The NATO Science for Peace and Security Programme

CountryFlyer 2022

August

Developing Practical Cooperation through Science

The NATO Science for Peace and Security (SPS) Programme is open collaborating with scientists and experts from the Republic of Korea.

The NATO SPS Programme enables close collaboration on issues of common interest to enhance the security of NATO and Partner nations by facilitating international efforts to meet emerging security challenges, supporting NATO-led operations and missions, and advancing early warning and forecasting for the prevention of disasters and crises.

The current SPS Key Priorities include:

- *Counter-Terrorism;*
- *Energy Security;*
- *Cyber Defence;*
- *Defence against CBRN Agents;*
- *Environmental Security;*
- *Security-related Advanced Technology;*
- *Border and Port Security;*
- *Human and Social Aspects of Security*.

Additionally, the SPS Programme helps to promote *regional security* through scientific cooperation among Partners. The Programme also helps to *prepare* interested eligible nations for NATO membership. SPS activities often have a high *public diplomacy* value.

REPUBLIC OF KOREA

Building on dialogue and cooperation that began in 2005, relations between NATO and the Republic of Korea deepened with the signature of an Individual Partnership and Cooperation Programme (IPCP). At present, the leading areas for cooperation with the Republic of Korea include **Cyber Defence, Security-related Advanced Technology** and **CBRN Defence**. Below are some examples of ongoing and completed projects with Korea within the framework of the NATO SPS Programme.

Cooperative Activities

NERVE AGENT DETECTION USING A COMPACT INFRARED SENSOR

This Multi-Year Project (MYP) was launched in August 2019 with the aim of developing a high-sensitivity micro-machined sensor head for the detection of nerve agents. The sensor head will use state-of-the-art technology, and will be integrated in a lightweight 3D printed package to produce a stand-alone compact sensor with integrated display. The sensor will be delivered to the end user (the Ministry of Defence of Spain) for laboratory testing and further joint sensor development, for the ultimate deployment of the sensor in unmanned vehicles for wireless, remote contaminated site monitoring. *This project is led by experts from the Republic of Korea and Spain, with experts from the United States.* [ref. G5640].

DEVELOPMENT OF MICRO-SCALE, BIO-INSPIRED PASSIVE DRONE SYSTEM

This MYP, launched in 2020, aims to develop passive bio-inspired atmospheric floating vehicles (used in swarm) to allow for the characterization of atmospheric flows of interest. This will result in more effective forecasting of the spread of chemical, biological, radiological and nuclear (CBRN) agents or emissions from man-made or natural catastrophes. CBRN agents are difficult to detect and spread unpredictability. Risk management is crucial in effectively handling the threat of CBRN agents in catastrophes, and innovating and improving upon the methods currently available is of vital importance. *This project is led by scientists from the Republic of Korea and Canada.* [ref. G5638].

MICROWAVE IMAGING CURTAIN

This ongoing MYP aims to develop an affordable solution to the challenge of detecting firearms or explosives concealed by a person in a mass-transit scenario, without disturbing the continuous flow of pedestrians. The project is included in the overall context of the DEXTER (Detection of EXplosives and firearms to counter TERrorism) programme. The project will design, develop and test a radar-based imaging device for the non-checkpoint detection of explosives and firearms. Taking into account current regulations on the impact of radiation exposure to human health, the project will integrate high-performance microwave modules, and will develop specific signal processing algorithms to construct 3D images of dangerous objects carried by moving persons. *This project is led by France and Ukraine, and also involves experts from the Republic of Korea.* [ref. G5395].

IMPROVING CYBER DEFENCE CAPABILITIES THROUGH CLOUD TECHNOLOGY

This MYP aimed to develop a solution for preserving confidentiality and integrity for big data processing in the defence sector. As with most technologically-dependent sectors, the defence sector also faces significant challenges with regards to information processing capabilities. This multi-year initiative tackled the pressing need to maintain confidentiality and integrity in data processing, and has the potential to make a fundamental impact on accelerating the adoption of big data/cloud computing technologies in the defence sector. *This activity, completed in November 2018, was led by experts from the Republic of Korea and the United States.* [ref. G4919].

COMPACT SENSOR SYSTEM FOR UNMANNED AERIAL VEHICLES

This project aimed to develop new compact sensor systems that can identify unknown electromagnetic signals and their incoming direction in the battlefield using Unmanned Aerial Vehicles (UAVs). The low weight and low power consumption sensors can identify key hazards, outposts or targets, and thus allow for the mapping of enemy outposts. *This activity, completed in 2018, was led by scientists from the Republic of Korea, Spain and Ukraine.* [ref. 4809].

NANOTECHNOLOGY BASED BIOSENSOR WITH PHOTO-RESPONSIVE LIQUID CRYSTALS

This MYP aims to develop a novel nanotechnology-based biosensor to detect harmful pathogens intentionally or unintentionally dispersed in potable water, and to minimize the risks associated with biological weapons of mass destruction. The contamination of drinkable water by pathogens could affect large portions of the population, endangering their health and lives. To address this threat to public health and security, this project will produce a miniaturized device capable of detecting a selection of specific pathogens in real time. More precisely, this project proposes a compact, low-cost, real-time, highly sensible biosensor offering a quantitative and chemical recognition evaluation of the bio-associated risks. The device will generate an alarm upon the detection of dangerous pathogens, to ensure a rapid response to the contamination and prevent casualties. *This project is led by scientists from the Republic of Korea and Italy*. [ref. G5759].