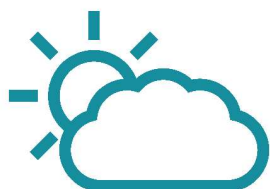


Catalyzer 16/07

International Chemistry Olympiad, Zurich, Switzerland

16 July 2023

Today's Weather



26°C

Schedule

Students

17:00–22:00 Registration and hand-in of electronic devices, Aja Hotel

Mentors and observers

All day Registration, Crowne Plaza

Excitement Barometer

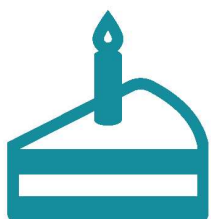


Delegations



Guides

Happy Birthday



Shakti Corthay
Film Crew

Milica Kosovic-Perutovic
Montenegro, Mentor

Piotr Olbrys
Poland, Student



Super Guides

ICHO would not be possible without our guides. They are the first point of contact for students and mentors. They know (almost) everything and are on duty around the clock.

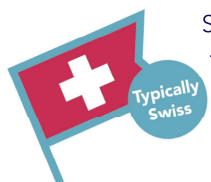
The guides greet “their” delegations on arrival, take them to the Opening Ceremony and to every other activity on the packed IChO agenda. They make sure that students and mentors are on time, get their lunch and dinner and take the right bus or tram. But they also know where Zurich is particularly exciting and where you can relax should you want a quiet minute. The guides have an extremely busy schedule from the arrival of the delegations to the farewell at the airport. They immerse themselves in the cultural world of “their” delegation and get to know many young and interesting people. Their task is more than exciting and when you talk to former guides, you only hear positive things:

“Being an IChO student guide was one of the best times of my life. You get to meet new and exciting people, learn a lot about unknown countries and - as a highlight - make new friends. When IChO is over, tears often flow, but wonderful memories remain.”

Many guides know the IChO from their own participation. Now they give something back and learn how important it is to be part of a team. The guides are the ambassadors for bringing this event to life. Let us thank and applaud all these superheroes who are ready to help at any time! (al/ Asira Lele)



Swiss Chocolate - What else?



Swiss chocolate is world famous. It has a rich history and gained a reputation for being some of the best chocolate in the world. The production combines modern techniques with traditional methods. Many Swiss chocolatiers still follow time-honored recipes and artisanal processes, ensuring the preservation of their chocolate-making heritage. Not only is Switzerland the country with the highest consumption of chocolate per capita with the average person consuming approximately 8.8 kg of chocolate every year, Switzerland is also one of the world's biggest chocolate producers with more than 200'000 tonnes of chocolate produced in 2019. *Marie A. Perrin*



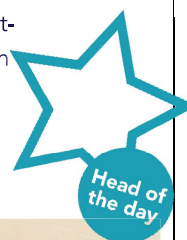
Greetings from Petra Ménová

Last year, Petra Ménová was elected chair of the IChO Steering Committee. Her journey from competing as a participant in 2004 and 2005 to becoming a mentor and now head of the Steering Committee is definitely one worth following.

The IChO changed Petra's life forever. It was the break-

ing moment when she decided not to do only chemistry as science but also chemical education and stay in the IChO community. Ten years later, as a mentor, she made many new friends. As chair of the IChO Steering Committee Petra can now pay back a little of what it gave to her - passion for chemistry, lifelong friendships and the possibility to travel and meet similarly passionate people. Petra is expecting a baby and therefore won't be able to come to Zurich, but you can look

forward to meeting her in person again in 2024 in Saudi Arabia.



Yesterday in pictures

(by Luca Ferrari)



Swiss Water: Enjoy it!

Swiss water is known for its exceptional quality, and this extends to the drinking fountains that are found throughout Switzerland. The participants of IChO got a drinking bottle of Swiss quality brand SIGG. But what to do with it? Just fill it with tap water or with water from one of the 1'200 drinking fountains in Zurich!

Zurich's tap water is amongst the best quality tap water in

the world. This is not a matter of chance but a matter of hard work. Zurich Water Supply counts about 300 employees who manage the collection, filtering and distribution of the drinking water. The city sources its water primarily from Lake Zurich and, to a lesser extent, from the Glatt and Sihl rivers. Through pipes it reaches one of the treatment plants. In the first step, the water is mixed with ozone. This kills all the bacteria and other organisms. Then it goes through a sand filter and, afterwards, through a filter of activated carbon. As the mineral content of the lake

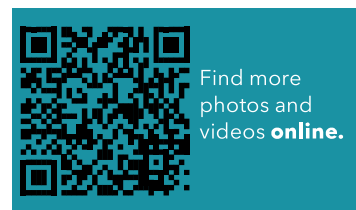
water is very low, it is mixed with ground and spring water. This gives it a nice fresh taste. So, the next time you're looking for a refreshing drink, consider the benefits of Swiss water. (al)



Question of the Day:

Which metal is the most reactive metal of the periodic table?

A. Lithium B. Francium C. Sodium D. Uranium



Editorial Team:

Andrea Leu (al), Chiara Brändli (cb), Lea Hasler (lh), Lena Frölich (lf), Saulė Akavickytė (sa) (volunteer)
Pictures: various sources

Catalyzer 17/07

International Chemistry Olympiad, Zurich, Switzerland

17 July 2023

Today's Weather



27°C

Schedule

09:30 - 11:00 Opening Ceremony

Students

14:00 - 18:45 Discover ETH and Zurich

Mentors and observers

13:00 - 15:00 Lab inspection, ETH Hönggerberg

16:00 - 18:00 Meet the authors, Crowne Plaza

20:00 - 24:00 Jury Meeting 1, Crowne Plaza

Discovery Barometer

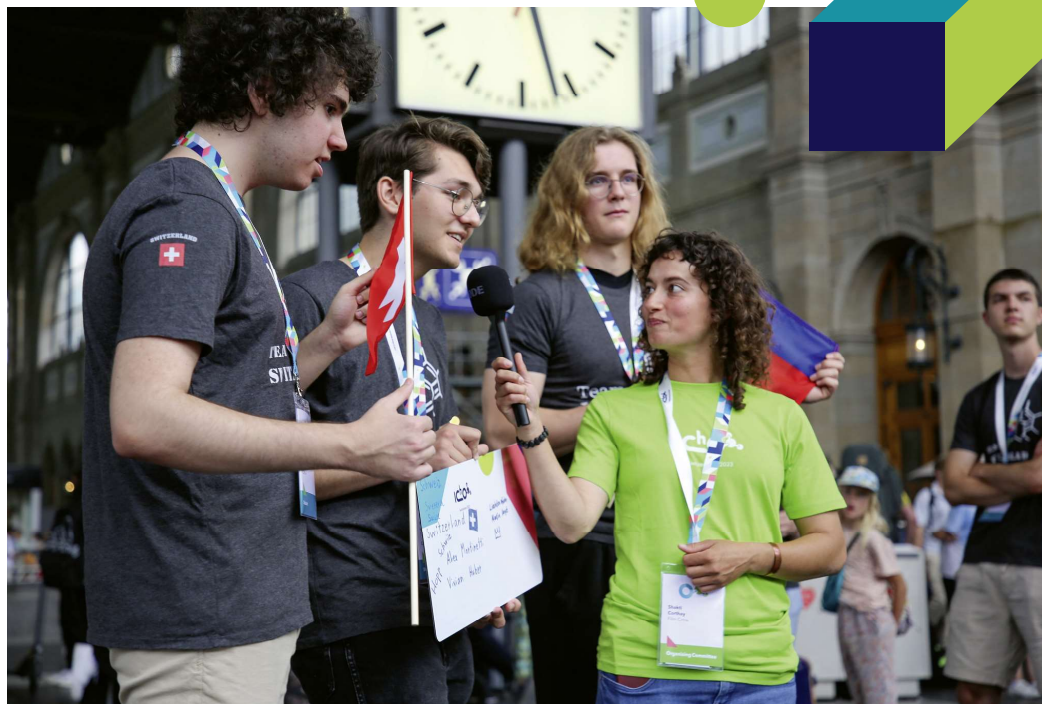


Everyone

Happy Birthday



Ayoub Al.Uwaisi
Oman, Observer



Registration Day - Let's Get Started

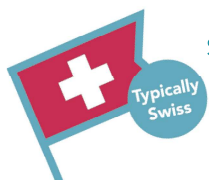
Yesterday was the big arrival day: 348 students with their 272 mentors and observers arrived in Zurich. For most of them, their stay in Switzerland started at Zurich airport, some teams arrived by train. From there, the students went to the hotel Aja for registration, and the mentors and observers to the hotel Crowne Plaza.

All in all, Zurich presented itself from its best side: blue skies, punctual trams and trains as well as a warm welcome by the IChO team. The anticipation of the IChO was great among participants, volunteers and organisers. Now the moment has finally come for everyone to physically meet at the venue. After three online IChOs, it is a truly great experience to finally meet in person again. Taiba from Kuwait already participated in the Middle East competition and is now excited for the IChO. She had a long but comfortable journey to Switzerland. Yavor, on the other

hand, had a relatively short flight of about two hours from Sofia, the capital city of Bulgaria. This is his first time in Switzerland, but he is already considering studying chemistry at ETH Zurich after finishing school. Sabine from Switzerland reached Zurich by train: "I feel very comfortable in my team and I am looking forward to meeting new people and learning something new about chemistry during the exams. Even if I do not know how to answer the question directly, I will use my current knowledge to try to find a solution."

We are all looking forward to making the 55th IChO a great celebration of joy, togetherness and cross-border friendships and are ready to work together to find solutions that will advance our world and make it a better place. (al/sa)

Be Punctual



Swiss punctuality is not just a cliché, it is widely recognized and often seen as a cultural characteristic of Switzerland. The Swiss value punctuality and consider it an important aspect of their daily lives.

If you are more than 5 minutes late, you should announce this by phone. Especially in the working world,

punctuality is very important. If you want to meet with somebody, you usually make



an appointment beforehand. Even in private life, unannounced visits are not the norm either.

Swiss punctuality is rooted in a sense of respect for each others' time. Being punctual is seen as a sign of consideration and reliability, demonstrating that one values and honors the commitments made with others. But don't worry, as with all things that characterise a country: not all Swiss people are always on time! (al)

Helma Wennemers – Professor, Researcher and IChO-Moderator



Helma Wennemers earned her Ph.D. at Columbia University, New York, and pursued postdoctoral studies at Nagoya University before joining Basel University as Assistant Professor. In 2011, she was appointed Full Professor of Organic Chemistry at ETH Zurich.



Chemistry fascinates Helma since chemistry allows for a understanding of nature at the molecular level and enables the creation of molecules with tailored properties. Her research group focuses on the development of bioinspired asymmetric catalysts, functional collagen peptides for targeting diseases such as cancer, and uses molecular scaffolds for applications in supramolecular and biological chemistry.

Helma hopes that IChO will form bonds around the world through the passion for chemistry.

Question of the Day:

Which of the following acids is the main type of acid found in grapes?

- A. Citric B. Malic C. Succinic D. Tartaric



Yesterday's solution: B: Francium is extremely radioactive, and the most stable isotope, francium-223, has a half-life of 22 minutes. The isotopes of francium quickly decay into astatine, radium and radon.



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Pictures: various sources

Yesterday in pictures

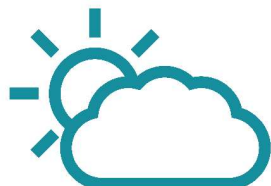


Catalyzer 18/07

International Chemistry Olympiad, Zurich, Switzerland

18 July 2023

Today's Weather



27°C

Schedule

Students

09:00 - 13:30 & 15:15 - 17:15

Discover ETH and Zurich

Finding Solutions Fair

18:00 - 18:45 & 19:30 - 20:15

Lab Safety, ETH Zentrum

Mentors and observers

08:00 - 20:00 Translation

Practical Exam, Crowne Plaza

Finding Solutions Barometer



Students



Partners & organisers

Happy Birthday



Miloš Selaković

Team Guide

Kristi Koitla

Estonia, Mentor

Nattapong Paiboonvorachet

Thailand, Head Mentor



It's All About Togetherness!

What a day: the very first IChO in Switzerland was ceremoniously opened yesterday. The teams from 89 countries gathered in the hall of the hotel Spigarten in Zurich for the opening ceremony.

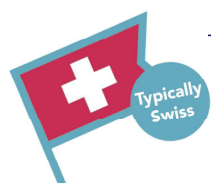
Günther Dissertori, Rector of ETH Zurich and President of IChO 2023, warmly welcomed all participants and pointed out how valuable and important an event like the IChO is: "The IChO is not just a competition, it is a celebration of knowledge, discovery and the beginning and continuation of friendships. We stand here today, ready to witness the passion of these young chemists with their talents and their dedication. Let us embark on this extraordinary journey together, united by the common language of science and inspired by the possibilities that lie before us for future solutions."

Helma Wennemers, Professor at the ETH Department of Chemistry and Applied Biosci-

ences, led the opening ceremony and was actively supported by Jane Mumford, a comedian for whom chemistry is now no longer a foreign word! Besides speeches by Silvia Studinger, State Secretariat for Education, Research and Innovation, Gábor Magyarfalvi, International Steering Committee IChO and Wendelin Stark, Head Scientific Committee IChO and professor at ETH, each country was introduced with country-specific symbols. The teams were enthusiastic and together with the two Swiss participants Sabine Neuhaus and Alex Martinetti they recited the Olympic IChO oath, which focuses on fair play, inclusion and equality. Overall, the opening was a great success as it was the start of an exciting and eventful IChO period. (a/)



Swiss Army Knife



The Swiss Army knife is a versatile multi-tool that originated in Switzerland. It is known for its compact size and multiple functions, making it a popular tool for various tasks. The original Swiss Army knife was developed by

Karl Elsener in 1891 and was intended for use by the Swiss army. It featured a blade, a screwdriver, a can opener and a punch. Over the years, the Swiss Army knife, today manufac-

tured by Victorinox, has evolved and now comes in various models with different tools and functionalities. (a/)



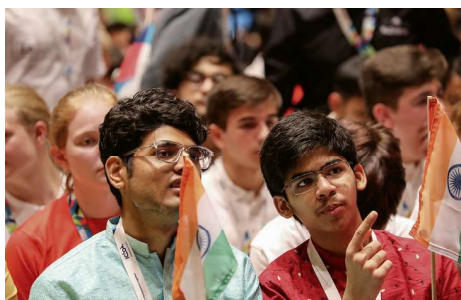
Vladimir Prelog - the King of Chemistry



Vladimir Prelog was a Croatian-Swiss chemist who lived from 1906 to 1998. He received his diploma in chemical engineering from the Czech Technical University in 1928. In the midst of World War II, he came to Switzerland to teach at ETH Zurich.

At ETH, he worked on the Cinchona alkaloids, especially quinine. His synthesis of the diamond-like hydrocarbon adamantane brought him international recognition. He received the Nobel Prize in Chemistry in 1975 for his research into the stereochemistry of organic molecules and reactions, i.e. the relationship between the structure of a chemical and its reactivity. Vladimir Prelog is the best proof that you are never too young to be a real scientist: he published his first scientific paper at the age of 16 in the renowned journal "Chemiker-Zeitung". (Marie A. Perrin)

Yesterday in Pictures



Question of the Day:

Which biopolymer can be found in the exoskeleton of shrimps, lobsters and insects?

- A. Cellulose B. Chitin C. Keratin D. Lignin

Yesterday's solution: D: There are three stereoisomeric forms of tartaric acid. The first is dextro-tartaric acid, found in grapes and several other fruits. The second is levo-tartaric acid. The third is a meso form.



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Saulė Akavickytė (sa)
Pictures: various sources

Catalyzer 19/07

International Chemistry Olympiad, Zurich, Switzerland

19 July 2023

Today's Weather



27°C

Schedule

Students

08:45 – 14:00 Practical Exam,
ETH Hönggerberg,

18:30 – 19:45 Career Evening,
ETH Zentrum

Mentors and observers

8:00 – 16:00 Excursion Discover
ETH Zurich/ Empa/ Eawag

16:00 – 18:00 Meet the authors,
Crowne Plaza

20:00 – 24:00 Jury Meeting 2,
Crowne Plaza

Tenseness Barometer



Students

Team Guides

Happy Birthday



Luca De Masi
Student, Italy



Let's Find Solutions Together

From food security and access to clean water to environmental pollution and human health – our global society faces many challenges to which the chemical sciences can help provide solutions. At the Finding Solutions Fair, the IChO participants met companies and many of their employees.

In addition to waterproof, breathable membranes from the start-up Dimfora, the start-up NexMR presented a new technology using sensitivity-enhanced NMR that can screen libraries of thousands of molecules within days. At Givaudan, the students were able to discover Ambrofix, an ambery molecule produced by sustainable synthesis, which is used in perfumes. At Metrohm, they got to know a model of a chromatography

column and a titration robot. Lonza gave some examples of how interdisciplinary scientific collaboration can help solve problems and at the NCCR Catalysis, the students learned more about new carbon-neutral value chains for the production of fuels and chemicals, starting from renewable resources via catalytic processes. Oleh from Ukraine was impressed: "At the Finding Solutions Fair, I found out about modern ways of solving chemical equations. I am so excited about the possibility to simulate chemical equations on modern computers and to get immediate results without having to be in a lab for days, weeks or even months or years. It saves much time and materials."

All in all, a very diverse and educational event. (al/sa)

Today is the day of the practical exams and we wish the students all the best! You can be very proud of yourselves to represent your country and will certainly do your country and family proud, no matter what the result is going to be. Good luck, you can do it!



Matterhorn - King of the Alps

At 4478 m above sea level, the Matterhorn is one of the highest mountains in the Alps. Because of its striking pyramid shape, it has become a symbol of Switzerland and the fascination of mountaineering. The Matterhorn is one of the most famous and most photo-

graphed mountains in the world. 158 years ago, on 14 July 1865, a seven-man rope team around the Briton Edward Whymper reached the summit for the first time. As beautiful as the mountain near Zermatt in Switzerland is as difficult it is to climb. On the descent, four men lost their footing and thus their lives. Nevertheless, the fascination of the Matterhorn never waned. Many tourists come to Zermatt to admire the view

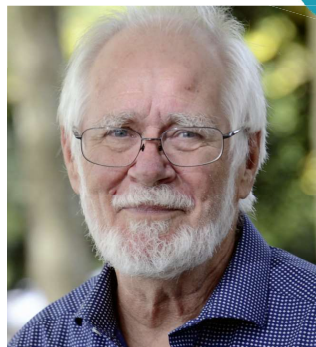
and to take pictures, others want to go all the way to the top. Every year, some 300 to 400 people attempt to climb the peak with a guide. The Matterhorn captivates people from all over the world and fires their imagination. (al)



Jacques Dubochet

Jacques Dubochet was born in 1941 in Aigle, Switzerland. He studied physical engineering at EPFL and molecular biology at the University of Geneva (UniGe). He was appointed professor at the University of Lausanne (UNIL) in 1987, where he stayed until his retirement in 2007.

Jacques Dubochet received the nobel prize in chemistry in 2017 for developing cryo-electron



microscopy for the high-resolution structure determination of biomolecules in solution, together with Joachim Frank and Richard Henderson. With cryo-electron microscopy, the structure of (biological) samples, including viruses, protein complexes or DNA, can be determined at a very high resolution without having to crystallize the samples. (Eva Vandaele)

Switzerland's growth engine

Switzerland has a well-established chemical and pharmaceutical industry that plays a significant role in the country's economy. The sector has a long history and is Switzerland's leading exporter, generating roughly 50% of total annual exports and 5% of GDP. There are approximately 1,000 industry operators, including many major multinationals. Employment in the Swiss pharmaceutical and chemical industry is significant and contributes to the creation of many jobs in the country. In 2020, the sector employed around 74,000 people in Switzerland and over 338,000 internationally. (al)

Question of the Day:

Which organic compound is responsible for the book pages turning yellow over time?

- A. Lignin B. Starch C. Cellulose D. NaOH

Yesterday's solution: B: Chitin is a polymer of N-acetylglucosamine and probably the second most abundant polysaccharide in nature. It is a component of cell walls and exoskeletons.



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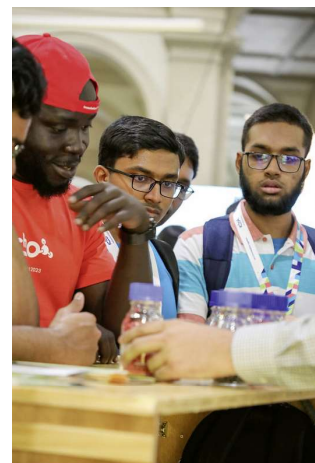


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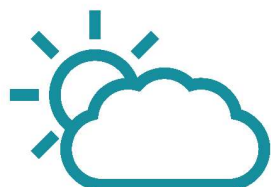
Yesterday in Pictures



Catalyzer 20/07

International Chemistry Olympiad, Zurich, Switzerland

20 July 2023
Today's Weather



28°C

Schedule

Students

13:30 – 18:00 Visit the Paul Scherrer Institute in 2 Groups

Mentors and observers

08:00 – 18:00 Translation theoretical exam, Crowne Plaza
18:00 – 22:00 S(h)ip & Dine, Lake Cruise, BBQ and Drinks, Lake Zurich

Relax Barometer



Students



Mentors

Happy Birthday



Ketevan Peranidze,
Georgia, Student



First Part of the Exams: Done

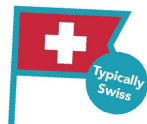
That's how fast it goes: the practical exams are already history. The students were able to demonstrate their skills and knowledge during five hours. Congratulations on this achievement! Also thanks to everyone who helped that all of the 348 students arrived on time at the ETH and their examination places. But how did the practical exam go? We asked some of the students.

The tasks were based around the topics of advanced separation techniques, thin layer chromatography and advanced inorganic qualitative analysis. Especially the second titration seemed to have caused some differences: "Was it blue or grey? No one here really knows", explained Judd from South Africa. Seljan from Azerbaijan, on the other hand, is convinced, "The second titration definitely got grey! All in all, the practical exam was awesome." Peradol from Thailand

agrees, "It was quite challenging but still fun." For Dániel from Hungary it was primarily the time management that was the most challenging. The tasks, however, were well designed, he said.

Did you know that translating all the exams is an enormous effort, done by our mentors? They meet before the exams and discuss all the tasks in detail. Then it is time to translate. The English translation provides the basis. So, a few countries are lucky and can keep the language. Nevertheless, there are about 50 translations into other languages that need to be made and that means a lot of work. So today, while students get a day to explore, all mentors will be busy translating for the theoretical exams tomorrow. In some cases, mentors choose to go for the English term if there is no direct translation. (If/sa)

Bircher- müesli



Birchermüesli is a traditional Swiss breakfast dish that was created by Swiss physician Maximilian Bircher-Benner in the late 19th century. Birchermüesli typically consists of grains, fruits, nuts, and seeds.

Birchermüesli is typically served cold and can be enjoyed as a refreshing breakfast or snack. It is known for being a healthy and nutri-

tious meal, providing a good balance of complex carbohydrates, fiber, protein, healthy fats, vitamins, and minerals. The dish is highly customisable, and additional toppings like fresh berries, shredded coconut, or a sprinkle of cinnamon can be added for extra flavor and texture. Birchermüesli has gained popularity worldwide for its simplicity, freshness, and wholesome ingredients. It is a versatile dish that can be adjusted to personal preferences and dietary needs, making it a go-to choice for those seeking a nutritious and satisfying breakfast option. (al)



Paul Karrer – From Carrots to Vitamins

Did you know that Paul Karrer won the Nobel Prize in Chemistry for his research on the structure of carotenoids, the pigments that give carrots and other vegetables their characteristic colour?

Paul Karrer studied chemistry at the University of Zurich, where he was mentored by the Nobel Prize winner Alfred Werner. After

completing his PhD in 1911, he moved to Frankfurt am Main (Germany) where he developed an interest in biological as well as medical applications.



In 1918, Karrer returned to Zurich and was subsequently appointed Professor of Chemistry as well as Director of the Chemical Institute. He then reoriented the focus of his research towards biologically active natural substances.

Paul Karrer received the Nobel Prize in 1937, shared with the British chemist Norman Haworth, for his investigations on carotenoids, flavins and vitamins A and B2. He passed away in 1971 at the age of 82, after more than 40 years of research career at the University of Zurich. (Jaime Martin)

Question of the Day:

Which of the following helps to remove ink stains and rust from clothes?

A. Oxalic acid

B. HCl

C. NaOCl

D. NaOH



Yesterday's solution: A: Most paper is made of wood, which consists of cellulose and lignin mostly. Lignin is susceptible to oxidation and the added oxygen alters the structure of the polymer creating chromophoric regions responsible for the colour change.



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Pictures: various sources

Yesterday in Pictures



Catalyzer 21/07

International Chemistry Olympiad, Zurich, Switzerland

21 July 2023
Today's Weather



24°C

Schedule

Students

08:45 - 14:00 Theoretical Exams

17:00 - 22:00 Reunion Event

Mentors and observers

07:30 - 17:00 Excursion to Mount Säntis and Metrohm

17:30 - 18:30 Jury Meeting

18:30 - 22:00 Reunion Event

Stress Barometer



Students



Mobile Devices Charging Stations

Happy Birthday



Fang Ng,
Malaysia, Student
Tsung-Shing Wang,
Chinese Taipei, Observer



Women at Paul Scherrer Institute

The Paul Scherrer Institute, PSI, is the largest research institute for natural and engineering sciences within Switzerland, conducting cutting-edge research in four main fields: future technologies, energy and climate, health innovation and fundamentals of nature. The students had the opportunity to visit the institute yesterday.

PSI puts a lot of emphasis on systematically reducing structural barriers as well as disadvantages and offer various support programmes specifically for women. One of their mentoring programmes is called feM-LEAD. The goal of this programme is the planning of the mentee's career, e.g. through an insight into the career and work experience of the mentor. Furthermore, PSI also takes part in international activities, such as the International Day of Women and Girls in Science, to encourage women and girls to consider a career in science, advocate for the critical role women play in research and technology and

increase their visibility as role models for present and future generations. Here is one of the many impressive women at PSI, Margit Schwikowski, head of the Laboratory for Environmental Chemistry at PSI: "Working in Science is incredibly exciting. It's a great feeling to discover something new. I particularly like that my work is very varied, from the ice drilling on the glacier to the experiments in the laboratory to the evaluation on the computer. Science is international and knows no borders. We always work in teams with other scientists, often from different countries. If you want to pursue a career in science, be guided by your interests and gut feeling. And not necessarily follow any well-intentioned advice." (lh)

Source and many more inspiring women at PSI:



Say Cheese

On bread, in sandwiches, on cheeseboards or melted in Raclette or Fondue in winter - we like our cheeses.

Switzerland produces over 475 varieties of cheese. Especially Emmental cheese is renowned worldwide as the quintessential Swiss cheese with holes. The holes are caused by the production of carbon dioxide gas during the cheesemaking process. In 2021, the average consumption per person was 23.2 kg. Yes, almost half a kilogram a week. We know that not everyone can literally stomach cheese and there are many reasons not to eat cheese. However, it's true: Cheese and Switzerland belong together. (lh)



Marie Curie

The scientist is one of the most known female nobel prize winners. She is not Swiss but French, but spent some time visiting ETH and Switzerland.

Marie Curie was born in 1887 in Poland and spent most of her life in France. She and her Husband Pierre Curie won the Nobel Prize in Physics in 1903 for their joint research on the radiation phenomena. A few years later, she won a second Nobel Prize, this time in Chemistry for isolating pure radium. After the death of her husband, she took over his place and became the first female professor at the Uni-

versity of Sorbonne (France). She had two daughters and she fought for the right of other women to find their place within science.

Marie Curie had met Einstein the first time at a conference in 1911 and in the autumn of 1913, they went on a hike in the Swiss mountains. Einstein was at ETH Zurich at that time. During the First World War, aided by her daughter Irène, Marie Curie devised a mobile X-ray station to examine wounded soldiers, even driving one of these vehicles to the front herself. Sadly, she died of leukaemia at a sanatorium on 4 July 1934 as the result of decades of working with radioactive substances unprotected. (lh)

Yesterday in Pictures



Question of the Day:

Which material did Stephanie Kwolek develop?

A. Nylon

B. Latex

C. Kevlar

D. Teflon



Yesterday's solution: A: Oxalic acid is a colorless, crystalline, toxic organic compound belonging to the family of carboxylic acids. Oxalic acid is widely used as an acid rinse in laundries, which helps remove rust and ink stains, because it converts most insoluble iron compounds into a soluble complex ion.



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Pictures: various sources

Catalyzer 22/07

International Chemistry Olympiad, Zurich, Switzerland

22 July 2023
Today's Weather



25°C

Schedule

Students

07:00 – 22:15 Excursion to Valais, Lonza and Bern, by train

Mentors and observers

08:00 – 18:00 Corrections, Crowne Plaza
20:00 – 24:00 Jury Meeting 3, Crowne Plaza

Excursion Barometer



Students



Mentors

Happy Birthday



Nobody's birthday at IChO today, but: Happy International Hammock Day!



What a Day!

Yesterday was a very busy day: the second exam took place and with it the academic competition of the IChO ended. The mentors visited Eastern Switzerland and in the evening the great reunion happened.

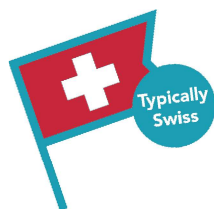
The theoretical exam also lasted 5 hours and especially the time management seemed to be a challenge for the students: "The exam actually went by so quickly, I can't even explain it! Time flies when you are so concentrated. I started the exam, then raised my head to look at the clock and two and a half hours were already gone. The time limit is one of the main challenges at IChO. Unfortunately, I didn't manage it correctly", said Andrea from Georgia. The Vietnam team found the exam very difficult and was very tired afterwards: "We did our best, but we are not exactly happy with how it went. No matter what, the exam was still fun and we are glad that we were able to participate." For Tomás from Argentina the practical exam was more tiring than the theoretical one: "The exam

met my expectations. However, I don't know what results to expect, mainly because I don't know how the rest of the students did. I just know that I did my best and the outcome will reflect what I know."

Now the hard part is over and the students are waiting for the results. However, the long wait is shortened by a very varied programme, e.g. the Reunion Party, which took place last night and at which mentors and students met again for the first time since Monday. Finally, the stress of the exams could be put aside.

While the students had to work hard and think a lot, the mentors visited Eastern Switzerland. The programme included an excursion to Mount Säntis and a visit to Metrohm, an IChO Partner and an international active Swiss manufacturer of precision instruments for chemical analysis, especially for ion analysis. (lh/sa)

Schwingen



Schwingen, also known as Swiss Wrestling, is a traditional sport

that originated in Switzerland. It is a style of folk wrestling that has been practiced for centuries.

The "Schwinger" compete on a circular sawdust-covered platform and wear short pants made of jute over their clothes which allow for easy grappling. They hold each other by these pants and try to throw

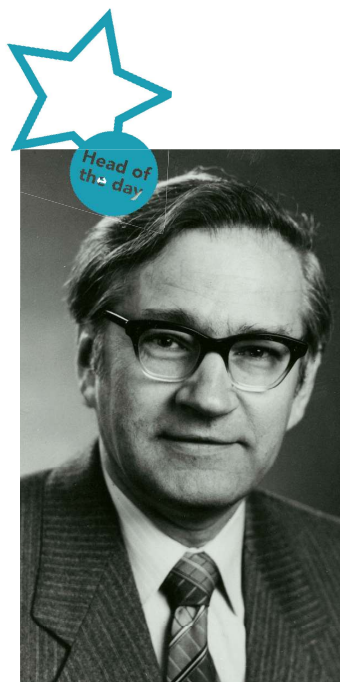
the opponent onto their back with both shoulders touching the ground. Unlike other wrestling styles, there are no points in Schwingen. The match is judged by three referees, one of whom stands in the ring. There are no weight classes nor any other categories. Usually, though,



"Schwinger" are big men, over 180 cm tall and weighing in excess of 100 kg. "Schwingen" places a strong emphasis on fair play and sportsmanship. It is deeply rooted in Swiss culture and tradition and is a popular attraction at regional festivals and events. (al)

Richard Ernst - Toolmaker, Musician, Researcher

Richard Ernst (1933-2021) received the Nobel prize for chemistry in 1991 for his contributions to the development of the methodology of high resolution nuclear magnetic resonance (NMR) spectroscopy.



He was born in Winterthur, Switzerland, and studied chemistry at ETH. After his PhD he joined a company in the US that worked on commercialising NMR. In 1968 he returned to ETH, where he soon started to focus on the development of multi-dimensional spectroscopy. Prof. Ernst was a member of various committees, editor for numerous journals and continued to lecture on many topics all over the world after his retirement in 1991.

(Eva Vandaele)

Question of the Day:

Which chemistry Nobel prize winner was on the betting sheet of the Simpsons in 2010?

A. Ben Feringa

B. Richard Zare

C. Omar Yaghi

D. Ada Yonath

Yesterday's solution: C: Stephanie Kwolek discovered poly-paraphenylene terephthalamide fibers while working at DuPont. She won multiple awards for her work in polymer chemistry.



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Pictures: various sources

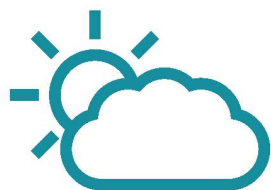
Yesterday in Pictures



Catalyzer 23/07

International Chemistry Olympiad, Zurich, Switzerland

23 July 2023
Today's Weather



27°C

Schedule

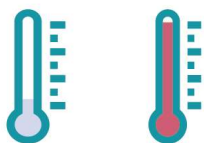
Students

08:30 - 22:30 Excursion to
Lucerne and Mount Rigi, by
coach

Mentors and observers

08:00 - 18:00 Arbitration,
Crowne Plaza
20:00 - 24:00 Jury Meeting 4,
Crowne Plaza

Pressure Barometer



Students

Authors

Happy Birthday



Johnmark Acheampong
Team Guide



Exploring Switzerland

Yesterday, our students travelled to the canton of Valais, had the opportunity to visit one of our partners, Lonza, and got to see our capital Bern. They travelled by train, which is a very convenient way to travel in Switzerland.

The Canton of Valais is the third largest Canton in Switzerland by area and Sion is its largest city. Valais is the highest canton in terms of absolute, relative, and mean elevation with many peaks over 4000 meters above sea level. That means: there are a lot of mountains and many of us Swiss spend some time there on our holidays in summer to hike or bike, and in winter to ski or snowboard. One specialty is that there are two languages spoken in the Canton: While the more populous Lower and Central Valais are French-speaking, Upper Valais is German-speaking. Their Swiss German dialect is very distinct and so different from many others that for example people

from Zurich struggle to understand them.

In the Canton of Valais, Lonza was founded in 1897 and is a very important company for the Canton as well as for IChO 2023. Lonza's site is located in Visp and is the largest and oldest site in a global network of more than 30 sites. It is also one of the most significant for research, development and manufacturing. In Visp, Lonza includes a number of industry-leading facilities specializing in the development and manufacture of products for pharmaceutical applications. The IChO student had a great time visiting the company and learning more about their activities in Switzerland as well as worldwide.

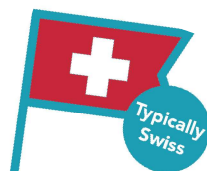
Today, the students have another day of exploring Switzerland ahead of them: They are off to the beautiful city of Lucerne and up to Mount Rigi. Meanwhile, the mentors are busy with arbitration all day. (lh)



Hiking Paths

Swiss people like to hike and there are over 65'000 km hiking paths across Switzerland.

One of the Swiss' main recreational activity is walking up hills and mountains or along lakes and rivers. Across Switzerland, there are over 65'000 km hiking paths. Signs along the paths indicate how long it takes to reach the next village, train station, cabin or mountain top. In addition, marked stones



show hikers that they are still on the right track. Most of the time, hikers enjoy a packed lunch with sandwiches on a break during their hiking day. In 2020, 57 percent of the Swiss over 15 years old confirmed that hiking is one of their physical and recreational activities. On average, they hike 15 times a year and around three hours per hike. In total, the Swiss population therefore spends 200 million hours hiking. (lh)

Patrik Willi

Patrik Willi is a member of our scientific committee. After his MSc Chemistry at ETH Zurich and two industry internships, he is now pursuing a PhD in chemical engineering at the Functional Materials Laboratory at ETH Zurich. An IChO alumni himself, he knows exactly how intense and fun the IChO experience is for everybody. The preparations for an IChO started many

years ago. Patrik has been passionately involved in IChO 2023 for more than 5 years. He is excited to finally see the results of the Scientific Committee's work, which was made possible by the motivated cooperation of the many people involved from the Department of Chemistry and Applied Biosciences D-CHAB, the Swiss Chemistry Olympiad and volunteers.



Pictures of the Day



Question of the Day:

Which reaction happens spontaneously?



Yesterday's solution: A: Ben Feringa received the Nobel prize in 2016 for the design and synthesis of molecular machines.



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Pictures: various sources

Catalyzer 24/07

International Chemistry Olympiad, Zurich, Switzerland

24 July 2023
Today's Weather



22°C

Schedule

Everyone

15:30 – 18:00 Closing

Ceremony, Tonhalle

18:00 – 22:30 Farewell Dinner,

Kongresshaus

Happiness Barometer



Everyone

Happy Birthday



Alberto Ariosto
Team Guide

Yhlas Jumayev
Turkmenistan, Student



You Are all Winners

Medals have been awarded for outstanding achievement since ancient times. They are a symbol of honor and excellence in athletics, diplomacy and science. Many of the students will also soon receive a medal for their performance at the IChO. And who knows, maybe one day someone of them will receive the Nobel Prize in Chemistry?

The Nobel Prize in Chemistry is perhaps the most well-known chemistry medal. The medal of The Royal Swedish Academy of Sciences represents nature in the form of a goddess resembling Isis, emerging from the clouds and holding in her arms a cornucopia. The veil which covers her cold and austere face is held up by the Genius of Sci-

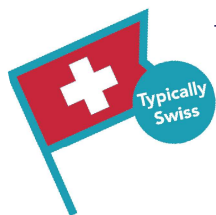


ence. The inscription on the medal reads: "Inventas vitam iuvat excoluisse per artes" and means literally: It is beneficial to have improved (human) life through discovered arts.

Whether at IChO you are aiming for a gold medal like Daniils from Latvia: "I hope for a gold medal because I already have bronze and silver, so it would be nice to get the last one and to have all three of them in my collection" or are happy with a certificate like Vivian from Switzerland: "I don't expect to get any medal or diploma, probably just a certificate for the participation. But, of course, I hope that we all from the Swiss team will get at least honorable mentions", the students all did a great job and we hope that they had an unforgettable time at the IChO 2023 in Switzerland! (If)

This is the last printed version of the IChO's 2023 Catalyzer. We would like to thank our readers for their daily support. The combination of print and online editions has helped us save over 20,000 sheets of paper!

Swiss Watches



The Swiss watchmaking industry has a long and rich history, dating back to the 16th century. It initially developed in Geneva, but soon spread to other regions of Switzerland. By the middle of the 19th century, the Swiss watchmaking industry became the world's leading producer of

watches. However, the American watch industry's mass production of watch components led to a decline in Swiss exports. In the early 20th century, Swiss watchmakers innovated with new features and functions, but they missed the opportunity to capitalise on



the quartz watch revolution. The Swatch, an analogue high-quality quartz watch that was also affordable, saved the Swiss watch market in the 1980s, and the industry has since recovered. Today, the Swiss watchmaking industry is once again one of the most prosperous economic sectors in Switzerland. The industry is known for its high-quality watches, and it is also a major producer of machine tools. (If)

Marco Gerber



Have you ever wondered who the person behind this huge event is? Someone you might hardly see but in whose hands most of the strings are? Who must make thousands of small and bigger decisions every day? Who was crazy enough to say YES to take over the role as a General Manager of the Organising Committee?

Dear Marco, only 1 year and 3 months ago, you decided to come on board, take on this unique event

and the challenge to be the General Manager of the Organising Committee. It was admirable to see how quickly you got the overview and picked up the pace. Your passion and stamina in this project impresses everyone. Let's Find Solutions Together is not just a claim for you. You show us



every single day what it means to work as a team towards a common goal. And to make every IChO 2023 day a successful one. After the IBO 2013 in Bern and the IPhO 2016 in Zurich, you now add the IChO 2023 to your palmares. Thank you for encouraging everyone, for calming us down, for supporting us, for bearing us and finally,

thank you for sharing your vision. You deserve a gold medal for working tirelessly towards IChO 2023!

Your team

Question of the Day:

Which of the following alloys will give white gold?

A. Au, Ag, Cu, Cd

B. Au, Cu, Ag

C. Au, Ni

D. Au, In

Yesterday's solution: A: zinc and copper can react in a redox reaction, as zinc is the stronger oxidizing agent.



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Pictures: various sources

Yesterday in Pictures



Student	Total	Rank	medal	First name	Middle name	Last name	DELEGATION
CHN-2	94,82	1	Gold	Weijie		Mao	China
CHN-3	88,69	2	Gold	Haozhe		Sun	China
QMP-1	88,04	3	Gold	Nikita		Perov	Individual Participant
TUR-2	83,97	4	Gold	Berkan		Tarak	Türkiye
SGP-1	83,71	5	Gold	Leemen	Chee Yong	Chan	Singapore
POL-1	82,91	6	Gold	Michal	Piotr	Lipiec	Poland
VNM-1	82,14	7	Gold	Dinh		Cao Son	Vietnam
CHN-4	80,84	8	Gold	Chuyue		Zhuang	China
HUN-1	80,47	9	Gold	Marton		Szabo	Hungary
VNM-2	80,02	10	Gold	Nguyen		Kim Giang	Vietnam
SGP-4	79,00	11	Gold	Marcus Jian-Hao		Chu	Singapore
TWN-3	78,77	12	Gold	Yu-Fan		Chou	Chinese Taipei
GBR-2	78,15	13	Gold	Kiran	Chaim	Diamond	United Kingdom
DEU-1	77,81	14	Gold	Mats	Henrik	Budäus	Germany
ARM-1	76,73	15	Gold	Leonid		Asatryan	Armenia
VNM-4	76,62	16	Gold	Nguyen		Manh Khoi	Vietnam
JPN-4	76,45	17	Gold	Mika		Yamanouchi	Japan
USA-3	76,42	18	Gold	Anurag		Sodhi	United States of America
USA-4	76,27	19	Gold	Phoenix		Wu	United States of America
SGP-3	76,06	20	Gold	Panshul		Sharma	Singapore
BGR-1	75,78	21	Gold	Victor	Delyanov	Lilov	Bulgaria
UZB-1	75,73	22	Gold	Azizbek	Farrukh ugli	Nazarov	Uzbekistan
IRN-2	75,24	23	Gold	Mohammad		Halaji	Iran
IRN-3	75,20	24	Gold	Zahra		Tahamtani Torkamani	Iran
THA-2	74,93	25	Gold	Jiraroj		Chawanasuntornpoj	Thailand
IRN-1	74,79	26	Gold	Zhiar		Moslemi	Iran
SGP-2	74,74	27	Gold	I-Shiang		Lee	Singapore
CHN-1	74,24	28	Gold	Changjiang		Wan	China
QMP-2	74,14	29	Gold	Sergei		Rosliakov	Individual Participant
KOR-3	74,07	30	Gold	Junsung		Jang	Republic of Korea
TWN-4	73,84	31	Gold	Ching-Chao		Ma	Chinese Taipei
BGR-2	73,83	32	Gold	Krum	Naydenov	Aleksandrov	Bulgaria
QMP-3	73,72	33	Gold	Vadim		Kharisov	Individual Participant

JPN-3	72,79	34	Gold	Kohei		Matsusaka	Japan
IND-1	72,72	35	Gold	Krish		Srivastava	India
ROU-1	72,64	36	Gold	Vlad Gabriel		Ristache	Romania
UZB-2	72,48	37	Gold	Abdullokh	Alisher ugli	Makhmudov	Uzbekistan
KAZ-2	72,43	38	Gold	Sanzhar		Bissenali	Kazakhstan
TWN-2	72,35	39	Gold	Pei-Yuan		Li	Chinese Taipei
UZB-3	72,05	40	Silver	Shahzoda	Bahriddin kizi	Hakimova	Uzbekistan
JPN-1	71,87	41	Silver	Haruto		Suzuki	Japan
ISR-4	71,59	42	Silver	Yonatan		Gontmakher	Israel
GBR-3	71,54	43	Silver	Pak Chuen		Fung	United Kingdom
BGR-4	71,51	44	Silver	Preslav	Ivaylov	Georgiev	Bulgaria
VNM-3	71,39	45	Silver	Mai		Van Duc	Vietnam
KOR-1	71,35	46	Silver	HeeJoon		Kim	Republic of Korea
IND-4	71,30	47	Silver	Avaneesh		Bansal	India
HUN-3	71,09	48	Silver	Marcell Imre		Papp	Hungary
CZE-1	70,68	49	Silver	Jiří		Vestfál	Czech Republic
IDN-2	70,61	50	Silver	Kevin		Lius Bong	Indonesia
LVA-4	70,11	51	Silver	Daniils		Kargins	Latvia
JPN-2	70,05	52	Silver	Shun		TanakaTanaka	Japan
IND-2	69,80	53	Silver	Aditi		Singh	India
KOR-4	69,64	54	Silver	Jimin		Jun	Republic of Korea
ISR-1	69,56	55	Silver	Neta	David	Eiger	Israel
BRA-2	69,50	56	Silver	Gabriel	Paz Sampaio	Aguiar	Brazil
AUS-4	69,20	57	Silver	George Zhibo		Chen	Australia
HUN-4	69,10	58	Silver	Dániel		Viczián	Hungary
SAU-1	69,07	59	Silver	Mohammad	Solaiman	AlHadlaq	Saudi Arabia
KAZ-4	69,01	60	Silver	Rinat		Ilyussizov	Kazakhstan
USA-2	68,49	61	Silver	Alice	Wang	Liu	United States of America
CZE-2	68,39	62	Silver	Zdeněk		Hartman	Czech Republic
DEU-4	68,34	63	Silver	Frederike		Saal	Germany
TUR-1	68,30	64	Silver	Dilara		Altundag	Türkiye
POL-2	68,02	65	Silver	Piotr	Michal	Olbrys	Poland
BGR-3	67,99	66	Silver	Yavor	Ivaylov	Hristov	Bulgaria
THA-1	67,70	67	Silver	Kanissorn		Kiratipongvoot	Thailand

ROU-2	67,61	68 Silver	Luca Mihai		RASCARACHI	Romania
USA-1	67,37	69 Silver	Mingwen	Wayne	Duan	United States of America
SAU-2	67,28	70 Silver	Ali	Habib	AlSaleh	Saudi Arabia
SVK-1	67,20	71 Silver	Richard		Grešák	Slovakia
IDN-1	66,81	72 Silver	Abraham		Abednego Lincoln	Indonesia
SWE-1	66,73	73 Silver	Markus	Erik Johan	Farnebäck	Sweden
GBR-4	66,53	74 Silver	Kiran		Desai-Kinvig	United Kingdom
IRN-4	66,39	75 Silver	Diako		Seyedi	Iran
POL-3	66,33	76 Silver	Szymon		Rozanski	Poland
QMC-1	65,98	77 Silver	Antanina		Shtytsko	Individual Participant
TUR-3	65,59	78 Silver	Azra		Şekercioğlu	Türkiye
CAN-1	65,51	79 Silver	Harry		Gong	Canada
TUR-4	65,45	80 Silver	Mustafa		Keskes	Türkiye
HUN-2	65,32	81 Silver	Dániel		Nemeskéri	Hungary
TWN-1	65,07	82 Silver	Zhong-Wei		Wu	Chinese Taipei
SAU-4	64,70	83 Silver	Ali	Salah	Al Mousa	Saudi Arabia
IND-3	64,47	84 Silver	Malay		Kedia	India
GBR-1	64,30	85 Silver	Kotchapun		Saritsiri	United Kingdom
SYR-4	64,22	86 Silver	Muhammad Ghazal	Anas	Hamida	Syria
BRA-3	64,08	87 Silver	Artur	Galiza	Magalhaes	Brazil
AUT-1	63,69	88 Silver	Leonard	Arkan	Çalışkan	Austria
SAU-3	63,59	89 Silver	Hassan	Abduljaleel	Alkhalifa	Saudi Arabia
THA-3	63,48	90 Silver	Peradol		Sae-chueng	Thailand
QMP-4	63,45	91 Silver	Aleksei		Mikheev	Individual Participant
LTU-2	63,35	92 Silver	Justas		Miliauskas	Lithuania
ARG-2	63,17	93 Silver	Pablo	Tomas	Rossetti	Argentina
SVN-1	62,70	94 Silver	Matej		Nastran	Slovenia
SVK-2	62,70	95 Silver	Tomáš		Iliaš	Slovakia
ROU-3	62,61	96 Silver	Vlad		DIACONESCU	Romania
SYR-1	62,14	97 Silver	Salama	Abdulnaser	Omran	Syria
FRA-2	61,97	98 Silver	Matthieu		Hazebrouck	France
MYS-1	61,86	99 Silver	Joyton	Hung Li	Fu	Malaysia
NZL-4	61,42	100 Silver	Oliver		Gunson	New Zealand
QMC-3	61,07	101 Silver	Maryia		Staubunik	Individual Participant

SVK-4	60,86	102	Silver	Matej		Škubla	Slovakia
TKM-3	60,76	103	Silver	Yhlas		Jumayev	Turkmenistan
AUS-2	60,73	104	Silver	Zenhuan		Lin	Australia
ISR-3	60,48	105	Silver	Shoham		Assis	Israel
GEO-1	60,43	106	Silver	Ketevan		Peranidze	Georgia
KAZ-1	60,37	107	Silver	Almira		Nurlanova	Kazakhstan
BRA-4	60,36	108	Silver	Joao Vitor	Pereira	Fonseca	Brazil
SRB-1	60,18	109	Silver	Uroš		Poleksić	Serbia
QMC-4	59,87	110	Silver	Aliaksandr		Sharaichuk	Individual Participant
HRV-1	59,11	111	Bronze	Tom	Kovačić	Kovačić	Croatia
LVA-3	58,93	112	Bronze	Daniils		Soško	Latvia
KOR-2	58,65	113	Bronze	Chaeone		Seo	Republic of Korea
FRA-1	58,04	114	Bronze	Antoine	Frederic Emmanuel	Mignon	France
UKR-3	57,85	115	Bronze	Oleh		Komarnytskyi	Ukraine
FRA-3	57,68	116	Bronze	Philippe		Dupont de Dinechin	France
LKA-2	57,58	117	Bronze	Thisarindu	Adeepa Lakshan	Kuragodage	Sri Lanka
POL-4	57,56	118	Bronze	Mikolaj		Warda	Poland
AUT-3	57,56	119	Bronze	Rahel	Ingrid	Vecsernyés-Handl	Austria
CAN-3	57,42	120	Bronze	Brandon		Ling	Canada
CZE-3	57,31	121	Bronze	Erik		Rozkovec	Czech Republic
DEU-3	57,14	122	Bronze	Maren	Sophie	May	Germany
TKM-4	57,05	123	Bronze	Aygul		Atajanova	Turkmenistan
BRA-1	56,72	124	Bronze	Nailton	Gama de	Castro	Brazil
AZE-1	56,27	125	Bronze	Hamid		Khalilov	Azerbaijan
DNK-4	56,04	126	Bronze	Sarah		Svaneberg	Denmark
QMC-2	56,02	127	Bronze	Hleb		Baravoi	Individual Participant
UKR-1	55,86	128	Bronze	Oleksandr		Sokolov	Ukraine
UZB-4	55,72	129	Bronze	Sohibjob	Farhodjon ugli	Dilmurodov	Uzbekistan
EST-3	55,61	130	Bronze	Artemi		Smõšljajev	Estonia
ARG-4	55,53	131	Bronze	Tomás		Santillán	Argentina
CAN-4	55,50	132	Bronze	Joey		Liu	Canada
DEU-2	55,47	133	Bronze	Niklas		Küstner	Germany
KAZ-3	55,46	134	Bronze	Bekbolat		Mamyrbekov	Kazakhstan
NZL-3	55,33	135	Bronze	Jayden		Kumar	New Zealand

MNG-1	55,13	136 Bronze	Amartuvshin		Anar	Mongolia
ISR-2	54,92	137 Bronze	Shon		Hentz	Israel
MDA-4	54,76	138 Bronze	Leo		Sprincean	Moldova
LKA-4	54,56	139 Bronze	Robolge	Pahanma Upani	Lenora	Sri Lanka
LTU-3	54,50	140 Bronze	Pijus		Tamošiūnas	Lithuania
TKM-2	54,49	141 Bronze	Yakup		Annaorazov	Turkmenistan
PHL-3	54,35	142 Bronze	Gelraycs Jules		Fornan	Philippines
UKR-4	54,17	143 Bronze	Vladyslav		Omelianchuk	Ukraine
EST-4	53,93	144 Bronze	Mihkel		Tali	Estonia
SRB-3	53,80	145 Bronze	Janko		Popović	Serbia
AUT-4	53,79	146 Bronze	Christopher		Taschler	Austria
HRV-2	53,25	147 Bronze	Kim	-	Radešić	Croatia
LTU-4	53,22	148 Bronze	Tomas		Babelis	Lithuania
TKM-1	53,11	149 Bronze	Begzada		Annayev	Turkmenistan
HRV-4	53,03	150 Bronze	Ema	-	Novak	Croatia
SVK-3	52,69	151 Bronze	Adam	Benjamin	Plšek	Slovakia
AZE-3	52,69	152 Bronze	Nihad		Hajizada	Azerbaijan
AUT-2	52,61	153 Bronze	Valentin		Mitterlehner	Austria
IDN-3	52,56	154 Bronze	Muhammad		Adyan Dafi	Indonesia
ARM-4	52,20	155 Bronze	Tigran		Mkhitaryan	Armenia
MKD-1	52,16	156 Bronze	Filip		Bojadjevski	North Macedonia
CAN-2	52,07	157 Bronze	Henry		Lalman	Canada
AZE-2	52,00	158 Bronze	Seljan		Shafizada	Azerbaijan
ITA-2	51,98	159 Bronze	Zefiro		Ferraro Fano	Italy
UKR-2	51,63	160 Bronze	Elina		Kamalova	Ukraine
ITA-3	51,37	161 Bronze	Andrea		Grossi	Italy
GRC-1	51,36	162 Bronze	DIMITRIOS		GEORGELES	Greece
IDN-4	51,28	163 Bronze	Muhammad		Ezra Sarliviano	Indonesia
AUS-3	51,28	164 Bronze	Hanlin	James	Liu	Australia
SRB-2	51,24	165 Bronze	Dunja		Vuković	Serbia
HRV-3	51,09	166 Bronze	Viktor	-	Delač	Croatia
AUS-1	51,01	167 Bronze	Shao Yu Bobby		Wu	Australia
EST-2	50,86	168 Bronze	Karl Johann		Külv	Estonia
MEX-1	50,79	169 Bronze	Rodrigo		Moreno Plascencia	Mexico

GRC-3	50,18	170 Bronze	KONSTANTINOS		KOUNDOURAKIS	Greece
CUB-2	50,12	171 Bronze	César Endris		Acosta Martínez	Cuba
CZE-4	50,08	172 Bronze	Jakub		Kocháň	Czech Republic
PER-2	49,99	173 Bronze	Daniel	Armando Nicolas	Rodriguez Cochachin	Peru
LKA-1	49,91	174 Bronze	Arachchige Don		Arachchi	Sri Lanka
LKA-3	49,66	175 Bronze	Thuvarahan		Chandrakumar	Sri Lanka
MYS-2	49,49	176 Bronze	Jia	Yao	Chin	Malaysia
ARM-2	49,35	177 Bronze	Arman		Kharatyan	Armenia
ITA-1	49,29	178 Bronze	Luca		De Masi	Italy
LTU-1	48,85	179 Bronze	Augustas		Rinkevičius	Lithuania
MNG-2	48,49	180 Bronze	Nomin-Undrakh		Batsuuri	Mongolia
ARG-1	48,29	181 Bronze	Melany	Denise	Algarbe	Argentina
CYP-4	48,06	182 Bronze	Petr		Mikhaylov	Cyprus
MKD-4	48,05	183 Bronze	Mario		Vanchoski	North Macedonia
ARG-3	47,61	184 Bronze	Santiago		Sirena	Argentina
GRC-2	47,45	185 Bronze	ODYSSEAS		KOMINIS - ALTANIS	Greece
NOR-1	47,32	186 Bronze	Erlend	Dukefos	Skretteberg	Norway
NZL-2	47,20	187 Bronze	Isla		Swanney	New Zealand
THA-4	46,86	188 Bronze	Amasaya		Liangbumrung	Thailand
LVA-2	46,85	189 Bronze	Linards		Lūsis	Latvia
DNK-3	46,42	190 Bronze	Mikkel	Bindsløv	Loesch	Denmark
BGD-1	46,41	191 Bronze	Avishek		Mazumder Santu	Bangladesh
PHL-2	46,19	192 Bronze	Mohammad Nur		Casib	Philippines
SVN-2	46,04	193 Bronze	Jakob	Starec	Starec Oman	Slovenia
FIN-1	46,02	194 Bronze	Nikolas		Juhava	Finland
IRL-4	46,00	195 Bronze	Richard	James	Sheahan	Ireland
LUX-1	45,92	196 Bronze	Siena	Jade	Ootes	Luxembourg
NZL-1	45,78	197 Bronze	Cedric		Siriwardana	New Zealand
SYR-2	45,75	198 Bronze	Salman	Eyad	Aldarweish	Syria
ROU-4	45,40	199 Bronze	Darius Alexandru		SINDRESTEAN	Romania
MKD-2	45,05	200 Bronze	Petar		Mirchevski	North Macedonia
MDA-1	44,88	201 Bronze	Bianca-Sofia		Leahu	Moldova
NOR-2	44,87	202 Bronze	Simen		Eilevstjønn	Norway
DNK-2	44,67	203 Bronze	Alexander	Svenstrup	Poulsen	Denmark

PHL-1	44,47	204	Bronze	Lemuel	Acosta	Philippines
NLD-1	44,24	205	Bronze	Guus	Bukkems	Netherlands
URY-1	44,23	206	Bronze	Juan	García Bouzá	Uruguay
PRT-3	43,88	207	Bronze	Simone	Barreira Morais	Portugal
ISL-3	43,69	208	Bronze	Rökkvi	Birgisson	Iceland
BEL-1	43,64	209	Bronze	Lowie	Frederik H	Belgium
DNK-1	43,53	210	Bronze	Anders	Moll-Elsborg	Denmark
AZE-4	43,51	211	Bronze	Daniz	Sattarli	Azerbaijan
ITA-4	43,45	212	Bronze	Enzo	Francesco	Italy
SWE-4	43,16	213	Bronze	Oskar	Karl	Sweden
SYR-3	43,03	214	Bronze	Abdulkader	Mohamad	Syria
KGZ-2	42,98	215	Bronze	Ivan	Reshetnikov	Kyrgyzstan
LVA-1	42,94	216	Bronze	Viesturs	Srteļčs	Latvia
CUB-1	42,81	217	Bronze	Erik Jordan	Valdés Abreu	Cuba
SVN-4	42,37	218	Honorable Mention	Gabriel	Žnidaršič	Slovenia
MDA-3	42,26	219	Honorable Mention	Iulia	Teleuca	Moldova
MKD-3	42,22	220	Honorable Mention	Marija	Petrova	North Macedonia
CHE-3	42,08	221	Honorable Mention	Vivian	Micheal	Switzerland
SRB-4	42,00	222	Honorable Mention	Dušan	Đurđević	Serbia
NLD-3	41,94	223	Honorable Mention	Kjeld	Zwitsertoot	Netherlands
GRC-4	41,28	224	Honorable Mention	STEFANOS-RAFAIL	MYLONOPOULOS	Greece
SLV-2	41,27	225	Honorable Mention	Luis Ronaldo	Chávez Escamilla	El Salvador
KGZ-1	41,02	226	Honorable Mention	Nurhan	Turdubaev	Kyrgyzstan
PER-1	40,92	227	Honorable Mention	Manuel	Mario Nadir	Peru
ARM-3	40,81	228	Honorable Mention	Yuri	Petrosyan	Armenia
PHL-4	40,68	229	Honorable Mention	Kiersten Gene	Calubaquib	Philippines
PAK-1	40,67	230	Honorable Mention	Abdul	Rafay	Pakistan
FIN-4	40,62	231	Honorable Mention	Paulus	Pöykkö	Finland
MYS-4	40,50	232	Honorable Mention	Yen	Jing	Malaysia
SVN-3	40,37	233	Honorable Mention	Nejc	Mohorič	Slovenia
NPL-1	40,31	234	Honorable Mention	Nishtha	Shah	Nepal
FIN-2	40,12	235	Honorable Mention	Aino	Koskinen	Finland
TJK-2	39,88	236	Honorable Mention	Sarvinov	Raufova	Tajikistan
IRL-3	39,62	237	Honorable Mention	Isobel	Molly	Ireland

NLD-2	39,49	238	Honorable Mention	Jesse		van der Waal	Netherlands
NOR-3	39,10	239	Honorable Mention	Yuliya		Zabelina	Norway
PRT-4	38,73	240	Honorable Mention	Tiago	Miguel Gomes	Sousa	Portugal
FRA-4	38,57	241	Honorable Mention	Gaëtan		Launay	France
MNG-4	38,25	242	Honorable Mention	Ermuunbold		Bold	Mongolia
NLD-4	38,14	243	Honorable Mention	Verff	Donna	Verhoeff	Netherlands
EST-1	38,08	244	Honorable Mention	Karlis		Suvi	Estonia
GEO-2	37,87	245	Participant	Nickolas	George	Metreveli	Georgia
MDA-2	37,85	246	Participant	Andrian		Zadic	Moldova
ESP-3	37,80	247	Participant	Carmen		Fuentes Campos	Spain
MYS-3	37,74	248	Participant	Fang	Boon	Ng	Malaysia
SWE-3	37,26	249	Participant	Emil	Henrik	Pettersson	Sweden
LUX-2	37,20	250	Participant	Nina	Hélène Gaëlle	Bernier	Luxembourg
CHE-1	37,05	251	Participant	Sabine	Isabelle	Neuhaus	Switzerland
IRL-2	36,96	252	Participant	Noah	James	Morgan-Doyle	Ireland
SLV-1	36,80	253	Participant	Claudia Sofia		Torres Guillén	El Salvador
CRI-2	36,71	254	Participant	Henry Johao		Mora Ureña	Costa Rica
MEX-4	36,67	255	Participant	Ionathan	Giovanny	Bello Gonzalez	Mexico
FIN-3	36,51	256	Participant	Severi		Sulander	Finland
QAT-4	35,74	257	Participant	Ibrahim		Khan	Qatar
PRT-1	35,74	258	Participant	Ana	Francisca Silva	Armada	Portugal
GEO-4	35,73	259	Participant	Illia	ილია დოკაძე	Dokadze	Georgia
GEO-3	35,33	260	Participant	Andrea		Utiashvili	Georgia
BEL-3	34,77	261	Participant	Edouard	Danilo	Princen	Belgium
LUX-3	34,53	262	Participant	Rémi	Waldemar	Peuscet	Luxembourg
MNG-3	34,51	263	Participant	Erkhesnabil		Zanjan	Mongolia
PAK-3	34,49	264	Participant	Asma		Ismail	Pakistan
VEN-2	34,18	265	Participant	Jesús	Manuel	Evia	Venezuela
MNE-2	34,07	266	Participant	Aleksa		Damjanovic	Montenegro
ISL-4	33,87	267	Participant	Jón	Halldór	Gunnarsson	Iceland
CHE-2	33,66	268	Participant	Andrin		Hauenstein	Switzerland
ESP-1	33,52	269	Participant	Sergio		Garrido Bourkhaeva	Spain
PER-3	33,20	270	Participant	Rodrigo	Fabrizio	Prado Visconte	Peru
ARE-2	32,83	271	Participant	Ardhra		Bijulal	United Arab Emirates

CHE-4	32,75	272	Participant	Alex		Martinetti	Switzerland
ESP-2	32,70	273	Participant	Miguel		Martín Rodríguez	Spain
PAK-4	32,58	274	Participant	Syed	Muhammad	Askari	Pakistan
QAT-1	32,52	275	Participant	Hassan	Mohamad	Al-Kaabi	Qatar
NPL-4	32,49	276	Participant	Atharva		Timsina	Nepal
PAK-2	32,14	277	Participant	Abdul	Rehman	Tahir	Pakistan
PER-4	32,05	278	Participant	Angela	Q'Orianka	Escalante Porlles	Peru
NOR-4	31,83	279	Participant	Vilde	Kroken	Viksøy	Norway
CYP-3	31,31	280	Participant	Marios		Fylaktou	Cyprus
ZAF-2	31,21	281	Participant	Faraaz	Ahmed	Parker	South Africa
CRI-4	31,08	282	Participant	Alexander		Sancho Dive	Costa Rica
BGD-3	30,78	283	Participant	Leehan		Hayder	Bangladesh
CYP-1	30,54	284	Participant	Nakou		Dimitra Eleni	Cyprus
OMN-1	30,52	285	Participant	Mohammed	Ahmed	Al.Habsi	Oman
CYP-2	30,51	286	Participant	Antonios		Antoniou	Cyprus
ARE-4	30,32	287	Participant	Nouf Ahmed Mohamed		Ahmed Alhammadi	United Arab Emirates
URY-2	30,17	288	Participant	Lautaro		Ferreira Rampa	Uruguay
NGA-1	30,12	289	Participant	Osewuike	Daniel	Igue	Nigeria
SWE-2	29,98	290	Participant	Alexander	Christian David	Ledin	Sweden
VEN-3	29,95	291	Participant	Nicolás		Osilia Taborda	Venezuela
MEX-2	29,55	292	Participant	Julián		Díaz Mojica	Mexico
URY-3	29,48	293	Participant	Leonel		Stolovas	Uruguay
IRL-1	29,46	294	Participant	Dominika	Eliza	Ryzwanowicz	Ireland
OMN-2	28,77	295	Participant	Alrabie	Habib	Al.Dhafri	Oman
KGZ-4	28,45	296	Participant	Roza		Musabekova	Kyrgyzstan
ARE-1	28,26	297	Participant	Shyaamal		Dwivedi	United Arab Emirates
ZAF-4	27,64	298	Participant	Judd	Chi	Symanovitz	South Africa
BEL-2	27,59	299	Participant	Stijn		Luyten	Belgium
ISL-2	26,92	300	Participant	Jón	Hilmir	Haraldsson	Iceland
SLV-4	26,84	301	Participant	Luz Giselle		Salomón Sandoval	El Salvador
QAT-3	26,62	302	Participant	Abdulla	Habib	Keshaish	Qatar
OMN-3	26,57	303	Participant	Jumanah	Azzan	Al.Amry	Oman
CRI-3	26,54	304	Participant	José Daniel		Muñoz Solís	Costa Rica
ISL-1	26,15	305	Participant	Kári	Christian	Bjarkarson	Iceland

MEX-3	26,10	306	Participant	Ivan	Jarim	Arreola Guillen	Mexico
CRI-1	25,89	307	Participant	Juan Pablo		Hernández Abarca	Costa Rica
ESP-4	25,71	308	Participant	Alvaro		Mairlot Níguez	Spain
BGD-2	25,56	309	Participant	Md. Ahad Islam		Talukder	Bangladesh
BEL-4	25,56	310	Participant	Guy-Louis	Pascal Christophe	Lhoest	Belgium
ZAF-1	25,47	311	Participant	Senthan	Satchi	Naicker	South Africa
TTO-3	25,29	312	Participant	Raymond	Yujian	Liu	Trinidad and Tobago
TJK-4	25,06	313	Participant	Mukhammadsolehi		Kamoliyon	Tajikistan
LUX-4	24,69	314	Participant	Rares	Stefan	Ciobanu	Luxembourg
NGA-3	24,21	315	Participant	Granville	Princewill	Chukwure	Nigeria
PRT-2	23,93	316	Participant	Miguel	dos Santos	Gomes	Portugal
NPL-3	23,71	317	Participant	Pujan		Lamsal	Nepal
TJK-1	23,67	318	Participant	Ismoil		Samiev	Tajikistan
TTO-2	23,37	319	Participant	Fazeel		Ali	Trinidad and Tobago
NPL-2	22,63	320	Participant	Bishnu		Sapkota	Nepal
MNE-4	22,58	321	Participant	Vanja		Lazarevic	Montenegro
MNE-3	22,49	322	Participant	Jelena		Orbovic	Montenegro
ECU-2	22,43	323	Participant	Ernesto	Matias	Idrovo	Ecuador
KGZ-3	22,22	324	Participant	Suleiman		Kozhegulov	Kyrgyzstan
VEN-1	22,14	325	Participant	Sergio	Rodrigo	Rodrigues	Venezuela
NGA-4	21,80	326	Participant	Chigozie	Favour	Nwadinobi	Nigeria
VEN-4	21,73	327	Participant	Carlos	Eduardo	Rodríguez	Venezuela
SLV-3	21,18	328	Participant	Fernando Josué		Méndez Palma	El Salvador
ECU-4	20,39	329	Participant	Gabriela	Nicole	Trujillo	Ecuador
ECU-3	20,18	330	Participant	Javier	Fidel	Navarrete Tutiven	Ecuador
NGA-2	20,04	331	Participant	Kenechukwu	Jefferson	Okereke	Nigeria
TTO-1	19,25	332	Participant	Saiesh	Vedam	Rampersad	Trinidad and Tobago
TJK-3	18,15	333	Participant	Aminjon		Asoev	Tajikistan
ECU-1	18,11	334	Participant	Emma	Madeline	Rivera	Ecuador
KWT-3	18,09	335	Participant	Mohammed	Ahmad	AlNajem	Kuwait
TTO-4	17,60	336	Participant	Jaron	Ishmael Rahul	Mohammed	Trinidad and Tobago
QAT-2	17,10	337	Participant	Hamad	Abdulla	Al-Hajiri	Qatar
ARE-3	16,39	338	Participant	Bashayer Ahmed		Obaid Mohamed Alyammahi	United Arab Emirates
BGD-4	15,33	339	Participant	Arjo		Kar	Bangladesh

PRY-2	15,19	340	Participant	Jazmín	Elizabeth	Benítez Vera	Paraguay
MNE-1	14,96	341	Participant	Lana		Bigovic	Montenegro
LIE-1	13,15	342	Participant	Merlin	Arthur	Vogt	Liechtenstein
KWT-2	12,94	343	Participant	Yaqob	Abdullaziz	AlShareekah	Kuwait
KWT-4	12,70	344	Participant	Abdullah	Faisal	Rajab	Kuwait
ZAF-3	12,59	345	Participant	Xu		Weng	South Africa
OMN-4	12,28	346	Participant	Ayaat	Abdullah	Al.Hinai	Oman
PRY-1	11,38	347	Participant	Constanza	Margarita	Ramos	Paraguay
KWT-1	10,48	348	Participant	Taiba	Khalid	ALDamkhi	Kuwait