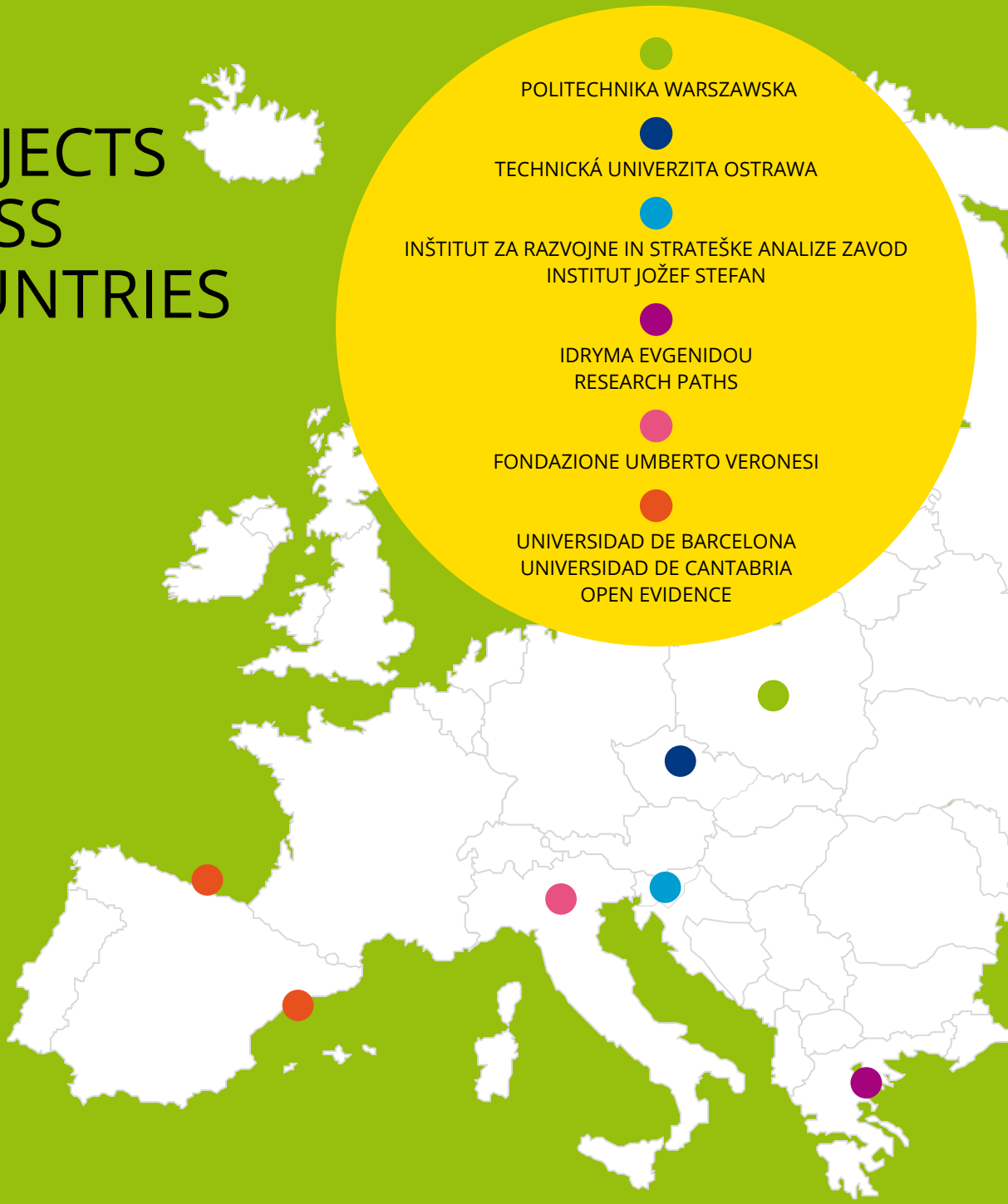
STEM FOR YOUTH

ENJOY. SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS.

7 SUBJECTS ACROSS 6 COUNTRIES



BRINGING TEENAGERS CLOSER TO SCIENCE & TECHNOLOGY. WHY?

- The 2000s are the years of technological breakthrough, of everything digital
- Future graduates in science and technology are expected to have the highest salaries
- The job market needs more tech-based professionals than higher education can supply

PEOPLE WHO STUDY SCIENCE OR TECHNOLOGY SUBJECTS

20%

ASIA

2%

EUROPE

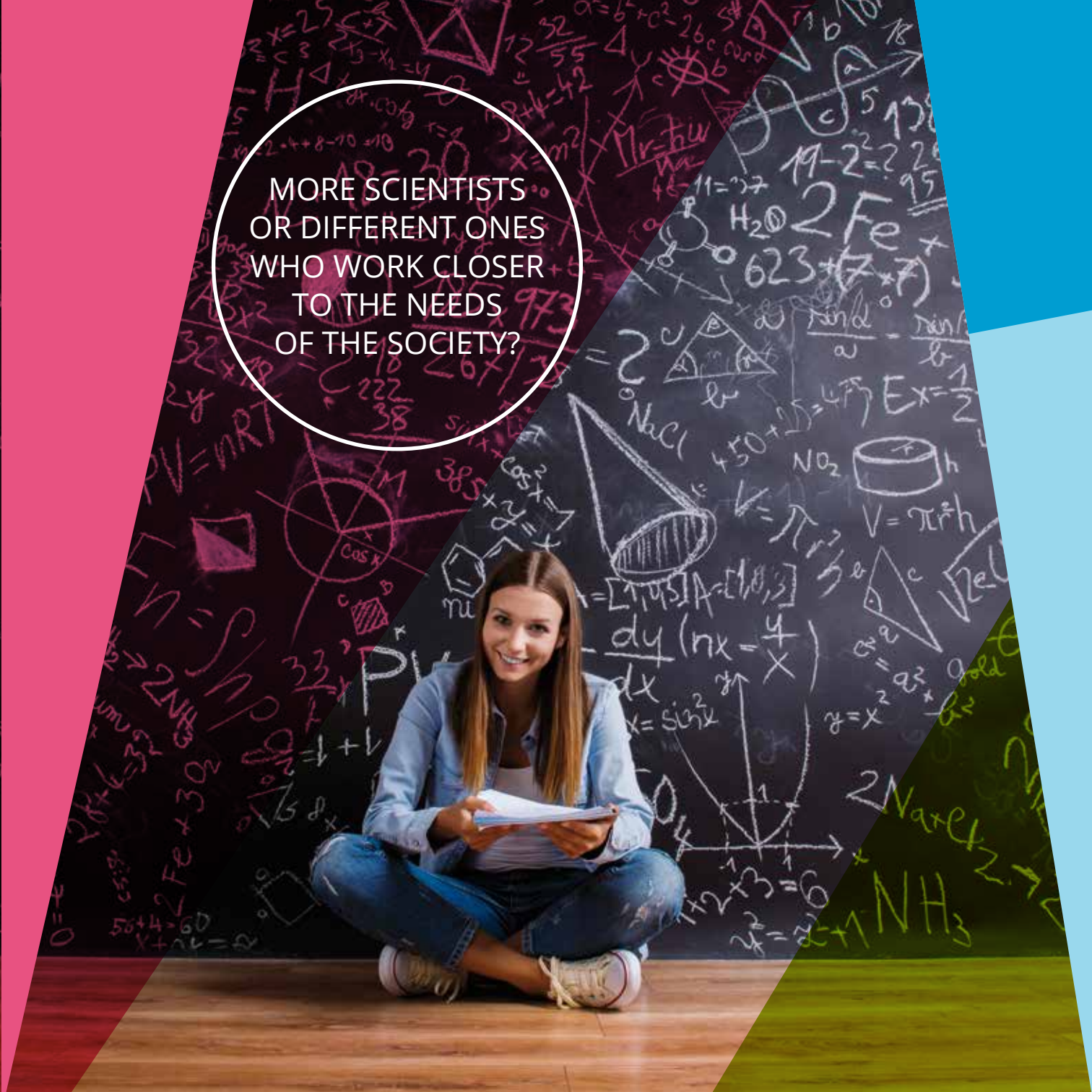
STUDENTS WHO WANT TO BECOME SCIENTISTS OR WORK WITH SCIENCE & TECHNOLOGY

IN **DEVELOPING** COUNTRIES

60% **90%**

IN **DEVELOPED** COUNTRIES

30% **20%**



MORE SCIENTISTS OR DIFFERENT ONES WHO WORK CLOSER TO THE NEEDS OF THE SOCIETY?

WHAT WE DO

School courses in 7 STEM subjects across our partner countries. Each of these will explain how core principles of that discipline happen in our everyday life. We will mix basic notions with hands-on experiments or activities, games and critical thinking sessions, and show how to use the skills gained in future professions.

A teachers toolkit to make science & technology fun through museums, science festivals, university lectures, self-study material, experiments, games, and citizen science activities at schools and in the streets.

Urban happenings and pop up installations open to everyone. Students, teachers and families will work side by side in crafting new objects and generating knowledge through science principles. All in public spaces.

Events where we will look at how to use STEM education for future jobs. Our workshops and conferences will target scientists, companies in need of STEM profiles, educational authorities, citizen and students.

An open-source educational platform where teachers and students can download and upload all the material from our courses and interact with one another through games and self-testing tools.

Social networks where our students and teachers can share memories and ideas.

A final proposal to public authorities to adopt the best STEM educational methods in school systems across Europe.

WHAT ARE THE NEW PROFESSIONS RELATED TO SCIENCE AND TECHNOLOGY?

WHAT ARE THE STEM SKILLS REQUIRED FOR THEM?

HOW CAN WE BLEND HUMANITIES WITH SCIENCE TO EMPOWER THE FUTURE OF OUR STUDENTS?

DISCOVER OUR COURSES

M *for* **MEDICINE**
HEALTHY IS THE NEW TREND

We live longer, and we grow older and older. But what can we do to have a healthier life?

Our course will explore the new challenges in medicine in the fields of genomics, intelligent cures and personalized medicine, along with the technologies that make all of these possible, such as genome editing, new generation sequencing, bioinformatics and data analysis.

We will also look at the social and ethical questions behind this new approach:

- Who will access such private and fundamental information as DNA data?
- What does genome editing mean for our identity?

This new way of doing medicine has created blooming professions, such as data analysts, cultural mediators, biotechnologists, bioinformaticians and medicine communicators.

M

for MATHEMATICS
THE NUMBERS BEHIND A TABLET OR A BEAUTIFUL PAINTING

iPads, smart phones, the internet, but also social interactions, the proportions of a painting, evolutionary processes, computer games, Facebook and many more all have the same root: **mathematics**, a very complex art of understanding how our world works with pure thinking and logic.

We will cover the basics of mathematics and link it to every day life. Some of our topics:

- The meaning of the world "chaos": its impact on the weather and on the stock exchange
- Calculating the human body and economic systems with fractal dimensions
- The role of mathematics in computer games
- Using mathematics skills to work on Big Data, Cyber Security and IT

Our course features interactive quizzes and games with visualizations. Teachers and students can use them in the classroom or at home.

C *for* **CHEMISTRY**
FOOD COCKTAILS & THE CHEMISTRY OF FEELINGS

We hardly ever think of how many chemical inventions and innovations shape our life.

In the modules of our chemistry course we will provide the theory that is necessary to understand different chemical principles and concepts:

- What is nanotechnology and how does it apply to chemistry?
- Does it allow more speed with less power?
- How does chemistry make our life easier through transportation?
- How has it increased athletes performance in “technology driven” sports?
- What is the chemistry behind the production and processing of food?

This experience will shed light on the many careers dependent on knowledge of this versatile field.

A *for* **ASTRONOMY**
EACH OF US IS A STAR!

From prehistorical times, astronomy was necessary for agriculture, traveling, navigation, climate forecast, and it gave new insights into the understanding of nature.

Our course will start with classical notions and then will dig deeper into the practical applications of astronomy and astrophysics in daily life:

- How has technology contributed to the construction of telescopes, spacecrafts and to the exploration of space?
- Why do we need space missions?
- How important are the Greenhouse effect and climate change for life on earth to exist?

We will educate young students for many new professions in astrophysics such as data analysis, computer programming and engineering specialized in modern technology materials.

E *for* **ENGINEERING**
UNLEASH THE GENIUS IN YOU!

The Engineering Design Process is a general framework used by engineers to solve a problem and design a solution. Engineering design creates our day to day, from the technologies that support our health, to communication, transportation, living environments and entertainment.

Students will learn how to transform research into technology and to apply the Engineering Design Process to solve pre-designed challenges and experiments in civil, electrical, mechanical, aerospace, marine, environmental and robotics engineering.

Some of the our engineering design activities:
/ Hydraulic bridges / Wind turbines / Electric vacuum cleaner / Tracking Solar Panel / Solar powered B.E.A.M 'bots

As our world becomes more and more complex, this approach to problem solving will also teach future job seekers to address unexpected situations.

P

for **PHYSICS**
SOUND EFFECTS, GPS NAVIGATION & WATER REFLECTIONS

Computers, mobile phones, tablets, nuclear power-plants, GPS satellites and many more devices. They all owe their existence to the revolution in physics that took part between 1800 and 1900.

Through experiments run with real instruments, parameter setting and data collection, students will have a hands-on experience of many different physical phenomena, which will help them understand how physics regulates both nature and technology, and introduce them to potential working fields where physics skills are required.

Some of the topics of our experiments:
/ Gamma radiation attenuation / The photoeletrical effect / The Michelson Interferometer / Snell's law / Black Body Radiation

C *for* CITIZEN SCIENCE
RESEARCH. MADE BY AND FOR THE PEOPLE.

Citizen Science is a thriving practice where the public is involved in scientific research activities.
The public raises scientific questions, designs experiments, builds devices and sensors, and interprets data, creating together brand-new scientific knowledge. Thanks to this participatory approach, science becomes more transparent, more human, and it opens up a dialogue with society.

Our multidisciplinary toolkit will allow teachers and young students to play an active role in a real citizen science project or create their own one, with a clear purpose: to make our cities better.

Key issues:
/ Urban mobility / Human behaviour / Digital society and action research / Collective decision making and deliberative democracy / Community actions and social welfare

Potential results:
- Results from experiments are published on academic journals
- Schools and students promote change in their neighbourhood acting as scientific citizens and thanks to an original research project raised from their own concerns.

FOLLOW US ON

WANT TO TAKE PART IN ONE OF OUR COURSES,
HOLD ONE IN YOUR SCHOOL
OR FIND OUT WHERE WE WILL BE NEXT WITH ONE OF OUR VENTURES?

VISIT OUR WEB AND REGISTER
WE WILL LET YOU KNOW WHEN STEMFORYOUTH COMES NEAR YOU!

info@stemforyouth.eu
www.stemforyouth.eu

/ GRAPHIC DESIGN BY FONDAZIONE UMBERTO VERONESI

POWERED BY

This project has received funding from the European Union Horizon 2020 Research and Innovation Programme under grant agreement no. 710577