History of Science at NATO

Science Committee

Committee on the Challenges of Modern Society

Intra-NATO Cooperation

Partnership

Building Scientific Communities

Security

SPS

60th ANNIVERSARY

60 70 80 90 00 10 18
The Science for Peace and Security (SPS) Programme is...

- Demand-driven
- Versatile
- Flexible
- High public diplomacy value

Partnership priorities

Science

Security relevant

...in close cooperation with other NATO Divisions & Bodies

...and beyond...
Key Priorities of the SPS Programme

EMERGING SECURITY CHALLENGES
- Counter-Terrorism
- Energy Security
- Cyber Defence
- Defence against CBRN Agents
- Environmental Security

SUPPORT FOR NATO-LED OPERATIONS & MISSIONS

NEW DEVELOPMENTS AND CRISIS PREVENTION
- Security-related advanced technology
- Border and port security
- Mine and UXO detection and clearance
- Human and Social aspects of Security

OTHER DIRECTLY SECURITY-RELATED TOPICS
**Euro-Atlantic Partnership (EAPC)**
Armenia, Austria, Azerbaijan, Belarus, Bosnia and Herzegovina, Finland, Georgia, Ireland, Kazakhstan, Kyrgyz Republic, Malta, Republic of Moldova, Montenegro, Serbia, Sweden, Switzerland, Tajikistan, Turkmenistan, Republic of North Macedonia, Ukraine, Uzbekistan

**Partners around the Globe (PaG)**
Afghanistan, Australia, Colombia, Iraq, Japan, Mongolia, New Zealand, Republic of Korea, Pakistan

**Mediterranean Dialogue (MD)**
Algeria, Egypt, Israel, Jordan, Mauritania, Morocco, Tunisia

**Istanbul Cooperative Initiative (ICI)**
Bahrain, Kuwait, Qatar, United Arab Emirates

**SPS COOPERATION**
SPS Grant Mechanisms

A. Projects
- Multi-year Projects
  - R&D projects
  - Purchase equipment
  - Reimburse travel expenses
  - Training for young scientists

B. Training
- Advanced Study Institute (ASI)
  - High-level tutorial courses
  - Latest developments
  - Young scientists at post-doctoral level

- Advanced Training Courses (ATC)
  - Specialists in NATO countries
  - Share security-related expertise with trainees from partner countries

C. Workshops
- Advanced Research Workshop (ARW)
  - Expert workshops aimed at finding solutions for today's security challenges
### Some highlights of the SPS Programme

**In the past decade, the SPS Programme:**

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young Scientists and Trainees</td>
<td>5800+</td>
</tr>
<tr>
<td>Multi-year Projects</td>
<td>160+</td>
</tr>
<tr>
<td>Events organised</td>
<td>400+</td>
</tr>
<tr>
<td>Journal Publications</td>
<td>300+</td>
</tr>
<tr>
<td>Books published in NATO series</td>
<td>200+</td>
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</tbody>
</table>

**Overall, participating in the dissemination of advanced scientific and technological knowledge and strengthening links between scientific communities**

**At present:**

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-going activities</td>
<td>119</td>
</tr>
<tr>
<td>Multi-Year Projects</td>
<td>85</td>
</tr>
<tr>
<td>Workshops and training events</td>
<td>34</td>
</tr>
<tr>
<td>Co-directors from more than 50 different countries</td>
<td>34</td>
</tr>
</tbody>
</table>
Success Stories

Former NATO grantee Prof. Aziz Sancar awarded 2015 Nobel Prize in Chemistry

Aziz Sancar received:
• NATO Fellowship in the 1970s
• 2 Collaborative Research Grants (1980s & 1990s)
• Grants supported award winning research on DNA repair mechanisms

Widely publicized through NATO outreach channels: Website, Social Media, etc.
Best Scientific Researcher of Tunisia:

- Prize award to **Prof. A. Abdelghani** by President of Tunisia in 2015
- Director of SPS project “Multisensing Platform for Warfare Agent Detection”

Best Demo Award at IEEE DySPAN 2015 conference:

- For demo implementation “REM-facilitated Smart WiFi” of SPS project “Optimization and Rational use of wireless Communication bands”
NATO SPS Partnership Prize to 3 multi-year projects in the following SPS Key priorities:

- Advanced Technologies
- Cyber Defence
- CBRN Defence

Prof. Otokar Grošek, SPS co-director, Slovak Scientist of the Year in the category “Figure of International Cooperation”.

Success Stories

Compact Sensor for Unmanned Aerial Vehicles

Secure Implementation of Post-Quantum Cryptography

The Anthrax MntABC Transporter: Structure, Dynamics, and Drug Discovery
High Visibility for your Research

• **Publications** in the NATO Science Series:
  - Proceedings of SPS Events (ARW, ASI ATC)

• **Mainstream Media Coverage**: SPS activities have e.g. been covered in the *New York Times, Bloomberg Business, Politico, Washington Post, local media and journals*

• **SPS Website**: Successful SPS activities are featured online in news stories and videos

• **Social Media**: Photos, Announcements & Updates of SPS activities are shared on the **SPS Twitter Account @NATO_SPS**
Science for Peace and Security (SPS) Cooperation with Belarus

Belarus has been an active Partner within the framework of the NATO SPS Programme since 1992. It is part of the 30-nation Euro-Atlantic Partnership Council (EAPC), a multilateral forum for dialogue and consultation on political and security-related issues among Allies and Partner countries in the Euro-Atlantic region.

- **36** activities with Belarus since 1992
- **42** NATO Ally and Partner countries have cooperated with Belarus in SPS activities since 1992
- **11** Multi-Year Projects (MYP)
- **14** Advanced Study Institutes (ASI)
- **11** Advanced Research Workshops (ARW)
- **21** publications resulting from SPS activities led by Belarus

Cooperation with Belarus over the Past Decade

Activities with Belarus have focused on the following SPS Key Priorities:
- **Advanced Technologies**
- **CBRN Defence**

- **343** students and lecturers have taken part in ARWs led by Belarus and NATO Allies
- **250** young scientists have benefitted from exchange programmes

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SPS Activities led by Belarus
Advanced Technologies

Nano-Structures and Photonics: Optical Strategies for Enhancing Sensing, Imaging, Communications and Energy Conversion (G4482)
July 2013, Sicily, Italy

Nano-Optics: principles Enabling Basic Research and Applications (G4883)
4-19 July 2015, Sicily, Italy

Quantum Nano Photonics (G5187)
(20 July-4 August 2017)

- Advanced Study Institutes (ASI) led by Belarus and United States of America
- Held at ‘ETTORE MAJORANA’, Centre and Foundation for Scientific Culture, Erice, Italy
Quantum Nano Photonics

- Advanced Study Institute (ASI) led by Belarus and the United States of America
- Organized by Stepanov Institute of Physics and Boston College
- ASI took place in July-August 2017 in Sicily

Goal: provide the young scientists with a clear exposition of the principles of nano-photonics, and the application of nanotechnology to mold the flow of light and control the interactions between light and matter.

Outcome:
- Enabled the participants to pursue research activities in this field
- Facilitated efforts to move from basic theory to applications, particularly those that relevant to the defence and security fields.
SPS Activities led by Belarus
Advanced Technologies

**Fundamental and Applied NanoElectro-Magnetics II: Terahertz circuits, materials, devices**

- Advanced Research Workshop (ARW) led by Belarus and Italy
- Organized by the Belarusian State University and University of Cassino and Southern Lazio
- ARW took place on 5-7 June 2018 in Minsk, Belarus

**Participants:**
- Internationally-recognized experts in different areas of nanotechnology and electromagnetics
- PhD students and post-docs had the opportunity to describe their research in a dedicated poster session.

**Goal:**
- to provide a forum for scientists specializing in different areas of the nanoparticles and nanostructured materials synthesis and applications to interact with their counterparts working in the areas of electromagnetic theory and applied electromagnetics.
- Establish the potential for nano-electromagnetics in the defence and security fields

**Outputs:**
Outcome:

- A general database on mobile and immobile radioactive substance from soil and water samples from the contaminated Polessie region in Belarus;
- Establishment of a dynamic map that includes meteorological and hydrological information for predicting the migration and transport of radioactive particles;
- Transfer of knowledge to end-users.

Goal: develop uniform methods for sampling and measurement of a number of isotopes in soil and water, and the level of contamination within Chernobyl exclusion zone and the Khoiniki District of the Reserve.

Radioactive Contamination in the Polessie State Radiation-Ecological Reserve

- Multi-year project led by Belarus, Ukraine, and Norway
- Kicked-off in June 2008 and concluded in January 2012

End users:
- Ministry of Emergency Situations
- Ministry of Environmental Safety and Natural Resources of Belarus

SPS Activities led by Belarus
Environmental security
SPS Activities led by Belarus
Environmental security

Flood Monitoring and Forecast in the Pripyat River Basin

- Multi-year project led by Belarus, Ukraine, and Slovakia
- Kicked-off in November 2009 and concluded in November 2011

End users:
- Hydrometeorological Centres at Brest Oblast (Belarus) and Volyn Oblast (Ukraine)
- Ministry of Natural Resources and Environmental Protection (Belarus)
- Central Research Institute for Complex Water Resources (Belarus)
- Nuclear Power Station at Rivne, Ukraine.

Outcome:
- Riverbed and floodplain cross-sections of the Pripyat river basin as a basis for river-monitoring design and hydraulic modeling;
- Installment of a network of seven river monitoring stations at the Pripyat river estuary (five upstream in Ukraine and two in Belarus);
- Online public data sharing of water level, current, precipitation, flood forecast and warning;
- 4. Knowledge transfer to end-users.
SPS Activities in cooperation with Belarus

Environmental security

New Phytotechnology for Cleaning Contaminated Military Sites

- Multi-Year Project led by Czech Republic and Ukraine
- Kicked-off in April 2016
- Involves experts from Belarus, Kazakhstan and Slovakia

Goal:
- Develop methods for producing biomass from grass hybrid, grown on contaminated military sites, in order to decontaminate soil.
- Focus on how to produce second generation biofuels from the biomass

Outputs:
- New phytoremediation technology could be another alternative approach to the rehabilitation of military sites.
- The biomass production would offer the possibility to the defence research and development community to advance the biofuel production.
- Publication of a guideline book that will enable relevant authorities to use the method for commercial production of this grass hybrid on contaminated soil.
Light-Matter Interactions Towards the Nanoscale

SPS Activities led by Belarus
CBRN Defence

Advanced Study Institute (ASI) led by Belarus and USA
Organized by Stepanov Institute of Physics and Wheaton College
ASI held on 20 July-4 August 2019 in Sicily, Italy
23 posters and 16 short seminars were presented
Website: https://sites.google.com/view/nanophotonics2019

Participants:
- advanced graduate students,
- postdoctoral appointees,
- researchers

Goal:
- introduce the participants to the fields of research that utilize light-matter interactions on the nanoscale
- provide a comprehensive overview of experiments and theory, basic physics and applications, as well as nanofabrication and optical characterization.
SPS cooperation with Belarus
Public Diplomacy Impact

The Pripyat River Basin on the border between Belarus and Ukraine is prone to severe flooding, impacting local economies and communities. The basin includes the Chernobyl Exclusion Zone and one of the river’s tributaries provides a local nuclear power station with cooling water, so effective monitoring is essential.

NATO helps Belarus and Ukraine cope with flood risks
29 Nov 2011 | Last updated 22 Mar 2012 10:27

This is to announce that the Funner of the “Applied Sciences Best Poster Award” at the Conference “Fundamental and Applied Nanoelectromagnetics” (FANEM) was Miss Silvia Bintelli, with the poster “2D model of silver nanocubes electrode for polymer solar cells applications.”
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