

STOCKHOLM

JUNIOR WATER PRIZE

Cyprus

DISCOVER THE IDEAS THAT MADE IT TO THE TOP.

2011-2026

The **winners** of the National Competition and their **Projects**



STOCKHOLM
JUNIOR WATER PRIZE
Cyprus

National Organiser

MN WATER MUSEUM

Limassol District
Local Government Organisation



ANNUAL
COMPETITION
for students of Secondary and Technical Schools
on the subject of
water

SCAN ME

CALL FOR ENTRIES

Approved by the
Cyprus Ministry of Education, Sport & Youth

MINISTRY OF EDUCATION
SPORT AND YOUTH

With the support of the
Embassy of Sweden in Cyprus

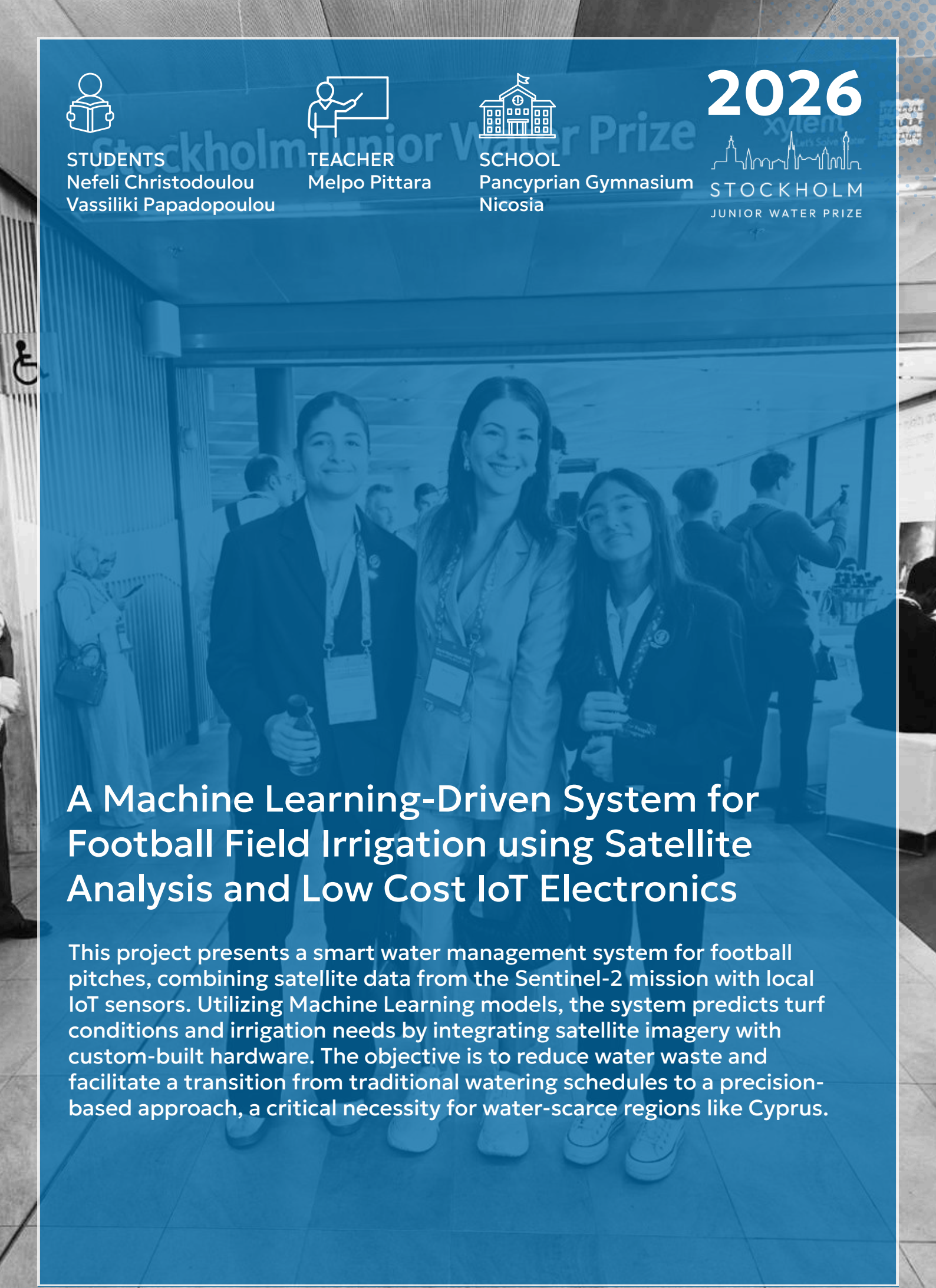
Embassy of Sweden
Nicosia

STUDENTS
Nefeli Christodoulou
Vassiliki Papadopoulou

TEACHER
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SCHOOL
Pancyprian Gymnasium
Nicosia

2026
STOCKHOLM
JUNIOR WATER PRIZE



A Machine Learning-Driven System for Football Field Irrigation using Satellite Analysis and Low Cost IoT Electronics

This project presents a smart water management system for football pitches, combining satellite data from the Sentinel-2 mission with local IoT sensors. Utilizing Machine Learning models, the system predicts turf conditions and irrigation needs by integrating satellite imagery with custom-built hardware. The objective is to reduce water waste and facilitate a transition from traditional watering schedules to a precision-based approach, a critical necessity for water-scarce regions like Cyprus.

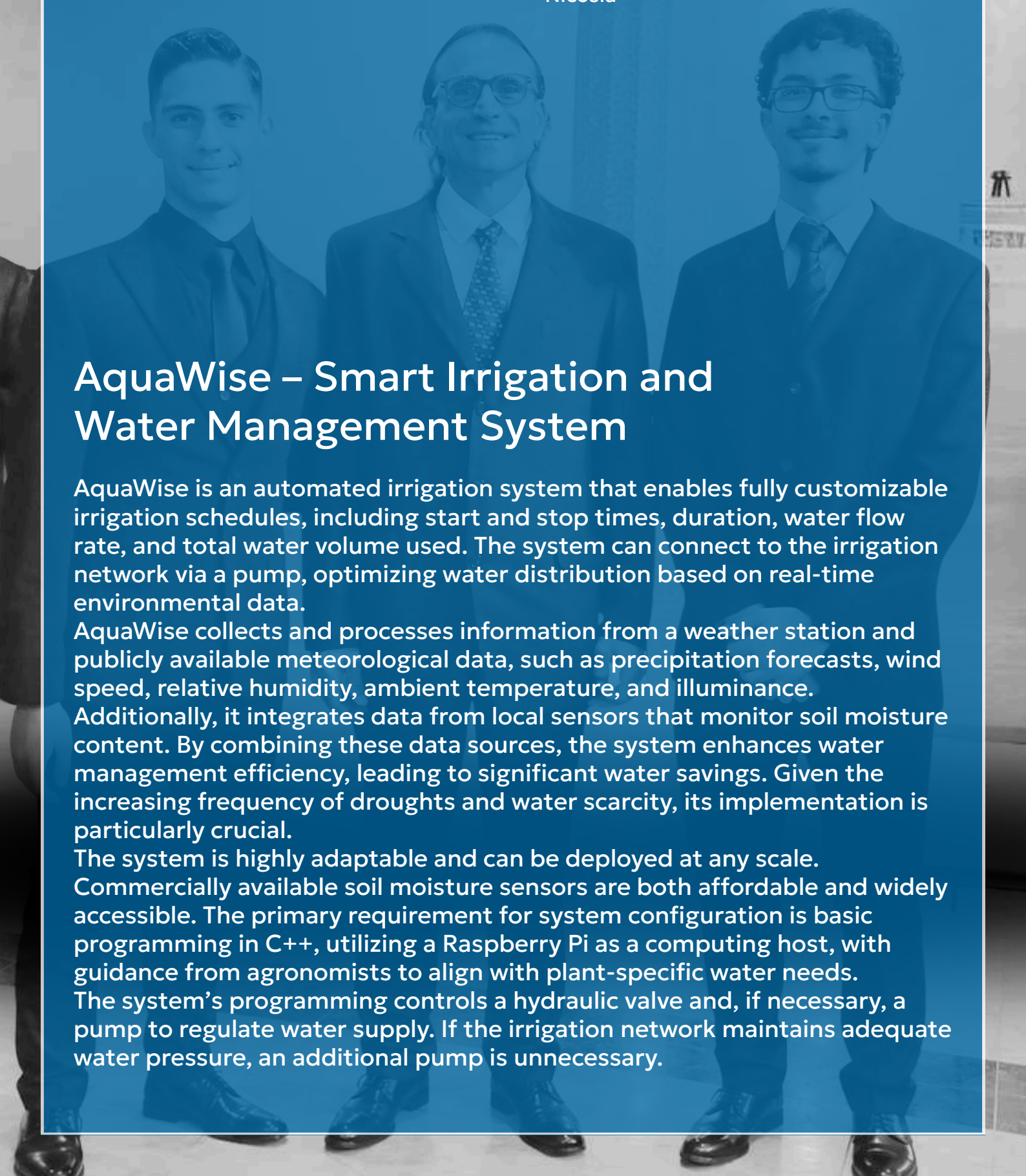
STUDENTS
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2025

STOCKHOLM
JUNIOR WATER PRIZE



AquaWise – Smart Irrigation and Water Management System

AquaWise is an automated irrigation system that enables fully customizable irrigation schedules, including start and stop times, duration, water flow rate, and total water volume used. The system can connect to the irrigation network via a pump, optimizing water distribution based on real-time environmental data.

AquaWise collects and processes information from a weather station and publicly available meteorological data, such as precipitation forecasts, wind speed, relative humidity, ambient temperature, and illuminance.

Additionally, it integrates data from local sensors that monitor soil moisture content. By combining these data sources, the system enhances water management efficiency, leading to significant water savings. Given the increasing frequency of droughts and water scarcity, its implementation is particularly crucial.

The system is highly adaptable and can be deployed at any scale. Commercially available soil moisture sensors are both affordable and widely accessible. The primary requirement for system configuration is basic programming in C++, utilizing a Raspberry Pi as a computing host, with guidance from agronomists to align with plant-specific water needs.

The system's programming controls a hydraulic valve and, if necessary, a pump to regulate water supply. If the irrigation network maintains adequate water pressure, an additional pump is unnecessary.

STUDENTS
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2024
STOCKHOLM
JUNIOR WATER PRIZE



Electrospun nanofiber membranes for mixed microplastic and co-contaminants removal on seed germination and early plant growth

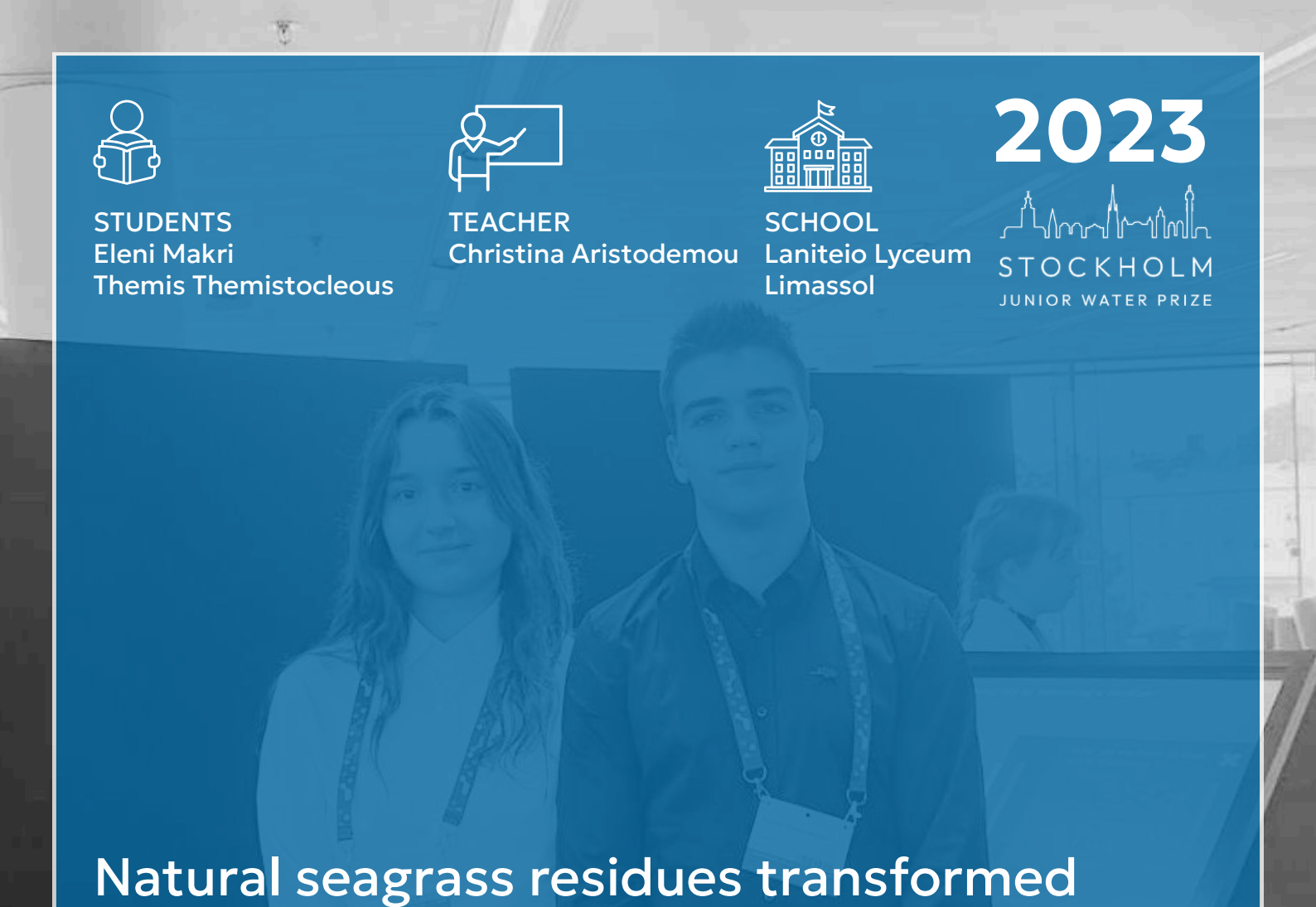
Over the past few years, the planet has faced various environmental challenges such as climate change and pollution. Plastic waste has emerged as a significant global environmental concern due to its widespread use and expanding presence in various fields. This study investigates the impact of microplastics (MPs) such as PVC and PS, along with the antibiotic SMX, on plant growth, both individually and in combination. Furthermore, this study highlights the potential of electrospinning as a sustainable solution for mitigating plastic pollution and other environmental hazards.

STUDENTS
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2023
STOCKHOLM
JUNIOR WATER PRIZE



Natural seagrass residues transformed into a phosphorous absorbing ally by becoming a fertilizer

This project aims to investigate the potential use of thermally treated seagrass Posidonia Oceanica to recover phosphate from wastewater and the production of a fertilizer substitute. Posidonia Oceanica residues were thermally treated at 550o C for 15 minutes and were tested as an adsorbent of phosphate for water collected from Finikaria dam. Results shows that thermally treated seagrass could be applied as adsorbents for Phosphate from synthetic and real wastewater solutions, with 98% and 97% adsorption efficiency, respectively. By using thermally treated P. Oceanica, which was exposed to phosphate, as a potential fertilizer to lens it seems to positively affect their growth. In total, the suggested solutions solve the following problems: since the thermally treated seagrass has a great ability to absorb through phosphate, it can effectively valorize seagrass residues rather than transporting them to landfills. Due to the thermally treated seagrass's great potential for phosphate adsorption, it may be used as a filter for water high in phosphate so it can prevent eutrophication in dams or lakes. Additionally, after adsorption, the solid residue (thermally treated seagrass with phosphate) indicates that it can be used as fertilizer.

STUDENTS
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SCHOOL
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Limassol

2022
STOCKHOLM
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Treatment of cyanobacteria harmful blooms with calcium peroxide granules: The effect of humics concentration

The current study emphasizes the necessity of developing an efficient and affordable treatment approach to eliminate cyanoHABs that may be present over wide areas of water and have the ability to threaten the aquatic ecosystem. Since our experimental treatment indicated successful cyanobacterial destruction, and that humic content can increase the treatment efficiency, CaO2 granules are a promising solid oxidant for mitigating cyanoHABs but further investigations are needed to evaluate other parameters regarding its safety before it could be used in the field.

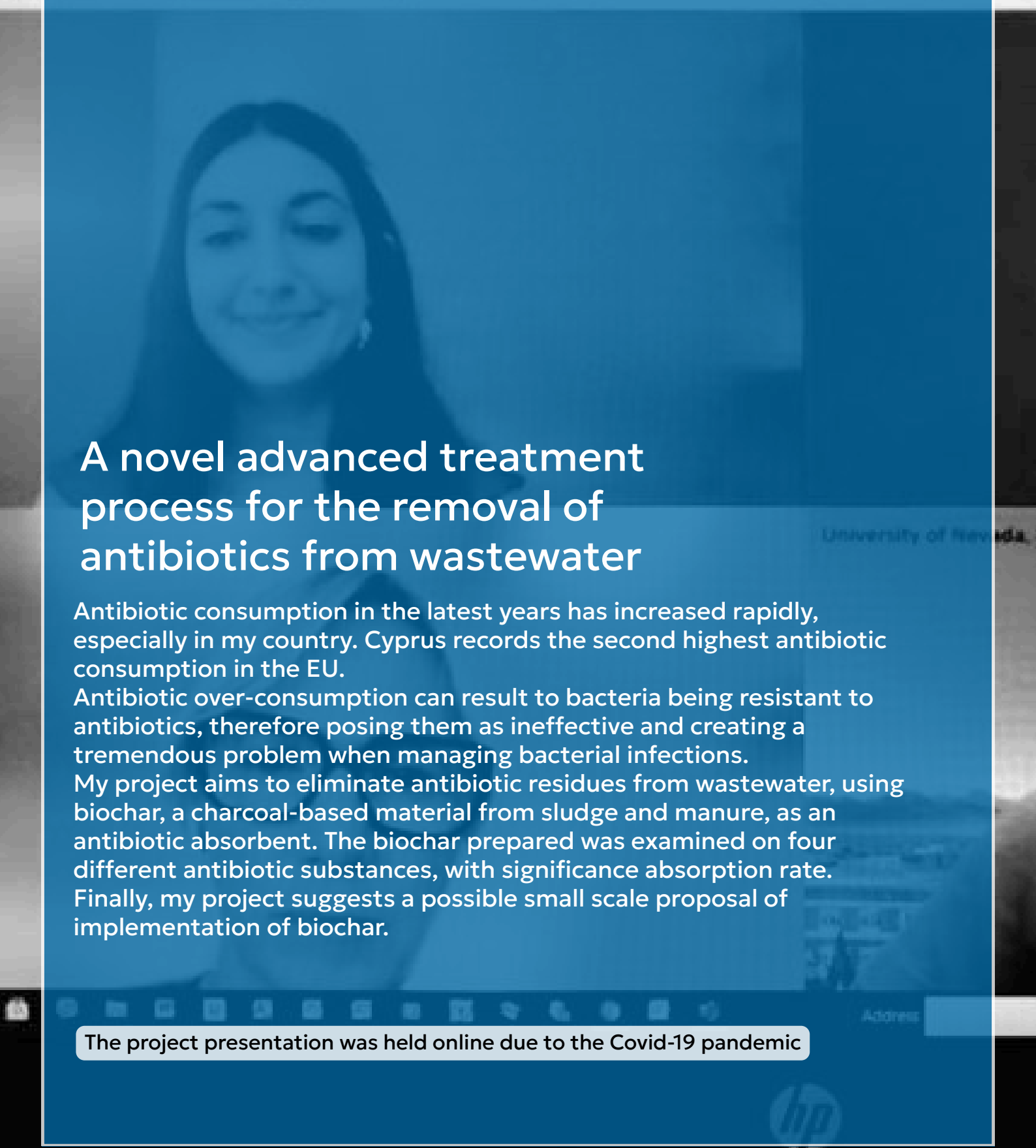
STUDENT
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TEACHER
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Limassol

2021

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A novel advanced treatment process for the removal of antibiotics from wastewater

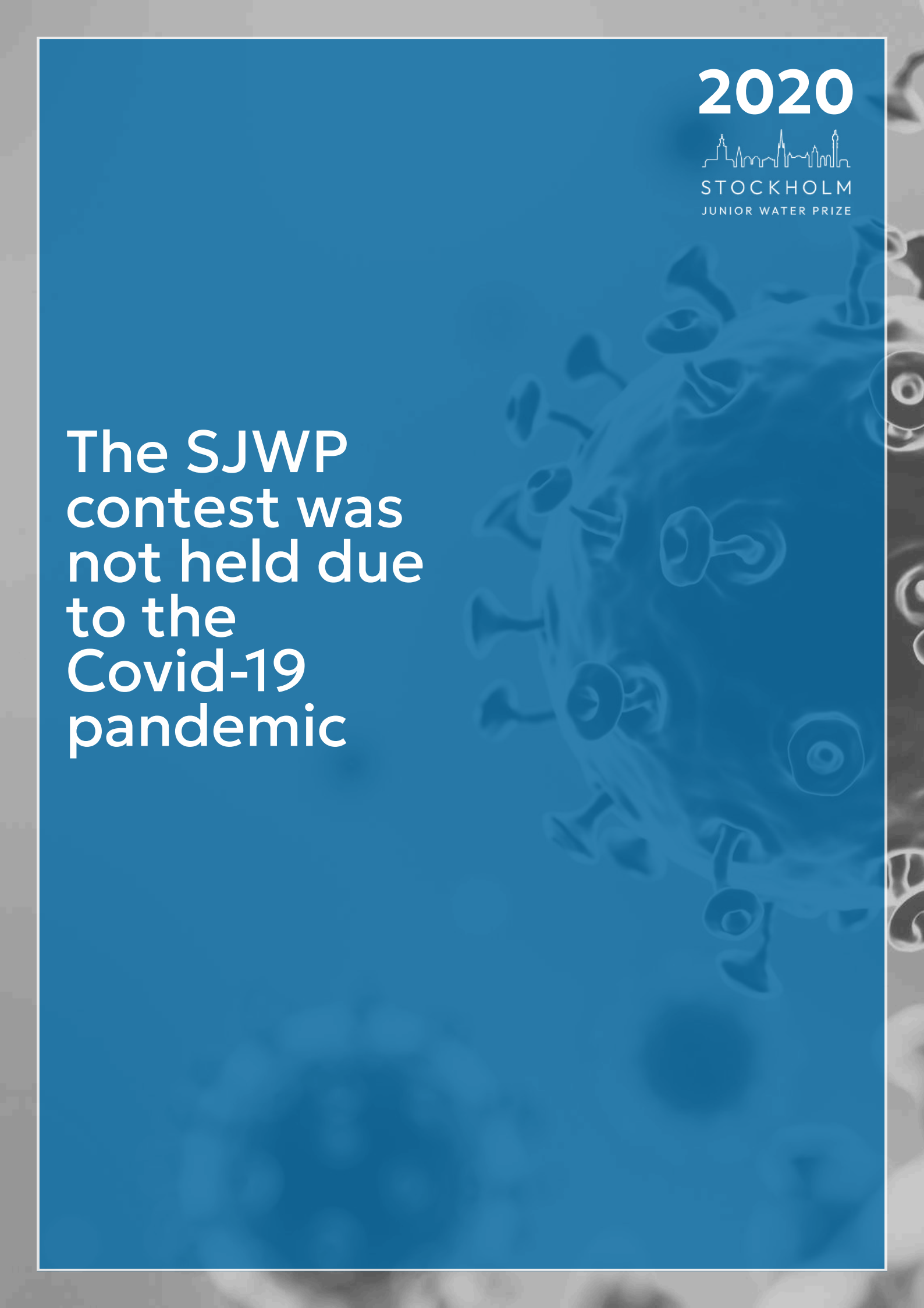
Antibiotic consumption in the latest years has increased rapidly, especially in my country. Cyprus records the second highest antibiotic consumption in the EU.
Antibiotic over-consumption can result to bacteria being resistant to antibiotics, therefore posing them as ineffective and creating a tremendous problem when managing bacterial infections.
My project aims to eliminate antibiotic residues from wastewater, using biochar, a charcoal-based material from sludge and manure, as an antibiotic absorbent. The biochar prepared was examined on four different antibiotic substances, with significance absorption rate. Finally, my project suggests a possible small scale proposal of implementation of biochar.

The project presentation was held online due to the Covid-19 pandemic

2020

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The SJWP contest was not held due to the Covid-19 pandemic





STUDENTS
Anna Koumi
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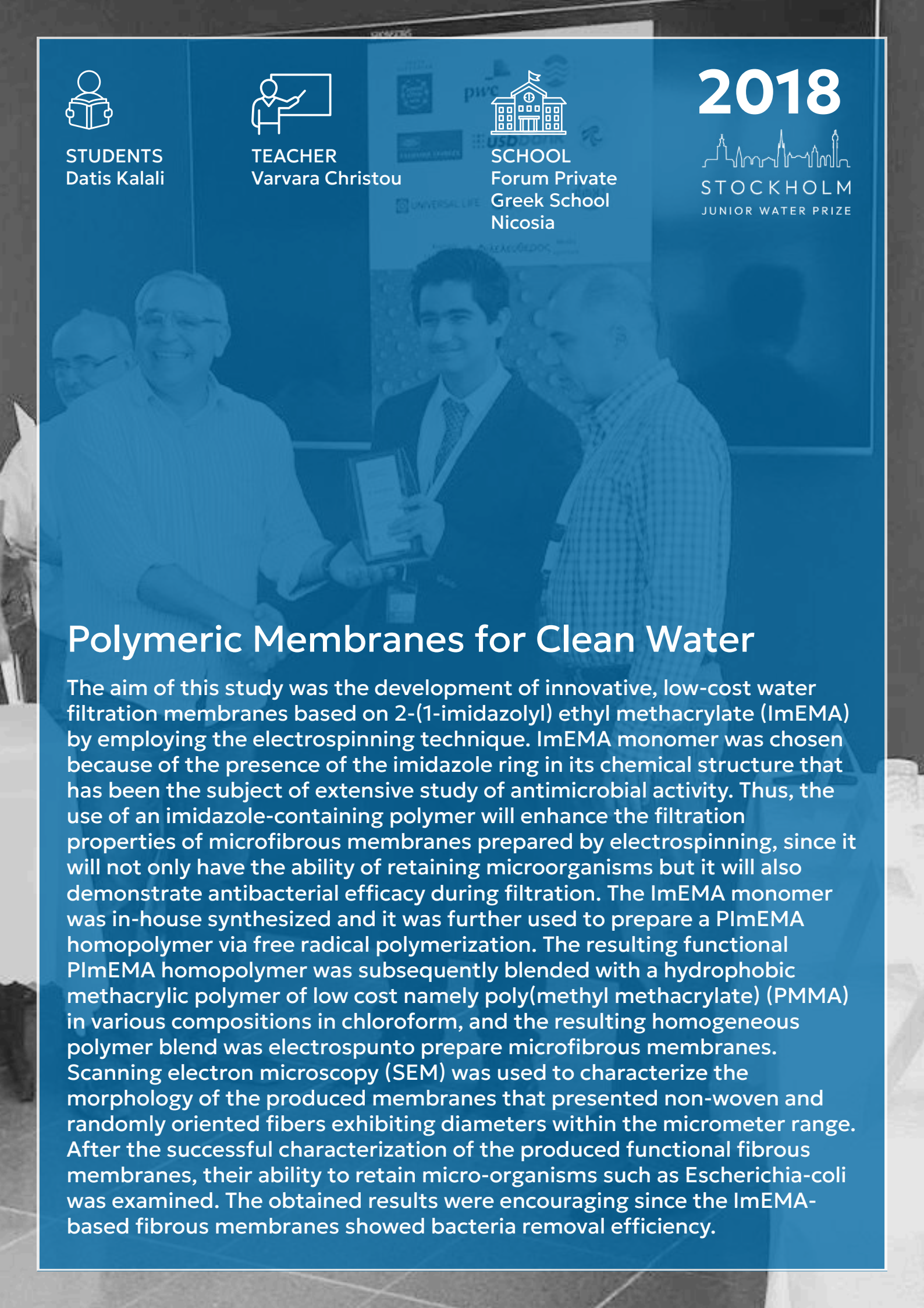
TEACHERS
Michalis Ioannou
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2019
STOCKHOLM
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Investigating detection of floating plastic litter from Space

The littoral zone of Lemesos is been polluted by manmade rubbish, especially plastic, something highly noticeable by the locals. Given that we were very aware of the huge damage done to the marine environment , we were determined to find a way to either prevent sea pollution as much as possible or to help the authorities clean the sea in a more effective way. As we know from our Science studies each material reflects or absorbs sunlight radiation differently, enabling the creation of a unique graph for each material, which is called: “Spectral Signature”. We decided to experiment using “Remote Sensing”. The idea was to create a “a plastic target”, in order to investigate if plastic floating in the sea can be detected, depending on its Spectral Signature using satellite or drone. Methodology evolved as we were investigating further and exchanging ideas, having hands-on experiences to become more familiar with the science and its instruments, then deciding how to apply our knowledge to make our idea happen. Therefore, we took in situ and laboratory measurements on plastic to create a database with the most representative spectral signatures and discovered its special characteristics which were used as guide to spot it using drone or satellite. After gathering all information needed, we created a floating plastic bottle target, so as to take measurements by both drone and satellite. Then, data was analyzed, and a Prototype Code was created, based on the Spectral Signature of plastic. Finally, by testing the Prototype Code of plastic bottle over and over again, we confirmed that accumulated plastic rubbish can be successfully detected by drone or satellite. Thus, a new, effective way of tracking plastic rubbish is introduced which can contribute in the protection of the marine environment.



STUDENTS
Datis Kalali

TEACHER
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SCHOOL
Forum Private
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Nicosia

2018
STOCKHOLM
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Polymeric Membranes for Clean Water

The aim of this study was the development of innovative, low-cost water filtration membranes based on 2-(1-imidazolyl) ethyl methacrylate (ImEMA) by employing the electrospinning technique. ImEMA monomer was chosen because of the presence of the imidazole ring in its chemical structure that has been the subject of extensive study of antimicrobial activity. Thus, the use of an imidazole-containing polymer will enhance the filtration properties of microfibrous membranes prepared by electrospinning, since it will not only have the ability of retaining microorganisms but it will also demonstrate antibacterial efficacy during filtration. The ImEMA monomer was in-house synthesized and it was further used to prepare a PImEMA homopolymer via free radical polymerization. The resulting functional PImEMA homopolymer was subsequently blended with a hydrophobic methacrylic polymer of low cost namely poly(methyl methacrylate) (PMMA) in various compositions in chloroform, and the resulting homogeneous polymer blend was electrospunto prepare microfibrous membranes. Scanning electron microscopy (SEM) was used to characterize the morphology of the produced membranes that presented non-woven and randomly oriented fibers exhibiting diameters within the micrometer range. After the successful characterization of the produced functional fibrous membranes, their ability to retain micro-organisms such as Escherichia-coli was examined. The obtained results were encouraging since the ImEMA-based fibrous membranes showed bacteria removal efficiency.

STUDENTS
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2017
STOCKHOLM
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Exploiting Biological Treatment Plants with the aim to Generate Electrical Energy

We investigated the amount of methane produced by the Biological Treatment Plant recycling waste water in our school and how methane can be exploited to generate electrical energy. We also researched several different plants similar to our own and visited the Sewerage Board to under-stand the process. We collected samples of waste water from the plant for a Chemical Oxygen Demand analysis, and investigated if there was a sufficient production of methane to use it for electricity production. Based on the results we could expand our project further in terms of how to increase the production of methane.

STUDENTS
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Thalia Sofocleous

TEACHER
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SCHOOL
St. Mary's School
Limassol

2016
STOCKHOLM
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Alternative ballast water treatment for sustainable transportation

In this project, the students propose the use of silver nitrate embedded on alumina for treating water ballast in ships. Ballast water is used in ships when they have no cargo in order to provide them balance and once they load the cargo they discard it in the sea. This water contains however various microorganisms which pollute sea water. So the students investigated the effectiveness of killing E.coli bacteria using the catalyst they created. The results were significant since the catalyst is effective and cheap.

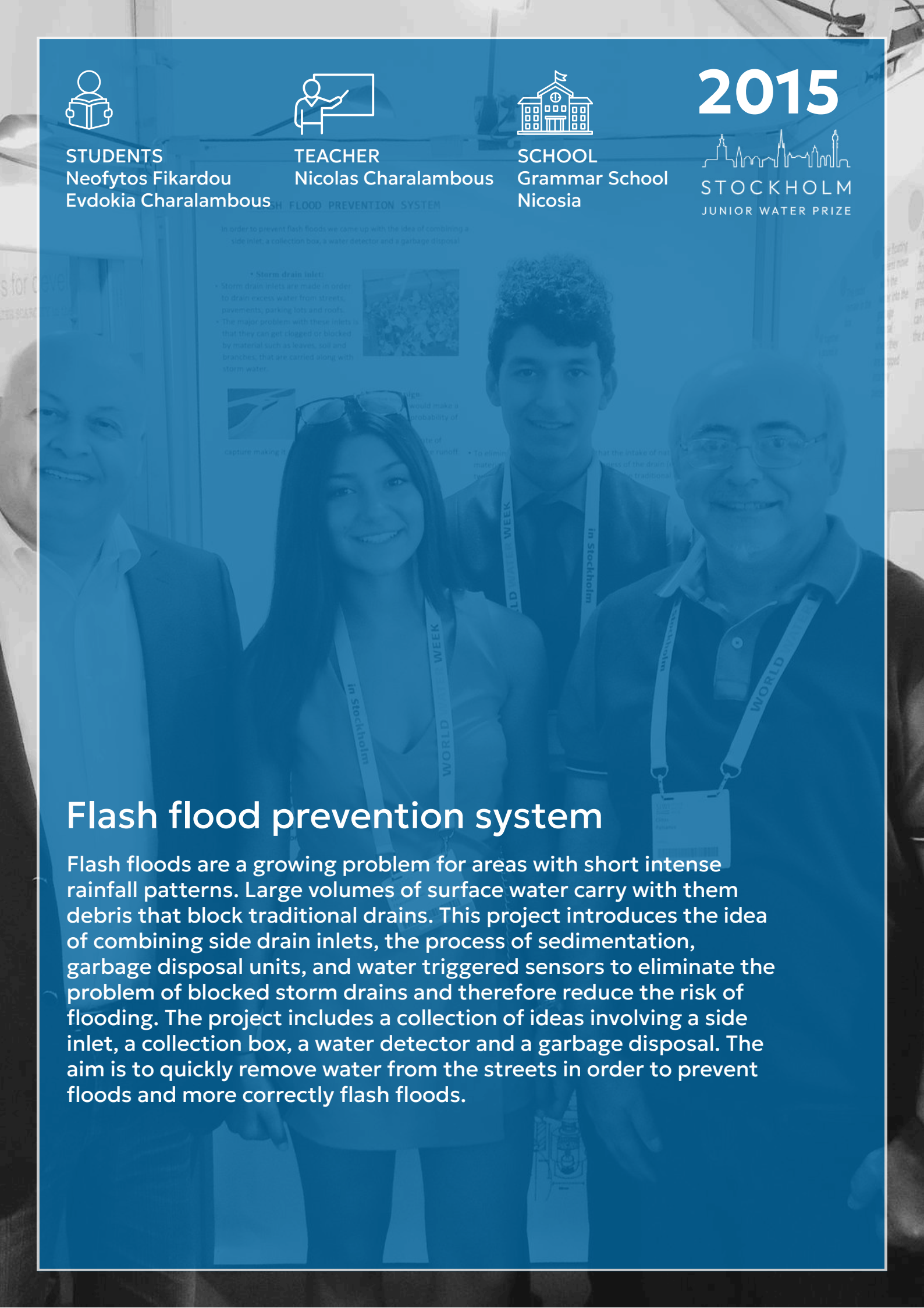
STUDENTS
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2015

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Flash flood prevention system

Flash floods are a growing problem for areas with short intense rainfall patterns. Large volumes of surface water carry with them debris that block traditional drains. This project introduces the idea of combining side drain inlets, the process of sedimentation, garbage disposal units, and water triggered sensors to eliminate the problem of blocked storm drains and therefore reduce the risk of flooding. The project includes a collection of ideas involving a side inlet, a collection box, a water detector and a garbage disposal. The aim is to quickly remove water from the streets in order to prevent floods and more correctly flash floods.



STUDENTS
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TEACHER
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SCHOOL
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2014

STOCKHOLM
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A novel advanced treatment process for the removal of Xenobiotic from wastewater

In this project the team examined the impact of specific pharmaceutical substances and studied ways of eliminating their negative effects on the environment. It focused on analgesics and fever reducers containing paracetamol and caffeine. The team proceeded to experiments with aqueous solutions of these substances in order to verify their effect on three main levels of the food chain. After having proved with experiments that the substances had a negative impact on each living organism they had examined, they applied the advanced chemical oxidation process of solar photo-catalysis on a laboratory and pilot scale in order to remove pharmaceuticals from water. They also estimated the acidity of the solutions, as well as their activated carbon content, before and after the cleaning process. This method led to an important depollution of water without further negative effects, while the project suggested to proceed to further research by using other living organisms and more pharmaceuticals.

STUDENT
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TEACHERS
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SCHOOL
Grammar School
Nicosia

2013
STOCKHOLM
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Creating a Sustainable Desalination system through Renewable Energy Generation Using Brine as an Energy Storage Medium

Desalination is a process that from its nature is a very energy-reliant activity. In Cyprus, seasonal droughts mean that the aforementioned process of obtaining water that is safe for consumption is counted on heavily. The team from Cyprus, aiming to meet the problem of the large energy demand for this activity has devised a new model that could fit right into the desalination system, providing renewable energy. Using brine as an energy storage medium, the design aims to store solar energy, and use it to create electricity. What's more, this method allows for the use of solar energy in daylight, as well as night.



2012

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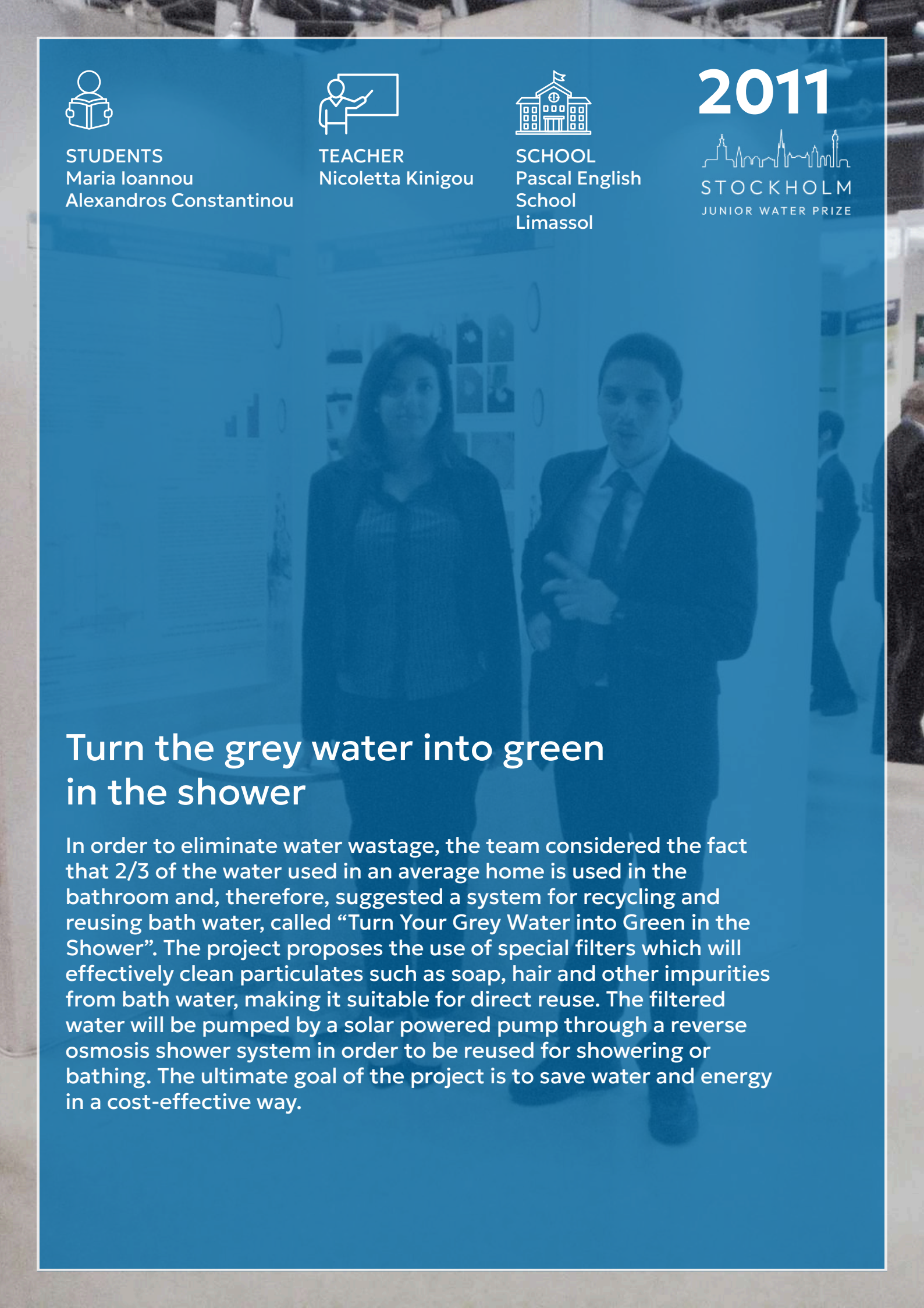
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Marios Christou
Andreas Ttofi

TEACHERS
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Christodoulidou

SCHOOL
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Surface oxygenation of water bodies by solar-wind oxygen mill, case study of Polemidia Water Dam

Water pollution and eutrophication, and the related causes of anoxic conditions are among the most serious problems related to water bodies. Aeration is required to eliminate these anoxic conditions. The endeavor of the team was to build and test a new kind of aerating machine. The team's model machine utilizes green energy, solar and wind, and introduces oxygen into the surface of the water to increase the water body's oxygen level. As a case study, the team examined the Polemidia dam (Cyprus) simulating its conditions, applying the model machine and evaluating its performance. The Chemical Oxygen Demand (COD) load in the scaled dam was substantially decreased after operating the solar-wind oxygen mill for some hours.



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Limassol

2011
STOCKHOLM
JUNIOR WATER PRIZE

Turn the grey water into green in the shower

In order to eliminate water wastage, the team considered the fact that 2/3 of the water used in an average home is used in the bathroom and, therefore, suggested a system for recycling and reusing bath water, called “Turn Your Grey Water into Green in the Shower”. The project proposes the use of special filters which will effectively clean particulates such as soap, hair and other impurities from bath water, making it suitable for direct reuse. The filtered water will be pumped by a solar powered pump through a reverse osmosis shower system in order to be reused for showering or bathing. The ultimate goal of the project is to save water and energy in a cost-effective way.

The world stage of water science is waiting. Could your team be next?

SCAN ME

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