

# COPE Projects

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The year 2022 has been one of hybrid events all over the world, as we emerge from the effects and aftereffects of COVID-19. With the repercussions still lingering, there are many aspects that need to be addressed before announcing any event. We are geared up to attend the 2022 IEEE Antennas and Propagation Society (AP-S) International Symposium on Antennas and Propagation/U.S. National Committee–International Union of Radio Science Meeting in Denver, Colorado, from 10 to 15 July 2022. In August, when you will be reading this issue’s “COPE Corner” column, we hope that we will have met in person at the IEEE symposium and will have many more topics to share.

While we are still holding virtual meetings, there are some updates to be shared that the COPE committee has been working on. We have been posting a call for submitting project proposals under the COPE mission and guidelines, and we continue to receive a very positive and enthusiastic response from all 10 IEEE Regions.

Some recently approved projects are focused on serving underprivileged students, promoting science, technology, engineering, and mathematics (STEM) education and also a basic awareness of hygiene, and providing many other fundamental needs underlying these strata of the society in which we live.

Digital Object Identifier 10.1109/MAP.2022.3178356  
Date of current version: 5 August 2022

## EDITOR’S NOTE

The IEEE Antennas and Propagation Society (AP-S) Committee on Promoting Equality (COPE) is now approved to be a standing committee. With a team of dedicated volunteers and leaders, we look forward to making a positive impact especially in the developing world, as we address the COPE agenda alongside the IEEE tagline, “Advancing Technology for Humanity.”



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On behalf of the IEEE Pune Section’s joint chapters on Antennas and Propagation/Microwave Theory and Technology (MTT)/Electromagnetic Compatibility (JCAME), Prof. G.S. Mani (Figure 1) presented the project “EU-REKA” and, on behalf of Dr. Rajeshri Jain, the project “Swasth,”

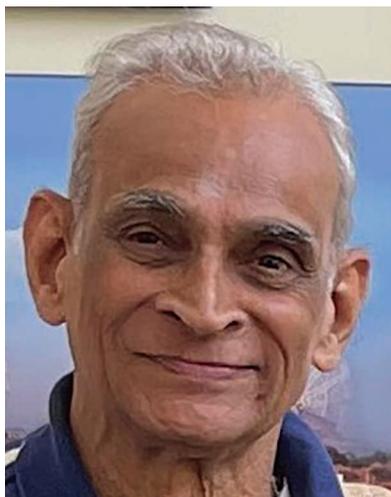


FIGURE 1. Prof. G.S. Mani.

and Dr. Manjusha A. Mungi presented projects that will be implemented in association with a local social outreach organization, Bhagini Nivedita Pratishthan (BNP) Pune, working for underprivileged communities (see Figure 2).

Prof. Mani is a former chair of the IEEE Pune Section and former dean and director at the Defence Institute of Advanced Technology, Defence Research and Development Organisation, Pune. He is currently serving as a chair of IEEE Pune JCAME. Prof. Mani says that if you have discipline, it provides you with tolerance, and that tolerance is important. He further adds that, when a student is given an idea about fine arts, he/she also gets an idea about tolerance, which is important for facing life’s problems. He states that, when the arts interact with STEM, it produces the biggest by-product. That is why there is a need for STEM to become science, technology, engineering, arts, and mathematics (STEAM) in our education system.

## THE EU-REKA AND SWASTH PROJECTS

### EU-REKA 2022

The main theme of EU-REKA 2022 is centered on engaging local AP-S Chapter officers and students, who take up the role of “ambassadors of education” and work on creating interest and curiosity among rural/urban high school children so that the school dropout rate is reduced. This project is targeted to spread over different parts of India and can be scaled up to other parts of IEEE Region 10.

### SWASTH

This project is an activity in which college students and school teachers are involved in educating high school children with special reference to food, water, hygiene, and sanitation (“swasth” in many Indian languages means healthy). It is proposed to use a “learning by doing” methodology for the project.

The main theme of Swasth is centered on college students, with school teachers working as mentors/guides, who are 1) helping the school children to assemble a low-cost microscope and using it to examine the quality of water and food available to them; 2) aiding them in making slides/photos using the microscope and uploading them; 3) helping them to understand the need for clean water and food and the causes of ill health; and 4) creating interest and curiosity among high school students about science and technology through the “learning by doing” process.

Sustainable Development (SD) Goal 6 concentrates on improving access to clean drinking water, sanitation, and hygienic facilities, which needs to be addressed for a large portion of our world. It also focuses on the quality and sustainability of water resources. According to United Nation reports, about 1.8 billion people are using a source of drinking water that has fecal contamination, and 2.4 billion people lack access to basic sanitation services, such as toilets or latrines. Food security is about all people having access to sufficient, safe, and nutritious food to meet

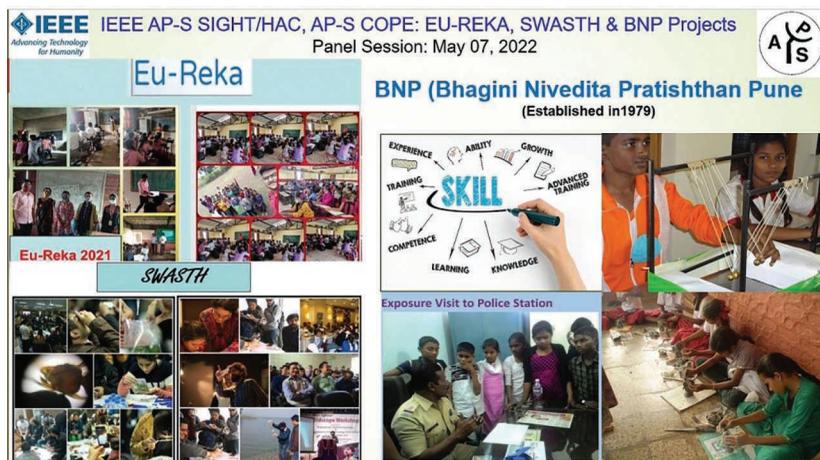


FIGURE 2. The EU-REKA 2022, Swasth, and BNP projects.

**Prof. Mani says that if you have discipline, it provides you with tolerance, and that tolerance is important.**

their needs. SD Goal 2 identifies this need. In 2012, an estimated 889,000 people died from infectious diseases caused largely by fecal contamination of water and soil.

What is the solution? Swasth aims at educating the children about these issues. They can learn by looking at the contamination in nearby water and food resources, using a microscope that they themselves have assembled. It is believed that this method of learning will leave a lasting impression on the children and help them make educated choices.

The project will be implemented in the following four phases. Phase 1 involves planning and registration activities (April–May 2022), information dissemination, and registration of participants. Phase 2 is a one-day workshop for registered volunteers on construction and using the microscope for project activities (May 2022). Phase 3 consists of helping the students to assemble their microscope and collect information (June–July 2022). Phase 4 is the end of phase activities (September–October 2022), including feedback, documentation, and a valedictory address.

The IEEE Pune Section JCAME in collaboration with the BNP, driven by the motto “Everything in the field of upliftment of women and children,” will be working on many different programs.

Dr. Manjusha A. Mungi (Figure 3), an IEEE AP-S member and active volunteer with the BNP, retired as a vice-principal of the Jnana Prabodhini Prashala (JPP) Pune, India, a unique school that was especially established for gifted students and is affiliated with the Central Board of Secondary Education. Other activities and goals of the JPP include developing leadership qualities among students, encouraging creative thinking, motivating intelligence for social change, and many more. Various experiments on teaching methods have been successfully implemented.



FIGURE 3. Dr. Manjusha A. Mungi.

Dr. Mungi motivates and mentors high school and preuniversity students in pursuing science and engineering in college. She has been teaching various STEM subjects and electronics for more than 35 years and has organized workshops in different remote parts of India that lack basic educational facilities. As an active volunteer with the BNP, she has led several programs for underprivileged students, helping them with their studies in science and math, during after-school (Abhyasika) and other programs.

### OTHER ACTIVITIES

The IEEE North Jersey Section recently completed the judging of the 2022 North Jersey Regional Science Fair IEEE North Jersey Section Young Engineer Award (with three award recipients) and the 2022 Hudson STEM Showcase Award (with two award recipients). This STEM initiative recognizes young talent. An award of US\$250 and a certificate were presented to each student during the

**It is important to separate a “lack of interest” from a “lack of opportunity.”**

Section’s annual awards banquet in May 2022. Figure 4 shows the award and student award recipients attending the ceremony.

COPE Task Force 3 met on 3 May 2022 through Zoom and held a panel discussion for brainstorming ideas on how to move forward. The panelists were Shanker Balasubramaniam, Reyhan Baktur, Shinichiro Ohnuki, Meisong Tong, and Junwei Wu. Dr. Balasubramaniam briefed the team about his meeting and discussion with the COPE leadership. The panel discussed how every Region has varying requirements that need to be addressed differently and that what works in one Region may not work in another. So, it is important to find effective ways to reach out and help people all the way

from kindergarten through grade 12. Based on their existing situations, it is important to get them excited about STEM with low-cost projects/programs. The panelists discussed learning from

what others are already doing effectively. Some regions, such as Mongolia, Kyrgyzstan, Kazakhstan, Uzbekistan, Azerbaijan, and others, seem to have almost no representation, as opposed to China, Japan, India, Korea, and Singapore.

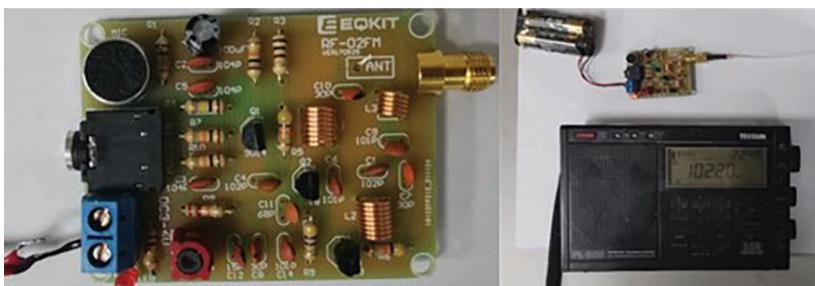
An idea to sponsor a summer activity and then learn from a pilot program was discussed. It is important to separate a “lack of interest” from a “lack of opportunity.” In general, STEP/STEM should be given importance in art and economics education as well. In some countries, like Japan, salaries may be a driving factor, resulting in a lower percentage of students obtaining Ph.D. degrees. The meeting concluded with a plan to gather some reports, starting with one Chapter from each country that is very active. This will be helpful in establishing dialogs and partnerships. Based on the reports, it was decided to find a pilot high school in which to start a pilot program.

A sample project was shared by Junwei Wu, State Key Laboratory of Millimeter Waves, Southeast University, Nanjing, China, and the panelists thought that it could be used as a model to implement it in a high school, perhaps the pilot high school. Junwei Wu recently tried to instruct a high school student to build a simple frequency modulation (FM) transmitter, as shown in Figure 5.

This project is based on kits bought from Taobao (the Chinese eBay), including resistors, capacitors, inductors, transistors, bare circuit boards, batteries, and other components. The cost is about US\$2. These elements are soldered together and connected to an antenna to transmit an FM signal. The radio is then used to test the signal strength at different distances and bearings. This project may give young students a preliminary impression of circuits and electromagnetic



**FIGURE 4.** The IEEE North Jersey Section Awards Ceremony.



**FIGURE 5.** The simple FM transmitter project.

radiation and stimulate their interest in learning.

### IEEE AP-S SPECIAL INTEREST GROUP ON HUMANITARIAN TECHNOLOGY/HUMANITARIAN ACTIVITIES COMMITTEE/COPE PROJECTS

The proposed projects that are currently under consideration for funding by the IEEE AP-S Special Interest Group on Humanitarian Technology (SIGHT)/Humanitarian Activities Committee (HAC)/COPE Chapter Activity Committee (CAC) are as follows:

- *IEEE Uganda Section:* The project aims to design an Internet of Things (IoT)-based indoor air-quality monitoring system for sustainable health.
- *IEEE Kolkata Section:* The project aims to develop an IoT-based virtual laboratory system appending the existing infrastructure of academic institutions.
- *IEEE Pune Section:* The project proposes a cloud cover sensor that will monitor the clouds by using an infrared camera and provide data to the stakeholders. The data will be processed in an embedded circuit and transmitted wirelessly using antennas to be viewed on a laptop or phone.
- *IEEE Turkey Section:* The purpose of this project is to reach out to K12 (high school) students in low-income regions by conducting a one-day program of IEEE and engineering meetings followed by Q&A and discussion sessions.
- *IEEE Islamabad Section:* This project aims to engage orphans via technology in a two-week STEAM camp for orphan children at a local school, involving a lot of creative hands-on activities in different domains, such as electronics, robotics, coding, 3D printing and modeling, and the IoT.
- *IEEE Kerala Section:* Project “Light Up—Spread Light in Darkness” has the goal to set up a smart street light system that uses solar energy and works on the IoT. It will use wireless communication to provide solar street lights to about 250

### This project may give young students a preliminary impression of circuits and electromagnetic radiation and stimulate their interest in learning.

families who reside in a forested area and return home from work after dark.

- *IEEE Uttar Pradesh Section (Dehradun):* The IoT-based “Real-Time Water-Quality Monitoring System” is a proposed project is to check the quality of water using different parameters, like pH, residual chlorine, nitrate, total dissolved solids, pressure, flow rate, and so on, using our Real-Time Water-Quality Monitoring System. After successful trials on campus, the device will be installed in Dhoolkot village’s overhead water tank.
- *IEEE Egypt Section:* Motivated by a shortage of teachers, this project aims to technologically support the new proposal by the Ministry of Education for voluntary teaching in public schools in Egypt.

### AP-S COPE FUNDING REQUEST DEADLINE: 30 SEPTEMBER 2022

AP-S COPE aims to fund projects that provide good use of IEEE expertise, exhibiting a strong technological component and clear engagement with the community, indicating that the proposed solution is both desired and feasible. We look for established relationships, ideally documented, with stakeholders who will be involved in the project, and implementation with a clear, detailed, and credible project assessment matrix, project implementation plan, and budget. The team should demonstrate combined experience to credibly execute the project and identify and address potential risks, and the project should have a real, tangible impact. If a proposal is missing the mark on two or

more of these areas, it might not be ready for funding.

### AREAS OF FOCUS

AP-S COPE is prioritizing immediate impact on poverty mitigation and inequality reduction through the following project areas:

- upgrading of marginalized populations
- STEM education for marginalized populations
- information and communications technology for underserved populations
- sustainable power sources for underserved populations
- water, sanitation, and hygiene for underserved populations.

Projects must be successfully completed and submitted to the AP-S through final reporting, indicating the status of the project and utilization of funds at the end of each calendar year. Expense vouchers should be submitted as supporting documents for audit. A spreadsheet “APS COPE Project Budget Template 2022” should be submitted for budget proposal during application and an expense report on completion of the project. The fund utilization should be clearly indicated. Each AP-S Chapter/Joint Chapter/Student Branch Chapter may submit multiple proposals. Proposals are subject to review and scrutiny, and the total project funding will not exceed US\$3,000 for any calendar year. For additional funding, applicants are encouraged to submit proposals to AP-S SIGHT and AP-S CAC.

Please use the link to the Google Form to submit your project proposals under the COPE mission. AP-S Chapter officers/members can fill out and submit the IEEE AP-S COPE—Special Project Funding Request Form 2022 using the link to Google Forms, <https://forms.gle/XwDUrDtZSkYojE35A>. If Google Forms is not available in your region, you may use “AP-S Special Project Request Form MS Word: PDF” found on the IEEE AP-S Website: APS | IEEE Antennas and Propagation Society | Chapters ([ieeeps.org](http://ieeeps.org)).

