
IAYC
International
Astronomical
Youth
Camp
56th International
Astronomical
Youth Camp 2022
Eichsfelder Hütte (in-person!)
St. Andreasberg, Germany
17th July - 6th August, 2022
Applications open until 31st March
www.iayc.org – info@iayc.org

The International Astronomical Youth Camp

The IAYC is a three-week long summer research camp aiming to promote the knowledge of astronomy and astronomy-related sciences in a unique and international atmosphere. Since the first camp in 1969, the IAYC has taken place in a different location in Europe each year. ~50 people come together from all over the world to live and work together on a project of their own choosing. Participants are 16–24 years old and all share a common interest: **astronomy**.





The IAYC is different from most astronomy camps for two reasons: **(1) it has a strong international character and (2) you will design and carry out your own small research project.** You will not just accept the facts, but you will discover them yourself while collaborating with others. We have had an incredible variety of projects over the past 50 years, including rocket and rover building; constructing radio telescopes; astrophotography; archaeoastronomy; machine learning; exoplanets; cosmology; astroparticles; and much, much, more.




Celebrating diversity is deeply embedded in the culture of the camp — we are dedicated to making the camp accessible to all, and we especially welcome applications from underrepresented groups in STEM. Every participant, with their own cultural background, forms an integral piece in the complex puzzle that is camp life.

IWA – *the organisation behind the* IAYC



The International Workshop for Astronomy e.V. (IWA) was founded in Germany as a non-profit organisation with two aims: (1) to promote international collaboration and agreement, and (2) to spread astronomical knowledge and teach young people to work scientifically on their own. IWA is run by members from all over the world who are all previous participants of the IAYC. As a non-profit organisation, IWA has no interest in commercial gain from the IAYC.



Participants

To participate in the IAYC you must be **16 to 24 years old** (16 and 24 included) if you have never attended the in-person camp before. If you are 15 at the start and turn 16 during the camp, then you may also apply; similarly, if you are 24 and turn 25 during the camp, this is also fine. For the IAYC 2022, we will consider applications from previous camp attendees only up to age 26 due to the two years of missed in-person opportunities due to COVID-19. English is the language of the IAYC, so you'll need to speak English throughout the entire camp. This makes it easier for everyone to share experiences, anecdotes and spend time together. **Don't worry if your English isn't perfect**, as long as you can have a normal conversation without a dictionary, you'll be fine.

As an astronomy camp, science and astronomy should interest you — but *prior experience isn't necessary*. We are looking for a willingness for you to carry out a small research project on your own, though your leader will always be there to support, orient and guide you and your project partners. You'll also need to cooperate with others during the IAYC.

The IAYC's international character is unique and enriched by a great variety of cultures. We celebrate diversity in an open and respectful environment, and often share our different perspectives on life. If you decide to apply, we encourage you to be open minded and embrace other's views and opinions.







About the IAYC 2022: 17th July - 6th August

The IAYC 2022 will take place at *Eichsfelder Hütte* in Germany for the first time! The house is located in central Germany, east of Hanover and just outside of the town St. Andreasberg. It is also near the Harz National Park, surrounded by nature and wildlife.

The camphouse is well equipped to host us. The main building, which we will have exclusive use of, is a hostel-style dormitory with bedrooms accommodating 1-8 people, multiple seminar rooms which we will use as our working spaces, and areas for socialising, exercising, and observing.





The house also has ample space for outdoor activities e.g. an outdoor and indoor ping-pong table, soccer field, terrace, and nearby meadows. The area is beautiful for hiking and even has a nearby lake (~1 hour walk).

Camp house: Eichsfelder Hütte
Address: Am Gesehr 38, 37444 St. Andreasberg, Deutschland
Latitude: 51° 43' 22.0" N
Longitude: 10° 31' 46.1" E
Altitude: ~705 m



A few facts about Germany

Area: 357022 km²
Population: ~83.2 Million (2020)
Capital: Berlin
Major Cities: Hamburg, Munich, Frankfurt/Main, Cologne
Official Language: German
Currency: Euro (EUR) €
International dialing code: +49 / 0049

Travelling in Europe in general, and in Germany in particular, is very safe. Most Germans — especially the younger generation — are fluent in English, therefore communicating with the locals will not pose much of a problem.

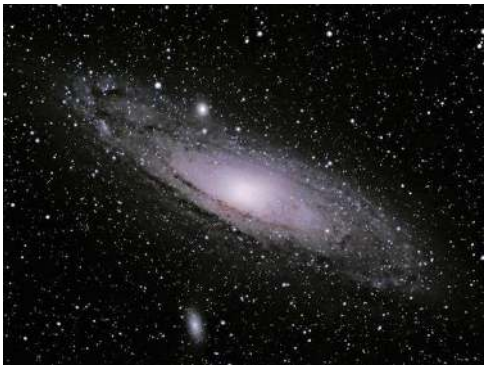


Observing

Eichsfelder Hütte is located in an area of little light pollution, and therefore has *very dark skies*. Observing takes place during working group as part of your project, or after midnight meal when the telescopes are available for everyone. Catch a glimpse of a celestial object through a telescope or lie down in your sleeping bag and enjoy the view.

Don't worry if you've never observed before, the leaders and other participants are always happy to show you how it's done and offer support. Everyone has the chance to learn how to use a telescope.

Last but not least, we'll also have a **Dark Room**. This means you'll have the opportunity to take film pictures and learn to develop them yourself. You're also welcome to bring your own telescope or binoculars. To see a current list of the **telescopes and CCD cameras** we have available, see our equipment list on the website.



The IAYC experience

Daily Schedule:

11:30 *Waking up service*
12:00 *Breakfast*
Free time
13:00-15:30 *1st working group*
Free time
17:30 *Lunch*
Free time
19:30 NAP
22:00-24:00 *2nd working group*
24:00 *Supper*
Observations / free time

An IAYC day starts with the 1st meal at noon (12:00), allowing for enough sleep after a long night out on the observation field.

Two daily working group sessions happen at 13:00 and 22:00. During working group sessions, you will work on a project of your choice. There are six different working groups to choose from with ~eight participants in each group, plus a leader. Collaboration is highly encouraged as projects are usually carried out in pairs.

You'll read up on your topic with your partner, explain things to each other, carry out observations and calculations, take measurements etc. You should **not expect a school-like environment** where a teacher provides all the information and tells you what to do. But no stress, your

leader will always be there to guide you if you get stuck. Projects are offered **at all levels**, from high school to university level. You'll also **write a report** which will be compiled together into a report book, and sent to you after the camp.

Free time is for lectures, sports activities, workshops and social interaction. Workshops are often organised by participants, so feel free to organise one of your own!

At 19:30, the Non-Astronomical Programme (NAP) begins. Many different activities take place to help you socialise and take a break from work — and so, everyone is required to attend!

After the 2nd working group, a light meal is served at midnight. Then, if the sky is clear, it's time to go out to the observation field and do what everyone loves to do: **observe!**



There are also two special days: **Excursion Day**: visit local attractions and learn something new! (This is included in the participation fee.) And **Free Day**: a day to be spent in any way you wish; go on a trip with some IAYC friends, catch up on some sleep, go hiking or swimming etc.

Participation

The participation fee is **870 EUR** and the application deadline is **31st of March 2022.** Applicants will receive an outcome **at the end of April**. If accepted, you'll need to transfer the fee **within seven days**. (Don't forget to check your spam — everyone who applied will hear from us, regardless of being accepted or not.)

You can withdraw your application at any time before we receive the participation fee. After that, we will refund you minus an administration fee of 50 EUR if you drop out before the 26th of June, and 100 EUR afterwards. If we can't fill your place, we cannot refund you.

Grants

If financial reasons keep you from applying, we encourage you to seek support from our (limited) grant programme. You can download the grant form as part of the regular application process.

This year we are able to offer additional **grants for German citizens and/or residents**, provided by the Wilhelm and Else Heraeus Foundation. If you are interested in

applying for a grant, please submit a camp application as normal, along with a grant application — if you fulfill the requirements, you will automatically be considered for this funding. We may ask for proof of German citizenship/residency.



You should also try reaching out to organisations like the RAS, EPS or charitable agencies (e.g. Polish Children's Fund, Swedish Astronomical Youth Association) that support young people doing research. Your school, university or workplace may also fund extra-curricular activities. If you can think of other ways or organisations that could support you, please try to explore them, as unfortunately *our grant program is limited* and we are unable to fund everyone.

The deadline for sending in a grant application is **17th of March 2022**. Be aware that you will be asked to take part in a **short 10 minute virtual interview** if you are a grant applicant. If you have questions about the grant programs, please contact info@iayc.org.

Diversity

We are dedicated to making the camp accessible to all, and especially welcome applications from those belonging to minority groups. If you require time away from the schedule for prayers, or if you have any questions about accessibility please do not hesitate to let us know. You can also read our policy on diversity here.

COVID-19 precautions

In light of the ongoing COVID-19 pandemic, we will require that all participants of the IAYC 2022 be fully vaccinated by World Health Organization (WHO)-validated vaccines (see an updated list here). Unfortunately we cannot make exceptions.

We may also require COVID-19 testing upon arrival or during the three weeks at camp. We ask that all participants be flexible as guidelines may change as the situation evolves.

Choosing your Working Group

In the following section you can find the abstracts of the six working groups offered at the IAYC 2022. On the application form you will need to indicate which working groups you want to participate in. The NAP and GEN will also introduce themselves.





EXPANSE: - *EXPloring AstroNomy for Sustainable dEvelopment*

Tags: astrosociology, sustainability, light pollution, theoretical, practical

Astronomy is the oldest science: for as long as homo sapiens have roamed the Earth, the night skies have been a source of awe, mystery and inspiration. Our studies of the heavens have influenced everything from culture to technology — if it weren't for astronomy we wouldn't have MRIs, 🐱 scans, Wi-Fi, GPS and more.

In 2015, the United Nations adopted the Sustainable Development Goals (SDGs) to address seventeen global challenges. Join me in EXPANSE to explore how astronomy can contribute to the Goals, and ultimately forge a sustainable future environmentally, economically, socially and culturally.

In EXPANSE, the stars' the limit! How can an unpolluted sky create jobs and empower rural communities? Does astronomy help to recover and celebrate indigenous knowledge? Can astronomers foster cultural relations, preserve our dark skies and protect ecosystems? What is the carbon footprint of the camp, and how could we reduce it?

Let's all put on our critical thinking caps and discover how we can use astronomy to make the world a better place! I'll be here providing tea & biscuits, and emotional support for when the going gets tough and the camp gets going.

I hope you'll be here with me too,
Hannah

hannah@iayc.org



Hannah is one of those people whose presence fills you with a kind of warm happy safety. Her conversations are filled with wisdom, her music taste is filled with 90's and the extinction of the rest of her kind in the Cretaceous–Paleogene extinction event – that's right, Hannah is a dino, with her first camp being in ~~65,000,000BCE~~ 2011 when some of you were only 6 years old. She became a leader in 2014 and has been warming our hearts ever since. Hannah has a PhD in star movement and works to help discover how astronomy can help people through education and jobs, having worked previously in the European Southern Observatory, and done loads of adulting stuff like talking at conferences and being a very cool and important big grown up person.

LAME: *Local Atmospheric Muons Experiment*

Tags: experimental, programming, particle physics, simulations, practical

Did you know that at this precise moment a lot of particles are going through your body at very high speeds? Some of these particles are formed in our atmosphere, when high energy radiation (cosmic rays) penetrate the Earth's surface and collide with atoms. These cosmic rays may have travelled from distant galaxies before reaching us, and guess what: we have a way to detect (some of) them!

If you feel like embarking on a hands-on project, here we will have the chance to test our experimental skills and build a simple cloud chamber — a small subatomic particle detector — and will also discover what information can be obtained from the trails these elementary objects leave.

Now you might be thinking... Why do people care about cosmic rays? We will learn more about these particles and how they can be useful to us. For those who like coding, we can build simple simulations of rays and some of their applications from a computational point of view. And if you are an adventurous coder, we can try to build an image analysis tool to detect different traces in a cloud chamber!

The only requirement to join our group is a ton of motivation and willingness to have fun. I will provide love and food. And indeed, you are always welcome to propose your own project, at roger@iayc.org :) See you in Germany!

roger@iayc.org



Who's this wonderful Catalonian? This is Roger, who is returning to the IAYC for the first time as a leader! Since his first IAYC back in 2017, Roger has always been incredibly friendly, welcoming and cheerful to everyone at the camp. Aside from physics and astronomy, Roger is a talented musician and screenwriter – ask him for film recommendations, or about his winning Rattlesnake strategy. If you join his group, you're guaranteed an unforgettable time!

MESSY: *Modelling Energy Systems SustainablY on exoplanets*

Tags: energy, colonisation, design, modelling, practical, theoretical

Do you like lights? How about heat? Or rockets, electronics, the internet, cars, trains, planes, food, hospitals or sanitation? All of those things need energy to be created and to run, and a colony on another planet would need to do all of those things too! How would their energy system work? Would it copy Earth? Or would they use a new system altogether?

In MESSY, we'll pick an exoplanet from a catalogue and use what's known about it to design an energy system for a future human colony there. We'll learn the basics of modelling. We'll guess what future human civilisations will want energy for and propose how they might obtain it. Is there nuclear fuel on the planet? Do they need to worry about greenhouse gas emissions in their atmospheres? We'll consider dozens of questions like this together, and see how the system we're designing compares to Earth!

For a bit of practical application, we can build a wind turbine (or any other generation device – be creative) and measure its power output!

If you like planning, designing and creating things, MESSY is for you. We'll combine existing knowledge with creativity to tell the story of the future of humanity's energy as an interstellar species! We'll also play endless games, drink our weight in tea, and discuss every topic imaginable.

finnbar@iayc.org



Finnbar, the fair-headed one, is an Irishman you will never forget. This will be his first camp as a leader, but fear not! He has not one but two Masters (one in creative writing and the other in wind power) as well as a bottomless bucket filled with enough energy to create a supernova (actually, maybe you should fear him). If you end up in his working group you will undoubtedly learn a lot – on topics you never even knew existed – and be prepared to be exposed to a hazardous dose of unadulterated chaos. Don't say I never warned you!

ODIN: *Observing Distant Interstellar pheNomena*

Tags: data analysis, theoretical, programming, radio astronomy, simulations

Sitting on his throne Hlidskjalf in Valhalla, Odin looked upon the world in which he ruled. He wanted to know everything there was to know of it, and see all the worlds that were hidden from him. So strong was his desire, he sacrificed his eye in Mimir's well, and in turn he could see visions and secret wisdoms previously unknown to even the immortal man.

In ODIN we will also observe what cannot be observed with the human eye. Using datasets from radio telescopes we can analyse faint and distant phenomena such as quasars and supernovae. With Python we can create simulations or models of the data which tell us the properties of the phenomena we observe. We will examine the constantly varying luminosities of Cepheid variables, the pulsating properties of pulsars, the redshift of distant galaxies or even the blackbody temperature of the Cosmic Microwave Background itself; the possibilities are endless!

May you be experienced in physics and programming or new, ODIN is guaranteed to have many fun projects in store for you! You need only to bring your favourite mug and a smiling enthusiasm for the cosmos, and I will provide you with all the coffee, tea, biscuits and exciting stories on Norse mythology you could ask for! See you in Germany!

ruurd@iayc.org



If you didn't apply for his working group, that would be Ruurd. Ruurd is a chill guy with a great sense of humour, he particularly appreciates puns on his name. Ruurd first appeared on the IAYC scene in 2018, and 2021 will be his first year as a leader in person. He has studied astronomy at the University of Groningen. Find him in free time to play a game of chess, or to chat about climbing or photography.

SHINY: *Stellar birtH and evolutIoN, Yay!*

Tags: stellar astronomy, nebulae, data analysis, programming

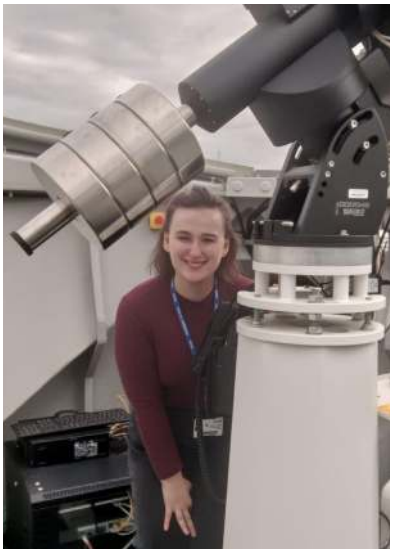
How do clouds of dust form into protostars then evolve into the literal powerhouses that host planets like ours? This working group will be everything related to star formation, and stars before their mid-life crisis; that is protostars and their early life on the main sequence. We'll leave the old age for another year, this year is for the young.

Nebulae are loved by amatuer astronomers everywhere because of the incredible images they make. In those pictures stars are just beginning to start their lives. Are you interested in what theories limit the sizes of stars? How fundamental principles can be applied on an astronomical scale? Or are you more experimentally minded? What could you determine from real astronomical data?

We will be focusing on how astronomical images are turned into meaningful data that we can analyse. In general we will be programming for data analysis in Python, but don't stress if you've never coded before I won't throw you in at the deep end, and soon you'll be surprised at how quickly you were able to pick it up.

If you have any questions or project ideas, reach out to me at carys@iayc.org even before applications are due.

carys@iayc.org



If you have thoughts of joining this working group, you are assured to get the full experience with Carys! Now on her 7th camp and her second as leader, she has lots of knowledge of IAYC traditions to bring to the table! And not only is she a very bright physics and astronomy graduate; she is also a very skilled musician! And did I mention her skills in jujitsu? Or calligraphy? But most important of all: she is very good at making friends, and a camp with her is guaranteed to be worth your time!

SUS: *SoUnds of the Stars*

Tags: music, astrophysics, observing, data analysis, programming

In space, no one can hear you scream. In the working group room next door, they might.

When you think about astronomy, you probably don't immediately think about how stars might sound. However, the Universe is surprisingly musical – full of resonances, vibrations and interesting variability. Did you know that with modern space telescopes like Kepler, TESS and the upcoming PLATO, we can actually "listen" to vibrations in the interiors of stars and use them to learn about their structure?

In SUS, you can explore the connections between music and space in any way you like. You could take a beautiful photograph of the Andromeda Galaxy with one of the camp's telescopes and turn your image into sound using a process called sonification. You could learn about asteroseismology (star-quakes), or why some variable stars have brightness variations that look like cardiograms. You could investigate orbital resonances of planets in our solar system and beyond, or create an original piece of music using the exoplanet transits of TRAPPIST-1. You could research the historical and cultural connections between music and astronomy. There's plenty of space to be creative and explore your ideas in SUS, whether you love observing, programming, making music, or researching new things.

In SUS, we'll work hard but also play hard. You're encouraged to bring along your favourite music and/or musical instruments (or borrow the camp guitar), and I'll bring plenty of software, books, tasty snacks, hot beverages and my trusty ukulele.

See you in Germany!

nikki@iayc.org



The incredible astrophysicist before yourself is Nikki! This endearing Brit is a PhD student at Keele University who is now a third-time leader at IAYC. She is developing an accurate method to measure the temperature of eclipsing binary systems. Wasn't this impressive enough? She also takes part in astronomy outreach and is an incredible speaker! Smart as a whip, she is the grounded voice you'll always want to listen to. And she will warm your hearts with her wonderful ukulele songs. Your trusted binary star specialist, you will always have a laugh by her side! Who wouldn't want Nikki to be their leader?

GEN: *General Coordinator*

So you're wondering what the General Coordinator of the IAYC does, right? It's easy to miss how much work goes on behind the scenes to make sure camp runs smoothly and everyone has a great time.

As the GEN it's my job to make sure everything is working right from start to finish. You need transportation to and from the camp? Let me get you a bus. You need hot food and all the tea and coffee you can lay your hands on when we get up at midday? I'll be constantly keeping up with the staff of the house to keep us fed and watered. You can't fit enough clothes for 3 weeks of camp into your suitcase (for some reason)? I'll see to it that we can do at least some laundry during the camp, just don't count on weekly washes.

Aside from the day to day running of the camp it's also my job to handle any problems that come up. Water not running, the heating/cooling is broken, your leader is missing/sick, and anything else you can think of. It's up to me to deal with issues as they arise so that you don't have to, and find solutions that keep things feeling seamless and smooth.

Nothing will keep me from delivering daily announcements and safeguarding your camp experience against all misfortune.

At the camp, I am your first port of call if you have any issues and I'm always happy to help so please come knock on my door any time. Just remember to ask your common sense if you can deal with it first since there is a camp to run after all.

Can't wait to see you all in Germany!

melanie@iayc.org



This wonderful, sunny person is Mel! You'll easily recognize her at camp lighting up every room with her smile and making sure everything runs smoothly. This camp will be her 6th camp, 4th as a leader and 1st as GEN. Mel grew up in California and is now doing a PhD at the University of Illinois Urbana-Champaign. Even though she will be busy managing the camp, don't miss the opportunity to talk to Mel because she is not only an amazing scientist, but also a great listener and someone who always has advice at hand. With Mel as GEN you're guaranteed to have an amazing time!

NAP: *Non-Astronomical Programme*

There's probably nothing better than a NAP after lunch, especially if you've spent your night chasing constellations and observing with a telescope. So grab your isomat and sleep mask (any other blindfold will do, of course) and let‘s go!

I‘m not talking about a giant slumber party, though, sorry to disappoint. But trust me: when your code isn‘t working, LaTeX just won‘t put the image in the right place or science/computer-failure/clouds-induced frustration is driving you mad - NAP is just what you need!

Ok, so what is this mysterious NAP, you ask?

There is no formula for NAP: it can be sixty people from all over the world running around and making weird noises. It can be reading your favourite poem in a candlelit room or performing an instrument or song you enjoy. It can be tasting foreign food and learning about another culture. It can be throwing eggs out the window and trying to make them survive the fall.

But one thing it is for sure: it‘s the time when you can forget about your project and just have fun!
Sounds good, but now you are afraid that this incredibly cool group might be full and you won't get a spot?

Don't worry: NAP is for everyone.

As NAP leader, I will not only make sure the chaos doesn‘t overtake, but I'll also make sure you‘re awake in time for breakfast and supplied with all the materials you might want for your project.

Can‘t wait to see you all at IAYC 2022 when the morning has broken!

wanda@iayc.org



Wanda is one of the most unique and genuinely kind people you will have the joy of meeting at IAYC. This leader hails from Germany, and her first camp took place in 2015. It will be her second year as a leader and she is sure to give us all a wonderful time as NAP. *She is pursuing a double bachelors in biology and physics and is especially interested in sustainable living. You can find her walking barefoot through nearby nature or headbanging at a metal party: she is relaxed in any environment and so easy to get to know!*

Your application for the IAYC 2022

If you want to participate in the IAYC 2022, complete the application form on our website. Please read the instructions carefully. We will also require from you, or your legal guardian if you are not yet 18 (21 in some countries), to sign a consent form to download when finalising your application. Please ***do not forget to send us the consent form, without it your application is invalid!***

Make sure you read the terms and conditions. Please note that you are obliged to have **health insurance which is valid in Germany for the duration of the camp**. If we decide to accept your application you will need to send a copy of your insurance certificate to us (e.g. travel insurance certificate, European Health Insurance Card, etc.).

The consent form needs to be signed and sent by regular post to:

IAYC 2022
c/o Aitor Aldama Campino
Professorsslingan 39, lgh1104
114 17 Stockholm
Sweden

You will be informed about your acceptance by the end of April 2022. If accepted, you will need to transfer the applicable participation fee **within seven days** of receiving the acceptance email.

If you need to apply for a **VISA** to enter Germany please contact the German embassy or foreign office in **your country as soon as possible** to find out what documents you will need. You should also **make an appointment for your visa application by May, even if your application has not yet been accepted**. *Organise this* ASAP!

Once you have been accepted we will provide a **letter of invitation** if you need one — please find out what details this letter should contain and **contact us at least 2 weeks before your appointment at the embassy**! Apart from the letter of invitation, obtaining a visa is **solely your responsibility**.



Travel to the IAYC

Please note that we cannot make travel arrangements for individual participants. **Travel to and from the camp is the sole responsibility of the participant.** It is also the sole responsibility of the participant to ensure that their travel plans comply with any COVID-19 related requirements throughout their travel journey.

After acceptance, we will share the Second Info booklet with you. It will contain more detailed information on how to travel to the camp. Additionally, you will be able to contact other participants and arrange travel to the camp together.

Please do not hesitate to contact info@iayc.org or any one of us should you have any questions!

We look forward to receiving your application and to seeing you in Eichsfelder Hütte,

Mel, Wanda, Ruurd, Roger, Carys, Nikki, Finnbar and Hannah



Supporters of the IAYC

We are very grateful to the following organisations for their sponsorship towards the eIAYC 2020 and 2021. If you are interested in sponsoring us and would like your organisation to be listed here, please contact us at sponsorship@iayc.org.

- Gather.town
- Nature Astronomy
- International Astronomical Union – Office of Astronomy for Development (IAU OAD)
- Copernicus – Open Access Publications
- Planetarium Wien
- HGS Astronomical Society

Furthermore, we would like to also thank the supporters of the IAYC 2022:

- Wilhelm und Else Heraeus-Stiftung
- Copernicus – Open Access Publications
- Planetarium Wien

The IAYC on the web

The latest news about the camp is always available on our homepage, www.iayc.org

You can also find updates on our social media:

Facebook – https://www.facebook.com/IAYC.astro/

Twitter – https://twitter.com/IAYC

Instagram – https://www.instagram.com/iayc_astro/

LinkedIn – www.linkedin.com/company/international-astronomical-youth-camp/

IWA is registered at the
Amtsgericht München, Infanteriestraße 5, 80325 München,
under registration number VR 208693