

ISRAEL

Cooperative Activities under the SPS Programme

Israel has been involved in NATO science activities since 1996. In total, scientists and experts from Israel have had leading roles in 178 activities, and more have joined various cooperative activities as key speakers and participants.

Today, NATO science activities enable close collaboration on the two key priorities of **defence against terrorism** and **countering other threats to security** and are managed under the Science for Peace and Security (SPS) Programme. SPS activities contribute to NATO's strategic objective of partnership, helping to connect scientists and experts from NATO countries with their counterparts from Partner and Mediterranean Dialogue countries through workshops, training courses, team collaborations and multi-year projects.



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All activities supported by the SPS Programme are approved by NATO nations on the basis of consensus.

Examples of Activities

On 19 to 20 March 2010 Israeli experts from the University of Haifa took part in the Advanced Research Workshop, entitled **“Predictors of Opposition to Western Modernity Among Young European Immigrants”** in Milano, Italy. This SPS event brought together 24 participants to analyze the psychological, cultural and sociological factors that contribute towards feelings of hostility, resentment, defiance and aggression held by young European immigrants. Immigration, radical Islam in Europe and an identity crisis amongst second generation immigrants were noted as key drivers shaping these feelings, which in turn can be used by extremists to instigate violence and acts of terror. This workshop was an intense but informal exchange of views between experts coming from the fields of anthropology, sociology, social psychology and cognitive psychology. [ref 983584]

Investigators from Israel, Italy, Russian Federation and the United States have cooperated since March 2006 in the development of ways to use **“Electromagnetic Signature of Edge-Structures for UXO Detection”**. This involves tracking the propagation of diffracted beams through complex media and developing algorithms to analyze scattering from large objects defined by edges. In terms of implementation, this research will be used in de-mining operations and for the detection of ordinance and explosives during security screening of luggage and passengers. The end-users of the developed system include Israeli governmental agencies and Israel Aircraft Industries Ltd. [ref: 982376]

Since July 2006, experts from Israel, Lithuania and the United States have worked to advance the detection of chemical agents

through a **“Novel Approach to Improvement of Ultra-Violet Detectors for Homeland Defence”**. This has involved using electron injection to control impurities in p-(Al)GaN semiconductors. An effort is made to change the material's intrinsic properties to enhance performance rather than to change the architecture of the devices. The focus is also on understanding the role of electron injection as a means of improving the photo detector's quantum efficiency. An identified end-user of these activities is the ALVIM Research and Development group based in Jerusalem, with whom the project co-

The project, entitled **“Behavioural Learning in Surveilled Areas with Feature Extraction” (BE SAFE)** involves building computer vision algorithms to analyze human body form and gait. A method for analyzing a person's trajectories and a complete statistical model of human motion has been developed, in order to infer behaviours. In addition, the experts created a tool for extracting visual features using a system of multiple cameras with partially overlapping fields of view. These methods are under development in a prototype device, and the complete system will be tested at the Hebrew University in Jerusalem. [ref 982480]



Young scientists under the supervision of Prof. David Cahen perform surface photo-voltage measurements at the Weizmann Institute of Science (photo: courtesy of Prof. Leonid Chernyak)

directors have discussed the fabrication of a prototype. [ref 981939]

Also in the field of Defence Against Terrorism, experts from Israel and Italy have been working on ways to automatically identify abnormal behavioural traits in people in areas under surveillance.

Israeli scientists and their collaborators from Jordan and the United States are working on a method for **“High-Recovery Desalination Process for Brackish Groundwater”**. The major innovation in the project is a proposed method to prevent the precipitation of sparingly soluble salts on the surface of the polymeric membrane—called “scaling”—a major barrier to efficient desalination during the reverse osmosis (RO) process. The participants will build demonstration desalination pilot plants in Jordan and Israel, which will be set up to extract 90-95% of brackish groundwater and generate around 50 m³ of product water per

day. By exploiting brackish groundwater to such a high degree and reducing brine volumes, these demonstration plants will encourage development of additional marginal water sources in Jordan and Israel. Relieving pressure on existing water sources, and therefore reducing water scarcity, is expected to contribute to the security of the region. [ref 982481]