STOCKHOLM INTERNATIONAL YOUTH SCIENCE SEMINAR

SINCE 1976

2025

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VENUE

FILMSTADEN SERGEL

Get to the venue

First of all, welcome to this year's Stockholm International Youth Science Seminar. In this booklet you can find out everything you need for the day. But before you scroll down, we need your help to make the most of the day:

- Meet up with your class outside at the meet up point given by your teacher. Stay together with your class. You need to be seated together in the theatre.
- Remember to put on your bracelet, otherwise you cannot attend the seminar. The color of your bracelet tells us which group you belong to. Some of you will have more than one bracelet. That is because you are attending more than one session.
- If you are not sure where to go, we have staff at the entrance, at the top of the stairs, by the theatre and by the entrance to the poster exhibition that can help you.
- Bags are allowed, but keep them as small as possible. It will be crowded.
- No food and drinks can be brought to the venue. The ordinary kiosk will be open, where it is possible to buy drinks, warm fast food and snacks.
- The theatre doors open approximately 30 minutes before the start of the session. You will be a part of the audience for a video recording/ live-streaming session. Please ensure that everyone is seated at least 15 minutes before the session's scheduled start time.
- All theatres are accessible to physically impaired people. The elevator is situated at street level. Accessible toilets can be found on level 1 and 3. Please inform us beforehand if help with the elevator is needed, there is a locked entrance for the elevator.

Take the opportunity to ask questions, talk to and engage with the participants to make the most of your day.

Enjoy your day at the seminar!

SCHEDULE

Morning sessions

Session 1
Live salon 1: 09:00–10:00)
Stream salon 5: 09:30–10:30
5 participants

Carolina Arevalo Camacho
Julia Marie Trapp
Dani Ghazwan Zuhair
Vrishank Chandrasekhar
Felix Qingzhou Xu

Session 2
Live salon 1: 10:30–11:30
Stream salon 5: 11:00–12:00
5 participants

Freja Weiss Nielsen
Amal Abdul Aziz
Yunze Wang
William Smith
Lethabo Molobi

Afternoon sessions

Session 3
Live salon 1: 12:30–13:30
Stream salon 5: 13:00–14:00
4 participants

Anna Cerná
Pragathi Kasani-Akula
Xiang Li
Le Wang

Session 4
Live salon 1: 14:00–15:00
Stream salon 5: 14:30–15:30
4 participants

Aarushi Pandey
Márton Krisztián Hegedüs
Jacopo Martino Fadini
Seong-ah Choi

Minds of the Future

Discussion panel
Live salon 1, stream salon 5: 15:30–16:30
4 participants

Dani Ghazwan Zuhair
Freja Weiss Nielsen
Amal Abdul Aziz
Vrishank Chandrasekhar

PREFACE

STEM — Science, Technology, Engineering, and Mathematics — aren't just subjects in school; they help open up a whole world invisible to the naked eye. Our hope here today is that we'll manage to light a spark in you, but the truth is: if you like asking "why" or "how", then you already have that spark. The spark that makes a great scientist, engineer, or innovator. If that's the case, we hope to help it grow even stronger.

The STEM subjects can indeed be challenging. The beauty in them is that every problem you solve will sharpen your mind, and every obstacle you meet will teach you resilience. When you finally grasp the equations, understand the chemical reactions, have those "aha!" moments when something finally clicks; that's what makes it exciting and the hard work worth it.

We've gathered 18 prominent young scientists from all around the world who will present their research today. These projects range from magnetic structures that could lead to more energy-efficient data storage (by Dani Ghazwan Zuhair), understanding how genetic mutations lead to diseases like cancer (by Anna Cerná), to optimizing the future of farming in space and controlled environments (by Aarushi Pandey). We encourage you to ask questions, be curious, and speak with them.

The world needs new ideas. Remember that some of the brightest minds in STEM started where you are now, with a lot of questions, and, most certainly, some doubts too. Embrace your curiosity, stay focused, and know that it could lead you to great discoveries.

The future will, and must, start with you.

I wish you only the very best,

Edvin Sebelius, Project Manager SIYSS 2025

ABOUT SIYSS

So what is SIYSS? Well technically speaking, SIYSS stands for Stockholm International Youth Seminar, an annual event organized by the Swedish federation of young scientists. SIYSS aims to inspire high school students to get into STEM. However, SIYSS is so much more than this.

The participants in SIYSS come from across the globe, are between 18-25 years of age, and have all gotten their spot at this seminar either as a price from a national or international science fair (like Swiss youth of science or ISEF) or as a reward from their university (like Cambridge or Luleå University of Technology). Together they spend the Nobel week here in Stockholm where they both present their work for high school students and make company visits and attend some Nobel festivities.

SIYSS dates back to 1976. The first participants were seven foreign students from the United States, former West Germany, and Atlantic college (Wales). It was organized by The Swedish Federation of Young Scientists with help from the Nobel Foundation. Since then it has grown and developed till today's event with approximately 1 200 high school students visiting here on site.

With this, we hope you have a little better understanding of what SIYSS is and why we decide to organize SIYSS annually. We hope you enjoy your day here with us and find some projects or questions that sparks your mind to become a future SIYSS participant. We have a great tip for where to start now that you've seen where it can take you:

Utställningen Unga Forskare is a competition where students compete with their high school diploma projects throughout Sweden with a chance to go all the way to the finals in Stockholm. At the finals you have a chance to win a spot in the Swedish Science Team among other amazing prizes.

If you're interested in Utställningen you can read more about it here:
https://ungaforskare.se/utstallningen/
It might be the first step in your journey to becoming a SIYSS participant!

The organization behind both SIYSS and Utställningen Unga Forskare

So what is The Swedish Federation of Young Scientists? The Swedish Federation of Young Scientists (or in Swedish – Unga Forskare) is a non-profit organization whose goal is to inspire youth to STEM and STEM related subjects. Our vision is that STEM-related hobbies should be as common as other hobbies like football, gaming or watching series.

PARTICIPANTS

Carolina Arevalo Camacho
Biology

Nationality: Mexico
Sending organization: Red Nacional de Actividades Juveniles en Ciencia y Tecnología (LaREDMex)

Carolina's journey into research began with a single conversation with her future advisor about bacteriophages – viruses that infect bacteria. Intrigued, she started asking questions and soon began exploring the topic more deeply. Together, they shaped an idea into a concrete project that combined Carolina's interest in biology with her desire to create sustainable solutions. The experience showed her how curiosity and collaboration can turn scientific concepts into real-world impact.

Carolina's project aims to develop a sustainable treatment using a virus called PDCC-1 to fight antibiotic-resistant bacterial diseases in aquaculture, helping marine farming worldwide and promoting phage-based alternatives.

https://ungaforskare.se/siyss/carolina-arevalo-camacho

Julia Marie Trapp
Chemistry

Nationality: Germany
Sending organization: Stiftung Jugend forscht

From an early age, Julia was fascinated by how the world works. She loved reading about great scientists and the discoveries that reshaped our understanding of nature. That curiosity grew into a desire to explore science herself. By chance, she came up with an idea for her own project – and soon found the same excitement for research that had once inspired her in books.

Julia's project developed new energy storage molecules based on nicotinamide, a natural compound, and showed they can efficiently charge and discharge, offering a promising path toward organic batteries.

https://ungaforskare.se/siyss/julia-marie-trapp

PARTICIPANTS

Dani Ghazwan Zuhair
Physics

Nationality: Sweden
Sending organization: European Union Contest for Young Scientists (EUCYS)

From a young age, Dani was fascinated by the world and eager to understand how things worked. In 7th grade, a supportive science teacher nominated him for a week-long STEM course with lectures from top universities, sparking his passion for research. He later engaged in youth STEM organizations like Brainpool, Astronomisk Ungdom, and Unga Forskare, and his interest deepened after astronomy and astrophysics lectures at Lund University. A chance mentorship led him to hands-on research, and he explored condensed matter physics during a summer internship at KTH Stockholm. Opportunities in Canada and later at PSI – ETH Zürich allowed him to gain experience with Muon Spin Spectroscopy (MuSR) and pursue his own projects.

Dani's project studied skyrmions – tiny magnetic whirlpools with potential for low-energy, high-density data storage – revealing how their behavior changes with depth inside materials, a key insight for future quantum technologies.

https://ungaforskare.se/siyss/dani-ghazwan-zuhair

Vrishank Chandrasekhar
Medicine

Nationality: United States
Sending organization: Regeneron ISEF, Society for Science and the Public

Vrishank's interest in medical research was sparked by a family emergency, when a relative's rare condition went undiagnosed despite repeated hospital visits. The experience left him wondering how doctors could detect such illnesses sooner and how technology might help. Determined to find answers, he immersed himself in scientific papers, online courses, and research discussions, eventually focusing on the intersection of medicine and artificial intelligence.

Vrishank developed a computational framework that uses doctors' notes – such as radiology reports and discharge summaries—to predict cancer outcomes, enabling earlier, more personalized treatments and improving patient care.

https://ungaforskare.se/siyss/vrishank-chandrasekhar

PARTICIPANTS

Felix Qingzhou Xu
Mathematics

Nationality: Austria
Sending organization: Schweizer Jugend forscht

Felix has always been drawn to the logic and clarity of science, appreciating how reasoning and evidence connect to reveal patterns in the world. His perspective on mathematics deepened when he began participating in math competitions, where he discovered creative problem-solving beyond what was taught in school.

While working on his project, he found himself connecting new concepts with past lessons, watching everything fall into place – a feeling he describes as deeply rewarding.

Felix's project explored methods for counting distinct cube colorings, accounting for rotations and color restrictions, to better understand complex combinatorial problems that appear in mathematics and real-world scenarios.

https://ungaforskare.se/siyss/felix-qingzhou-xu

Freja Weiss Nielsen
Biology

Nationality: Denmark
Sending organization: Ungdommens Naturvidenskabelige Forening

Freja has always been naturally curious, a trait her teachers quickly recognized and encouraged through science competitions and seminars. Those experiences helped her discover a passion for scientific thinking and for using research to solve real-world environmental problems.

Inspired by her sister's work in astrophysics and by ongoing debates about sustainable farming, Freja became particularly interested in how agriculture can coexist with healthy ecosystems. Her goal is to find practical solutions that benefit both farmers and the environment – a balance she believes is achievable with the right approach.

Freja's project explores using nitrogen-fixing legumes, specifically Sainfoin, to reduce fertilizer pollution in Danish seas by studying its symbiosis with Rhizobia bacteria and compatibility with local soils.

https://ungaforskare.se/siyss/freja-weiss-nielsen

PARTICIPANTS

Amal Abdul Aziz
Medicine/Biomedicine

Nationality: Canada
Sending organization: Youth Science Canada

Amal's interest in research began simply because it sounded fun – she imagined working with chemicals and glassware in a lab. Her perspective changed in high school when she participated in the Canada-Wide Science Fair, where she discovered that research could take many forms and found where her true passion lay. The experience also connected her to an inspiring community of like-minded students, many of whom remain her close friends and motivation to keep exploring new ideas.

Amal's project focuses on developing a low-cost, wearable breast ultrasound device that creates 3D images and shows blood flow to help detect and assess breast cancer more effectively, especially in women with dense breast tissue.

https://ungaforskare.se/siyss/amal-abdul-aziz

Yunze Wang
Physics

Nationality: Singapore
Sending organization: World Scientific Publishing Company

Yunze has been fascinated by science from a young age, reading widely to understand the world around him. In secondary school, physics captured his interest through training for the school's physics olympiad, but it was at 16 that he discovered his passion for research by participating in the Singapore Young Physicists' Tournament and the International Young Physicists' Tournament.

What began as curiosity quickly grew into a drive to understand complex phenomena. He fondly recalls the months spent working in the lab with like-minded peers and engaging in lively discussions about physics as some of his happiest memories.

Yunze's project designed and tested a 3D-printed quadruped robot that walks down a ramp using only gravity, studying how its shape affects movement to inspire more efficient, low-energy robotics.

https://ungaforskare.se/siyss/yunze-wang

PARTICIPANTS

William Smith
Chemistry

Nationality: Australia
Sending organization: University of Melbourne

William has always been passionate about science, though he arrived at the University of Melbourne in 2021 uncertain about which field to pursue. He initially studied physics but eventually found his way to the chemistry department, drawn in large part by the inspiring people in the School of Chemistry.
One of the aspects William values most about chemistry is that the work is both complex and tangible. He has been able to create crystals and films that can be held and observed directly, allowing him to see how they interact with their environment. This hands-on aspect keeps his research grounded, no matter how intricate a synthesis or reaction becomes.

William's project designs and creates fluorescent metal-organic frameworks (MOFs) that change color or brightness when interacting with water or small biological molecules, offering potential for chemical sensing applications.

https://ungaforskare.se/siyss/william-smith

Lethabo Molobi
Computer Science

Nationality: South Africa
Sending organization: University of Pretoria

Lethabo's passion for science grew from a curiosity about how things work and a desire to tackle real-world problems. Encouraged by a teacher who fostered critical thinking, she became interested in exploring the impact of artificial intelligence in education. Observing how often AI is used in schoolwork, she wanted to understand its true effects.

A memorable moment came when people taking part in her study were surprised to realize they couldn't always tell AI-generated text from human writing. Seeing their reactions reinforced her interest and motivated her to explore the topic even further.

Lethabo's project studies how well students and educators can distinguish human-written text from AI-generated text, revealing challenges in detecting AI content and raising questions about its role in education.

https://ungaforskare.se/siyss/lethabo-molobi

PARTICIPANTS

Anna Cerná
Biology

Nationality: Czech Republic
Sending organization: European Union Contest for Young Scientists (EUCYS)

Fascinated by molecular biology from a young age, Anna reached out to her future supervisor and was welcomed into a research lab while still in her first year of high school. The supervisors she worked with became major inspirations, and their guidance fueled her curiosity and strengthened her dedication to science.

Anna's project studies how the protein RECQ4 helps start DNA replication by forming tiny liquid-like droplets with MCM10, revealing insights into genome stability and links to certain disorders and cancer.

https://ungaforskare.se/siyss/anna-cerna

Pragathi Kasani-Akula
Chemistry

Nationality: United States
Sending organization: Regeneron ISEF, Society for Science and the Public

Pragathi's curiosity in science began at a young age, nurtured by a love of reading historical fiction and biographies, including one about Marie Curie that inspired her interest in chemistry.

In middle school, a friend encouraged her to join the National Science Bowl team, a buzzer-based competition that combined learning with fun. Determined to succeed, Pragathi studied hard for the chemistry qualifier, often spending late nights on video calls with her friend reviewing textbooks. Making the team boosted her confidence and reinforced her ambition to pursue a career in science.

Pragathi developed a low-cost, non-invasive nanomaterial system using fruit-based carbon dots, magnetic nanoparticles, and RNA molecules to detect exosomes and study aggressive Triple Negative Breast Cancer.

https://ungaforskare.se/siyss/pragathi-kasani-akula

PARTICIPANTS

Xiang Li
Computer Science

Nationality: China
Sending organization: University of Cambridge

Xiang never imagined himself in research until a friend encouraged him to give it a try. In his first year of undergrad, his friend Kevin, who was about to join a research lab, inspired Xiang to reach out to the only CS professor he knew. That simple step led to a summer research role in VR and game design, where he quickly discovered a passion for human-computer interaction. Since then, Xiang has worked in labs across four continents, gaining experience and deepening his interest in innovative technologies.

Xiang's project developed a new VR/AR interaction method called "Bend It, Aim It, Tap It," using a curved finger-guided ray and forearm projections to make selecting objects faster, easier, and more intuitive.

https://ungaforskare.se/siyss/xiang-li

Le Wang
Medicine

Nationality: China
Sending organization: The University of Melbourne

Le has been fascinated by virology since his undergraduate studies, inspired by early papers highlighting how challenging it is to eliminate HIV. That experience motivated him to pursue a PhD and focus on understanding and tackling the virus at a deeper level.

Le's project explores ways to eliminate hidden HIV-infected cells by testing drugs that make them more vulnerable to cell death, bringing research closer to a potential functional cure.

https://ungaforskare.se/siyss/le-wang

PARTICIPANTS

Aarushi Pandey
Biology

Nationality: India
Sending organization: Regeneron ISEF, Society for Science and the Public

From a baking soda volcano in kindergarten to six years of science fairs, Aarushi's curiosity has always been driven by hands-on discovery. Those early experiments taught her to build projects from scratch and adapt when things didn't go as planned. Reading The Code Breaker later reshaped her view of science as both creative design and social responsibility. During an internship at Rice University, she modeled virus structures that affect coral reefs, an experience that deepened her passion for research with real-world impact.

Aarushi's project studied how Allium fistulosum roots and shoots respond to water, gravity, and magnetic cues under space-like conditions, helping improve farming in space and other controlled environments.

https://ungaforskare.se/siyss/aarushi-pandey

Márton Krisztián Hegedüs
Chemistry

Nationality: Hungary
Sending organization: Hungarian Association for Innovation

Since 7th grade, Márton has been deeply interested in chemistry, participating in numerous competitions that helped him build skills and discover new challenges. His curiosity and experience eventually led him to his current project, inspired by a problem from the International Chemistry Tournament 2022.

Márton's project created a light-responsive molecular system called a [2]catenane, where tiny rings can move controllably when exposed to specific wavelengths of light.

https://ungaforskare.se/siyss/marton-krisztian-hegedus

PARTICIPANTS

Jacopo Martino Fadini
Physics

Nationality: Switzerland
Sending organization: Schweizer Jugend forscht

Jacopo's love for science began early, as his parents often took him to conferences and activities that fueled his curiosity about how the world works. Over time, his fascination with natural sciences and mathematics grew stronger, making a STEM project the obvious choice for his high school studies. When a teacher suggested he explore quantum entanglement and Bell's Theorem – the topic of that year's Nobel Prize in Physics – Jacopo eagerly accepted, a decision he now considers one of his best.

Jacopo's project investigates the foundations of quantum physics by testing Bell's Theorem and simulating quantum experiments to explore the validity and non-locality of the theory.

https://ungaforskare.se/siyss/jacopo-martino-fadini

Seong-ah Choi
Chemistry

Nationality: Republic of Korea
Sending organization: Korea Advanced Institute of Science and Technology (KAIST)

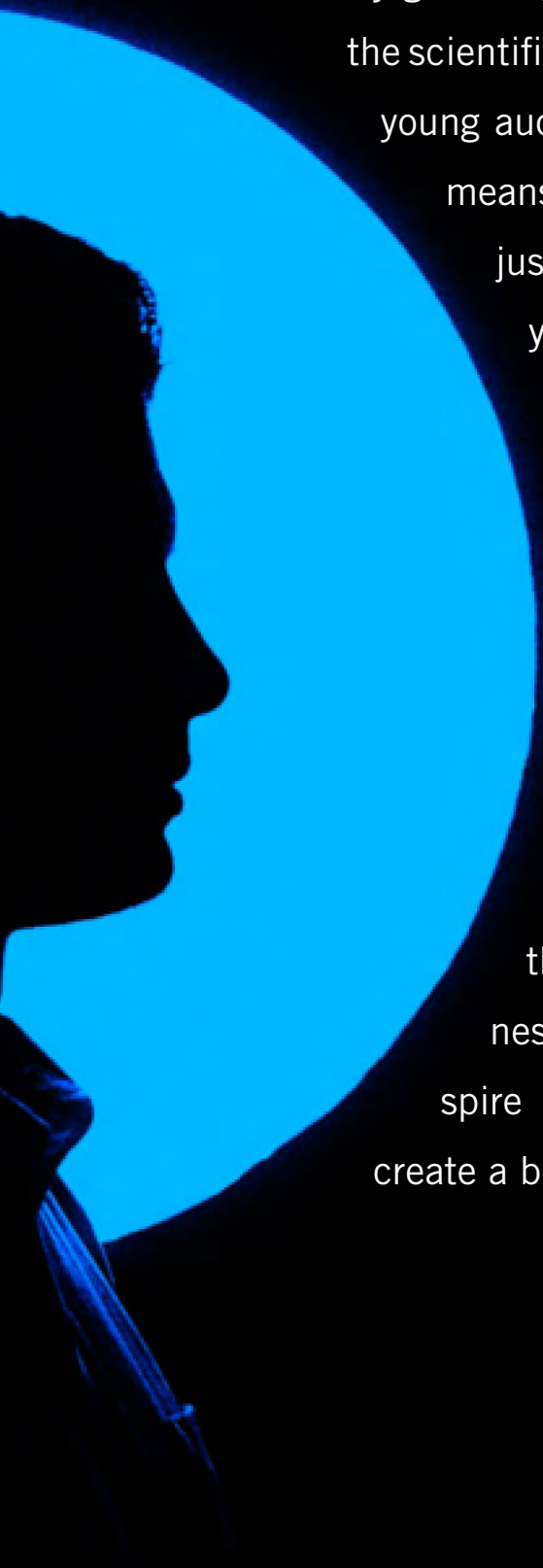
Seong-ah developed a natural interest in chemistry early on and later became fascinated by computational chemistry. She was intrigued by how theoretical approaches could explain chemical phenomena that experiments alone could not fully capture.

Over time, her curiosity shifted toward the theory itself, including the mathematical frameworks that underpin chemical behavior and why they work. This growing interest in theoretical chemistry continues to motivate her and shapes the way she approaches learning through research.

Seong-ah's project developed a computational model to efficiently predict how molecules release energy after being excited by light, offering a faster and more practical way to study photochemical reactions.

https://ungaforskare.se/siyss/seong-ah-choi

MINDS OF THE FUTURE



By gathering some of the brightest young minds in the scientific community, SIYSS hopes to inspire the young audience members by showcasing what it means to be a scientist. However, science is not just about doing research and presenting your findings. A major aspect of science is communication across disciplines in order to tackle greater issues in society at large. Minds of the Future will highlight this by providing a number of SIYSS participants representing different disciplines and countries with a stage upon which they can discuss some of these issues. The purpose of the panel discussion is to raise awareness of some of these issues, but also inspire hope that scientific collaboration can create a better future.

Why BTH excels in world-class software engineering research

Software has become a fundamental part of modern society, influencing not only digital products but organisations across all sectors.

– This shift illustrates how essential software competence is for maintaining reliable and sustainable operations, says Professor Darja Šmite at Blekinge Institute of Technology (BTH).

BTH's research in software engineering is ranked among the very best globally, despite comparatively modest resources.

– Its success is built on a long-standing focus on applied research carried out in close collaboration with industry, explains Professor Tony Gorschek.

What began with regional partners has grown into cooperation with companies such as Ericsson, Volvo and Spotify, providing valuable insight into contemporary challenges in digitalisation, team structures and software security.

BTH has created environments where students, researchers and industry meet, such as the Ericsson Space Lab. Many students move directly into qualified roles, supported by BTH's strong connection to societal needs and the growing demand for software expertise.

Visit www.bth.se to learn more

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Sven och Dagmar Saléns stiftelse