Workshop on **Countering Radiological and Nuclear threats**
8th November 2018
Istituto Superiore Antincendi (ISA) - Via del Commercio 13, 00154 Rome (Italy)

REGISTRATION **08:00 a.m. - 08:30 a.m.**
OPENING CEREMONY
08:30 a.m. - 9.00 a.m. **Welcome addresses** Arch. Gennaro Tornatore (Italian Fire Fighters – Director of ISA) Rector Prof. Giuseppe Novelli (University of Rome Tor Vergata, Italy) Major General Paolo Giovannini (Italian Army)
09:00 a.m. - 09:10 a.m. **The Role of Research for R/N Risks** Prof. Francesco d'Errico *(University of Pisa, Italy)*
09:10 a.m. - 09:15 a.m. **International Master courses in Protection against CBRNe events** Prof. Leonardo Palombi *(University of Rome Tor Vergata, Italy)*
SESSION 1
09:15 a.m. - 09:45 a.m. ***KEYNOTE SPEAKER*** **Defusing the Bomb: A Phased Approach for a Verified Denuclearization of North Korea** Prof. Alexander Glaser *(Princeton University, USA)*
09:45 a.m. - 10:05 a.m. **WMD Disablement – Developing a new Capability** Lt. Col. Bernd Allert *(JCBRND COE NATO, Czech Republic)*
10:05 a.m. - 10:40 a.m. COFFEE BREAK/INDUSTRIAL EXHIBITION
10:40 a.m. - 11:00 a.m. **Guidelines for first responders based on results from deploying a mockup dirty bomb** Carlos Rojas Palma *(SCK CEN, Belgium)*
11:00 a.m. - 11:20 a.m. **Developing procedures and actions in R/N improvised devices attacks** Milica Marčeta Kaninski *(Vinča Institute of Nuclear Sciences, University of Belgrade, Serbia)*
11:20 a.m. - 11:40 a.m. **The role of Italian Navy in CBRN events – The radiological and nuclear concerns** Commander Fabio Polidoro *(NAVAL GENERAL STAFF, CBRN Section Chief, Italian Navy)*
END SESSION 1
11:40 a.m. - 12:10 a.m. POSTER SESSION/INDUSTRIAL EXHIBITION
12:10 a.m. - 01:30 p.m. LUNCH / POSTER SESSION / INDUSTRIAL EXHIBITION

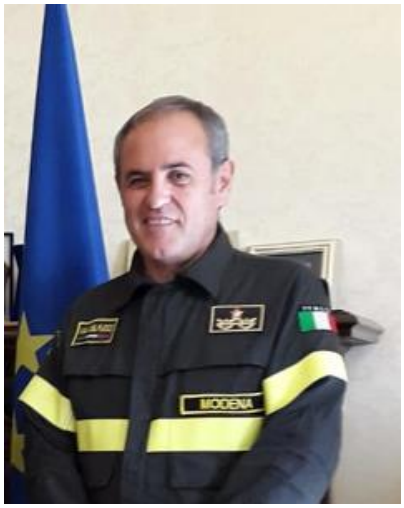
SESSION 2
01:30 p.m. - 02:00 p.m. ***KEYNOTE SPEAKER*** **Official and "unofficial" dosimetric measurements: the way from Chernobyl to post-Fukushima citizen science** Vadim Chumak *(National Academy of Medical Sciences of Ukraine)*
02:00 p.m. - 02:20 p.m. **Fukushima: an experience on the field** Massimo Morichi *(CAEN-SYS, Italy)*
02:20 p.m. - 02:40 p.m. **Detection of special nuclear material with a transportable active interrogation System: from the proof of concept to a dedicated design** Giuseppe Felici and Francesco Zanetti *(SIT-SORDINA, Italy)*
02:40 p.m. - 03:00 p.m. **Airborne and ground-based gamma radiation monitoring for man-made and environmental hazard mitigation purposes** Massimo Chiappini *(INGV, Italy)*
END SESSION 2
03:00 p.m. - 03:30 p.m. COFFEE BREAK
SESSION 3
03:30 p.m. - 04:00 p.m. ***KEYNOTE SPEAKER*** **Global security and safeguards** Massimo Aparo *(IAEA, Austria)*
04:00 p.m. - 04:20 p.m. **Modelling the economic impact of radiologically dispersed devices on a country** Prof. Steve Johnson *(Cranfield University, United Kingdom)*
04:20 p.m. - 04:40 p.m. **Active neutron interrogation in nuclear security applications** Bent Pedersen *(Joint Research Centre – European Commission - Italy)*
04:40 p.m. - 05:00 p.m. **Passive interrogation techniques** Alessandro Dodaro *(ENEA, Italy)*
END SESSION 3

ROUND TABLE
05:00 p.m. - 05:30 p.m. **Presentation New Agreements** Dr. Anna Figueras Masip (*Institute for Public Security of Catalonia, Spain*) Dr. Frank Duschek / Dr. Karin Grűnewald (*Aerospace Center Institute of Technical Physics, Germany*) Prof. Ricardo Armetano / Prof. Parag Chatterjee (*National Technological University, Buenos Aires, Argentina / University of the Republic, Uruguay*) Dr. Dieter Rothbacher *(President of SASIR, Italy)*
CLOSING REMARKS

Opening session

Commander Gennaro Tornatore

Italian Fire Fighters, Director of ISA - Istituto Superiore Antincendi (National Fire Academy)



Rector Prof. Giuseppe Novelli

University of Rome Tor Vergata, Italy

Rector of the University of Rome "Tor Vergata".

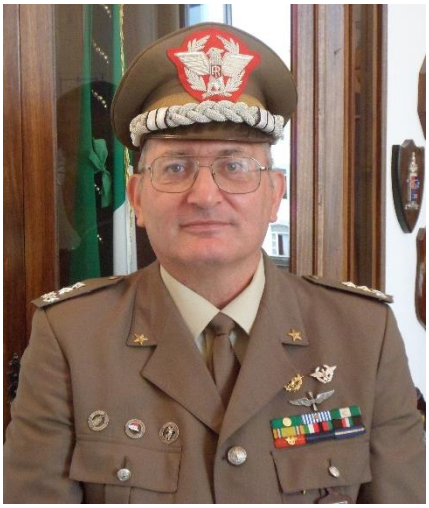
He has been Director of the U.O.C. Laboratory of Medical Genetics of the University “Policlinico di Tor Vergata”. He is Adjunct Professor at the University of Arkansas for Medical Sciences, Little Rock (USA). He is Scientific Director of the “Fatebenefratelli” Research Center, Rome “S. Pietro” Hospital and of the Center for Molecular Genetics of the IRCCS Neuromed Institute. He has been a member of the CRUI "Research Evaluation" Working Group and a member of the Superior Health Council.

Maj. Gen. Paolo Giovannini

Engineers Corp Italian Army

Born in Rome on 6 May 1957, he was appointed second lieutenant of the Technical Corp in 1981. He graduated in Mechanical Engineering at the Politecnico di Torino in 1985 and in 1987 he obtained the specialization in the engine sector.

In 2002 he was appointed helicopter section chief. He filled the position of Director of the 6th Division (Helicopters) and afterwards the 7th Division Vertical Flywheel aircraft.

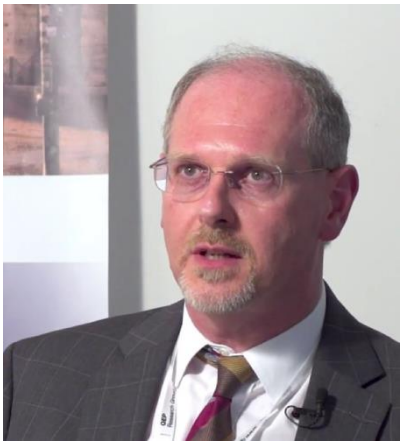


Oral contribution

The Role of Research for R/N Risks

Prof. Francesco d'Errico

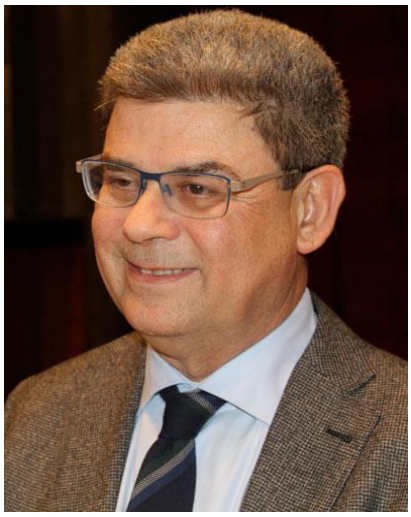
University of Pisa, Italy



Francesco d'Errico is an Associate Professor of Nuclear and Biomedical Engineering and of Medical Physics. He has performed and led multiple projects on advanced methods for radiation detection, dosimetry and imaging, and on image-guided radiological procedures supported by Italian, European and US agencies. FE has been Editor in Chief of the journal Radiation Measurements and is the Director of the Advanced Radiation Protection School "C. Polvani".

International Master courses in Protection against CBRNe events

Prof. Leonardo Palombi



University of Rome Tor Vergata, Italy

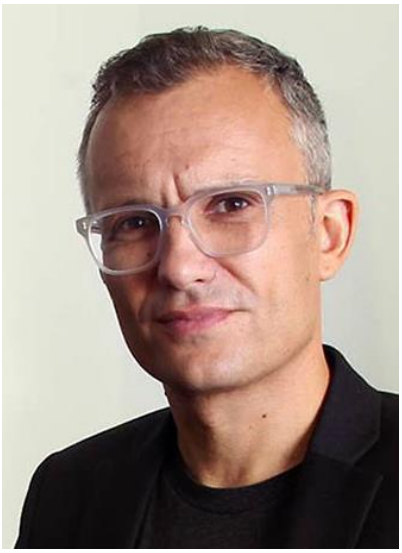
Dr. Leonardo Palombi, MD is a full Professor of Hygiene, Epidemiology and Public Health at University Tor Vergata, Faculty of Medicine. He is the head of the Biomedicine and Prevention Department in the same university. He is also scientific director of the DREAM (Drug Resource Enhancement against AIDS and Malnutrition) Program, a large private/public intervention in 10 African countries with 33 health centers and 20 molecular labs, run by a faith-based organization: the Community of Sant'Egidio. He is the coordinator of a PhD on Nursing sciences and Public Health at University of Tor Vergata, Rome. His main area of research has been HIV infection, infectious/ tropical diseases, global health, health planning and epidemiology of ageing. He has been Co-Principal Investigator in a number of national studies and international interventions. He has been involved as Managing Director for two World Bank Interventions in the Balkan area (1998-2000) and in Mozambique (2004-2007). He was a member of the National Italian Committee for HIV/AIDS (2003-2005) and was involved in the WHO guidelines preparation in Geneva for HIV (PMTCT 2006 -2008, HIVRESnet 2009, Consolidated Guidelines, 2012). Leonardo Palombi authored more than 250 publications (H Index 22), books and oral presentations at international meetings.

Abstract: The evolution of Safety and Security threats at an international level places remarkable focus on the improvement of the emergency systems to deal with the crisis, including those connected to ordinary and the non-conventional events (Chemical, Biological, Radiological, Nuclear, and explosives). Given the global interest in these issues, the Department of Industrial Engineering and the School of Medicine and Surgery of the University of Rome Tor Vergata organize the International Master Courses in "Protection against CBRNe events". The master courses aim to give a multidisciplinary and integrated education, in order to prepare the students to face a complex event such as a CBRNe event. The courses address all the CBRNe fields, from physics to chemistry, from law to communication. In fact, a CBRNe scenario requires a deep collaboration between Firefighters, Army, Public Health Departments, Privates, Research Institutes, etc. The CBRNe masters are characterised not only by theoretical studies but also practical activities and visits to public and private entities.

Defusing the Bomb: A Phased Approach for a Verified Denuclearization of North Korea

Prof. Alexander Glaser

Princeton University, USA



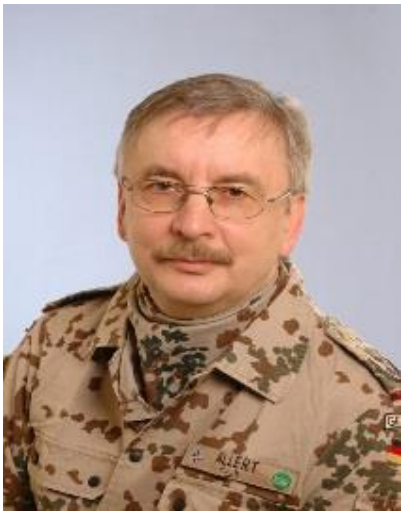
The work of Professor Glaser is focused on the technical aspects of nuclear-fuel-cycle technologies and policy questions related to nuclear energy and nuclear-weapon proliferation. He plans to continue research on these issues and to locate it in two important new contexts that have emerged only recently: 1) Proposals to increase reliance on nuclear energy, as part of the effort to mitigate climate change, and 2) Proposals to cut deeply the numbers of nuclear weapons and perhaps even eliminate them entirely. He intends to work on these issues with my current colleagues at the Program on Science and Global Security and on the International Panel on Fissile Materials. More importantly, He hopes to develop new collaborations with faculty and researchers in the School of Engineering and Applied Science and to contribute to the work on international security and climate change at the Woodrow Wilson School and at the Princeton Environmental Institute.

Abstract: Since the 1990s, there have been a number of unsuccessful attempts to halt and roll back North Korea's nuclear weapon program. Unexpectedly, in 2018, a possible denuclearization of North Korea has re-emerged as a genuine possibility. Confirming compliance with an agreement laying the basis for such a process would pose unprecedented verification challenges: No international inspections have taken place in North Korea since its withdrawal from the NPT in 2003. Since then, North Korea has significantly expanded its fissile-material production infrastructure and developed a nuclear arsenal that now also may include thermonuclear warheads. This talk proposes a number of elements that could become part of a new framework and verification plan. The approach relies on phased, technical measures to allow for the scope, pace, and intrusiveness of denuclearization to reflect progress in political confidence building. A critical first step would be a freeze on fissile material production and current weapon-related activities, followed by baseline declarations of current stockpiles of nuclear weapons, fissile materials, ballistic missiles and key components, and then verified reductions of these stockpiles and downsizing of its weapons complex. Along with being a historic opportunity to eliminate a nuclear weapons program, this effort to could help demonstrate new verification approaches and advanced nuclear forensic techniques. In the best case, it could therefore also pave the way for tackling the arsenals of other nuclear weapon states.

WMD Disablement – Developing a new Capability

Lt. Col. Bernd Allert

JCBRNe COE NATO, Czech Republic



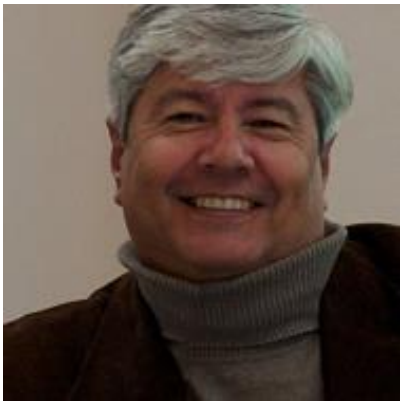
Bernd Allert joined the German CBRN Defence Corps in 1977. Since 2013, he has been working for the newly established Bundeswehr CBRN Defence Command within the Policy and Forces Development Division. He is responsible for standardisation and international cooperation. In addition, Allert works currently as the Acting Chairperson of NATO's Doctrine & Terminology Panel (DTP). From 2008 to 2013, Allert had been assigned to NATO's Weapons of Mass Destruction Non-Proliferation Centre (WMDC). His areas of expertise covered CBRN defence training, civil-military cooperation and international outreach. Prior to the NATO HQ assignment, he worked as a Deputy Force Protection Officer / Staff Officer CBRN Defence for Allied Component Command Headquarters Heidelberg (ALCC HQ). A seven-month tour as HQ ISAF's Deputy Theatre Force Protection Officer was included.

Abstract: At the 2009 NATO Summit in STRASBOURG/KEHL NATO's Heads of State and Government endorsed "NATO's Comprehensive, Strategic-Level Policy for Preventing the Proliferation of and Defending Against CBRN Threats". A capability gap on WMD Disablement (WMDD) was identified. Since then NATO's Military Committee endorsed a WMD Disablement Functional Concept. Currently, WMDD is defined as operations, which aim to systematically locate, secure, characterize, eliminate or dispose WMD, CBRN weapons, CBRN devices and materials. Along all lines of capability development (DOTMLPFI), the development of a WMDD doctrine has been initiated. Some minor WMDD events were and will be included into NATO's major exercises.

Guidelines for first responders based on results from deploying a mockup dirty bomb

Carlos Rojas Palma

SCK CEN, Belgium



Carlos Rojas Palma holds a PhD in Physics from the University of Antwerp, Belgium. In the past he has been actively involved in the field of nuclear emergency preparedness and response under the Environment, Health and Safety Institute of SCK•CEN. He coordinated several R&D projects and thematic clusters for the Euratom FPs (SAMEN, MOSES, DAONEM and DETECT), in off-site nuclear emergency management and rehabilitation of contaminated environments, and optimisation of radiological monitoring networks. He also coordinated the project resulting in the handbook for triage, monitoring and treatment of members of the public exposed to ionising radiation after a malevolent act (TMT Handbook). He has been a member of the expert group chair of the Assistance Work Group in charge of the implementation of the new IAEA action plan on notification and assistance in case of a nuclear incident or radiological emergency. He is currently advisor to the Belgian Superior Health Council; to the Counter Terrorism Unit of the European Commission DG Migration and Home Affairs and to the European Commission Research Executive Agency on security related matters

Abstract: One of the most documented scenarios whereby a terrorist organization could cause disruption and mass hysteria is the so-called “dirty bomb”, radiological dispersal device or improvised explosive device with a radiological payload. Many studies include source term characterization and have been conducted in environments with favourable dispersion conditions with little or no turbulent mixing which would occur in urban areas. During the past 7th Security Framework Program the European Commission (EC) funded a research project called CATO (CBRN Crisis management, Architectures, Technologies and Operational procedures) to develop a prototype decision support system for crisis management in addition to providing a suite of guidelines for first responders and incident commanders when dealing with chemical, biological, radiological or nuclear incidents. The results and guidance reported in this work originate from a set of field experiments, which were used to assess and evaluate the performance of the prototype decision support system (the CATO Lab) under realistic conditions with on-site support from the UK Counter Terrorism Unit Forensic Management Team. The EC classified the outcome of this research and the CATO security scrutiny group has ensured no sensitive information was released in this report.

Developing procedures and actions in R/N improvised devices attacks

Milica Marceta Kaninski

Vinča Institute of Nuclear Sciences, University of Belgrade, Serbia

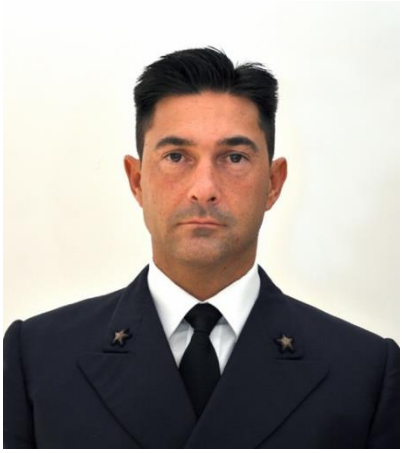
Dr Milica Marčeta Kaninski is Research Professor and Head of the Department of Physical Chemistry at VINČA Institute of Nuclear Science in Belgrade, Serbia. Dr Marčeta Kaninski received M.Sc. degree in 2005 and PhD in Physical Chemistry at University of Belgrade in 2009, with thesis Hydrogen Membrane Fuel Cells: Energy, Isotopic and Electrochemical Aspects. She has managed national and international scientific projects and published more than 30 papers in peer - reviewed journals. Dr Marčeta Kaninski is a member of Serbian Chemical Society and International Society of Electrochemistry ISE. She is also the reviewer in many journals, including Energy and Environmental Sciences, Electrochemistry Communications, International Journal of Hydrogen Energy and Journal of Applied Electrochemistry.

Abstract: Nowadays terrorist attacks using improvised explosive devices containing radioactive materials or diversion on nuclear installations causing leakage of radioactivity in environment is very realistic. In that sense everything possible has to be done to prevent that or to minimise the consequences of such attacks. Starting from risk assessment of possible attack and proper planning of security of nuclear installations and radioactive material storages, all necessary procedures of acting in such a cases should be developed. Field trainings of the explosives experts and technicians could serve as a good starting point in preparation of relevant structures in preventing and acting in case of R/N incidents, providing them necessary knowledge through the detection and decontamination scenarios, as well as the R/N waste removal procedures.

The role of Italian Navy in CBRN events – The radiological and nuclear concerns

Commander Fabio Polidoro

NAVAL GENERAL STAFF, 4th LOGISTIC DIVISION 2° Branch – CBRN Section Chief, Italian Navy



Commander Fabio Polidoro is a Marine Engineer officer with more than 25 years of military experience, twelve of them spent on board. He is specialized in Damage Control and for more than one decade he served as Branches Chief in Italian Navy Maritime Warfare Training Centre.
Since 2000 he has involved in CBRN operations as planner and instructor.
At present, he is a CBRN Section Chief in Naval General Staff (Rome).

Abstract: It is a common opinion, substantiated by publications, scenarios and exercises, believing or thinking that CBRN events affect and influence mainly "terrestrial" aspects. But are we sure of that?

A sight on the CBRN aspects in the NAVY with specific focus on R(adiological) and N(uclear) events.

Official and "unofficial" dosimetric measurements: the way from Chernobyl to post-Fukushima citizen science

Vadim Chumak

National Academy of Medical Sciences of Ukraine

Head of Department of Dosimetry and Radiation Hygiene, National Research Center for Radiation Medicine of National Academy of Medical Sciences of Ukraine. (Ukraine)
Since 1986 he worked in Ukrainian Research Centre for Radiation Medicine Academy of Medical Sciences, Department of Dosimetry and Radiation Hygiene. From 1994 to 2018 worked as head of Department of Applied Dosimetry, Radiation Protection Institute ATS Ukraine. Currently he is head of Department of Advanced Dosimetric Studies, Radiation Protection Institute ATS Ukraine.
He is also member of the: Commission of Hygiene Regulation of Radioactive Materials and Radiation Factors; Committee on Hygiene Regulation of Ministry of Health, Ukraine; Profile Commission 6 “Radiation Hygiene” of the Coordination Commission of the Principal Sanitary and Epidemiological Department of Ministry of Health, Ukraine. He has scientific experience and interests in dosimetry of external exposure, retrospective dosimetry, Monte-Carlo photon transport simulations, stochastic approaches in dosimetric models, EPR-dosimetry, individual dosimetric monitoring.

Abstract: Large scale radiological emergency, in particular nuclear accident, is associates with unexpected outbreak, rapid development and large uncertainty regarding the scale and degree of contamination due to release, particularly at the very beginning (initial or early phase of the event). As a result, specially trained and dedicated radiation surveillance forces and facilities will not be able to come to the scene and promptly collect the data (dose rates, samples, spectrometric characterization of the release vector, air concentrations etc) needed for decision making and countermeasure planning and implementation. The experience of past radiological emergencies shows that at this stage the lack of dedicated official (planned in advance and highly professional) measurements may be addressed by the unplanned measurements done in some occasions by non-professionals using, sometimes, improvised measurement instruments. Such measurements, performed after Chernobyl accident by uncoordinated persons served mainly to self-assurance of selected individuals or small groups (i.e. families). In turn, with development of communication technologies and increased role of social media, the ‘unofficial’ measurements after Fukushima accident became a significant phenomenon, providing essential information for filling data gaps and increasing public assurance and building trustful picture of post-accidental contamination and associated hazards. Nowadays the move towards citizen science in the area of radiological monitoring under normal and accidental conditions maintains this impetus. The evolution, current status and future developments will be presented and discussed in the talk.

Fukushima: an experience on the field

Massimo Morichi

CAEN-SYS, Italy

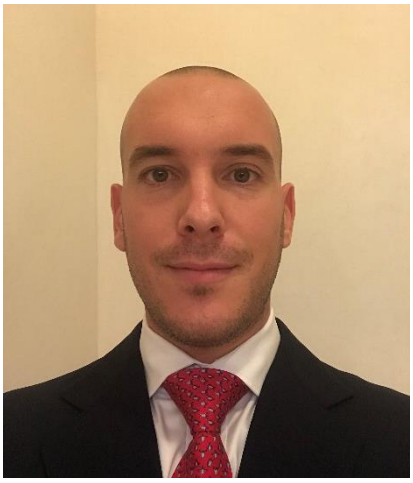
Upon finishing his technical studies at E. Fermi Institute of Rome in "Nuclear Energy", he specialized in Reactor Core Physics simulation & modelling participating to ENEA-PEC nuclear reactor studies on reactivity transient analysis. Doctor in Nuclear Physics at University "La Sapienza" of Rome (Italy) and Certified Radiation Protection Expert. Mr. Morichi start his activity with the Italian National Institute of Nuclear Physics-INFN and the Ministry of Interior for the Chernobyl emergency, and was teacher for the Ministry of Interior on Gamma-Spectrometry and Nuclear Emergency Measurements. Mr. Morichi worked in Oak-Ridge (US) as Spectroscopy Specialist, lived in Connecticut (US) for many years while he was CTO-VP R&D of CANBERRA Industries Inc. till 2012 launching and coordinating the development of many innovative nuclear measurement products/systems and collaborations with IAEA, DOE National Laboratories: Los Alamos, Sandia, DNDO, CEA. Group Leader of the AREVA Fukushima Project for the site remediation plan in Japan. In 2012 joint the AREVA-Group in Paris as SVP-Director of R&D Innovation where he contributes to establish the Nuclear Light Water Reactor Institute (EDF-CEA-AREVA) developing Technology Roadmaps and many new projects. He was visiting member of the Scientific Committee of IRSN (Institute for Nuclear Radiation Safety) and has been Board member of the Nuclear Experimental Reactor J. Horowitz (CEA Cadarache). He's panellist, chairman and invited speaker at IAEA Safeguard Conference, STS-Kyoto Forum on "Nuclear Technology Trends and Future Prospective", ANIMMA Conference, IEEE-NSS. Mr. Morichi supervised and tutor many Master and PhDs Thesis of international universities and has more than 40 International Scientific Publications.
Awards: Three International Patents related to innovative Nuclear Measurement Technologies

Abstract: Fukushima accident imposed a stretch to nuclear measurement operational approach requiring in such emergency: fast concept development, fast system integration, deployment and start-up in a very short time frame.
This paper is describing the Nuclear Measurement realized and foresight at Fukushima accident site by Dr. Morichi and his staff while he was Group Leader of Site Remediation describing the technical solution conceived, developed and deployed at Fukushima.
A detailed description of post-accident situation, action taken and all intervention and design choices, from detection technologies to system architecture is offered in the paper. This paper describes also the technical choices executed and put in place to overcome the challenges related to the high radiological contamination on site.

Detection of special nuclear material with a transportable active interrogation System: from the proof of concept to a dedicated design

Francesco Zanetti

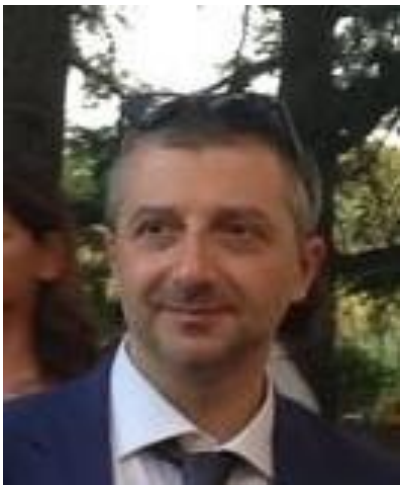
SIT-SORDINA, Italy



Francesco Zanetti is Executive Vice President of SIT Sordina IORT Technologies S.p.A. (SIT), company 96% owned by Zanetti family active in designing, manufacturing and selling miniaturized electron linear accelerators for IOeRT. SIT recently invested in new fields of business, SIT DEFENSE is SIT's new branch created especially for interacting with the Defense field. Mr. Zanetti main role has been company internationalization, new market opening and business diversification projects. He is partner of "Studio Zanetti & Partners" a CPA firm owned 100% by Zanetti family specialized in extraordinary enterprise national and international operations.He is shareholder of FIAMM S.p.A. a world leader manufacturer of components for automotive industry. Francesco Zanetti CEO of Thor S.r.l, a company 100 % owned by Zanetti family active in the Real Estate business.

Giuseppe Felici

SIT-SORDINA, Italy

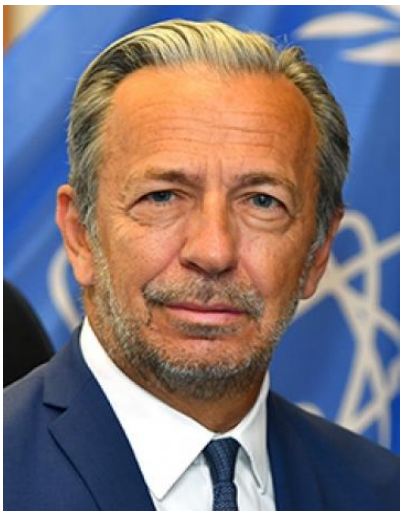


Giuseppe Felici is an Experienced Scientific Director with a demonstrated history of working in the medical practice industry, particularly in radiation therapy. Skilled in Medical Devices, Patent Law, Dosimetry, Management, and Nuclear Physics

Abstract: Rapid detection and identification of biological and chemical agents represent one of the major challenges today. Active Interrogation are considered the only viable option to detect the presence of Special Nuclear Material (SNM) such as Pu-239, Np-237 and highly-enriched U- 235 (HEU).
Our group created a complete active interrogation system based on detectors developed by the universities of Pisa and Yale and on an ultra-compact linear accelerator (LINAC) based on technology previously used in medical field. Initial test has proven the efficacy of the strategy adopted, and on such basis, a complete design of the system has been carried out.

Global security and safeguards

Massimo Aparo



IAEA, Austria

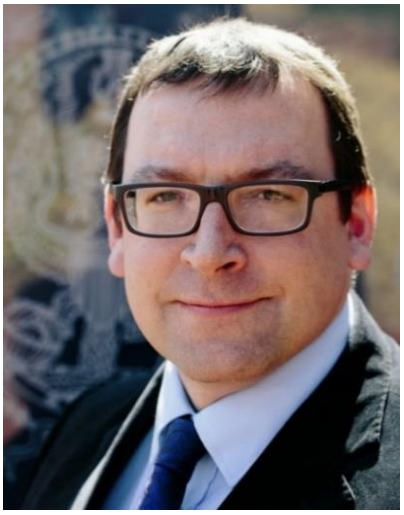
Massimo Aparo is Deputy Director General and Head of the Department of Safeguards. Prior to this, Mr Aparo was Acting Director, Office for Verification in Iran, since 1 March 2016.
Mr Aparo has been working at the IAEA's Department of Safeguards since 1997. He served as Section Head in the Division of Technical and Scientific Services, as Head of the Tokyo Regional Office in the Division of Operations A, and as Head of the Iran Task Force. Before joining the IAEA Mr Aparo worked as Director General of an Italian company in the area of radiation detection and monitoring, in the European Space Agency and at Italy's former National Committee for Nuclear Energy. Mr Aparo is a nuclear engineer.

Abstract: IAEA safeguards make a vital contribution to international peace and security. Through safeguards, the IAEA is able to provide credible assurances that States are honouring their international obligations to use nuclear material only for peaceful purposes, thereby helping to deter the spread of nuclear weapons. Through early detection of any diversion of nuclear material or misuse of technology, the IAEA can alert the world to potential proliferation.
This serves to build international confidence in the non-proliferation regime. However, the field of nuclear verification never stands still. The number of nuclear facilities coming under IAEA safeguards continues to grow steadily. While the demand for safeguards verification continues to increase, the IAEA's budget is not rising commensurately. We are meeting this challenge by maximising the collaborative contribution of our skilled workforce, streamlining our processes and introducing new technologies in support of our mission. To maintain its vital role as the cornerstone of the non-proliferation regime, the IAEA will also need to demonstrate its capability to detect undeclared nuclear activity, as well as verify what has been declared. This presentation considers the challenges and opportunities currently facing the IAEA.

Modelling the economic impact of radiologically dispersed devices on a country

Prof. Steve Johnson

Georgetown University, School of Continuing Studies, USA; Cranfield University, UK



Steve Johnson is an academic and consultant, with a distinguished track record in providing strategic advice, training and education to government, armed forces, academia and industry on CBRNE and forensics. Educated at Cambridge University and Cranfield University, he has received broad training across policing and counter terrorism. He is Adjunct Professor at Georgetown University where he teaches on Terrorism, CBRN, International Disaster response and Emergency and Disaster Management policy and law. At Cranfield University he is Course Director for the MSc Forensic Explosive and Explosion Investigation and runs courses and research on CBRN, Explosives and Terrorism. He was recently appointed to a number of committees at the University of Tor Vergata, on their CBRNE Protection Master of Engineering program, where he has also taught on explosives, CBRN and crisis communication. He advises the Insurance industry on CBRNE and other terrorist attacks. His calculations and models have been used by a wide range of insurers and reinsurers and his PhD research focuses on numerical methods to forecast frequency and severity of political violence using historical data sources. He has been Cranfield University's lead on the Pool Re research prg developing enhanced modelling and scenarios. Previously he worked for the security journal CBRNe World as the Deputy Editor and director of technical consulting and continues to be a contribute articles. He is also on the editorial panel of the Crisis Response Journal and is the Head of Man Made Risk for Fractal Industries. Positions of responsibility: Chair of the Forensic Science in Security and Defence Symposium; Member of the ASTM standards committed for Forensic Science and Homeland Security; Accredited CT adviser with the UN Centre for Counter Terrorism; EU & JRC Accredited Security expert.

Abstract: The impact of radiological dispersal devices (RDD) or 'dirty bombs' as they have become known, is extremely complex to assess. This talk presents some research that was commissioned at Cranfield University to examine some of the key parameters in determining the economic impact. Using principles applied within Insurance, a stakeholder industry which also wants to understand the impact of RDDs, the research has identified the types of economic harm and key areas of research that are required in order to better be able to assess the risk of these devices. The research finds that human behaviour with regard to contamination can be inconsistent and not always as negative as presumed. In addition to presenting the parameters and some examples of the modelling, the talk will also explore the applications of such impact models. Specifically the ability to use such tools to explore security measures around certain isotopes, policy decisions, and prioritisation of certain capabilities and research questions.

Active neutron interrogation in nuclear security applications

Bent Pedersen

Joint Research Centre - European Commission, Italy

Dr Bent Pedersen has worked more than 25 years at the Joint Research Centre in Ispra in Italy with non-destructive assay methods and instrumentation for applications in nuclear safeguards, nuclear security and waste characterisation. He specialises in passive and active neutron detection systems for the development of characterisation, or detection, methods for fissile materials. In the lab he operates a pulsed neutron interrogation facility for R&D in active neutron methods concentrating mainly on fissile materials both for safeguards and security applications. He also teaches neutron correlation techniques in both passive and active neutron counting to nuclear safeguards inspectors from Euratom and IAEA.

Abstract: Among the non-destructive assay (NDA) methods for the detection or characterisation of radioactive and nuclear materials, the passive methods are intrinsically more accurate than active methods due to the additional uncertainty introduced by an external interrogation source. However, in many cases the only way to achieve a usable radiation signature, in terms of signal to background ratio, from a sample is through stimulation of a characteristic radioactive decay by means of an external radiation source. In the Nuclear Security Unit of JRC we develop methods and instrumentation for the assay of fissile materials in applications in nuclear safeguards and nuclear security. Active methods typically use a neutron source, either based on radioactive decay or a pulsed neutron generator, to induce fission with subsequent detection of the so-called fission signatures. The fission prompt and delayed neutron and gamma-ray emissions are powerful signatures each with their characteristics that can be exploited in the development of NDA analysis methods. The choice of signature depends on many factors related to the detection system and the requirements to the method. The presentation will discuss in general some of the active NDA methods applied in nuclear security and give as an example further details about an ongoing project at JRC on the detection of Special Nuclear Materials in air cargo by means of a pulsed neutron generator.

Passive interrogation techniques

Alessandro Dodaro

ENEA, Italy

Alessandro Dodaro, born on December 25th 1969, is an Italian nuclear engineer who works in the nuclear field since his Master degree on 1993. He works at ENEA since 1999 in the field of radioactive waste management with particular focus on waste treatment and radiological characterization. Since July 2015, he is Head of the ENEA Division "Technologies, Facilities and Materials for Nuclear Fission" in the frame of the "Nuclear Fusion and Safety Technologies" Department; as head of division he operates the two main Italian nuclear research reactors (TRIGA and TAPIRO); he is responsible of the ENEA Integrate national service of Low and Intermediate level radioactive waste and orphan radiation sources collection, treatment, conditioning and disposal; he operates the nuclear laboratory of characterization of nuclear materials and radiochemistry. Since 2013, he is also Chairman of the Board of Nucleco S.p.A. (private company, controlled by SOGIN and participated by ENEA, for Low and Intermediate Level Radioactive Waste management).

Abstract: The current threat for international terrorism is set to a severe level, demanding for worldwide enhanced security. As a direct consequence, the scientific community is strongly requested for both preventive foiling of illicit traffic of dangerous substances, and managing hazardous events. The main concern is about attacks to people in crowded places by means of explosives, radioactive, or bio-hazardous weapons. This led to the blooming of research programs oriented in conceiving, and prototyping, devices able to early detection of such kind of offences. This research field is relatively young, and technical solutions seem to be currently at a first-of-a-kind level. In the last few years, detection of Special Nuclear Materials (SNMs) in freight has been one of the most critical security issues for the European countries. An effective work of prevention and contrast to this threat cannot ignore the use of the most advanced technologies by the authorities responsible for surveillance, seen in this case as end users of the technologies themselves.
This speech is mainly focused on the state-of-the-art passive measuring techniques aiming to detect suspicious materials to prevent Nuclear threats. The most promising research activities and some ready-to-use technologies will be described to give a picture of where we are and what is still needed.

Airborne and ground-based gamma radiation monitoring for man-made and environmental hazard mitigation purposes

Massimo Chiappini

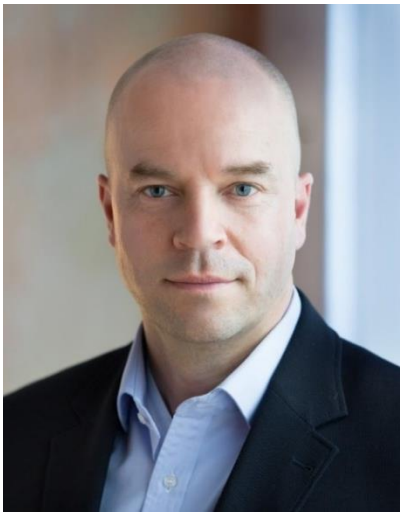
INGV - Italian National Institute for Geophysics & Volcanology, Italy

Author of about 100 scientific papers in peer-reviewed international journals. Principal Investigator of several international research projects aimed at crustal studies, potential fields research and environmental security. Author of national and international Industrial Patents. Contract Professor at national and foreign Universities, and Lecturer of geophysical techniques for On-site inspectors at CTBTO and at international CBRNe Masters courses. Dr. Chiappini has broadly applied ground-based and airborne geophysical techniques to crustal exploration, environmental hazard mitigation and security. He has collected wide experience in field activity in extreme environmental conditions, participating to 9 Antarctic research expeditions, measurements campaigns for CBRN risk mitigation in various continents. M. Chiappini has acted for many years as national Delegate at the Working Group of experts of the Preparatory Commission for the Comprehensive nuclear Test-Ban Treaty (CTBT).

Abstract: Environmental hazards can be caused by man-made activities or associated to natural events. The areal distribution of a potential contamination as well as the specific radionuclide agents present on site are detected by means of aerial or ground-based vehicles equipped with detectors, acquisition systems and position finding devices. The surveying strategy depends on various parameters, as a function of terrain, meteorological conditions, type of vehicles, equipment, etc. Case studies are shown using different approaches and platforms

Round table

Dieter Rothbacher



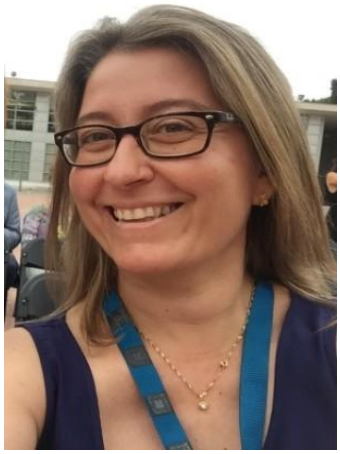
President of SASIR, Italy

Dieter Rothbacher, born 1966, a graduate from the Austrian Military Academy, military rank lieutenant colonel (NATO OF-4), is the Managing Director of CBRN Protection GmbH, a company specialized in CBRNE training and consulting services.
His professional background includes more than 25 years of experience in the area of Chemical, Biological, Radiological and Nuclear Materials (CBRN) and Weapons of Mass Destruction (WMD): extensive CBRN/WMD training experience in providing training to military personnel and first responder units from Europe, the Middle East, Asia and North – and South America;
more than 15 years as a CBRN Defence Officer of the Austrian Armed Forces; 10-year employment with the Organization for the Prohibition of Chemical Weapons (OPCW) as an Inspection Team Leader and as lead trainer for Chemical Weapons Inspectors of the OPCW Inspectorate; WMD destruction and inspection assignments with the United Nations Special Commission (UNSCOM) and the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) in Iraq.
He is currently part of the directive board of the Master Courses in protection against CBRNe events at the University of Tor Vergata, Rome, Italy, where he has also delivered lectures to students since 2012. Mr. Rothbacher has a Master of Science degree (MSc) in Business Development, and a postgraduate Master of Science (MSc) degree in Safety and Security Management.

Round table

Anna Figueras Masip

Institute for Public Security of Catalonia, Spain



Dr Anna Figueras Masip is currently the manager research in risk, emergencies and civil protection at the research unit of Fire-fighters and Civil Protection School of Catalonia at the Institute of Public Security of Catalonia, where she has been working since 2015. She is degree in Psychology at University of Barcelona and PhD in Clinical and Health Psychology. For the last 10 years, she has been involved as a psychologist in the field of security, emergencies and civil society, and has been trainer in the Police School of Catalonia and in the Fire-fighters and Civil Protection School of Catalonia.

Abstract: The Institute for Public Security of Catalonia (ISPC in its Catalan acronym) is the training centre for the region's police forces and emergency services and a key part of Catalonia's public security and safety system. By training all public security and safety workers in a single centre, we can focus on the principles of cooperation and coordination that form the cornerstones of any integrated public safety system.

As well as providing training, the Institute is involved in the recruitment and professional development of members of these services; it builds on and transfers knowledge relating to public security and safety through research, international cooperation, publications and public events.

As such, it has also become an important meeting place and networking centre for people working in this field. In recent years, quick to meet the needs of organisations and other groups, the Institute has branched out into university education, leadership training and new learning tools, such as ISPC on network.

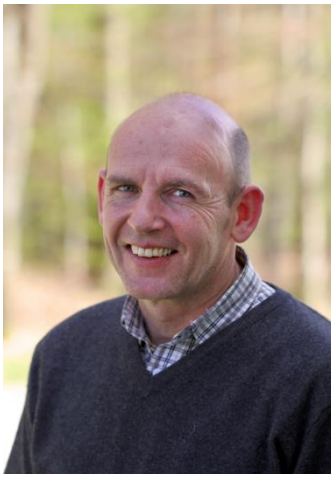
The Institute builds its training programmes on the acquisition of competencies -incorporating theoretical knowledge and practice- and on developing the skills and attitudes needed to make effective and efficient professionals. The Institute designs the strategies needed by organisations and provides training at every level for all groups of people working in the safety and security sector.

One of the Institute's priorities is to further thinking on and analysis of security issues. To this end, it supports and organises research, study and advisory activities both in the field of policing, through the Police Academy, and in the field of risk and emergencies, through the Fire Service and Civil Protection Academy. To become a benchmark in the study and applied research on security, the Institute participates in European research projects, which is one of the ways to update knowledge and keep abreast of experiences and, as a consequence, help to update and innovate the training.

Round table

Frank Duschek

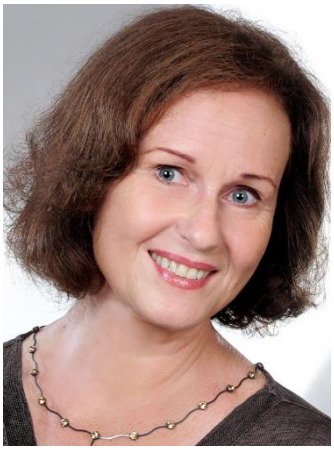
Aerospace Center Institute of Technical Physics, Germany



After finishing his PhD on resonance Raman spectroscopy in 1996 at the University of Würzburg, Germany, Frank Duschek joined the Germany Aerospace Center (DLR) for research and development on high power and chemical lasers. Since 2008, his main research interest is focused on standoff detection of chemical, biological and explosive hazards applying laser based spectroscopy. The main aims are to develop solutions for defence and security applications, to evaluate mature and new technologies and to advise and train end users. Frank Duschek is the head of the department Atmospheric Propagation and Effect at the Institute of Technical Physics at German Aerospace Center.

Karin Grűnewald

Aerospace Center Institute of Technical Physics, Germany



Karin Grünewald studied Aerospace Engineering at the University of Stuttgart. She wrote her doctoral thesis on the Modelling of Energy Transfer Processes in Longitudinally Flown CO2 lasers. In 1986, she started her work in the R&D of gas flow lasers at the Institute of Laser Technologies in Stuttgart. In 1994, she changed to chemical laser development at the DLR Institute of Technical Physics. After initial investigations on the atmospheric conditions and their effects on low energy laser propagation at the open space laser test range at DLR Lampoldshausen she developed the framework for establishing the microbiological branch in the CBE detection and has been working on the optical characterization of bio-agents since 2012

Abstract: The German Aerospace Center (DLR) Institute of Technical Physics develops laser systems for applications in aerospace as well as in the areas of security and defence. At the Institute sites in Stuttgart and Lampoldshausen, scientists, engineers and technicians work on interdisciplinary issues in the key areas Detection and Removal of Space Debris, Laser-based flight instruments, Long Range Laser Effectors and Laser-based remote detection of harmful and hazardous substances. Identifying dangerous substances with a laser without putting staff in danger – the accidental or intentional release of hazardous or explosive materials poses numerous threats to humans and the environment. The laser-based detection of chemical, biological and explosive hazardous substances (CBE) is one of the main topics of the Institute of Technical Physics. Having realistic scenarios in mind, spectroscopic methods such as LIBS (Laser Induced Breakdown Spectroscopy), LIF (Laser Induced Fluorescence) and vibrational spectroscopy are being researched and further developed. Using suitable laser irradiation and the recording of the backscattered spectrum, suspicious unknown substances can be detected and identified early and in a safe manner. Thus, appropriate countermeasures can be taken promptly, reducing threats to the population, rescue teams, and the environment. In this context, particular application-relevant aspects such as eye safety, the influence of daylight and weather, as well as the identification of substances against the natural

background play a fundamental role in the validation of the methods. Experimental studies in this area are carried out on the 130-metre optical test range at the DLR site Lampoldshausen.

Round table

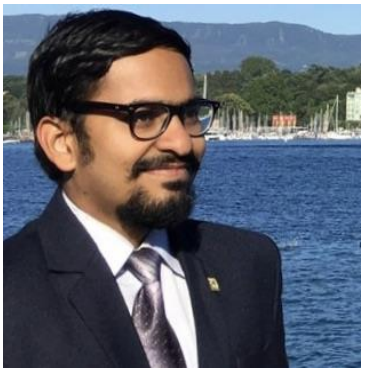
Ricardo Armetano

National Technological University, Buenos Aires, Argentina

Ricardo Armentano is a distinguished professor of Cardiovascular Engineering, member of the EMBS IEEE Technical Committee on Cardiopulmonary Systems Technology and Vice Chair of Global Citizen Safety and Security Working Group of the International Federation of Medical and Biological Engineering. Also he is the Director of PhD program (signal & image processing) at the National Technological University in Buenos Aires, Argentina and a Grade 5 researcher of the United Nations Program for the Development of Basic Sciences in Uruguay. He has acquired international recognition in the field of cardiovascular hemodynamics and arterial hypertension. He has taught in the fields of cardiovascular dynamics and in the broad area of engineering in medicine and biology and has extensive experience in research supervision. He is on the editorial board of journals of cardiovascular research and is a reviewer for over 25 international scientific journals. He has over 200 publications including books, book chapters and peer-reviewed articles.

Parag Chatterjee

University of the Republic, Uruguay



Parag Chatterjee is an Assistant Professor at the Department of Biological Engineering in the University of the Republic, Uruguay and a Research Professor at the National Technological University in Buenos Aires, Argentina. His current research is focused to the aspects of IoT and smart data analytics, especially applied to eHealth. He is the editor of the book “The Internet of Things” featuring 21 chapters by authors from 15+ countries, published by CRC Press (Taylor & Francis) last year. Also he is the associate editor of the Internet of Things journal (Elsevier) and member of the editorial board of several international journals. He is a member of the IoT Council and chair of the ISOC - IoT SIG’s Working Group on IoT and Academia.

Abstract: Internet of Things (IoT) clubbed with intelligent data analysis techniques have revolutionized the domain of healthcare. Data acquisition in an IoT environment followed by the use of machine learning and computationally intelligent techniques has enabled newer perspectives in treating patients and analysis of health risks. At the National Technological University in Buenos Aires, Argentina, the research and development group in bioengineering (GIBIO) is focused to the study, research, development and evaluation of methods and equipment for the diagnosis and prevention, mostly of cardiovascular diseases and its allied areas. In the aspects of computational analysis, the IoT-based data leads to a wealth of information for establishing a complete biomechanical and hemodynamical map for the aging process as well. Using artificial intelligence over the smart datasets leads to efficient prediction of health risks and deeper insights to the overall public health. The cooperation with University of Rome Tor Vergata is looked forward to open new

frontiers of joint research in strategic areas, involving collaborated research and the exchange of students and researchers.

Poster Session

"Pharmacology of radiological protection. An operative proposal"

Ciccotti M.[1,2], Carbone D.[4]., Ciccotti M.E.[5], Peluso I. [6], Buccolieri C.[2], Scimonelli L. [7], Munzi D. [2], Di Muzio M. [5], Sciarra T.[2] and Palmery M. [1] and Lista F.[3]

1. *Department of Physiology and Pharmacology "V. Erspamer"*
2. *Joint Veteran Center, Scientific Department, Army Medical C enter, Rome, Italy 3*
3. *Scientific Department, Army Medical Center, Rome, Italy.*
4. *Department of Oral and Maxillofacial Science, "Sapienza" University of Rome, Piazzale Aldo Moro 5, 00185 Rome, Italy.*
5. *5. UO Clinical Pharmacy, INRCA-IRCCS Ancona 60121.*
6. *6. Research Centre for Food and Nutrition, Council for Ag ricultural Research and Economics (CREA-AN), Rome, Italy.*
7. *7. Higher Institute of Health, seconded to the Ministry of Health, Viale Giovanni Ribotta 5, 00144.*

"Direct X-ray Photoconversion in Organic Flexible Thin Film Devices: Photoconductive Gain and High-Z Nanoparticle-doping"

Andrea Ciavatti[1], Tobias Cramer[1], Laura Basiricò[1], Piero Cosseddu[2], Annalisa Bonfiglio[2], Beatrice Fraboni[1]

1. University of Bologna, Department of Physics and Astronomy, Italy
2. Department of Electrical and Electronic Engineering, University of Cagliari, Italy

"Fully-passive and real-time X and gamma rays detectors based on flexible high mobility oxide field effect transistor"

Tobias Cramer[1,2,3], Ilaria Fratelli[1,2,3], Pedro Barquinha[1,2,3], Ana Santa[1,2,3], Cristina Fernandes[1,2,3], Rodrigo Martins[1,2,3], Elvira Fortunato[1,2,3], Beatrice Fraboni[1,2,3]

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2. *CENIMAT/I3N and CEMOP-UNINOVA, Departamento de Ciência dos Materiais, Faculdade de Ciências e Tecnologia,*
3. *Universidade NOVA de Lisboa, Campus de Caparica, 2829-516 Caparica, Portugal*

"Development of a radiation-detection simulator with smartphones and beacons for first responders against radiological threat"

Ken'ichi Tsuchiya[1], Takeshi Moritake[2], Yang Ishigaki[3], Norihisa Kosukegawa[4]

1) National Research Institute of Police Science, Japan
2) University of Occupational and Environmental Health, Japan
3)The University of Electro-Communications, Japan
4) Yaguchi Electric Corp, Japan

"Antidotes transport by Unmanned Aerial Systems (UASs) in BVLOS mode in case of CBRN Event"

Pietro Rossetti[1], Giuseppe Beolchi[2], Rosario Canneva[3], Fabio Garzia[4], Nicola Silverio Genco[5]

1. International Master Courses in Protection Against CBRNe events (Italy) ; S.T.A.S.A. Studies Center, Rome (Italy).
2. System Administrator / IoT project Engineer freelance Consultant (Italy)
3. IT Infrastructure Administrator / Network Security freelance Consultant (Italy).
4. University of Rome La Sapienza (Italy) ; Wessex Institute of Technology (U.K) ; European Academy of Sciences and Arts (Austria).
5. S.T.A.S .A. Studies Center, Rome, (Italy).

"Compact setup for standoff laser induced breakdown spectroscopy of radioactive material"

Florian Gebert[1], Karin Grünewald[1], Carsten Pargmann[1], Frank Duschek[1]

1.German Aerospace Center, Institute of Technical Physics, Langer Grund, Lampoldshausen, 74239 Hardthausen, Germany

"Counter method against I2(g) radionuclides in CBRN scenario"

Quiñones Javier[1], Pascual, Laura[1], Fernández, Marta Domínguez[1], Jose Antonio[1], Amigo Luis[1], Cobo Jose Manuel[1] and Mazanec, Karel[2]

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2. Military Research Institute , Veslařská 230 637 00 Brno, Czech Republic.

"HADES Field Exercise. Outcomes from synergy between military and science professionals"

Ardanaz Ibañez Carlos[1], Quesada Medina, Mª Rosario[1], Aguado Valladares, Carlos[1], Álvarez García, Alicia[2], Benavente Ruiz, Mª Angeles[2], Gómez Caloca, Candelas[2], Sáez Vergara, Jose Carlos[2], and Quiñones, Javier[2].

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2) Centro de Investigaciones Energéticas, Medi oambientales y Tecnológicas (CIEMAT), Avenida Complutense nº 40, 28040, Madrid. Kingdom of Spain

"Resistance of DNA forensic evidence after CBRN attack scenario"

Javier Quiñones[1], Julio Serrano[2], Marta Fernández[1], Pedro P. Valdivieso[1], José Manuel Cobo[1]

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2. Guardia Civil. Interior Affair Ministry. Guzman el Bueno 110. 28003 Madrid. Kingdom of Spain

"Italy after 30 years of denuclearization: what are the effects on the health? A review of the literature"

Rosiello F[1], Menga LS[2], Zelinotti L[3], Montibeller M[1], Kolaparambil Varghese LJ[4]

1. Facoltà di Medicina ed Odontoiatria, Sapienza-Università di Roma(Italy)
2. Facoltà di Medicina, Università Cattolica del Sacro Cuore(Italy)
3. CBRNe Emergency Management-Formazione e sicurezza (Italy)
Facoltà di Medicina, Università degli studi di Perugia(Italy)

"Entomological warfare"

Marco Serale[1], Luca Zelinotti[2], Giulio Boschetti[3]

1. ASL Cuneo (Italy)
2. CBRNe Emergency Management-Formazione e sicurezza (Italy)
3. Istituto zoprofilattico del lazio e della Toscana (Italy)

"Working dogs in a contaminated environment, problems and possible work solutions in safety"

Zelinotti Luca[1], Marco Serale[2], Giulio Boschetti[3], Botti Lorenzo[4], Cardamone Rocco[5], Guido Petrelli[6], Cristina DI Santo[7], Francesco Rosiello[8,9]

1. CBRNe Emergency Management-Formazione e sicurezza (Italy)
3. ASL Cuneo (Italy)
4. Vigili del Fuoco(Italy)
5. Polizia di Stato (Italy)
6. Istituto Zooprofilattico Sperimentale del Lazio e della Toscana (Italy)
7. Italian Red Cross (Italy)
8. Civil protection association (Italy)
9. Sapienza University of Rome (Italy)

"Testing an integrated service for radiological detection supported by UAV and satellite systems"

Edoardo Cavaliedi d'Oro[1], Giacomo Lunerti[2], Michele Martino[3], Francesca Giacobo[4] Guido Parissenti[5], Samuele Giovanardi[6], Alberto Pievani[7].

1. *Italian National Fire Corps*
2. *RPS Aerospace*
3. *ALTEC*
4. *Politecnico of Milan*
5. *GP advanced Projects*
6. *SFM consortium*
7. *SFM consortium.*

"Nuclear decommissioning & wastes management: the point of view of Italy."

Prof. Fabrizio Fontana[1,2], Prof. Matteo Martini[1,2], Professor Fiorito Roberto M.D[3], Mss Francesca Maria Beuti[4]

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2. *INFN, Laboratori Nazionali di Frascati, via E. Fermi, 40, 00044, Frascati (Italia)*
3. *Specialist Emergency Surgery & First Aid Chest Surgery Anesthesia & Intensive-Care. Professor: Magistral Medical Degree/Post Graduate Medical Degree Bachelor/Master of Science FACULTY of MEDICINE & SURGERY. Director : 1) I.S.S.M.M. Δ POST GRADUATE DEGREE MASTER of SCIENCE (International Security/Safety, Global Strategies and Medical Maxi-Emergency Management in the Unconventional Events : Analyses and Management) FACULTY of MEDICINE & SURGERY*
4. *FACULTY of MEDICINE & SURGERY - 1) I.S.S.M.M. Δ POST GRADUATE DEGREE MASTER of SCIENCE (International Security/Safety, Global Strategies and Medical Maxi-Emergency Management in the Unconventional Events : Analyses and Management)*

"The importance of the first-responders training for appropriate response to CBRN threats"

Boris Rajčić[1], Vladimir Karić[1], Milica Marčeta Kaninski[1], Vladimir Nikolić[1], Slavko Karić[1].

1. *Vinca Institute of Nuclear Sciences, University of Belgrade;*

"GeGI gamma-ray imaging spectrometer: redefining stand-off radiation detection of special nuclear material"

Ethan Hull[1], Matt Kiser[1]

1. *PHDS Co. - Desmond Longford MA.*

"CBRN training for fire-fighters at the institute for public security of Catalonia (ISPC)"

Xavier Sabaté Vallvé[1], Anna Figueras Masip[1]

1. *Institute for Public Safety of Catalonia (ISPC), Spain;*

"Differential-fading luminescent materials for chain of custody applications in nuclear safeguards and arms control"

Francesco d'Errico [1,2,3], Andrea Chierici [1,3], Riccardo Ciolini [1,3], Marialisa Staglianò [1 3], Danilo Junot [4], Divanizia Souza [4], Susana Souza-Lalic [4].

1. *Università di Pisa, Scuola di Ingegneria, Pisa, Italy*
2. *Istituto Nazionale di Fisica Nucleare, Sezione di Pisa, Pisa, Italy*
3. *Yale University Center for Emergency Preparedness and Disaste r Response, New Haven CT USA*
4. *Universidade Federal de Sergipe, Sao Cristovão, SE Brasil.*

"The neutron/gamma irradiation facility of the University of Pisa"

Riccardo Ciolini [1,2], Andrea Marini [1,2], Valerio Giusti [1,2], Francesco d'Errico [1,2].

1. *Università di Pisa, Scuola di Ingegneria, Pisa, Italy*
2. *Istituto Nazionale di Fisica Nucleare, Sezione di Pisa, Pisa, Italy.*

"Superheated emulsions with opto-electronic readout for active interrogation systems"

Andrea Chierici [1,2], Luis Abegão [2], Fernanda Cava lcante [2], Jesus Martin [2], Marialisa Stagli anò [1,2], Francesco d'Errico [1,2,3].

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2. *Yale University Center for Emergency Preparednes s and Disaster Response, New Haven CT USA*
3. *Istituto Nazionale di Fisica Nucleare, Sezione di Pisa, Pisa, Italy.*

"Numerical simulation of gamma rays propagation in construction materials and human body"

Jean-François Ciparisse[1,2], Valentina Gabbarini[1,2]

1. University of Rome Tor Vergata, Dept. of Industrial Engineering, via del Politecnico, 1 - Rome 00133
2. University of Rome Tor Vergata, International Master Courses in Protection against CBRNe events, via del Politecnico, 1 - Rome 00133

"3D-numerical simulation of inhalational Cobalt-60 absorption and biological damage."

Valentina Gabbarini[1,2], Alessandro Puleio[2], Gian Marco Ludovici[2], Orlando Cenciarelli[1,2], Jean-François Ciparisse[1,2]

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2. *University of Rome Tor Vergata, International Master Courses in Protection against CBRNe events, via del Politecnico, 1 - Rome 00133*

"Application of Miniaturized sensors to Unmanned Aerial Vehicles, a new pathway for the survey of critical areas"

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