NATO OTAN

The NATO Science for Peace and Security Programme

Science for Peace and Security (SPS) Programme

Dr. Deniz Beten
Senior Advisor SPS Programme and Partnership Cooperation

Emerging Security Challenges (ESC) Division

NATO HQ

History of Science at NATO

SPS

60th ANNIVERSARY

60 70 80 90 00 10 18

Science Committee

SPS

Committee on the Challenges of Modern Society

Intra-NATO Cooperation

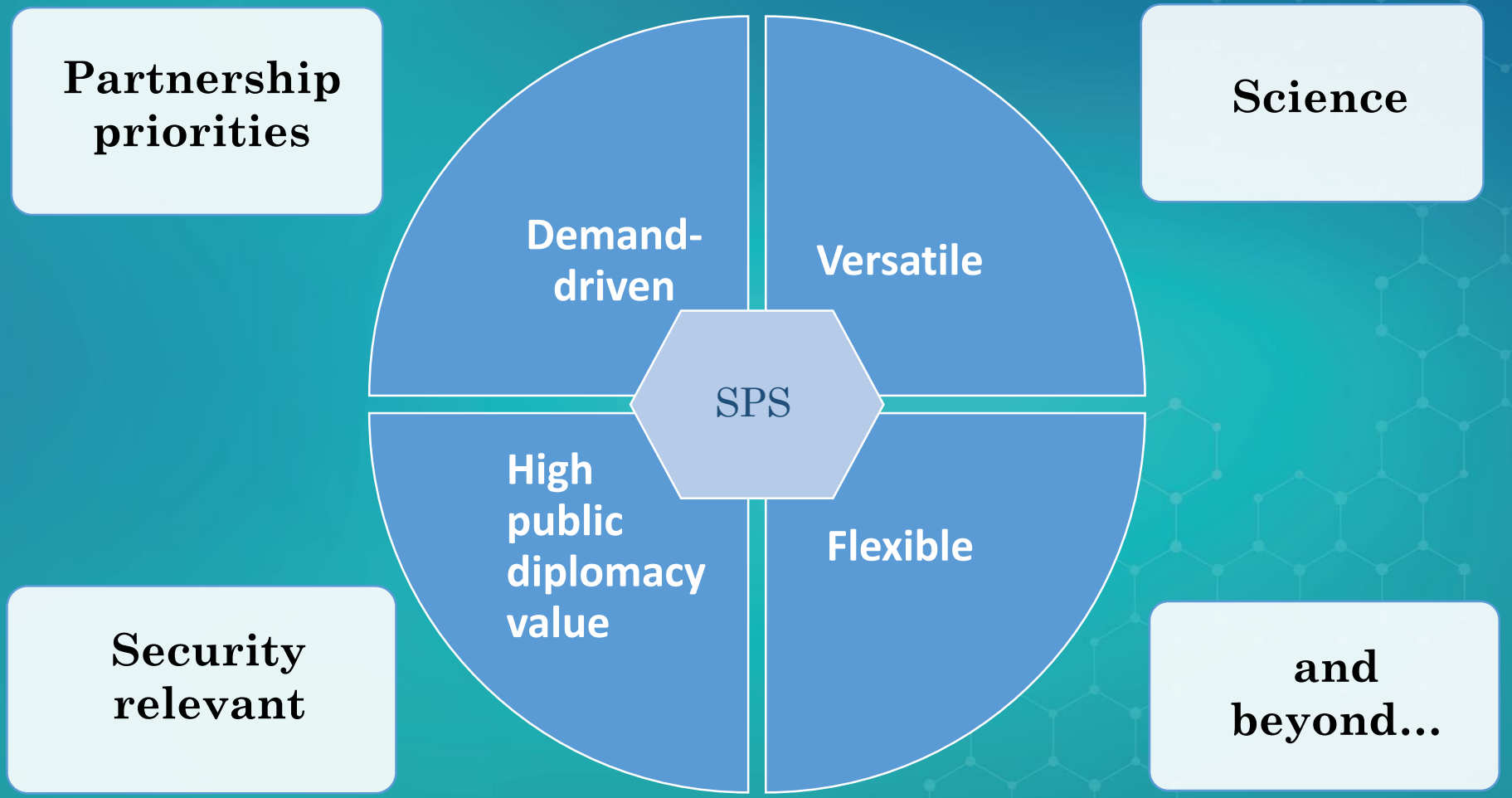
Partnership

ESC Division

Building Scientific Communities

Security

The Science for Peace and Security (SPS) Programme is..



…in close cooperation with other NATO Divisions & Bodies

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

SPS COOPERATION

Mediterrean Dialogue (MD)

Algeria, Egypt, Israel, Jordan, Mauritania, Morocco, Tunisia

Istanbul Cooperative Initiative (ICI)

Bahrain, Kuwait, Qatar, United Arab Emirates

SPS Grant Mechanisms

Multi-year Projects

R&D projects; Purchase equipment; Reimburse travel expenses; training for young scientists

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

Advanced Research Workshop (ARW)

Expert workshops aimed at finding solutions for today's security challenges.

A. Projects

B. Training

C. Workshops

Some highlights of the SPS Programme

In the past decade, the SPS Programme:

5800+ young Scientists and trainees trained

160+ multi-year projects completed

400+ events organised (Advanced Research Workshops, studies Institute and Training Courses)

300+ journal publications supported

200+ books published in the NATO Science Series

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

At present:

119 on-going activities

85 Multi-Year Projects

34 Workshops and training events

34 Co-directors from more than **50** different countries

Success Stories

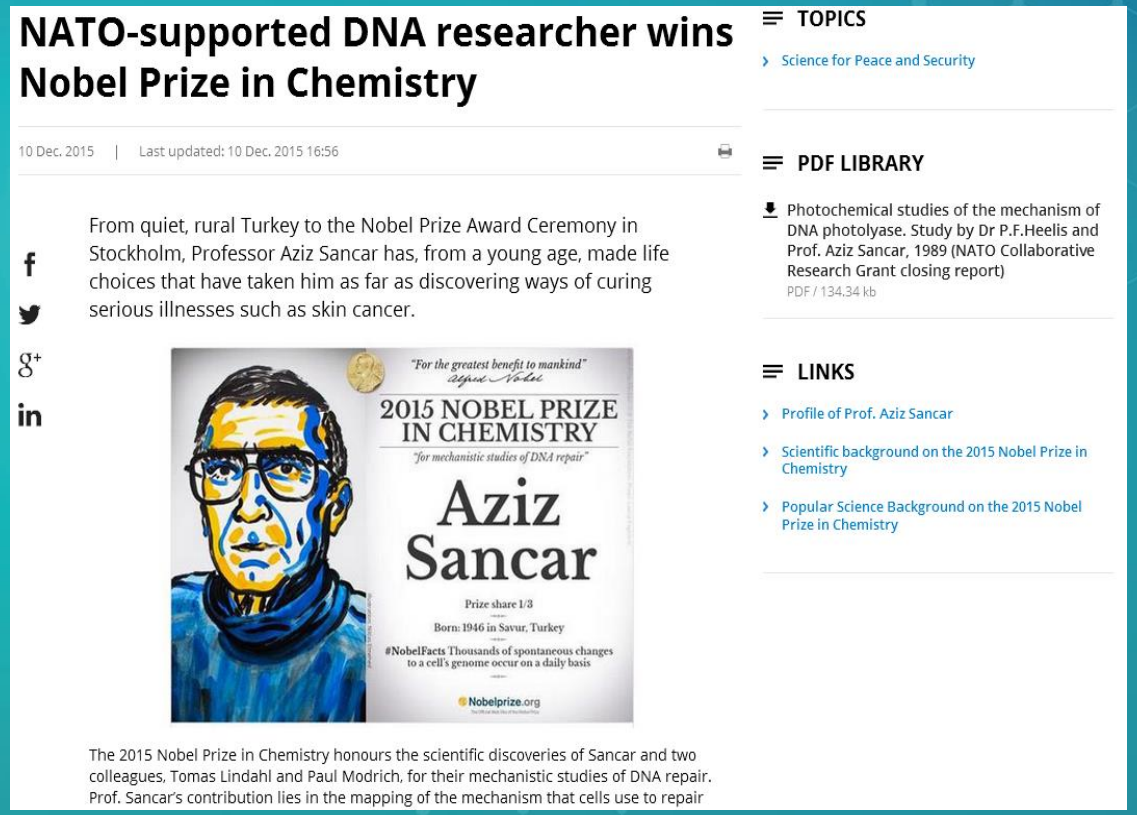
Former NATO grantee Prof. Aziz Sancar awarded

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.



NATO-supported DNA researcher wins Nobel Prize in Chemistry

10 Dec. 2015 | Last updated: 10 Dec. 2015 16:56

From quiet, rural Turkey to the Nobel Prize Award Ceremony in Stockholm, Professor Aziz Sancar has, from a young age, made life choices that have taken him as far as discovering ways of curing serious illnesses such as skin cancer.

The 2015 Nobel Prize in Chemistry honours the scientific discoveries of Sancar and two colleagues, Tomas Lindahl and Paul Modrich, for their mechanistic studies of DNA repair. Prof. Sancar's contribution lies in the mapping of the mechanism that cells use to repair

TOPICS

› Science for Peace and Security

PDF LIBRARY

Photochemical studies of the mechanism of DNA photolyase. Study by Dr P.F.Heelis and Prof. Aziz Sancar, 1989 (NATO Collaborative Research Grant closing report)
PDF / 134.34 kb

LINKS

› Profile of Prof. Aziz Sancar

› Scientific background on the 2015 Nobel Prize in Chemistry

› Popular Science Background on the 2015 Nobel Prize in Chemistry

Success Stories

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**"

Success Stories

NATO SPS Partnership Prize to 3 multi-year projects in the following SPS Key priorities:

- **Advanced Technologies**
- **Cyber Defence**
- **CBRN Defence**

Compact Sensor for Unmanned Aerial Vehicles

Secure Implementation of Post-Quantum Cryptography

The Anthrax MntABC Transporter: Structure, Dynamics, and Drug Discovery

Prof. Otokar Grošek, SPS co-director

Slovak Scientist of the Year in the category "**Figure of International Cooperation**".

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**

SPS Activities in cooperation with Belarus since 1992

Facts and Figures

NATO OTAN

The NATO Science for Peace and Security Programme

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 50-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

11 Multi-Year Projects (MYP)
14 Advanced Study Institutes (ASI)
11 Advanced Research Workshops (ARW)

21 publications resulting from SPS activities led by Belarus

42 NATO Ally and Partner countries have cooperated with Belarus in SPS activities since 1992

- Armenia
- Australia
- Austria
- Azerbaijan
- Belgium
- Bulgaria
- Canada
- Czech Republic
- Denmark
- Finland
- France
- Georgia
- Germany
- Greece
- Hungary
- Israel
- Italy
- Japan
- Kazakhstan
- Kyrgyz Republic
- Latvia
- Lithuania
- Mexico
- Norway
- The Netherlands
- Pakistan
- Poland
- Portugal
- Republic of Korea
- Republic of Moldova
- Romania
- Russia
- Saudi Arabia
- Slovakia
- Spain
- Sweden
- Switzerland
- Turkey
- Ukraine
- United Kingdom
- United States of America
- Uzbekistan

250 young scientists have benefitted from exchange programmes

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

www.nato.int/science @NATO_SPS

SPS Activities led by Belarus

Advanced Technologies

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

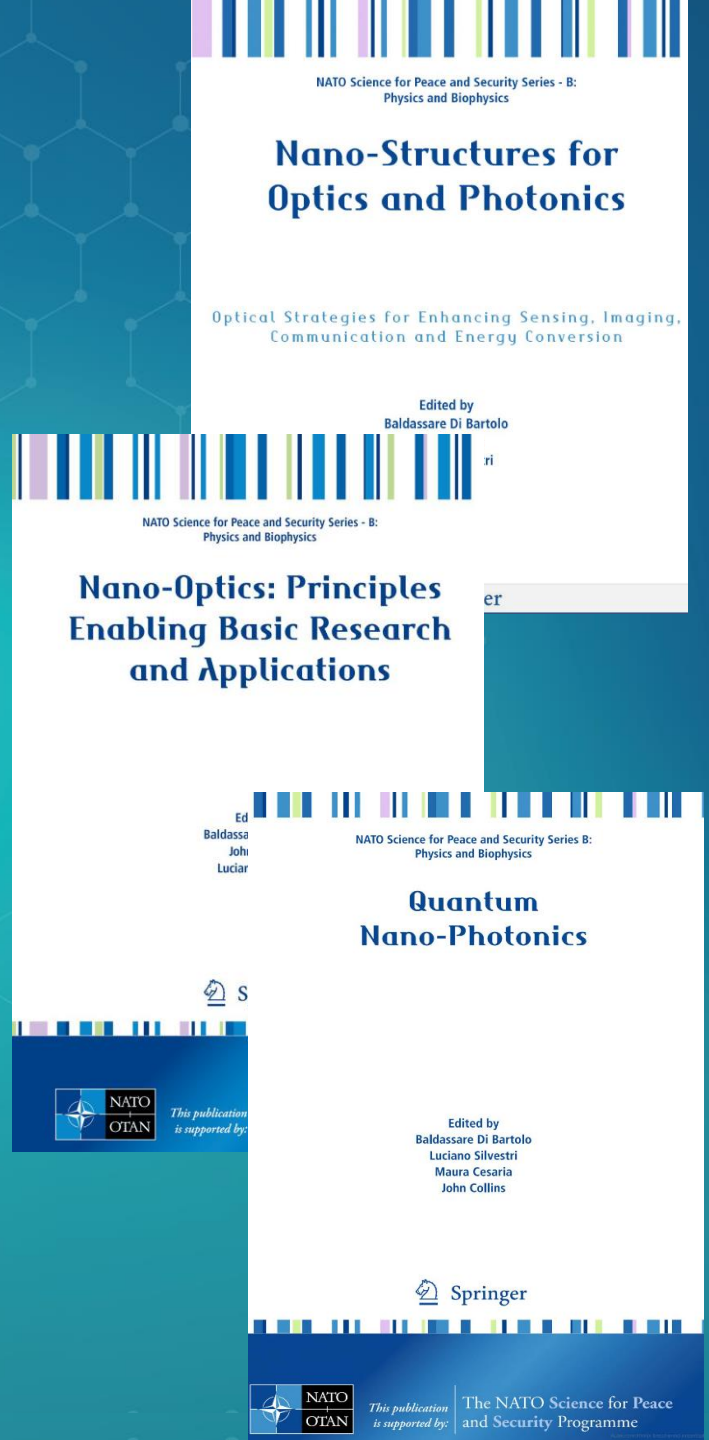
July 2013, Sicily, Italy

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**

SPS Activities led by Belarus

Advanced Technologies

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**

- **Participants:**
  - ✓ advanced **graduate students**
  - ✓ **postdoctoral** appointees
  - ✓ **researchers** working in the field of nano-photonics

Two **poster sessions** presenting **30 posters**

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.**

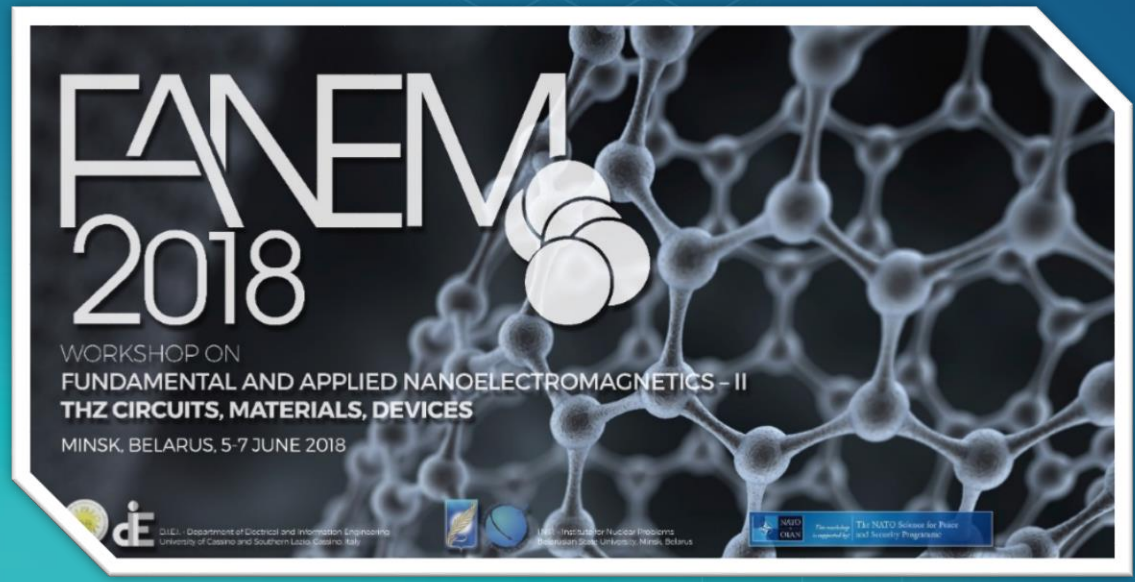
Outcome:

- ✓ 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.
- ✓ Publication, '***Quantum Nano-photonics***', Springer, NATO Science Series

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:

- ✓ Publication '***Fundamental and Applied NanoElectroMagnetics-II: THz circuits, materials, devices'***, Springer, NATO Science Series

SPS Activities led by Belarus

Environmental security

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**

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.**

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**.

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.

Nano-Structures and Nano-Optics
Lukas Novotny, ETH, Zurich, SWITZERLAND

Nano-Plasmonic Whispering Gallery Mode Hybrid Sensors
Stephen Arnold, New York University, New York, NY, USA

Terahertz Light-Matter Interactions at the Nanoscale
John Bowen, University of Reading, Reading, UK

3D Laser Nano-Printing
Martin Wegener, Karlsruhe Institute of Technology, Karlsruhe, GERMANY

Symmetry in Light-Matter Interactions
Ivan Fernando-Corbaton, Karlsruhe Institute of Technology, Karlsruhe, GERMANY

Time Reversal Symmetry, Nonreciprocity and Topology in Photonics
Mário Silveirinha, Technical University of Lisbon, Lisbon, PORTUGAL

Plasmonic Effects on Photonic Processes and Devices
Sergey Gaponenko, National Academy of Sciences, Minsk, BELARUS

Near-zero Index Metamaterials
Clayton DeVault and Eric Mazur, Harvard University, Cambridge, MA, USA

Integrated Quantum-Optical Chips
Wolfram Pernice, University of Münster, Münster, GERMANY

Workshop in Computational Nanophotonics
Lora Ramunno, University of Ottawa, Ottawa, CANADA

Metamaterials
Ekaterina Shamonina, Oxford University, Oxford, UK

Ultrafast and Strong-Field Optics
Mark I. Stockman, Georgia State University, Atlanta, GA, USA

Surface-Plasmon Mediated Decay Processes of Ions
John Collins, Wheaton College, Norton, MA, USA

Fluorescence Nanoscopy from Ensemble to Single Molecule
Ilaria Testa, KTH, Stockholm, SWEDEN

SPS Activities led by Belarus

CBRN Defence

Light-Matter Interactions Towards the Nanoscale

- **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

INP

| INP at a Glance | Research | Scientific laboratories | Projects | Publications | Innovative activities | Contacts |

Events

5-7 June 2018

The international scientific workshop **FANEM 2018** (Fundamental and Applied NanoElectroMagnetics II: THz circuits, materials, devices) was held in Belarusian State University.

Following the success of the 2015 Edition, this NATO Advanced Research Workshop on "Fundamental and Applied NanoElectroMagnetics (FANEM)" became a unique forum for scientists and technologists providing a complete coverage of the current state-of-the-art in nanoelectromagnetics.

Internationally-recognized experts in different areas of nanotechnology and electromagnetics discussed about general theory, modeling, design, synthesis and characterization, focusing on different applications ranging from commercial thin-film coatings to metamaterials, from circuit components to nanodevices.

Specifically, the focus of the 2018 Edition of FANEM was on nanoelectromagnetics enabling technologies for the Terahertz applications. Terahertz technology is indeed a challenging frontier in electronics and electromagnetics applications, with a potential huge impact on fields like medical imaging and security, as well as spectroscopy, characterization, failure analysis and so on.

Institute for Nuclear Problems BSU became the co-organizer of the workshop.

NATO helps Belarus and Ukraine cope with flood risks

29 Nov. 2011 - | Last updated: 22 Mar. 2012 10:27

English | French | Russian | Ukrainian

The Pripyat River Basin on the border between Belarus and Ukraine is prone to severe flooding, impacting local communities and economies. 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.

Applied Sciences @Applsci Segui

This is to announce that the #winner of the "Applied Sciences Best Poster Award" at the Conference 'Fundamental and Applied NanoElectroMagnetics (#FANEM)' was Miss Silvia Bistarelli, with the poster 'A 2D model of silver nanowires electrode for polymer solar cells applications'.

19:03 - 11 giu 2018

4 Mi piace

Applied Sciences @Applsci · 12 giu

The picture of the official ceremony during the conference banquet. From the left: the award recipient Silvia Bistarelli and the members of Applied Sciences editorial board Prof. Gregory Slepyan, Prof. Antonio Maffucci and Prof. Philippe Lambin

GEFAM

- Grupo Especializado de Física Atómica y Molecular – RSEF – RSEQ -

¿QUIENES SOMOS? NOTICIAS EMPLEO PREMIOS Y AYUDAS SOCIOS CONTACTO

NATO Advanced Study Institute titled "Light-Matter Interactions Towards the Nanoscale" to be held in Erice, Italy on July 20- August 4, 2019.

The *International School of Atomic and Molecular Spectroscopy* of the *Ettore Majorana Center* is organizing a NATO Advanced Study Institute titled "**Light-Matter Interactions Towards the Nanoscale**" to be held in Erice, Italy on July 20- August 4, 2019.

MISCOMAR at the 14th International Phytotechnologies Conference in Montreal

12.10.2017

MISCOMAR idea and results after first growing season was presented by project coordinator - Dr Marta Pogrzeba on 14th Inte Phytotechnologies Conference - Phytotechnologies: New sustainable solutions for environmental challenges. IPC2017 took place in from 25 to 29 of September 2017.

Few pictures from presentation titled: Phytoremediation potential of novel seed-based *Miscanthus* germplasm cultivated on contamina an introduction to the MISCOMAR project you can find below.

Moreover presented results of seed-based hybrids and their potential to phytoremediation have aroused great interest among scientist, the groups working with *Miscanthus*. Prof. Larry Erickson and Dr Ganga Hettiarachchi representing Kansas State University are really i in future collaboration, but also to exchange the knowledge within MISCOMAR and NATO Project G4687 - New Phytotechnology for Contaminated Military Sites on they are involved. Below the picture of prof. Larry Erickson, Dr Marta Pogrzeba and Dr Ganga Hettiarach the left).

Issue	Radioprotection Volume 46, Number 6, 2011 ICRER 2011 – International Conference on Radioecology & Environmental Radioactivity: *Environment & Nuclear Renaissance*
Page(s)	S771 - S777
Section	Management and General Considerations
DOI	https://doi.org/10.1051/radiopro/20116948s
Published online	09 January 2012

Radioprotection, vol. 46, n° 6 (2011) S771-S777

Radioactive contamination in the Belarusian sector of the Chernobyl Exclusion Zone

J.E. Brown[1], Y. Bondar[2], V. Kashparov[3], A. Nalbandyan[1], A. Navumav[4], L. Skipperud[5], G. Sokolik[6], P. Strand[1] and

[1] Norwegian Radiation Protection Authority, P.O. Box 55, N-1332 Østeras, Norway

[2] Polessie State Radiation-Ecological Reserve, Tereshkovoy Street 7, Khoiniki, Gomel Region 247601, Belarus

[3] Ukrainian Institute of Agricultural Radiology of National Agricultural University, Mashinobudivnykiv St., 7, Chabany, I distr., Kyiv reg. 08162, Ukraine

[4] Institute of Radiobiology of the National Academy of Science of Belarus, Fedjuninskogo st., 4, Gomel 246007, Belaru

[5] Norwegian University of Life Sciences, P.O. Box 5003, N-1432 Ås, Norway

[6] Belarus State University, Faculty of Chemistry. Nezavisimosty ave. 4, Minsk 220030, Belarus

[7] Republican Center of Radiation Control and Environment Monitoring, Nezavisimost' av., 110a, Minsk 220114, Belaru

Abstract

This article summarises some key activities undertaken as part of a NATO-funded project to map and improve our un behaviour and fate of radionuclides in the Belarusian Sector of the Chernobyl Exclusion zone. Data are presented concentrations of ^{137}Cs, ^{90}Sr and selected actinides and how these data have been used to produce contour maps densities. Factors affecting the transfer of radionuclides to plants and animals at selected study sites are cc geochemical phase association of radionulcides in soils and implications for actinide mobility commented upon. subject for elaboration has been the transboundary transport of contamination by natural phenomena. The influenc remobilisation of radionuclides, for example, has been addressed through the application of a bespoke probabilistic n

ОБЩЕСТВО

С декабря в Беларуси начнет эксплуатироваться первая автоматизированная гидрометеорологическая станция

1 декабря 2011 в 02:18

Анастасия Янушевская, БелаПАН

С декабря в Беларуси начнет эксплуатироваться первая автоматизированная гидрометеорологическая станция.

Как сообщил БелаПАН начальник отдела водного мониторинга и кадастра Централь научно-исследовательского института комплексного использования водных ресурсо Владимир Корнеев, станция будет установлена на реке Стырь (бассейн реки Припят деревне Лопатин Пинского района Брестской области. Она позволит измерять пять показателей режима воды в бассейне Припяти: уровень воды, температуру воздуха воды, влажность воздуха и количество осадков. На основании полученных данных специалисты смогут оценивать и прогнозировать паводковую ситуацию. В перспекти это позволит снизить ущерб от наводнений в регионе.

По словам Корнеева, в Беларуси насчитывается более 120 пунктов наблюдений за уровнем воды. Особенностью первой автоматизированной станции по сравнению с существующими является ее большая оперативность, возможность показывать

NATO OTAN

MILITARY SITES CLEANING

NEW PHYTOTECHNOLOGY FOR CLEANING CONTAMINATED MILITARY SITES

HOME | LATEST NEWS | PARTNERS AND LIASONING ORGANIZATIONS | EVENTS | PUBLICATIONS | RESEARCH | DISSEMINA | USEFUL DOCUMENTS

SEARCH ...

COMING EVENTS

MAY 27, 2019

Dessimination results SPS MYP project G4 2nd International Mee New Strategies in Bioremediation Proces 25 October, Porto, Portugal.

APRIL 1, 2019

March, 2021. Expert's "Pest management of crops with focus on Miscanthuxxgiganteus",

NATO SPS MYP G4687

"New Phytotechnology for Cleaning Contaminated Military Sites"

Project is granted by **NATO Science for Peace and Security Program** (SPS), Multiyear Research Project (MYP), http://www.nato.int

Duration of the project: 54 month.

Project active day: October 6, 2016.

The NATO Science for Peace and Security Programme

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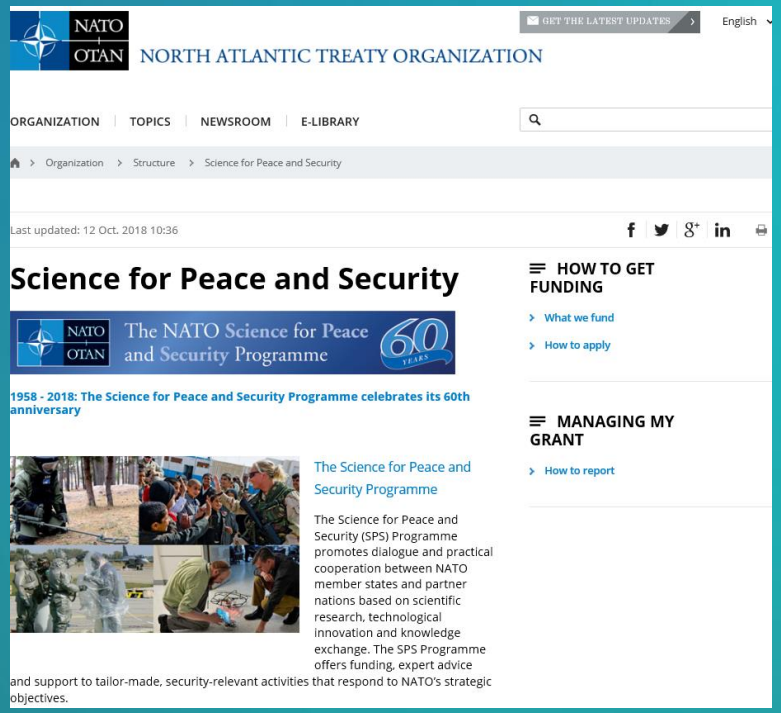

nato.int/science

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