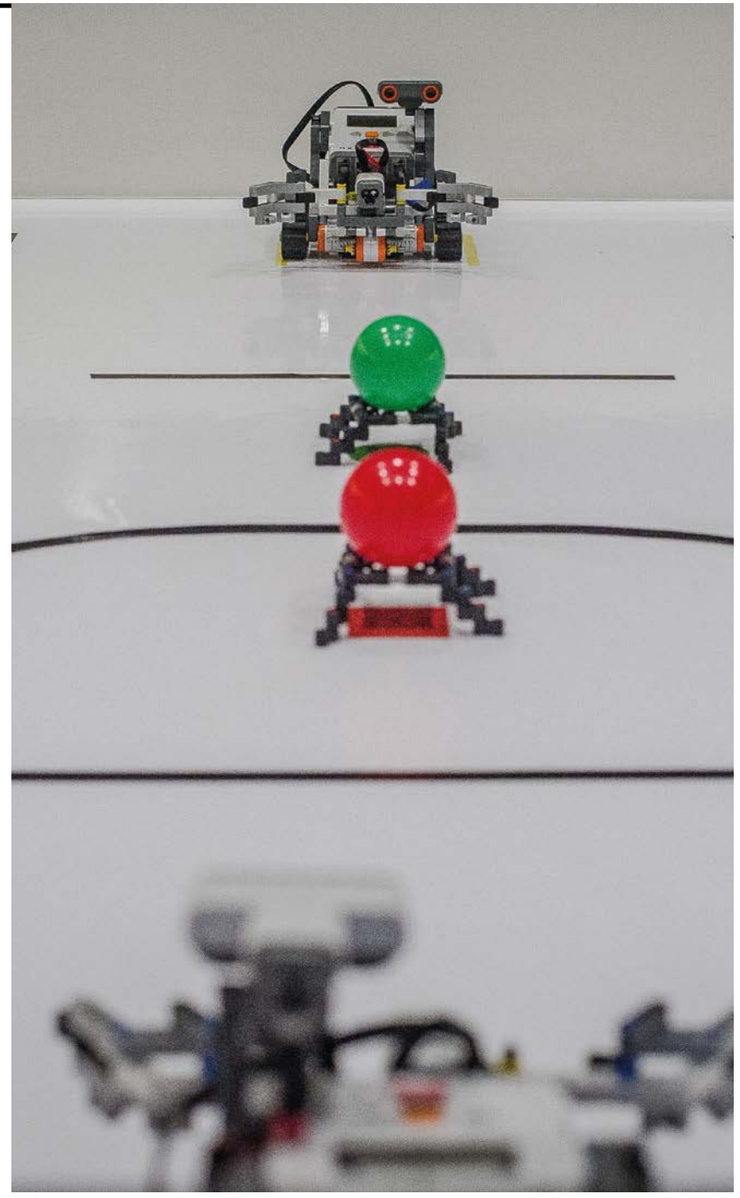
8317 participants

Robotics workshop:

4 different class topics

5710 participants

On 30 April, we held **Robots Day**. In the technology zone, visitors learned about applications of robotics in entertainment as well as in more serious areas that make our everyday lives easier and help us work. In the construction zone, we converted old toys into robots and held cyber-races. In the relaxation zone, Maciej Wojtyszko – author of *Bromba i inni* ("Bromba and Others") – was joined by popular artists who read excerpts from his book.



From the original film production
"Dream to Fly"

People with passion!

Amazing experiences.

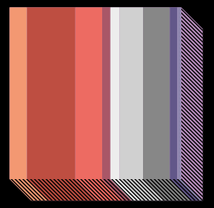
Opinions from the planetarium's Facebook page

195 710

people visited the planetarium

Visitors by age

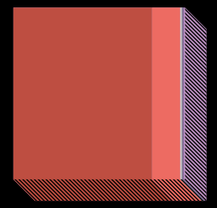
- **10%** – 0–6
- **28.2%** – 7–12
- **15.6%** – 13–16
- **4.8%** – 17–19
- **5.3%** – 20–25
- **13.7%** – 26–35
- **15.5%** – 36–45
- **4.4%** – 46–55
- **2.4%** – 56–65
- **0.5%** – over 65 years old



Visitors' opinions (guests over 15 years old)

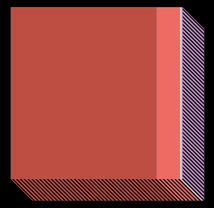
Are you generally pleased with your visit to the planetarium?

- **80.8%** – yes, definitely
- **16.4%** – yes
- **1.7%** – neither yes nor no
- **0.5%** – not really
- **0.4%** – definitely not
- **0.5%** – I don't know



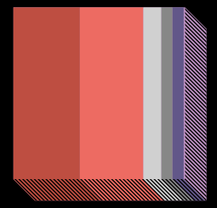
Would you recommend visiting the planetarium?

- **84.9%** – yes
- **13.5%** – yes, definitely
- **1%** – neither yes nor no
- **0.1%** – not really
- **0%** – definitely not
- **0.6%** – I don't know



Following your visit to the screening(s), do you feel you have a greater understanding of a particular branch of science?

- **38.7%** – yes
- **37%** – yes, definitely
- **10.5%** – neither yes nor no
- **6.5%** – not really
- **6.3%** – definitely not
- **1.1%** – I don't know



Dream to Fly

Three years of work at our film studio, using state-of-the-art technologies and innovative ideas, produced this film about pioneers, made by pioneers. Even before it was completed, the production received numerous awards at international festivals. On 24 October, the world finally saw “Dream to Fly” – the first Polish film made using fulldome technology.

The origins of aviation can be found in ancient dreams and longings; the desire to rise up to the stars has accompanied humankind from its earliest days. It features in Greek mythology, One Thousand and One Nights, and the Chinese tradition of launching sky lanterns. “Dream to Fly” is an amazing adventure with science and the history of aviation, taking viewers on flights by balloon, airship and airplane. Audiences discover the great secrets of flight together with Leonardo da Vinci, the Montgolfier brothers and the Wright brothers. But what else makes this film so special?

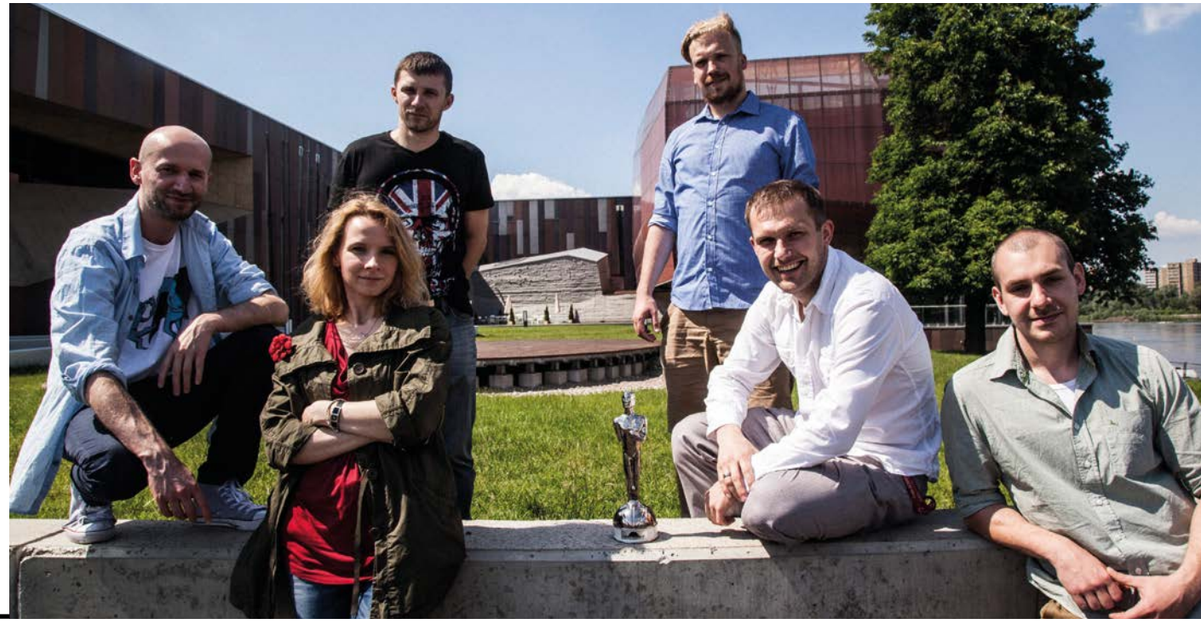
Fulldome is a very young technology in early stages of development. It works by projecting images onto a spherical screen – such as screens in planetariums – with the audience sitting inside the sphere. Watching the images all around makes the viewers feel as though they are actually “inside” what they are seeing. The work on the film was highly unconventional: the initial storyboards and then entire frames had to be in a circular format. Once they were printed out, they resembled CD stickers. The animation, lasting almost 40 minutes, comprises 63,000 frames, each one 4000 x 4000 pixels – twice that of an ordinary film!

The film was shown to an international audience before its official premiere. On 1 June, it was awarded the Janus Fulldome Award – the Oscar of planetarium productions – at the Fulldome Festival in Jena, Germany, and in September it won the Best Script/Story Award at the Imiloa Film Festival in Hawaii. The film has also been hailed by producers from planetariums. One even said that “Dream to Fly” may become a milestone in the development of fulldome films, much as “To Fly!” (1976) was to the IMAX format.

The film was seen by 10,000 viewers between its premiere in October and the end of 2013.

The soundtrack was composed by Michał Lorenc, with Danuta Stenka providing the voiceover. The film is also available in English and Russian.

Our three years of hard work on the film have been a huge success. Photo: our film studio team with the Janus Award. From the left: Maciej Sznabel, Paulina Majda, Mirosław Restel, Bartłomiej Borawski, Maciej Ligowski, Maciej Rasała.



The best combination of dreams and new technologies at Warsaw’s Copernicus.
– www.antyweb.pl

Copernicus should be visited by everyone, especially if they are going to the screening with kids. “Dream to Fly” is a simple but moving tale of the power of human passion and imagination, which has made it possible for us to soar in the air – and the fulldome technology really means we’ll be able to fly without leaving the ground.
– www.film.org.pl

On one hand, it’s a story about humankind’s dream of flying and the attempts to make it possible; on the other, it’s a cinematic dream-come-true with the power to enchant viewers and take them on an extraordinary journey. If you have ever envied the first viewers of “Arrival of a Train at La Ciotat” the incredible impression that film must have made on them, “Dream to Fly” will be perfect for you. While it’s unlikely to make anyone flee the cinema, it’s bound to provide thrill after thrill.
– www.stopklatka.pl

New at the planetarium

The planetarium is about more than just films and screenings: we have also created a space for discussion, scientific debate and art. We try to keep surprising regular visitors and attracting new ones. This year, the planetarium started a wide range of new activities – and we are delighted to say that they have been very well received.

Starry Night concerts

Friday evenings in 2013 were a unique opportunity to participate in stellar musical spectacles. The program included pearls of classical music from Chopin, Bach, Beethoven, Debussy, Messiaen and Satie. The concerts, performed by young, talented musicians, were accompanied by visualizations of the night sky under the planetarium’s dome. 33 such concerts were held in 2013, experienced by a total of around 4,300 people.

Around Jazz

We took fans of musical improvisation into a monthly jazz orbit. The program featured well-known standards for trumpet and piano, as well as free jam sessions. The music was accompanied by visualizations of the cosmos and the farthest reaches of the Universe. Four such concerts were held in 2013, with 513 people taking part.

Lectures

Creating the impression of flying in a spaceship piloted by astronomers, astrophysicists and other scholars of space – that was the format of the monthly meetings with experts, introduced in November and held in combination with multimedia screenings at the planetarium. The participants had the opportunity to learn about the latest scientific achievements, space discoveries, and other stellar news. The meetings were accompanied by discussions with the speakers and visualizations under the planetarium’s dome. We held two such lectures in 2013: Dr. Andrzej Kotarba from the Space Research Centre of the Polish Academy of Sciences talked about the methods and equipment used for observations of our own planet (7 November), while Prof. Jarosław Włodarczyk from the PAS Institute of the History of Science revealed some of the secrets of the Star of Bethlehem (5 December).

Dark Side of the Moon

In December, we unveiled a new attraction for fans of rock music: a veritable tribute to Pink Floyd, one of the finest groups of all time. The viewers are taken on a journey into the world of extraordinary, fantastical and hypnotic graphics. The trip is accompanied by the band’s greatest hits, including “Time”, “Money”, “Us and Them”, and “Eclipse”. The presentation also features a specially designed **laser display**.

2013 premieres:

Films:
Secrets of the Sun,
Secrets of a Cardboard Rocket,
Dream to Fly (more on p. 30),
Chirpie’s Amazing World Adventure,
Extreme Planets,
Timespace: A Neverending Adventure

Seasonal demonstrations held live before screenings:
The Antipodes,
A Journey through the Galaxy,
Time of the Comet,
On the Silver Globe

Longer live presentations:
Planetarium – How Does It Work?,
A Cosmic Journey,
Special demonstrations held during the monthly After Hours sessions

Observing the Perseids

Things like this only happen here... The outside lights are dimmed at Copernicus, the planetarium, the National Stadium and the Świętokrzyski Bridge – all especially for fans of astronomy. And thousands of them gathered to observe the meteor shower!

The planetarium has an extraordinary capacity to spontaneously attract people who are discovering the fascinations held by the night sky. We still remember the crowds of Varsovians who joined us to celebrate the transit of Venus last year. This year’s observations of the Perseids exceeded our wildest dreams: on the night of 12/13 August, our Discovery Park hosted over three thousand visitors! Karol Wójcicki, a presenter at the Heavens of Copernicus, pointed out the brightest stars in the sky, and explained the differences between meteoroids, meteors and meteorites. Might we manage to dim the lights across the entire city next year? We’ll have to wait and see.

3,000 participants

Other events:

It's become a certain tradition to spend Valentine's Day away from all the schmaltz and kitsch, and instead taking in the refined company of thousands of stars in the planetarium. On 14 February, during the presentation **"Constellation: Love"**, we searched for sensual stories hidden in the constellations of the winter sky, and ventured to the most romantic corners of the Milky Way. This astronomical "date" proved so popular, we had to hold additional demonstrations!

Scorpio 3, Hyperion and SKNL are all names of state-of-the-art **Mars rovers**. They weren't made in secret NASA laboratories, but rather in teaching rooms of Poland's Universities of Technology in Wrocław, Białystok and Rzeszów. On 15 May, representatives of the **Mars Society** came to our planetarium to present in-depth lectures about each rover, introducing their creators and describing the tasks they are set during competitions in desert in Utah.

We celebrated International **Children's Day** for two whole days: on 1 and 2 June. The festivities featured a special planetary repertoire. Kids built and launched their own rockets, created their own personal interpretations of one of seven constellations, and learned how to find their chosen constellation in the sky. We also presented the premiere of the film "Secrets of a Cardboard Rocket."

Books were also a welcome guest under the stars. On 22 June, as part of the **Big Book Festival** (of which the Copernicus Science Centre is a partner), the planetarium hosted a meeting "Communication in the Future". How is Facebook affecting us? Do we face the threat of a communication disaster? Why do we dream of distant worlds? The science fiction author Jacek Dukaj joined us in the search for answers to these questions. The meeting opened with the screening of "Extreme Planets."

The skies above us are open to observations of more than just the Moon and the planets. During the annual celebrations of "Summer in Discovery Park," the planetarium hosted outdoor observations of the sky. The high point was the Night of the Perseids, attracting record-breaking crowds of over 3,000 people! More on p. 34.

Our celebrations of **St. Nicholas' Day** featured something for adults as well as kids. On 6 December, our guests were the first to see **"Dream to Fly" in 3D**, while on 7 December we hosted **Comet Night**. Although C/2012 SI ISON, known as the comet of the century, broke apart as it passed close to the Sun, we didn't give up. The less-well known comet C/2013 R1 Lovejoy also passed close to our planet; in good weather, it was visible from Warsaw using just binoculars. The evening's guests were Prof. Grzegorz Pojmański (discoverer of two comets), Michał Kusiak (discoverer of over 150 comets as part of the SOHO Sungrazing Comets project), and Piotr Guzik (well-known astronomy expert and observer). As well as lectures and comet workshops, our guests enjoyed a night-time marathon of planetarium films and conducted astronomical observations, culminating with breakfast the following morning. During Comet night, we also premiered the laser projection "Dark Side of the Moon" (more on p. 32).

International Planetarium Society (IPS). The organization incorporates planetariums from 35 countries from around the globe, and holds conferences every other year, each time in a new location. The next event will be held in Beijing later this year, while the following conference, in 2016, will be hosted by the Heavens of Copernicus planetarium! Other candidates in the running were the TELUS World of Science in Canada and the Cite l'espace in France, but the IPS chose Warsaw as the venue for this prestigious international event. This means that June 2016 features double celebrations – the conference will coincide with the planetarium's fifth anniversary.

For a whole week in the autumn (14–18 October), astronomy ruled supreme at the Warsaw University of Technology and the Copernicus Science Centre. **The conference Communicating Astronomy with the Public** (CAP) was visited by almost 180 people from 40 countries. The participants attended lectures, demonstrations and discussions on space exploration, the International Year of Light 2015, and the relationship between popularizing astronomy and business. The CAP conference was organized by the New Space Foundation, the Faculty of Power and Aeronautical Engineering at the Warsaw University of Technology, and the Copernicus Science Centre. The event was held under the auspices of the International Astronomical Union. On 14 October, the public were invited to a meeting with **Dr. Robert Simpson**, astronomer, founder of the Zooniverse and Astronomy portals, and blogger for the Orbiting Frog. During his lecture, Dr. Simpson stressed the importance of citizen science. We are all able to be active participants in science – for example, by joining online projects that harness our computer's spare processing power to conduct wide-reaching calculations. Such activities are highly popular, and they have already resulted in the accumulation and analysis of vast amounts of data. The fields of neurology, medicine, zoology, astronomy and the humanities are all undergoing a revolution in which whole communities become involved with projects, which in turn creates entirely new opportunities. On 18 October, **Dr. Edward Gomez** – astronomer, programmer and popularizer of science – described innovative ways of discovering planets beyond our Solar System. The participants were invited to consider the motivation of humankind's space exploration. What are we really searching for? Extraterrestrial life? Or perhaps planets we could one day inhabit?

PIKNIK NAUKOWY

POLSKIEGO RADIA I CENTRUM NAUKI KOPERNIK

17th Science Picnic

Held at Poland's relatively new National Stadium for the first time, this event is now a celebration of science on an international scale. The Science Picnic seems to defy the flow of time – even after so many years, it continues to evolve and inspire. This year it broke all attendance records, with almost 150,000 participants! It is Europe's prime outdoor event promoting science, and it is laying claim to being the largest in the world. It attracts numerous guests from abroad, who come to enjoy the event and pick up ideas hoping to recreate a similar concept back home. All this goes to show that the "Science Picnic of Polish Radio and the Copernicus Science Centre" is truly a phenomenon, unique on a global scale.

How did it happen that just one species on Earth has been able to develop the ability to ask questions? And it is those same beings that created something even more remarkable: culture, which – together with our ability to ask questions and think scientifically – gave rise to our civilization. This year's leitmotif was "Life", in the sense of human genesis and identity, and, more broadly, in the context of science as an integral part of all facets of social life that have a direct impact on our lives now and in the future.

The external ring of the National Stadium and the avenues leading to it held close to 200 tents hosting over 1000 scientific demonstrations presented by representatives of 21 countries, from as far afield as China, South Africa, the US, South Korea, Italy, France and Israel.

The erected stage held further attractions, including a concert of original African instruments, presented by Derek Fish from South Africa to explain the physics of sound. In turn, Dr. Matt Pritchard from the UK demonstrated that science can transform ordinary people into superheroes with real superpowers. Guests from the Science Centre AHHAA in Estonia presented explosive experiments.

The picnic broke more than just the attendance record: the balance between numbers of visitors from Warsaw and further afield has shifted over the years. In 2013, the number from outside Warsaw and the Mazowsze Voivodeship was proportionally greater than ever before, rising to 17% from 8% during the previous Science Picnic. This means that the event is gaining in popularity across the country.

93.3% of Picnic attendants stated that science is needed by society, and that taking an interest in it broadens our horizons and understanding of the world. 85.6% respondents could see a link between scientific research and everyday life, while 84.5% felt that science will provide answers to challenges of the modern world.

The National Stadium proved to be an excellent location, attracting additional visitors interested in the venue itself and the events it hosted. Until 2012, the majority (53.9%) of visitors had attended the Picnic at least for the second time. In 2013, the trend was reversed for the first time: for the majority of guests (57.9%), this was their first visit.

The organization of the event was mostly described as very good (51.1%) or good (30.2%). Guests' views on the program were equally positive (43.6% – very good; 43.9% – good). Almost 93% people stated that they hope to come back for next year's Picnic; in other words, more than nine out of ten guests were so pleased with their visit to the Picnic that they plan to attend again next summer.

The Science Picnic of Polish Radio and the Copernicus Science Centre was awarded the prize "Best Tourism Product in the Mazowsze Voivodeship in 2013" by the Polish Tourism Organization.

The Copernicus Science Centre tent at the Picnic enjoyed great popularity: we had robots that mimic the movement of animals, and we hosted the Biosphere project. It seemed that everyone wanted to make their own self-contained garden in a jar – after the vessel is sealed, the plants don't even need watering!

Science Picnics abroad

The Science Picnic of Polish Radio and the Copernicus Science Centre has become a mark of quality, and a product that can be exported. In 2013, nine cities in five European countries held similar events. Copernicus regularly hosts guests from around the globe, hoping to get involved and learn the secrets of the Picnic's popularity. The egalitarian nature of the event means that schoolchildren are as welcome to present their experiments as established, successful scientists are. It is equally open to people who are fans of science and those who question or challenge its usefulness. It is a concept we want to share and spread, and we provide support to our foreign colleagues in their work to recreate this grand celebration of science in their own countries. This year, Ukraine proved that nothing is impossible, hosting five (!) Science Picnics over the course of just five weeks.

Russia (Samara)

In March, we participated in the Science Picnic held during the Festival "Science Museum in the 21st Century" on the invitation of the Dynasty Foundation and the Samara in Space Museum. We held workshops in aerodynamics for around 100 children, during which we constructed extraordinary flying objects such as paper cylinders and planes with circular wings. The kids worked as aerodynamics engineers, making paper rockets which they then tweaked and improved. We also held a special workshop for teachers and curators of scientific circles and clubs, sharing our experiences in holding classes and popularizing science.

Ukraine (Ternopil, Lviv, Kiev, Luhansk, Kharkiv)

The concept of holding Science Picnics in Ukraine came from several young activists from various cities in the country during their study visit to Copernicus. Ternopil (7 September) and Lviv (14 September) held the first two Science Picnics. Both proved to be a success: the Ternopil event was visited by over 2500 guests, with 23 institutions attending as presenters. The campus of the Lviv University of Technology hosted 1500 visitors, with 13 exhibitors taking part. The picnic in Kharkiv was also very popular, even though it had to be moved into university buildings because of adverse weather conditions.

It's worth stressing the social aspect of Science Picnics, in particular those in Eastern Ukraine, where they are not just events that popularize science, but also integrate and change society. In some cities, they may be the only open, free events with no political subtext. The Picnics organized by dedicated and enthusiastic social activists and leaders of local nongovernmental organizations were met with interest by scientific circles and those promoting and popularizing science.

The results of the picnic in Ternopil speak for themselves: a week after the event, during enrolment at local science clubs and circles, a third of people hoping to sign up stated that their inspiration for joining was attending the recent Science Picnic. For the first time, there were more applicants than places. The organizers of the Ternopil picnic were also approached with an offer to prepare a regular popular science program for a local TV station.

We participate in all the Picnics in Ukraine. Visitors to the tents of the Copernicus Science Centre learned about experiments in acoustics, launched paper rockets powered with compressed air, and solved logic puzzles. Poland's participation was coordinated by the Centre for Intercultural Initiatives. The involvement of its team, local coordinators and scores of volunteers made it possible to achieve the seemingly impossible: hold five events popularizing science in a short space of time, and in far-flung corners of Ukraine. The project received financial support from the Polish-American Freedom Foundation as part of the Regions in Transition (RITA) program, implemented by the Education for Freedom Foundation.

The five Science Picnics held in Ukraine attracted in a total of around 12,000 visitors.

Lithuania (Kaunas)

Lithuania's first Science Picnic was held on 13 September as part of the Science Festival "Erdvėlaivis Žemė" (Spaceship Earth). The Kaunas University of Technology became home to a scientific tent village. The event was opened by the University's Rector Petras Baršauskas, the Science and Education Deputy Minister Rimantas Vaitkus, and Robert Firmofer, Director of the Copernicus Science Centre. The Picnic was attended by numerous organizations from Lithuania, Latvia and Poland.

Croatia (Zagreb)

The 2nd Science Picnic in Zagreb was held on 15 September, gathering together numerous research institutions and science promotion groups. We presented Copernicus' laboratories and held demonstrations with the participation of the audience. The Picnic was attended by over 10,000 people.

Georgia (Tbilisi)

The Tbilisi Science Picnic made its debut last year. The 2nd Science Picnic (5 October), organized by the Ilia State University, formed a village of 50 tents spread around the Old Town. The Picnic was officially opened by the Mayor of Tbilisi, the Rector of the Ilia State University, and the Director of the Copernicus Science Centre. The event was highly successful. We were delighted that one of the presenting groups was one of Copernicus' ambassadors to the East: the Young Explorer Club from Rustavi. The CSC tent presented experiments using a microwave, as well as holding a science demonstration about music on the Picnic stage. We were even more delighted that we weren't the only Polish participants: this year, Tbilisi also hosted a team from the PAS Institute of Physical Chemistry.

After Hours

We are constantly striving to make Copernicus increasingly attractive to families. But, since we also wanted to do something especially for adults, in May we inaugurated a cycle of meetings just for them – whether visiting alone, as pairs or in groups of friends; whether they are parents who want to see what all the fuss is about, or even couples on an unusual first date. A fascinating program, a curious approach to science, a good dose of humour – that's our recipe for an excellent evening at Copernicus.

Each meeting, organized together with Samsung – the strategic sponsor of the Copernicus Science Centre – focused on a different topic. The scripts were inspired by titles of novels and films. As well as opening our exhibitions to visitors, we prepared workshops, film screenings, performances, games, lectures, meetings with experts and concerts. Heavens of Copernicus also showed special live displays of the sky, tying in with each evening's topic. Guests could take part in as many or as few activities as they felt like – they could experiment with the exhibits, or simply relax, listen to music and chat with friends over a glass of wine. The choice was up to them – as always at Copernicus.

Similar evenings have been held at other science centres, for example in London, for many years. We hoped that our visitors will like the concept, and we weren't wrong: during the eight evenings (from May to December), we had 7,174 participants.

Timetable for 2013:

"Hopscotch" (23 May)
What are the underlying mechanisms involved in games? How do they work? How do we recognize them? How can we use them for tasks such as interpreting reality? During the first evening, we invited our guests to observe and experience various aspects of games and play: from mathematical puzzles, actors' performances, to playing musical instruments.

"Crime and Punishment" (20 June)
Around two hundred years ago, fighting crime took on a more formal shape: successive countries in Europe formed police forces, which soon started drawing on scientific advancements. Dactyloscopy, forensic medicine, ballistics and toxicology are just some of the scores of new scientific fields created specifically to combat crime.

"I, Robot" (18 July)
Robots are now very much at home in factories, where they perform the most monotonous, repetitive tasks at production lines. But is that all? In recent years, growing numbers of disciplines have been increasingly relying on automation. We have robot sappers working in bomb disposal, and robot surgeons conducting meticulous cardiological and neurological

operations. Will a time come when robots fully replace humans?

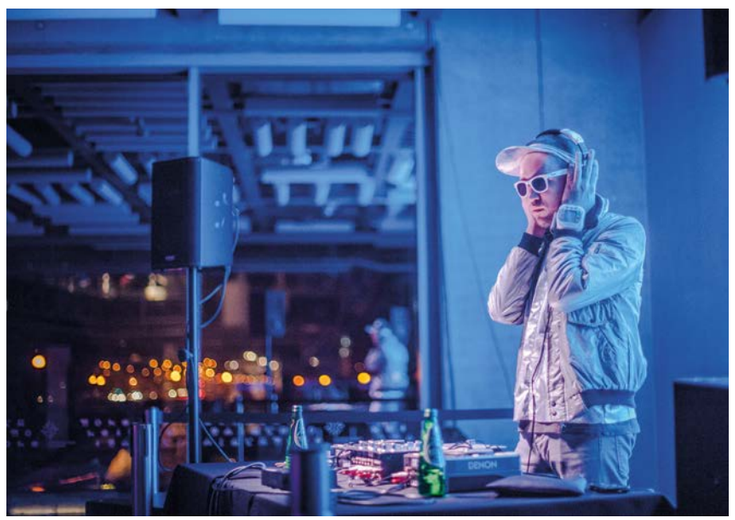
“Paradise Lost” (22 August)
Ecologists are sounding the alarm: our planet’s natural resources are running out, while overexploitation is damaging ecosystems and leading to irreversible environmental changes – and to the destruction of life. Are such disasters really just around the corner? We discussed environmentally-friendly urban planning, the impact of 3D printing on environmental protection, and the future of ecology in the era of mass personalization.

“Dangerous Liaisons” (19 September)
Over 60 million distinct chemical compounds exist today, with more being synthesized in laboratories around the globe. However, not all are useful; in fact, some may pose major yet unknown threats to our health. A new branch of medicine – clinical ecology – aims to identify threats resulting from the distribution of these dangerous compounds, diagnose illnesses they may cause, and devise methods of treating and preventing them.

“Elementary Particles” (17 October)
Quarks, bosons, leptons, neutrinos... elementary particles have made their way out of the safe world of quantum physics and come striding into popular culture, taking firm root in literature and films. But is it possible to discuss the physics of elementary particles simply and comprehensively? Of course! As an added bonus, our guests had an opportunity to view our latest exhibition “Accelerating Science”, straight from CERN.

“Empire of the Senses” (21 November)
Our senses allow us to experience the world around us, communicate with other people, avoid dangers and make the best possible decisions. And, of all our senses, two stand out in particular: taste and smell. They are responsible for many the experiences that bring us the most pleasure and satisfaction. In November, we invited our guests to discover the secrets of the mysterious world of fragrances at the exhibition “Scent – An Invisible Code”.

“Time Machine” (12 December)
Is time travel purely a figment of our imaginations? Can it really be a genuine inspiration for scientists? Time is a mysterious and elusive concept that keeps evading a concrete definition. Perhaps it can only be fully understood by physicists; in recent years, even they have been increasingly addressing this topic that has thus far been firmly in the domain of science fiction.



Each evening features lectures held by eminent experts and scientists. Pictured here: **Fr. Prof. Michał Heller** talks about the boundaries of the cosmos and the tyranny of time (12 December, “Time Machine”).

Summer at Discovery Park

The city as planet. The city as our home. Urban living makes certain aspects of our lives easier, but it doesn't come without its problems, so we took a closer look at the challenges faced by residents of metropolises. Over the course of eight summer weekends, we encouraged Varsovians to seek out and use innovations and processes that make their lives in the city easier, and to expand their understanding of the momentous changes taking place all around them.

Cities have become drivers of cooperation and progress. The process has been gaining momentum since the dawn of the industrial revolution. According to forecasts, by 2050 around 80% of the world's population will live in cities. But urban complexes also focus the greatest problems of our times: destruction of the environment, overpopulation, and crime. Of course, this doesn't mean that cities are a problem in and of themselves; on the contrary, they provide access to cheap energy, water, education and healthcare while being responsible for the creation of 80% of global wealth. However, there are a number of questions: are services fully accessible to all urban dwellers? To what extent do all city residents benefit from the capital they generate? What is urban sustainable development? We invited the participants in our Summer in the City project to look for answers to these and many other questions. Throughout all weekends in July and August, visitors enjoyed free workshops, activities and other attractions. Around 1300 people attended.

Create-a-City – children's workshops

What do we need to create a city? How should it look to make people feel good? To seek answers to these problems, we asked the experts: children. During eight weekend workshops, we worked with kids to build metropolises to match different climate zones, came up with alternative public transport systems and created models representing our urban visions of cities in the clouds and in space.

Grounded – workshops for teenagers and adults

A healthy city starts in our homes, on our balconies and in our gardens, and extends as far as public spaces of streets, courtyards and parks. We invited teenagers and adults to a cycle of workshops intertwining garden design and urban planning, and promoting sustainable development in cities. Working together, we tried to create new green standards for Warsaw. We designed miniature vegetable gardens, self-watering plant pots, and home pools with aquatic plants. The cycle of eight workshops concluded with a stroll along Powiśle, with the participants using cracks and holes in pavements and walkways as sites for plant installations. The workshops were prepared as part of the Warsaw Health Resort program, forming a part of the KiiCS project supported by European Commission funds as part of the 7th Framework Programme. More about KiiCS on p. 58.

Sounds of the City – sound installation

Urban noises come together to form a diverse acoustic collage. We hear them from different places, levels, perspectives and contexts. Their impressions are stored in our subconscious, where they come together to form powerful experiences and emotions. On Saturday evenings during the summer, we encouraged our guests to create interactive sound installations. All participants used special equipment stations for modelling sound to shape the music being played, bringing to life an entirely new acoustic dimension of Warsaw. The installation was designed by the composer and scholar of musical technologies Paweł Cyrta.

Copernicus August Sky

We spent Saturday nights in August glued to telescopes, observing nebulae, galaxies, star clusters and myriads of rare events. A special event was the Perseid night, which attracted over 3,000 participants! More on p. 34.

Relaxation Zone

Every weekend, visitors were encouraged to borrow games, puzzles and books – free of charge! Lazier guests lounged about on deckchairs, while the more active played various sports.

Summer Cinema

Our summer screenings under the open skies are now a permanent fixture in Warsaw's summer holiday calendar. The program of the 3rd event, this year under the banner "Planet City", acted as a guide around contemporary urban spaces. Each film was a journey to a different metropolis, and each city provided a motif for discussing a range of perspectives of development. As well as their indisputable educational value, our selection of films were a real treat for all lovers of good artistic cinema.

Each screening was preceded by a discussion with experts in the fields of cultural studies, sociology, architecture, city planning, design, urban activism and publicity. We discussed global trends that are affecting Warsaw, and examined which cities are creating standards that are worth emulating. We also talked about how architecture affects our emotions, how city space is divided, how we see the future, revitalization and transformation of agglomerations, and how to solve the problem of living space in the future. The screenings, held at Discovery Park on Fridays, were attended by crowds of spectators: they were visited by a total of 2,400 people.

Repertoire:

Medianeras, dir. Gustavo Taretto (5 July)

Waydowntown, dir. Gary Burns (12 July)

La Haine, dir. Mathieu Kassovitz (19 July)

Waste Land, dir. Lucy Walker (26 July)

Detropia, dir. Heidi Ewing, Rachel Grady (2 August)

Beijing Bicycle, dir. Xiaoshuai Wang (9 August)

A Thousand Clowns, dir. Fred Coe (16 August)

Sleeper, dir. Woody Allen (23 August)

Invited guests (in chronological order):

Dr. Elżbieta Anna Sekuła,
Dr. Jacek Wesołowski,
Dr. Łukasz Jurczyszyn,
Grzegorz Młynarski,
Dr. Joanna Kusiak,
Joanna Erbel,
Maciej Czeredys.

Talks were hosted by the journalist Adam Leszczyński.

The 2012 International Architecture Biennal Rotterdam hailed the 21st century as the era of great metropolises. According to forecasts, with each year cities such as Shanghai, Sao Paulo and New York will be increasingly able to concentrate capital and innovation, to some extent becoming countries within countries. We are already seeing the creation of smart cities – fully digitalized and energy self-sufficient. And yet intelligent cities cannot rely on state-of-the-art technologies alone. First and foremost, they must provide a platform for effective collaboration of three sectors: local government, business, and civic efforts. They must also invest in education, improve social opportunities, and are environmentally-friendly, but do such cities exist at all? To what extent are the tenets of sustainable development being implemented in actual, real urban spaces? Is life really better in cities, or are we increasingly seeking alternative solutions?

Przemiany Festival

The future cannot be divined, but it can be shaped, and this power is within each and every one of us. Our individual determination, supported by modern technology, can change the world – the only limit is our imagination. Using sense and sensibility, we are able to solve specific social problems, and influence the future of science, the arts, medicine and manufacture of everyday objects from furniture and clothing to food. For in order to create, we simply need to know what we create for.

"In reality, the world is changed by people who dream and who take action" said **Prof. Behrokh Khoshnevis** from the University of South California during his lecture opening the Przemiany Festival (5 September). The talk was transmitted live online. The Professor is working on a plan which will revolutionize construction: using 3D printing, building a family home will take just a single day. He is also working on a concept of 3D printing NASA stations on the surfaces of the Moon and Mars.

All festival events were free. The Przemiany ("Transformation") event was visited by 10,500 people.

Power to the People

State-of-the-art production technologies are no longer a domain of experts: a new way of creating objects is developing before our very eyes. The third industrial revolution, which we are witnessing right now, will transform the way in which we design, produce and use almost everything. Digital production methods are abolishing existing divisions between designers, makers and users. One of the main implications of these changes is mass personalization – a way of fully adapting products to individual users' needs. The exhibition Power to the People featured a review of new digital processing methods and examined their likely impact on our everyday lives. We hosted the most important players on the dynamically growing market of 3D printing. The exhibition was interdisciplinary, and it was divided into seven thematic blocks: design, architecture, fashion, nutrition, medicine, open source and fab lab.

OperaLab

The post-competition exhibition of designs for mobile pavilions for the Grand Theatre – National Opera was shown outside of the Grand Theatre for the first time. The exhibition was an excellent opportunity to see many valuable architectural concepts from around the globe. The display intertwined architecture, contemporary design and state-of-the-art technologies. Visitors saw ten design projects for new pavilions, presented as 3D animations. OperaLab was based on the augmented reality technology, which builds relationships between the material and virtual worlds. The exhibition was viewed on tablets using a custom-designed app: when the devices were within the range of trackers printed on exhibition stands, the app displayed the designs on the screen.

Short Films, Big Ideas

A review of documentaries portraying extraordinary people, made by acclaimed directors. They included Jessica Yu, awarded an Oscar for her film "Breathing Lessons. The Life and Work of Mark O'Brien" and Eddie Schmidt, nominated for an Oscar for "Twist Of Faith." The screenings were accompanied by meetings with the protagonists of winning productions: Neil Harbisson, the world's first cyborg who can hear colours, Massoud Hassani who builds wind-powered constructions that detonate explosives in mine fields, and Ap Verheggen, creator of the SunGlacier project who believes that climate change means culture change.

Constellaction

Created by the group panGenerator, the interactive installation is based on the principles of emergence – a phenomenon by which complex systems and patterns arise out of a multiplicity of relatively simple interactions. Visitors became co-creators of objects comprising autonomous modules – regular tetrahedrons receiving and emitting light and sound signals. The interactions between individual elements and the spatial configuration which was easy to rearrange created audiovisual designs with a startling complexity.

For External Use!

Activities in urban space, civic participation and new technologies all came together for this project. We held consultations with residents of the Powiśle district – which is Copernicus' home – as well as hosting workshops and urban games. In spring 2014, we hope to work with the project participants to affect real change in a number locations in Powiśle which are currently seen as wasteland.

Heroes 3.0

A multimedia exhibition presenting 25 visions of the future. Experts from the worlds of science, art and business answered questions about how the development of science and state-of-the-art technologies will affect our lives in the coming decades. Participants included Jan Lubiński, Rafał Ohme, Paweł Janicki, Konrad Smoleński, Sister Małgorzata Chmielewska, and Wojciech Modest Amaro.

Breakfast on the Lawn

During the Sunday breakfast, guests got to eat a delicious meal, buy local produce and learn some secrets of food production. Workshops were led by well-known local activists: Jodie Baltazar discussed urban composters, Nina Bąk (from the Dobrze Cooperative) introduced the concepts of socially-supported farming, while Marta Wajda talked about urban gardening. During her workshop, participants planted herbs to take home to grow.

Sonic Fiction

Traditionally, the Przemiany Festival closes with a concert. For Sonic Fiction, the BarKa barge, moored on the Vistula near Copernicus, was transformed into a concert stage. The main stars were musicians representing three generations whose creative paths took very different routes: Fimber Bravo, Victor Rosado and Young Marco. All artists were performing in Poland for the first time.

As well as the finale concert, every evening during the festival we hosted the **Distorted Club** – concerts and DJ sets held on a specially designed outdoor terrace.

Warsaw Health Resort

Do you believe that Warsaw can be a healthy place to live? A place where people are full of vitality? Where all the residents' needs are met? We do! Since 2013, Copernicus Science Centre has been a member of a three-year international project called Knowledge Incubation in Innovation and Creation for Science (KiiCS). The program is financed by the European Commission and implemented by the European Network of Science Centres and Museums ECSITE. It has nine member institutions with different scopes of activity: science centres, universities, nongovernmental organizations, associations and art galleries. They all experiment with different forms of interaction between scientists, creative people and commercial organizations, with the goals of learning about effective incubation of innovative solutions and preparing recommendations for institutions. "Warsaw Health Resort" is the name given to the series of activities conducted as part of KiiCS by the Copernicus Science Centre. Participants in the program learn about best ways of working together in multidisciplinary groups. The main theme of the program is "healthy city".

In 2013, we held a series of incubation workshops for adults (workshop of ideas and workshop of product design) and young adults aged 16–17 (the "Urbanauts" project), as well as hosting a hackathon. Each session was planned differently to help us test different ways of interacting within groups: an intensive two-day marathon, a cycle of meetings held over the course of a few months, and daily workshops lasting a week. We invited several technical experts and coaches specializing in teamwork, and we used innovative methods of project work, including design thinking. The activities were attended by around 150 people, including 70 in the hackathon and around 20 in each workshop for adults and young people.

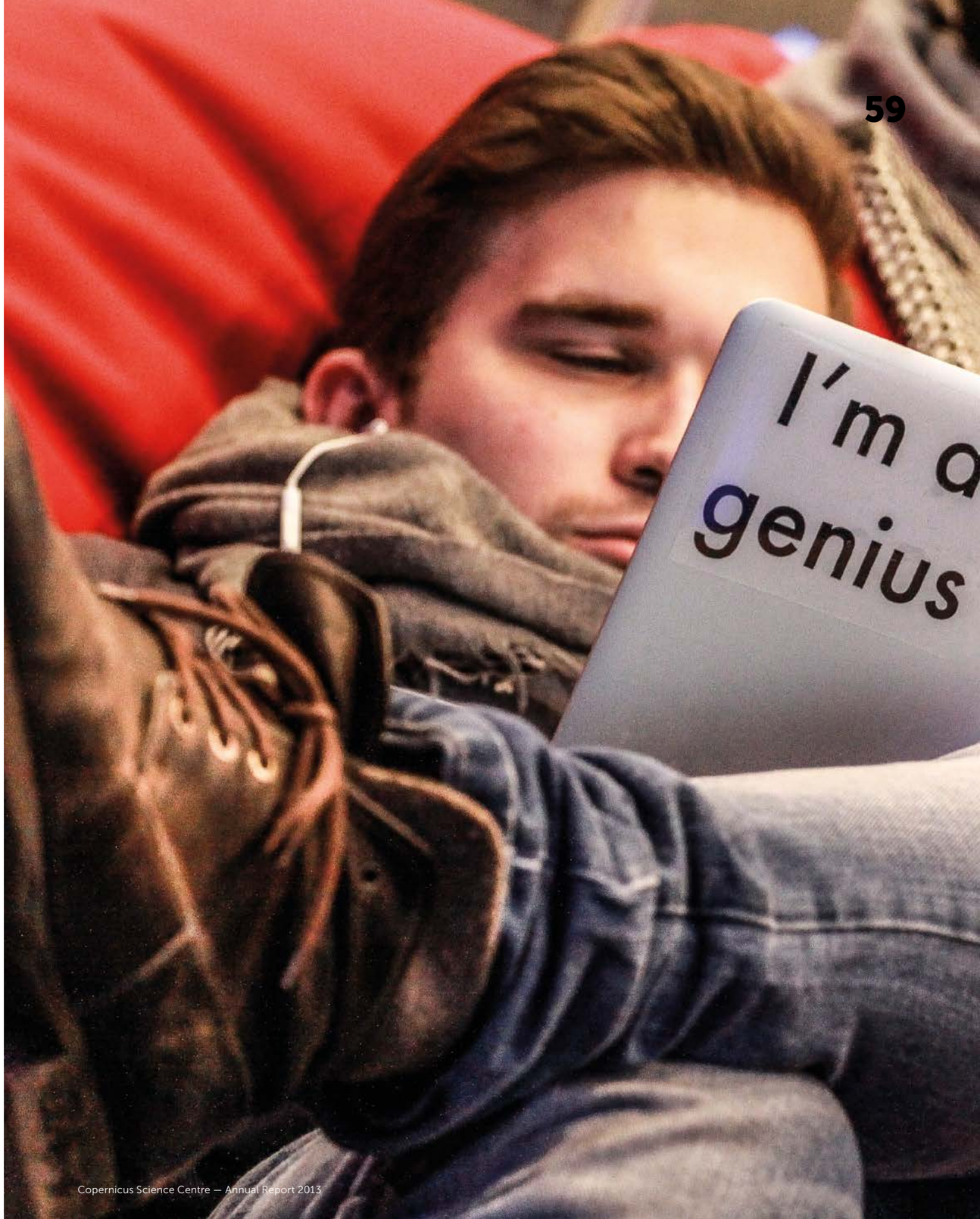
All incubator activities featured open enrolment at an earlier stage. The interdisciplinary groups were formed on site, and all projects (solutions, services, products) were prepared and refined in terms of content and marketing.

Although the implementation of concepts created during the workshops was not part of the project plan, some are in fact being brought to life. The determination of participants in one of the sessions has resulted in the initiative Kontener.to – a mobile container used as a technical workshop.

The project is documented on a blog at www.uzdrowiskoblog.kopernik.org.pl, where we post reports and results of workshops.

To introduce the concept of a healthy city and ways of achieving it by working together to a broader audience, the Warsaw Health Resort project also featured summer urban gardening workshops open to the public (around 70 participants) and a stall for constructing biospheres during the Science Picnic, where a few hundred biospheres were made.

The KiiCS program continues in 2014, with more workshops ahead. We will also be preparing recommendations for the international guide "DIY: Incubation Toolkit".



Other Events:

Family Workshops, aimed at kids aged 5–8 and their parents and carers, have been as popular as ever. Last year we pondered the questions of where clouds come from, whether we can eat fractals, and why we cry while chopping onions. In 2013, we held 193 Family Workshops, which were visited by 4,292 people (2,215 adults and 2,071 children).

We also staged a performance of the scientific fairytale **"Wyprawa po deszcz"** ("Looking for Rain") for children aged 3–6. The play was created in 2008, before the opening of the Copernicus Science Centre, and it has been staged at venues including the Ateneum Theatre. It is written and performed by present and former members of Copernicus' team – Małgorzata Karwowska, Urszula Koss, Błażej Dawidson, Wiktor Gajewski, Aleksander Kalinowski and Tomasz Ruszkowski – and directed by Marcin Chydziński. The play was performed on 12 and 13 January, and again on 7 and 8 December as part of our St. Nicholas' Day activities. The performances were seen by a total of around 500 people.

For the second time, we held a multigenerational celebration of **Grandma's Day and Grandfather's Day** (22 January). The program included a tour of the Centre with animators acting as guides, screenings of short films, and workshops with the Wzorowo Group, where we made family books of wisdom. The event was attended by around 200 people.

One of the world's leading competitions of science communication – **FameLab** – visited Poland for the second time. Once again it was co-organized by Copernicus and the British Council. The finalist of this year's competition was Marcin Stolarski. Dr. Stolarski works at the PAS Space Research Centre; he captivated the jury with his presentation about electrical charges that accumulate on our clothes and can even cause a spark. While the spark is completely harmless to us, the situation is quite different with electronics: for tiny processors, an electrostatic discharge is not unlike a powerful lightning strike. The jury included Prof. Marek Abramowicz (astrophysicist), Dr. Jacek Wasilewski (cultural studies expert), Irena Cieślińska (Deputy Director of the Copernicus Science Centre), Piotr Najsztub (journalist) and Monika Koperska (winner of last year's FameLab). The Polish final was hosted by the historian and publicist Jan Wróbel. Dr. Stolarski represented Poland during the international finals of FameLab in Cheltenham in the UK. He made it into the final round, which included 10 of 21 winners of national stages of the competition. The national semi-finals (23 February) and finals (11 May) attracted almost 900 people to the Copernicus Science Centre.

On 13 July, we hosted **Sir Roger Penrose**. The eminent physicist and mathematician addressed the visitors gathered in our auditorium, discussing the cyclic model of the Universe. According to the theory, the Big Bang wasn't the beginning of everything, but rather it was just one point of an infinite number of cycles during which the Universe expands and collapses. The lecture "A New Cosmological Copernican Revolution?" was attended by approx. 300 people. The talk was also available online on our website. Sir Roger's stay in Warsaw formed a part of the GR20/Amaldi10 Conference, organized by the Polish Society for Relativity and the University of Warsaw.

Events we participated in:

Museum Night (18/19 May)
Featured attractions included our exhibitions, laboratories, displays in the High Voltage Theatre and the planetarium, Copernicus experiments on wheels, building models of fullerene, observations of Saturn, blowing giant soap bubbles, and discovering the effect of liquid nitrogen on solids. There was also a cyberaquarium for the youngest guests. The planetarium and exhibitions attracted **5,604 guests**, with more people visiting attractions outside the building.

Powiślenia Festival (14 September)
We joined this celebration of our district by inviting visitors to our Discovery Park, where we hosted experiments (building models of fullerene, making rainbows and blowing soap bubbles) and scientific demonstrations on an outdoor stage. Participants in Powiślenia could also enter various competitions to win tickets to MiniLabs at Copernicus.

17th Science Festival (20–29 September)
The festival was a week of lectures, workshops, and meetings with fascinating people and subjects. For two days, our conference centre was transformed into a mini-Science Picnic dedicated to particle physics. We joined forces with scientists from the Polish National Centre for Nuclear Research, Warsaw University of Technology and the University of Warsaw to conduct demonstrations and experiments. Organized school groups participated in lessons and workshops, as well as attending the planetarium. Are all liquids miscible? Does a sheet of Styrofoam fit in a one-litre jar? What happens when we combine acids and alkalis? At the Young Chemist's Zone at the **"Little People's Science Festival"** held at the Warsaw University of Technology (28–29 September), we helped kids and adults find answers to tricky questions. The festival hosted 2,200 people.

During the campaigns **Winter and Summer in the City** (in January, and July and August respectively), we once again handed out vouchers for free entry to our exhibitions. The distribution was coordinated by the Education Office of the Capital City of Warsaw. The tickets were given to children from all across the city.

Sir Roger Penrose

You get a C for playing bridge, or a teacher from out of this world

As soon as he walked through the door, he got the nickname Woland. Tall, dressed in a perfectly tailored suit, walking with a slight limp – and no, he didn't have gold teeth or a giant talking cat like the professor of black magic from Bulgakov's *The Master and Margarita*, but to us he did appear "as a foreigner, someone from out of this world".

"I couldn't care less if you take notes, or even if you have notebooks," the math teacher told us during the first lesson.

"You'll get a C from me if you're a decent bridge player.

"You'll get a B if you solve the problems correctly.

"Now, an A…", he paused for effect, "I only give As for asking smart questions."

We knew straight away that elementary school was over.

He taught us to ask, to doubt, to search, to observe the world closely; he encouraged us to question old truths. Of course sometimes he simply taught by showing interesting methods, introducing theories, explaining. But he never let us forget the most important things. And that wasn't what we knew, memorized, practiced by mindless repetition; it was the courage to face the unknown. And, most of all, it was attention that allowed us to notice new perspectives on things.

With time, we got better at biting into each problem, like a pack of dogs bites into bones. Some were easy to crack, others took longer, while some remain unsolved until today. Our efforts to solve puzzles brought us joy and satisfaction. The first one of us to reach the solution was admired by the rest of the class. But the one who posed a riddle, "threw a bone", was showered with praise – and received top marks.

A few years ago, I talked to Kenneth Ribet, mathematician specializing in algebraic number theory, whose work is credited with paving the way towards the solution of Fermat's last theorem. He told me, "If I regret anything, it's that I generally can't find problems to solve. Someone else must find them for me – I'm a hound dog for solving puzzles."

Even a genius such as Ribet needs to meet a "Woland" along his way.

– Irena Cieślińska – Deputy Director of the Copernicus Science Centre

Copernican Revolution

How do we make sure we don't lose the joy of discovery, the pleasure of active learning about connections in nature, and the creativity to make new things? We want to help children, parents and teacher change Polish schools for the better; make them modern, but not by investing in new buildings, but in competencies of teachers and improved teaching methods. The central point of the education process should once again be students, who will discover the world actively and with curiosity, discover their talents, and develop skills. The aim of this change is to foster a creative, open environment supporting students in the process of gaining knowledge and skills, and shaping attitudes. The project "Copernican Revolution", supported by the Ministry of National Education, hopes to bring about the return of natural science laboratories, where children use simple tools and techniques to discover relationships that occur in nature and create new things, with teachers supporting them in this process.

One of the key tasks of the project has been the preparation and dissemination of tools for helping teachers of natural sciences to use the best methods of working with their students, based on conducting experiments, posing and verifying hypotheses and discovering scientific phenomena through direct experience. As part of the "Revolution", we are conducting workshops for educators, held at Copernicus and in all regions of Poland. In 2013, almost 300 teachers took part in the project, and we are aiming to double the number in 2014.

Towards the end of 2013, we finished preparing the first of three teaching kits including lesson plans centred around experiments and gaining knowledge through direct experience. "Professor Czochralski's Suitcase" helps students improve their understanding of many chemical and physical processes, as well as introducing important events from the tumultuous history of the 20th century.

This "Copernican Revolution" is co-financed from EU funds as part of the European Social Fund – Operational Programme Human Capital. It covers five aspects:

Copernicus at Large – 30 travelling workshops, held throughout Poland, focusing on using research methods and inquiry-based science education (IBSE) in teaching

Teachers as Explorers – 80 workshops at Copernicus' four laboratories (biology, chemistry, physics and Robotics Workshop)

Show and Tell – a conference for teachers and educators, and representatives of institutions of formal and informal education (August 2014)

Copernicus in a Box – developing three teaching kits as tools for supporting teachers and helping students improve their scientific abilities; includes 36 workshops on using the kits

New Natural Science Labs – recommendations for tools and equipment for school science labs for years 4–6 in primary school

Show and Tell Conference

The "Show and Tell" conference is one of the most important events devised with teachers in mind. How can kids maintain curiosity in the world around them? How do teachers inspire them to experiment? The main theme of this year's conference was curiosity as a driver for independent learning about the world, conducting research and verifying existing knowledge.

The conference included 22 workshop sessions, discussion panels, lectures and scientific demonstrations at the Copernicus Science Centre. The event was attended by 230 teachers from all regions in Poland. Other participants were representatives of non-governmental organizations (the Federation for Educational Initiatives, "Citizens for Science", the Civic Education Centre), independent educators, representatives of scientific circles, and professors from the PAS Institute of Physics, Warsaw University of Technology, Wrocław University of Technology, University of Warsaw, and University of Silesia.

Teachers' work should focus on making the most of children's natural desire to learn about the world in their own way. If students conduct experiments themselves, if we encourage them to ask questions and allow them to find answers to those questions for themselves, that will form a basis for feeding this curiosity. And curiosity is a natural human trait.
– Krystyna Szumilas, Minister of Education

The world outside our windows isn't divided into discrete bits of chemistry, physics and biology. It's a greater whole – thus education should also be interdisciplinary.
– prof. dr hab. Marcin Pałys, Rector of the University of Warsaw

If we are to develop fast and don't want to fall prey to environmental or social dumping, we must be innovative or we will never be competitive. Bill Gates, Steve Jobs and Mark Zuckerberg didn't have to graduate from college. Having a great idea and a great curiosity whether the idea will work was enough.
– prof. Jerzy Buzek

I'm an ordinary high-school student from Eastern Poland. I realized a while ago that I don't have any books that would answer my questions. I remember the moment when I approached my biology teacher. I said I have an idea for a research project, but I don't know how to implement it. And she helped me.
– Kinga Panasiewicz, 17-year-old high-school student from Hrubieszów. Winner of the prestigious competition for young scientists Intel International Science and Engineering Fair. Her research into the synchronization of brain hemispheres has won acclaim from international experts.

Our brains don't absorb information as though water were flowing from a full vessel into an empty one. Our brains learn when they focus on something that stirs passion and emotion. The scientific method in natural sciences is about more than discovering the secrets of nature. It is also about the ability to use the right tools, which in turn requires acquiring certain skills: teamwork, formulating and solving problems, communication, creativity and innovation (...) We expect modern education systems to find and nurture individual talents in every one of us, and to provide us with tools to face up to challenges we don't even known yet. The challenges of the future.
– Robert Firmhofer, Director of the Copernicus Science Centre

Young Explorer Club program

Young Explorer Club is a place where all children become researchers. Without having their knowledge tested and evaluated, without being marked. No one makes mistakes when they conduct their own experiments, and everyone is encouraged to verify their own hypotheses. The method is universal and international, with clubs in countries as far-flung as Georgia in the Caucasus and the United States.

The key to the program is an approach that abstains from supplying ready answers and encourages independence instead. The clubs help kids and young people to develop their own understanding, skills and competencies such as teamwork, creativity and critical thinking.

In 2013, 116 new clubs were formed (increasing the number from 186 to 302). There are 283 clubs registered in Poland, with a further ten in Georgia, eight in Belarus, two in Russia and one in the US. The active, diverse environment provides an ideal opportunity for working together on projects, competitions and science festivals. To help teachers and supervisors work together and inspire one another, we held the second **Young Explorer Club Forum**.

On 15 and 16 November, Copernicus hosted supervisors of Clubs from around Poland, as well as visitors from Georgia, Belarus, Ukraine and Russia. They participated in lectures, panel discussions and several thematic workshops focusing on developing active working methods, non-standard forms of promoting local activities, and improving social skills of the Clubs' young members. Some of the most popular events was the workshop hosted by **Ian Russell** – an independent constructor of scientific exhibits from the UK – and the session "Do it yourself", focusing on the maker culture; the visitors introduced the movement's ethos of using new and unique applications of technologies and examined the underlying principles.

Members of the Clubs are increasingly becoming local popularizers of science. They get involved in preparing Young Explorer Festivals and share their discoveries and experiences with the broader public. The festivals attract other local clubs, former members, students from nearby schools, local authorities, media and institutions, as well as residents of towns where the Clubs are based. Numerous events were held across Poland in 2013.

Young Explorer Clubs also have a presence at the Science Picnic of Polish Radio and the Copernicus Science Centre. Representatives of five Clubs, selected through a competition, presented their favourite experiments. The Club tent enjoyed great popularity during the Picnic.

In 2013, we held 15 stationary and travelling workshops for teachers interesting in founding their own Clubs. On 2 October, we took the workshops to Georgia as part of the Poland Partners Foundation project "Direction: experiment – Working together to develop Young Explorer Clubs in Georgia." The most active teachers were invited to take part in the 2nd Young Explorer Club Forum and study visits at Clubs near Warsaw. As a results of the training sessions and visits, new Clubs have been formed in Georgia, strengthening ties between Clubs in the two countries.

Young Explorer Clubs are partnered with the Polish-American Freedom Foundation.

Educational Events

We have also created a **database of educational resources.** Available online, it is a tool for reviewing articles, and accessing descriptions of exhibits and routes to take during visits. It serves as a repository for hundreds of texts about Copernicus and our exhibitions, helping teachers prepare visits by selecting the most appropriate routes through the centre or devising their own.

"Teachers' Afternoons with Copernicus" are hugely popular regular meetings, with higher attendance in 2013 than in the previous year (2013: 810 participants; 2012: 641 participants). During the meetings, teachers are able to visit our exhibitions free of charge, and participate in a selection of workshops, conferences and other activities. They also meet with animators and other members of our team, conduct simple experiments and engage in discussion. Last year, we held meetings with teachers on 37 Thursday afternoons. We are delighted that over 90% of the participants are definitely interested or quite interested in attending future meetings.

81.7% respondents said they feel their professional skills have improved as a result of their visit, and that they are keen to use the acquired knowledge in everyday practice.

Workshops in the exhibition space
Many extraordinary and creative ideas can emerge on the boundaries of formal and informal education. Almost 70% of visiting teachers are interested in finding out how to prepare interactive classes based on what they learned at Copernicus. During the workshops, we discuss how to make the most of our interactive exhibits, laboratories and planetarium in the context of specific subjects and stages of education. We work together on developing ideas and on creating thematic routes through the Centre, keeping in mind different types of visitors. Importantly, we don't just host teachers of science, but also those of technical subjects and the humanities such as languages, the arts, music and history. We have held workshops in music and physics, mathematics, social sciences, and robotics, meetings about science in the media, as well as workshops on fostering creativity by teachers and carers. A total of 187 teachers participated in 11 meetings last year.

Workshops with educational kits
We develop educational kits (known as "boxes") which help teachers apply elements of the scientific method at different levels of school education. These educational aids, designed and developed by experts at the Copernicus Science Centre, are ultimately designed to have an impact on students, although the direct beneficiaries are teachers at the schools that have the boxes. Our workshops form an intrinsic part of our educational kits. Participating teachers not only discover the contents of the boxes and conduct experiments, but they also develop their own ideas of how to use the kits in schools. Each box is designed in such a way that it can be used by teachers of a variety of subjects – so not just natural sciences, physics or chemistry, but also math or history. In 2013, together with the RWE Foundation, we created the **Power Box**, aimed at students in elementary years 4–6 dedicated to the subject of energy. It is important for young people to understand energy sources, be aware that natural resources are being depleted, to ask questions about new, alternative energy sources, and to learn how we can all conserve energy. The free workshops were attended by teachers of natural sciences, technology and mathematics. Each participating school received three Power Boxes. In 2013, we held a total of 17 workshops featuring educational kits, both those designed that year and ones from previous years, such as the "Lessons of Marie Skłodowska-Curie" kit. The events were attended by 345 participants.

Edu-Action is a project co-organized by Copernicus, aimed at schoolteachers and higher education lecturers, created as part of the social movement Citizens of Science. Its purpose was to create links between representatives of scientific, educational, research and NGO circles, and implement interdisciplinary research projects. The participants learned how best to use open source materials and new technologies in their projects, as well as discussing the concepts behind citizen science and comparing ways of engaging students in scientific research. We held two cycles of the workshops, with a total of 40 participants.

On 11 June, we held the third **"Summer Seminar of Wars and Sawa"**, a meeting for teachers from Warsaw schools aimed at introducing innovative ways of working that foster their pupils' interests and talents. This year, we devoted particular attention to the role played by popular science demonstrations, festivals and science picnics in the teaching of natural sciences. We also discussed the origins and purposes of activities on the boundaries of science and the arts, such as theatre performances with scientific themes. The seminar was opened with a lecture entitled "Seeing the Invisible" by Prof. Andrzej Wysmołek, physicists at the University of Warsaw. Participants attended demonstrations at the

High Voltage Theatre and joined in discussions on the design of a functional guide to exhibitions at Copernicus. The seminar, co-organized by the Warsaw Centre for Socio-Educational Innovation and Training, was attended by 170 people.

In September and October, we hosted a cycle of seven meetings with students and teachers from rural schools in regions where cultural institutions are frequently inaccessible. We had a total of 350 guests, mainly from the Podlaskie and Warmińsko-Mazurskie Voivodeships.
The concept of their visit to Copernicus, our planetarium and the Children's University was brought forward by the **Navegadores** association. The organization implements humanitarian and developmental projects supporting local communities, as well as providing access to one of the key categories of fundamental human rights – that to education.

Can children and young adults conduct serious scientific research or make momentous discoveries? Of course they can. **The Young Researchers' Festival** was held at Copernicus on 15–17 March. The flight range of the honeybee, the principle of solar blinds, new butterfly species – these are just a handful of examples of subjects that fascinate young scientists. The twenty works shortlisted in the final were presented to the jury and to all visitors to Copernicus. The research was presented as posters, available for viewing for all. The festival was co-organized with the Polish Children's Fund. Winners of the competition represented Poland during the European finals of the EUCYS competition in Prague, where they received numerous accolades. Finals of this year's EUCYS will be held in September 2014 in Warsaw.

The year 2013 was hailed as the year of Prof. Jan Czochralski – the acclaimed Polish chemist. As part of the occasion, we designed and developed our next educational kit, this time aimed at high-school students. It is intended for use by teachers wishing to enhance their teaching program with experiments in material science, crystallography, studies of the structure of matter and historical research. The educational kit **"Professor Czochralski's Suitcase"** will be unveiled in 2014.

339,020 group tickets

79.3% of organized groups that visit us are school trips

Breakdown of school trips

49.4% primary schools

30.9% middle schools

11.7% secondary schools

2540 people have attended events for teachers organized or co-organized by Copernicus

We are delighted that 2013 has taken us closer to creating a strong environment for communicating science in Poland. We came together with institutions with which we share a mission of fostering a society based on education, science and technology to forge a Collaborative Agreement and define joint goals for the future.

We held the latest national conference **"Interaction – Integration"** for representatives of science centers, interactive exhibitions and planetariums. Although it was the 5th event of the cycle, it turned out to have been pivotal. The participants were joined by representatives of festivals and science cafés, children's universities and universities of the third age.

The event featured a lecture by Dr. Dominik Batorski and Edwin Bendyk outlining the structure, dynamics and modes of operation of social interactions, as well as nine sessions including workshops on devising concepts for interactive exhibitions and preparing scientific demonstrations. Participants had opportunities to talk about their successes and difficulties, and meet companies from Poland and abroad working in developing interactive exhibitions. The conference (28 February – 1 March) was attended by around 150 people from 69 institutions from 41 locations in Poland.

During the second day of the event, we prepared the final draft of the **Collaborative Agreement** between conference participants – non-profit organizations involved in the promotion of science and education. We hope that working together will make our activities more effective. Our plans include exchanging best practices, preparing joint projects on a national scale, voicing opinions in public discourse, obtaining financing for our work and ideas, and developing international collaboration aiming to serve common goals. Participants in the session also decided that the next conference, scheduled for 2014, will take place at the EXPERYMENT Science Centre in Gdynia.

Members of the Agreement:

Hewelianum Centre (Gdańsk)

EXPERYMENT Science Centre (Gdynia)

Copernicus Science Centre (Warsaw)

"Knowledge Mill" Modernity Centre (Toruń)

EC1 Łódź – City of Culture (Łódź)

Correspondance des Arts Foundation Museum of Art Books (Łódź)

Prof. Jerzy Stelmach "Eureka" Foundation (Szczecin)

Silesia Park Foundation (Chorzów)

"Prof. Inquisitive" Foundation (Bydgoszcz)

Children's University Foundation (Kraków, Olsztyn, Warsaw, Wrocław)

Community Cultural Centre (Świnna)

Institute of Competence – Explora Park (Wałbrzych)

Municipal Cultural Centre (Olsztyn)

Museum of Municipal Engineering (Kraków)

Jagiellonian University Museum (Kraków)

Olsztyn Planetarium and Astronomical Observatory (Olsztyn)

"Signum" Centre for Popularizing Mathematics at the Faculty of Informatics of the Białystok University of Technology (Białystok)

Regional Centre for Developing Education (Opole)

"Island" Creative and Educational Association (Sopot)

"ExploRes" Association for Disseminating Knowledge (Rzeszów)

Silesian Botanical Garden (Mikołów)

Educational Establishment Complex (Opole)

Supporting partners:

City of Zielona Góra

Gen. J. Ziętek Voivodeship Culture and Recreation Park in Chorzów

Secretary:

Robert Firmhofer, Copernicus Science Centre

Program Committee of the Interaction – Integration Conference:

Irena Cieślińska, Copernicus Science Centre (Warsaw) – Chair

Anna Grąbczewska, Children's University (Kraków, Olsztyn, Warsaw, Wrocław)

Ewa Jasińska, EXPERYMENT Science Centre (Gdynia)

Tomasz Michalski, "ExploRes" Association for Disseminating Knowledge (Rzeszów)

Monika Wiśniewska, Centrum Nowoczesności Młyn Wiedzy (Toruń)

International Partners

Supporting the communities of individuals involved in existing science centers in Poland and the new institutions being developed in Poland and around the globe is one of our strategic aims. We believe in formalizing and strengthening ties with exiting partners, and paving the way for building relationships with new ones. We are passionate about science, and we feel that as well as being fascinating in itself, it can also serve as a foundation for close social bonds, shaping independent inspirations and critical thinking – factors that are a key part of social capital. We provide a platform for connecting science-communication circles from different countries, both those that are members of ECSITE and those just starting out, for whom international collaboration may become an important catalyst for development.

Eastern Projects

Copernicus hosts many Russian-speaking guests, and we have published Russian versions of the Centre's plan and guide. We are visited by school groups, organized outings and individual guests, as well as representatives of numerous science museums and people involved in creating science centers in Russia, Ukraine, Georgia and even countries in Central Asia.

Many of them hope to discover the secrets of Copernicus from the inside. Such meetings can bring surprising results, such as the concept of hosting Science Picnics in Ukraine modeled in part after the successful Polish event (the idea became reality in September and October 2013). We have also created a Russian version of our website and monthly newsletter providing information on the most important events at the Centre and also at Europe's other science centers, aimed at both existing guests and potential partners.

2nd Copernicus Science Centre Academy. On 14–21 June, 16 guests from Russia and Georgia took part in a week-long course for museum and science centre staff and people interested in creating similar venues. We shared our experiences of building interactive exhibitions, planning and implementing programs, combining art and science, and working with children, and introduced the concept of Young Explorer Clubs and the work of animators. The participants also came along to the 17th Science Picnic of Polish Radio and the Copernicus Science Centre.

More about **Science Picnics** in Russia, Ukraine, Georgia, Lithuania and Croatia on p. 44.

European projects we are members of:

KiiCS (Knowledge Incubation in Innovation and Creation for Science) is a three-year program financed by the European Commission and implemented by the European Network of Science Centres and Museums ECSITE. More about the project “Warsaw Health Resort” on p. 58.

PLACES (Platform of Local Authorities and Communicators Engaged in Science) brings together science centers, museums, festivals and European regional networks. The project is coordinated by a consortium of European organizations working in the field of scientific communication, led by ECSITE and EUSEA . The aim of PLACES is to create and develop a set of best practices in science communication, and disseminate it to other European cities. The project will create the model for a European City of Scientific Culture. PLACES includes around 90 cities and regions from 34 countries; Poland is represented by Warsaw, Białystok and Wrocław. The Copernicus Science Centre participates in the project through its partnership with the Capital City of Warsaw and the Science Festival.

VOICES (Views, Opinions and Ideas of Citizens in Europe on Science) is an excellent example of how science centers provide people with a voice on important issues of scientific and technological research, and shows how those issues have a real impact on their everyday lives. The project focuses on urban waste as a resource, and started with in-depth research into the problem and ways of dealing with it in different EU countries. In Warsaw, focus groups discussing the issues of generating, segregating and collecting waste were held at Copernicus in March, with a total of 30 people from Poland’s largest cities taking part. Similar meetings were held in parallel in 33 locations in all 27 EU member states. The consultation aimed to facilitate the exchange of ideas and experiences, with the ultimate goal of devising strategies for minimizing the impact of waste on the environment and reducing the depletion of natural resources. The main conclusions were that the participants want packaging that is fully biodegradable or easily recyclable, new technologies that make waste segregation easier (such as smart bins), and improved ways of incinerating waste to generate energy. The participants also suggested how research could be directed to improve waste management.

In June 2013, Robert Firmhofer, Director of the Copernicus Science Centre, ended his two-year term as President of the European Network of Science Centres and Museums ECSITE. In his present role of Past President, he sits on the Executive Committee of the Board. He also represents Europe on the International Program Committee of the 7th Science Centre World Summit. He has presented lectures outlining Copernicus’ program, activities and success stories at numerous international conferences, as well as speaking during debates on the importance of informal education and the key role played by science in shaping society.

Robert Firmhofer, Director of the Copernicus Science Centre, during his tenure as President of ECSITE – annual ECSITE conference in 2013 in Goteborg, Sweden. Copyright: ECSITE

Irena Cieślińska, Deputy Director of the Copernicus Science Centre, is one of the select group of graduates from the annual Robert Noyce Teacher Scholarship Program for leaders of science centers from around the globe. The US-based program aims to improve the effectiveness of introducing and managing innovative solutions at institutions. Our goal is to create a center that engages adults, builds a sense of community and respect for different views, and stimulates discussion on the vision of the future development of our country.

Joanna Kalinowska is a member of the Annual Conference Programme Committee of ECSITE. The team is responsible for selecting sessions and preparing Europe’s largest conference for science centers and interactive museums.

Delegation from Croatia
(29 January):
inc. Branko Grčić, Deputy Prime Minister and Minister of Regional Development and EU Funds of Croatia, Ivan Del Vechio, Croatian Ambassador to Poland

Delegation from Germany
(12 February):
inc. Guido Beermann, Secretary of State for Economics, Technology and Research; representatives of the Archimedes Exhibitions

Delegation from Croatia
(20 February):
inc. Hrvoje Marusic, Director-General for the EU at the Foreign and European Ministry, Ivan Del Vechio, Croatian Ambassador to Poland

Delegation from Lithuania
(14 March):
representatives of the Lithuanian Ministry of Culture

Delegation from Croatia
(10 April):
a group of journalists from Croatian media

Delegation from Tatarstan
(18 April):
representatives of the Tatarstan Ministry of Culture

City mayors
(19 April):
from Riga, Sofia, Kiev, Vilnius and Belgrade

Visit of representatives of the European Commission
(25 June):
inc. Gregory Paulger, Director-General of the Directorate-General for Communication

José Manuel Barroso, President of the European Commission, and Donald Tusk, Prime Minister of Poland
(11 July)
opened the meeting held at Copernicus dedicated to a new narrative for Europe

Visit by Wanda Nowicka, Deputy Marshal of the Sejm (17 July)

Delegation from Lithuania
(26 July):
Eduard Trusevič, Deputy Minister of Culture, and Rasa Rimickaitė, Cultural Attaché

Delegation from Croatia
(17 September):
representatives of the authorities of the Capital City of Zagreb

Delegation from Mongolia
(9 October):
representatives of Mongolia's Ministry of Education and Science and educational establishments

Visit of representatives of the US Embassy (24 October):
Cultural Attaché Mark Wenig and Daniel Hall from the Political Department visited exhibitions and the Copernicus Conference Centre

Nobel Prize laureates
(24 October):
Prof. Carol Greider, laureate for Physiology and Medicine in 2009, and Prof. Theodor W. Hänsch, laureate for Physics in 2005

Representatives of the Sejm Committee for Education, Science and Young People
(5 November)

Vice President of Intel Corporation and President of the Intel Foundation Shelly Esque
(5 November)

Romanian Ambassador Ovidiu Dranga
(20 November)

German and French Ambassadors
(21 November):
Rüdiger Freiherr von Fritsch and Pierre Buhler attended the vernissage of the exhibition "Smell – the Invisible Code"

President of Croatia Ivo Josipović with colleagues (24 November)

Prof. Manfred Spitzer, psychiatrist and neurobiologist, author of books "How the Brain Learns" and "Digital Dementia" (26 November)

Vint Cerf, **Vice President of Google**
(5 December)

One of the fathers of the internet, Vint Cerf was instrumental in the development of the first commercial email system. During his visit, he described Copernicus as one of the most creative science centers

Vint Cerf, Source: Wikipedia, Author: Joi Ito

José Manuel Barroso, President of the European Commission, and Donald Tusk, Prime Minister of Poland, opened a debate on "A New Narrative for Europe" held at Copernicus. Participants discussed the future, and the problems and challenges it brings. Guests included Bogdan Zdrojewski, Cultural Minister, and artists and scientists from across Europe. José Manuel Barroso talked about the right time for new investments. He mentioned the roles of science and culture in Europe, and Europe's role in the development of science and culture. Our task as Europeans is to question, to query, and to seek solutions to new challenges as they arise. He also mentioned Copernicus in this context, saying, "I really appreciate the venue for today's meeting – the Copernicus Science Centre – named after the outstanding Polish and European man of science, a man of culture, who drew a new vision of the world." It was Barroso's second visit to Copernicus: he first visited in 2011, during Poland's Presidency of the EU.

Sponsors

We are proud to be able to count on support from business circles. We are an organization that helps people develop highly desirable and marketable skills: creativity, innovation, and flexibility. The financial support we receive from companies and the partnerships we forge during individual projects mean we have a real opportunity to influence the future competencies of young people.

In 2013, our Strategic Partner was **Samsung Electronics Polska**, providing us with financial support and electronic equipment since our opening. This year, they joined us in the design a new project expanding the content of our galleries: trolleys with workshops linked to individual exhibits fitted with Samsung equipment such as tablets, smartphones and cameras.

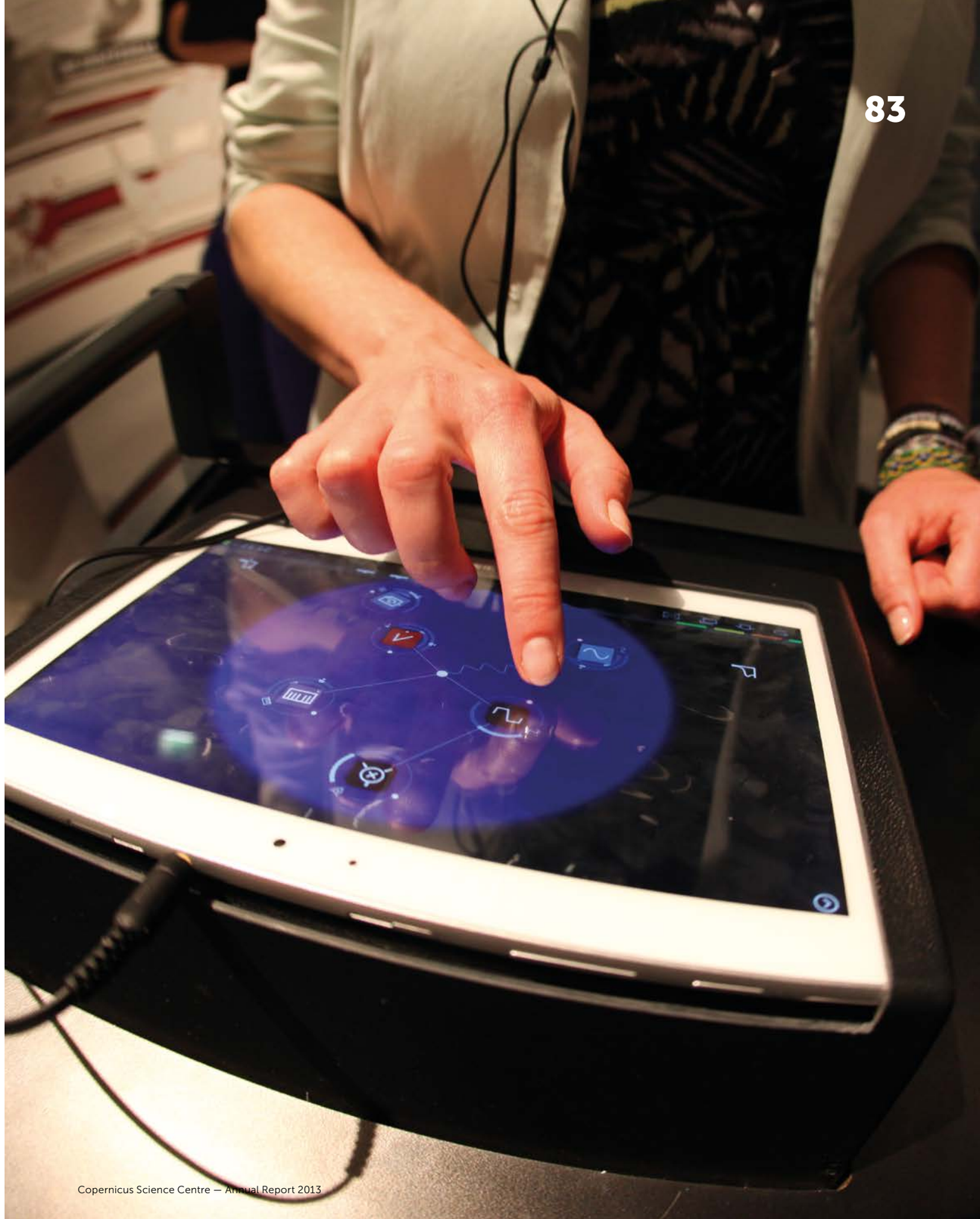
Together with the energy company **RWE**, our Supporting Partner, we have developed the Power Box project – a box demonstrating future technologies for generating and processing energy. The kit enables teachers and students to work together to generate solar and wind power and make a car driven by electricity.

Other companies helping us develop our program are **BASF** supporting the Chemistry Laboratory, **Polskie LNG** backing the Physics Laboratory, and **Polpharma** looking after exhibits focusing on health; we also work closely with all our partners to prepare workshops for our visitors.

Other companies also support projects organized by Copernicus: FameLab has been backed by **BMW** since its inception, while the Science Picnic has been sponsored by **Warbud**, **Toyota** and the **Polish Security Printing Works (PWPW)**.

The "Heavens of Copernicus" planetarium enjoys the support of bank **PKO BP**, which co-finances the production of screenings.

In 2013, we have received backing in various forms from Samsung, RWE Polska, Plus, PKO BP, BASF, Polskie LNG, Polpharma, BMW, Intel, Sony PlayStation, Warbud, the Polish Security Printing Works, Toyota Motor Poland, Ivona, Fido Intelligence, and RS Components.



Partners

2 + 2 = 5. When can such an equation be true? When the synergy effect comes into play. Teamwork is more effective than individual efforts, so we are delighted to have the support of our partners, and we are grateful to all the institutions that help us further our mission. Joint ventures and projects are an expression of our sense of responsibility for the changes occurring in the world around us. Together, we have a real opportunity to influence the future and drive our society forward.

The annual Science Picnic, originated by **Polish Radio** in 1997, has been co-organized with the Copernicus Science Centre since 2008. Our joint efforts have resulted in Europe's greatest event celebrating and presenting science and new technologies, contributing to building a knowledge-based society. The Picnic's management board includes the Chairman of the Board of Polish Radio and the Director of the Copernicus Science Centre. The Organizational Team includes members of both institutions.

For the second year running, Young Explorer Clubs are partnered with the **Polish-American Freedom Foundation**. The Foundation is involved in developing the methodology and promoting the program, as well as providing financial support. Just last year, 116 new clubs were founded in Poland and abroad.

FameLab is one of the world's leading competitions of science communication. The Polish section of the event was initiated by the **British Council**. Since 2012, together we have been looking for researchers who aren't afraid to think outside the box and who have a knack for popularizing science.

The exhibition "Scent – the Invisible Code" was created through a collaboration between the Copernicus Science Centre, the **French Institute in Poland**, and the **Goethe-Institut**. The project was supported by **the Embassy of the Federal Republic of Germany** and **the French Embassy**, and implemented as part of the French-German cultural fund. It was Poland's first exhibition dedicated to smell, and it has enjoyed enormous popularity.

Events held at the Copernicus Science Centre are close to the mission and values of the Copernicus Science Centre. We host institutions and companies marked by innovation, bold thinking and the desire to change the world for the better. We also co-organize debates on hot topics in science, technology and social issues.

Events we have co-organized

Discovery Festival (15–17 March) featured **Polish heats of the 25th European Union Contest for Young Scientists** (EUCYS). The jury assessed 20 best research projects by high-school students and selected a group to represent Poland at the international finals in Prague. During the open poster session, finalists talked about their research to Copernicus' visitors. Organizers: Polish Children's Fund, Copernicus Science Centre.

Communicating Astronomy with the Public (14–18 October); more about the conference on p. 37.

10th Intel Education Summit (5–6 November) was a prestigious forum on the challenges and opportunities faced by education around the globe. The leading topic of this annual international conference was "Entrepreneurship and Education." Speakers included **Simone Baldassarri** (member of the Directorate-General for Enterprise and Industry at the European Commission), **Shelly Esque** (Vice President of Intel and President of Intel Foundation), **Jean-Christophe Pic** (lecturer in entrepreneurship and finance at the Sorbonne), and **John E. Davies** (Vice President of Intel and Director-General of the Intel World Ahead Program). The event was co-organized by the Capital City of Warsaw, Centre for Citizenship Education, the Koźmiński University, the Junior Achievement Young Enterprise, and the Copernicus Science Centre.

The Fifth International Conference on Science in Society (22–23 November), organized by the US-based Common Ground Publishing, publisher of the magazine Science in Society. The opening lecture was delivered by Robert Firmhofer, Director of the Copernicus Science Centre and the former President of ECSITE.

In 2013, we hosted **84** events with the participation of **16,640** people.

Example events

20th Invention Exchange (Giełda Wynalazków)

European Seminar on Sustainable Urban Rural Partnerships

9th Warsaw International Medical Congress

DG Climate Action – European Commission

13th Educational forum for Small and Medium Enterprises

Meeting of the Management Committee of the EUROCITIES network

Polish-Swiss Round Table

Meeting of the Minister of Science and Higher Education with representatives of the World Bank and public and non-public universities "Quality of practical higher education – European examples and opportunities for Poland"

Young Innovators – Young Entrepreneur Forum

Europolis: Smart cities of tomorrow

Conference of the Patent Office of the Republic of Poland

4th Innovative Economy Congress

5th PGNiG Conference "Accountable Energy"

AIESEP 2013 International Conference "Physical Education and Sport: Challenging the Future"

Debate "A New Narrative for Europe" held on behalf of the Prime Minister's Office in collaboration with International Conferences, Workshops and Exhibitions

Citizen Dialogue

5th Final of the European BEST Engineering Competition EBEC

Scientific Conference "CTA Consortium General Meeting"

20th anniversary of Intel Technology Poland

6th Public Library Congress

International conference "Shale gas as a bridging energy carrier – from fossil fuels to green energy"

Media

9,153 appearances in the media, including:

3,242 on TV and radio

5,911 in the press and online

1,827,765 hits on the Copernicus Science Centre website

177,598 hits on the Heavens of Copernicus planetarium website

24,895 hits on the FameLab competition website

24,632 hits on the "Przemiany" Festival website

58,718 Facebook fans of the Copernicus Science Centre

11,020 Facebook fans of the Heavens of Copernicus planetarium

6,533 Facebook fans of the Science Picnic

5,019 Facebook fans of the "Przemiany" Festival

Awards

Gold Cross of Merit for Przemysław Wielowiejski, Deputy Director of the Copernicus Science Centre, for his contribution to the development of Polish education and science promotion

Prize for the Przemiany Festival awarded by the Klub Twórców Reklamy

Grand Press Photo 1st Prize for Agnieszka Rayss for "Distant Place" in the "Environment" category

Janus Fulldome Award – the "Oscar" of planetarium productions – at the Fulldome Festival in Jena, Germany, for "Dream to Fly" made by the Heavens of Copernicus planetarium

Best Script / Story Award at the Imiloa Film Festival in Hawaii for "Dream to Fly"

Best Tourism Product in the Mazowsze Voivodeship in 2013 from the Polish Tourism Organization for the Copernicus Science Centre

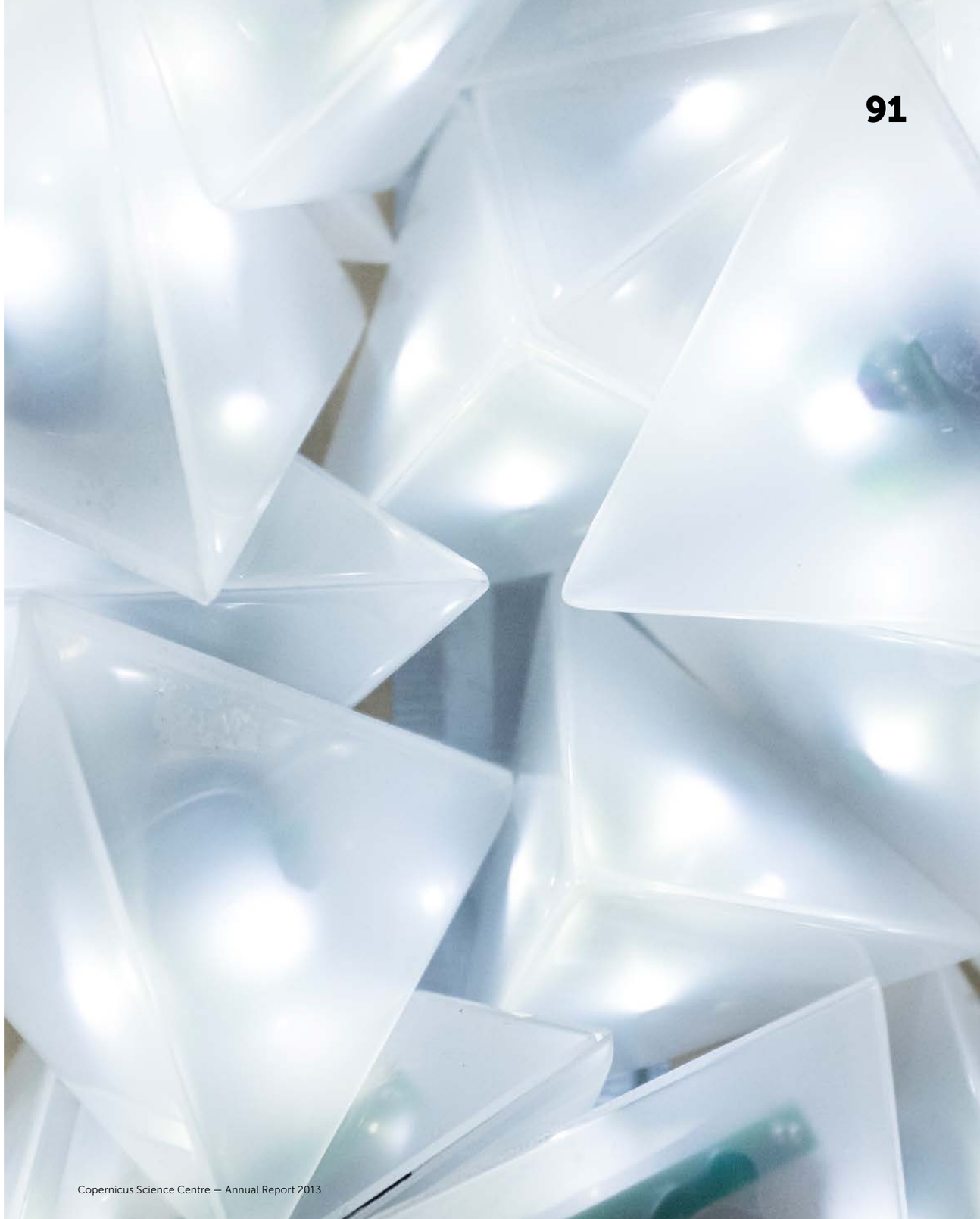
Best Tourism Product in the Mazowsze Voivodeship in 2013 from the Polish Tourism Organization for the Science Picnic of Polish Radio and the Copernicus Science Centre

Prize for the Copernicus Science Centre awarded by the **"Beautiful Poland"** group, striving to find the most attractive places in the country

Gaga Heart 2013 for the Copernicus Science Centre in the category Venue of the Year, awarded by the parenting monthly "Gaga" for inspiring children to become personally engaged in discovering, studying and understanding the world

Titles **"Superbrands 2013/2014"** and **"Superbrands Created in Poland 2013/2014"** for the Copernicus Science Centre brand. Poland's best brands were revealed through the Superbrand Certification Process. The Copernicus Science Centre was the winner in the "leisure" category

Nomination for the title **"Najwyższa Jakość Quality International 2014"** for the Copernicus Science Centre. Najwyższa Jakość QI is a national competition program held under the patronage of the Ministry of Infrastructure and Development, the Polish Forum ISO 9000 Club, and the Polish Agency for Enterprise Development



Our team

The Strategic Team (including our directors and department managers) prepared our **strategic plan for 2014–2016**, including strategic and program goals in terms of target audience, finance, development, and internal processes. Following consultations with the entire team, we prepared a list of key values of our institution: **collaboration and trust, creativity, innovation, courage, integrity and accountability, and team engagement**. We also defined a vision for Copernicus' ongoing development. **The Copernicus Science Centre brings together people and organizations, builds a society that believes in development through science, and presents a standard for other science centers in Central Europe**.

We increased our employment by approx. 4 percent (from approx. 221 full-time staff slots in late 2012 to approx. 229 in late 2013), and signed 225 annual contracts with animators recruited during the first quarter. The team now includes 189 animators who had already worked at Copernicus, and 36 new recruits.

Management of the Copernicus Science Centre

Robert Firmhofer – Director

Jolanta Brzywczy – Deputy Director, Chief Accountant

Irena Cieślińska – Deputy Director

Przemysław Wielowiejski – Deputy Director

Program Board

The Program Board has an advisory role in overseeing that the statutory objectives and activity program of the Copernicus Science Centre are met. The Board includes representatives of scientific, artistic and teaching circles in Poland, appointed for terms lasting six years.

prof. dr hab. **Łukasz Turski** – Chairman of the Board

prof. dr hab. **Aleksander Bursche** – Deputy Chairman

prof. dr hab. **Jerzy Axer**

dr hab. **Konrad Bajer**

Irena Cieślińska

prof. dr hab. **Magdalena Fikus**

prof. dr hab. **Maciej Geller**

dr hab. **Dariusz Jemielniak**

prof. dr hab. **Krzysztof Konarzewski**

Maria Mach

prof. dr hab. **Henryk Skarżyński**

prof. dr hab. **Tadeusz Skośkiewicz**

Hanna Wróblewska

The Copernicus Science Centre is a cultural institution organized by the Capital City of Warsaw, the Minister of Science and Higher Education, and the Minister of National Education.

Legal Basis

Agreement dated 1 Jun 2005 on establishing a joint cultural institution named Copernicus Science Centre, with annexes dated 21 Jun 2006 and 26 Jul 2010

Granted the status of a cultural institution on 1 Jun 2005, with amendments dated 21 Jun 2006 and 26 Jul 2010

The Polish Parliamentary Act of 25 Oct 1991 on organizing and implementing cultural activities

Text:
Patrycja Strzetelska (CSC)

Design:
Michał Romański (CSC)

English translation:
Sax Translations (D. Sax, C. Stupnicka)

Cover:
The cover illustration was created in an unusual way, using software searching for solutions to algebraic inequalities.
The white line illustrates a set of solutions for the inequality
$|(x - 3y - 7)4 + 4(x + 4y + 4)3 - 6000| > 3000$,
where x and y are Cartesian coordinates. The software was designed by Dr. Lech Nowicki from the Copernicus Science Centre and the National Centre for Nuclear Research.

Photos by:
Sebastian Czarnecki (CSC): pp. 34, 35
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Filip Klimaszewski: pp. 25, 28, 48, 71
Przemek Kulaga: p. 9
Robert Kowalewski: pp. 21, 22, 23, 69
Adam Kozak: pp. 5, 6, 15, 19, 37, 49, 76, 89, 92
Stanisław Łoboziak (CSC): p. 25
Katarzyna Nowicka (CSC): p. 18
Agata Steifer (CSC): pp. 2, 7, 10, 13, 18, 31, 38, 40, 41, 42, 43, 45, 48, 50, 51, 53, 61, 65, 66, 67, 71, 73, 75, 77, 81, 85, 87
Wojciech Surdziel: p. 14, 33, 59
Bartek Warzecha: p. 54, 56, 91

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Organisers

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Strategic Partner

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