



Rome,  
25 - 29 September 2023

Conference program  
**SICC SERIES**  
**CBRNe**  
**CONFERENCE**  
**2023**

SICC

# Program of SICC Series - CBRNe Conference 2023 THIRD EDITION

25-30 September 2023 Rome (Italy)  
Istituto Superiore Antincendi (ISA)

University of Rome Tor Vergata  
HESAR - Health Safety Environmental Research Association Rome



The banner for the SICC Series - CBRNe Conference 2023 features a background image of the Colosseum in Rome. The main title 'SICC SERIES - CBRNE CONFERENCE' is in large blue letters at the top left. To the right, the dates '25-29 SEPTEMBER 2023' and the venue 'NATIONAL FIRE ACADEMY ROME - (ITALY)' are displayed. Below the main title, the 'SICC SERIES - SUMMER SCHOOL OPENMC - MONTE CARLO CODE' is highlighted in red. The banner also includes logos for 'CBRN GATE' and 'SICC'. At the bottom, there are two rows of logos for participating organizations and sponsors, including Tor Vergata, OPCW, DLR, Abu Dhabi Civil Defence Authority, Yale School of Medicine, DICI, HECAR, Master CBRNe, NATO, Ministero della Difesa, Ministero dell'Interno, ENEA, SOGIN, and others. The banner also mentions 'WITH THE PARTICIPATION' and 'WITH THE PATRONAGE OF' various entities.

**SICC SERIES - CBRNE CONFERENCE**

25-29 SEPTEMBER 2023  
NATIONAL FIRE ACADEMY  
ROME - (ITALY)

**SICC SERIES - SUMMER SCHOOL  
OPENMC - MONTE CARLO CODE**

DAY 1 - 26 SEPTEMBER 2023  
NATIONAL FIRE ACADEMY  
ROME - (ITALY)

DAY 2 - 30 SEPTEMBER 2023  
UNIVERSITY OF ROME TOR VERGATA  
ROME - (ITALY)

**Logos and Sponsors:**

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- OPCW
- DLR
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- Ordine dei Biologi
- ASSOCIAZIONE ITALIANA NUCLEARE

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## SICC SERIES – CBRNe CONFERENCE 2023

The third edition of the SICC Series - CBRNe Conference 2023 will take place on 25-29 September 2023, at the National Fire Academy – Istituto Superiore Antincendi in Rome (Italy).

The conference will host 3 plenary sessions, 12 technical sessions, 2 poster sessions and the industrial exhibition.

In the first edition (2017) we had 620 participants and in the second edition (2020-held in a virtual reality platform) we had 596 participants from all over the world.

The conference is organized by the University of Rome Tor Vergata in collaboration with HESAR in the aim of the International Master Courses in Protection against CBRNe activities in cooperation with the following international entities:

- OPCW (Organization for the Prohibition of Chemical Weapons)
- IAEA (International Atomic Energy Agency)
- NATO Joint Centre of Excellence
- U.S. Department of State (UNITED STATES OF AMERICA)
- Yale University (USA)
- School of Public Health, University of Yale (USA)
- Abu Dhabi Civil Defence Authority (UAE)
- German Aerospace Center, DLR (GERMANY)
- Institute of Physics of the German Space Center (GERMANY)
- NATO SCHOOL of Oberammergau (GERMANY)
- Joint Chemical, Biological, Radiological and Nuclear Defense Centre of Excellence (JCBRN Defense COE) (CZECH REPUBLIC)
- NATO EOD Centre (SLOVAKIA)
- Chornobyl Centre (UKRAINE)
- Vojenský Výzkumný Ústav (CZECH REPUBLIC)
- Seibersdorf Laboratories (AUSTRIA)
- Vinča Institute of Nuclear Science, University of Belgrade (SERBIA)
- National Technological University Buenos Aires (ARGENTINA)
- Pakistan Army (ISLAMIC REPUBLIC OF PAKISTAN)
- Federal Ministry for Environment, Nature Conservation and Nuclear Safety (GERMANY)
- National Technological University of Argentina & the University of the Republic of Uruguay (ARGENTINA & URUGUAY)
- Federal University of Sergipe (BRAZIL)
- University Lady of Good Counsel University (ALBANIA)
- City of New Haven OEM, (UNITED STATES OF AMERICA)
- Catholic University of Louvain (BELGIUM)
- Polytechnic University of Madrid (SPAIN)
- University of Fukui (JAPAN)
- Turkish Atomic Energy Authority (TURKEY)
- The University of Adelaide (AUSTRALIA)
- Hirosaki University (JAPAN)
- British Army (UNITED KINGDOM)
- University of Defence Military Academy Serbia (SERBIA)
- National Aerospace University Kharkiv (UKRAINE)
- The University of Birmingham (UNITED KINGDOM)
- JCBRN Defence Centre of Excellence (Czech Republic)
- Embassy of Italy to the Netherlands (ITALY)
- CIEMAT (SPAIN)
- European Defence Agency (BELGIUM)

- CBRN Protection, (AUSTRIA)
- International Alliance on CBRNe, (UNITED KINGDOM)

And National Entities:

- Prime Minister Office
- Ministry of Defense
- Ministry of Interior
- Ministry of Health
- Ministry of Foreign Affair
- Ministry of University, Research and Training
- Institute Superior of Health
- Institute of Geophysics and Vulcanology (INGV)
- ENEA
- University of Pisa
- Italian Federation of Biologist
- ASL Roma 6
- SOGIN

With the patronage of:

- NATIONAL FEDERATION OF CHEMISTS AND PHYSICISTS
- Interregional Order of Chemists and Physicists of Lazio, Umbria, Abruzzo, Molise
- Interregional Order of Biologist of Lazio and Abruzzo
- Italian National Nuclear Association

**KEY DATES**

Abstract submission OPEN	08 March 2023
Abstract submission DEADLINE	25 August 2023 - Extended
Notification to the authors (Abstract Acceptance)	1-2 weeks from submission
Registration OPEN	15 May 2023
Early Bird Registration Deadline	05 September 2023
Late Registration Deadline	24 September 2023
On site Registration	25-29 September 2023
Conference Dates	25-29 September 2023
Full paper submission DEADLINE	October-November 2023
Notification to authors (Full Paper Acceptance)	November-December 2023
Full Paper Published on Scientific Journals	December 2023 - March 2024
Full Paper Published indexed on SCOPUS and ISI WEB of SCIENCE	3-4 weeks from the publication on Scientific Journals

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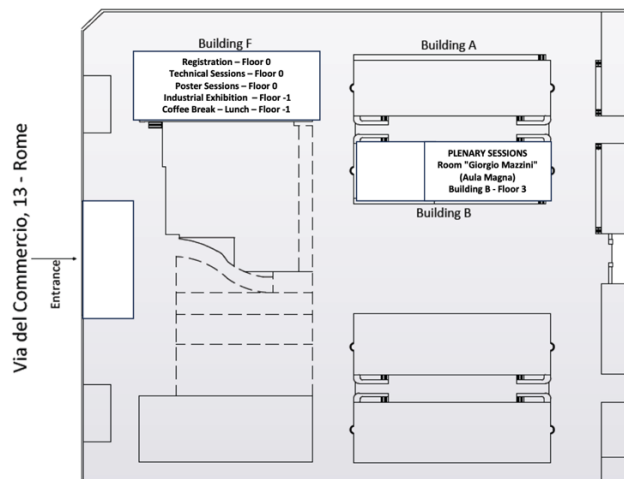
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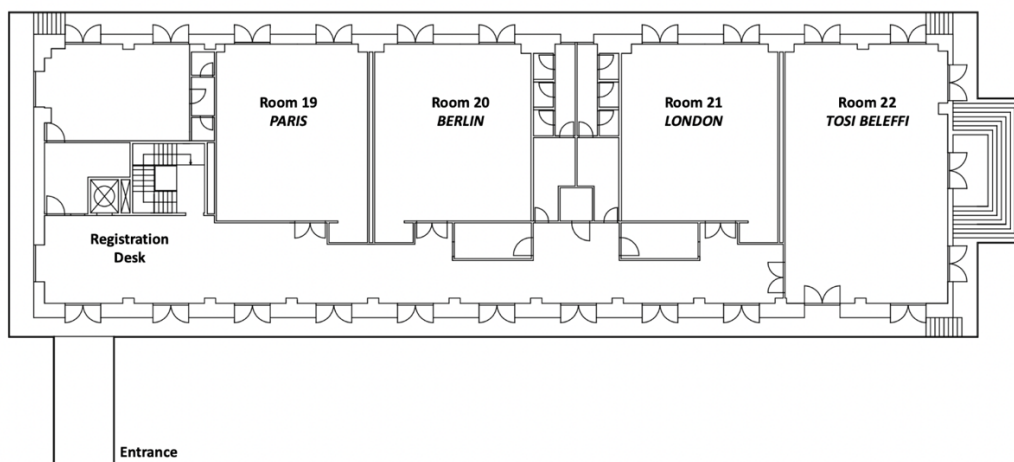


## CONFERENCE VENUE

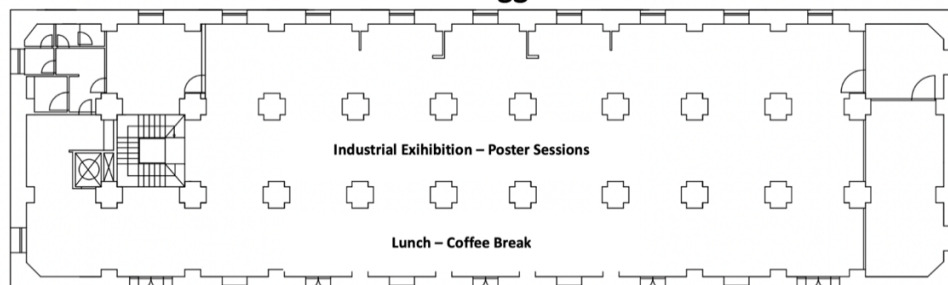
The conference venue is the National Fire Academy (Istituto Superiore Antincendi - ISA) located in the city centre of Rome.



### Building F FLOOR 0



### Building F FLOOR -1 Room «Caravaggio»



The area of the ISA is covered by a series of warehouses, built between the end of the XIX century and the beginning of the XX century. It was designed to host the industrial and commercial activities flourishing at that time in Rome, the new capital city of Italy (1870). The structure, planned by Mr. Tullio Passarelli, opened in 1912 and was one of the first reinforced concrete structures built in Rome.

Food and goods were unloaded from boats from the nearby river Tiber, and sorted into several warehouses by means of crane wagons and lifting winches.

The Institute organizes training and information programs aimed specifically at officers of the National Fire Corps, as well as seminars and conferences open to the public with the participation of national and international organizations in the field of security, rescue, and fighting fires.

### How to reach ISA

*Conference Venue: ISA - Istituto Superiore Antincendi (National Fire Academy)*

Via del Commercio 13, 00154 Rome, Italy

You can reach ISA - Istituto Superiore Antincendi using the subway (B-line, "Piramide" station), or public bus (Bus No. 23 or No. 769). Also, ISA is only 400 meters from "F.S. Ostiense" train station, that is connected to Rome Fiumicino Airport.

#### **From Fiumicino Airport to Termini Station**

- **BY TRAIN** Go to the railway station located in the airport, near the Arrivals and Departures terminals, you can take: *Leonardo Express*, a non-stop service exclusively for airport passengers to/from Rome Termini railway station leaving every 15 minutes with a journey time of 32 minutes, or *Regional FL1 trains* to/from other stations in Rome, including Rome Tiburtina, with departures every 15 minutes on weekdays and every 30 minutes on weekends and holidays. Please refer to the [Fiumicino Airport Website](#) for the latest timetables.
- **BY BUS** Buses take about 45 minutes to get to Rome Termini station from Fiumicino airport in normal traffic conditions. Buses available include: [SIT BUS SHUTTLE](#), [T.A.M. Srl](#), [TERRAVISION](#).

#### **From Ciampino Airport to Termini Station**

- **BY TRAIN:** The nearest train station is in the town of Ciampino, connected to the airport by COTRAL/SCHIAFFINI buses every 30 minutes. The journey time is about 5 minutes.
- **BY BUS:** Bus connections are provided by these companies: [ATRAL](#), [COTRAL](#), [SIT](#), [TERRAVISION](#), [SCHIAFFINI](#). OPTION 1: Bus to Termini Station. OPTION 2: Bus to Anagnina Metro station (A line). Then take the Metro A-Line to Termini Station.

#### **From Termini Station to the venue**

- from Termini Station take the subway: Metro B line (color: blue) to "Piramide" station.
- from "Piramide" station you can reach the *Istituto Superiore Antincendi (ISA) – building H*, on foot (about 10 minutes) or you can take a taxi.

#### **BY TAXI (From Fiumicino Airport or Ciampino Airport directly to the venue)**

At all Terminals of Rome Fiumicino Airport, as well as at Ciampino Airport, taxi services for the city of Rome are available. You do not need to go to Termini Station but can directly go to the venue, that is 900 meters from Ostiense Station. The fare from/to Fiumicino Airport – Ostiense Station is EUR 45, from/to Ciampino Airport – Ostiense Railway Station is EUR 30. Fares are fixed by the Municipality of Rome and are subject to change without notice. Please check the [Municipality website](#).

#### **Conference dinner venue**

VILLA PARCO DELLA VITTORIA

Link: <https://www.sicc-series.com/conference-dinner-sicc-2023/>

# CONFERENCE PROGRAM – TIMETABLE and PRESENTATIONS SCHEDULING

DAY 0 – Sunday 24 September 2023 - National Fire Academy (Rome)

**Sunday 24 September 2023**



2.00 p.m.-2.30 p.m.	<b>Participants Registration</b> Building F Floor 0	<b>Industry booths installation</b> Building F Floor -1 Room "Caravaggio"
2.30 p.m.-3.00 p.m.		
3.00 p.m.-3.30 p.m.		
3.30 p.m.-4.00 p.m.		
4.00 p.m.-4.30 p.m.		
4.30 p.m.-5.00 p.m.		
5.00 p.m.-5.30 p.m.		
5.30 p.m.-6.00 p.m.		
6.00 p.m.-6.30 p.m.		

NATIONAL FIRE ACADEMY ROME

## DAY 1 – Monday 25 September 2023 - National Fire Academy (Rome)

\*Registration desk is always open from 8.00 a.m. to 6.00 p.m. in Building F - Floor 0

### Monday 25 September 2023



8.00 a.m.-9.00 a.m.			
9.00 a.m.-11.30 a.m.	<b>Participants Registration*</b> Building F Floor 0	<b>Industrial Exhibition</b> Building F Floor -1 Room "Caravaggio"	<b>Welcome Coffee</b> Building F Floor -1 Room "Caravaggio"
11.30 a.m.-1.30 p.m.	<b>PLENARY SESSION 1</b> Building B - Floor 3 - Room "Giorgio Mazzini" (Aula Magna) Chairperson: Guglielmo Manenti		
1.30 p.m.-2.30 p.m.	<b>Lunch break</b> Building F Floor -1 Room "Caravaggio"	<b>Industrial Exhibition</b> Building F Floor -1 Room "Caravaggio"	

\*Permanent coffee station always available from 9.00 a.m. to 5.00 p.m. in Building F - Floor 0  
NATIONAL FIRE ACADEMY ROME

\*Registration desk is always open from 8.00 a.m. to 6.00 p.m. in Building F - Floor 0

### Monday 25 September 2023



2.30 p.m.- 2.55 p.m.	<b>T.S.1 - Emergency management</b> Building F - Floor 0 - Room 22 "Tosi Belefli"	<b>T.S.3 - Cybersecurity, artificial intelligence, data mining, big data analysis, and DSS applied to CBRNe</b> Building F - Floor 0 - Room 21 "London"	<b>T.S.8 - Radiological and Nuclear events: methods, instrumentation, protection/decontamination, and technological developments</b> Building F - Floor 0 - Room 20 "Berlin"	<b>T.S.11 - CBRNe investigation and forensic</b> Building F - Floor 0 - Room 19 "Paris"
2.55 p.m.- 3.20 p.m.				
3.20 p.m.- 3.45 p.m.				
3.45 p.m.- 4.10 p.m.				
	Chairpersons: S. Johnson, S. Schiaroli, M.Baleani	Chairpersons: O. Illiashenko, P. Chatterjee, R. Rossi	Chairpersons: F. d'Errico, T. Kokalova Wheldon, E. Gallego	Chairpersons: I.M.Z. Almarzouqi, A. Gloria, F. Ewann
4.35 p.m.- 4.45 p.m.	<b>Coffee break</b> Building F Floor -1 Room "Caravaggio"		<b>Industrial Exhibition</b> Building F Floor -1 Room "Caravaggio"	
4.45 p.m.- 5.10 p.m.	<b>T.S.1 - Emergency management</b> Building F - Floor 0 - Room 22 "Tosi Belefli"	<b>T.S.3 - Cybersecurity, artificial intelligence, data mining, big data analysis, and DSS applied to CBRNe</b> Building F - Floor 0 - Room 21 "London"	<b>T.S.8 - Radiological and Nuclear events: methods, instrumentation, protection/decontamination, and technological developments</b> Building F - Floor 0 - Room 20 "Berlin"	<b>T.S.11 - CBRNe investigation and forensic</b> Building F - Floor 0 - Room 19 "Paris"
5.10 p.m.- 5.35 p.m.				
5.35 p.m.- 6.00 p.m.				
6.00 p.m.- 6.25 p.m.				
	Chairpersons: S. Johnson, S. Schiaroli, M.Baleani	Chairpersons: O. Illiashenko, P. Chatterjee, R. Rossi	Chairpersons: F. d'Errico, T. Kokalova Wheldon, E. Gallego	Chairpersons: I.M.Z. Almarzouqi, A. Gloria, F. Ewann
6.30 p.m.- 7.30 p.m.	<b>Aperitif</b> Building F Floor -1 Room "Caravaggio"			

\*Permanent coffee station always available from 9.00 a.m. to 5.00 p.m. in Building F - Floor 0  
NATIONAL FIRE ACADEMY ROME



September 25th												
Time					Welcome Addresses							
11:30-13:30				Plenary 1	1.PL1	Giorgio Mazzini (Aula Magna)						
					2.PL1							
					3.PL1							
					4.PL1							
					5.PL1							
					6.PL1							
					7.PL1							
13:30-14:30	Lunch - Industrial exhibition - Room Caravaggio											
Parallel sessions												
14:30	T.S.1	22.TS1	Room 22 Tosi Beleffi	T.S.3	49.TS3	Room 21 London	T.S.8	107.TS8	Room 20 Berlin	T.S.11	157.TS11	Room 19 Paris
14:55		23.TS1			50.TS3			108.TS8			242.TS11	
15:20		24.TS1			51.TS3			109.TS8			158.TS11	
15:45		26.TS1			52.TS3			112.TS8			159.TS11	
16:10		27.TS1			53.TS3			113.TS8			160.TS11	
16:35	Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition		
16:45	T.S.1	28.TS1	Room 22 Tosi Beleffi	T.S.3	54.TS3	Room 21 London	T.S.8	121.TS8	Room 20 Berlin	T.S.11	161.TS11	Room 19 Paris
17:10		37.TS1			55.TS3			114.TS8			162.TS11	
17:35		25.TS1			56.TS3			115.TS8			163.TS11	
18:00		248.TS1						120.TS8				
18:30-19:30	Aperitif - Industrial exhibition - Room Caravaggio											
19:30	End of day 1											

## DAY 2 – Tuesday of September 2023 - National Fire Academy (Rome)

\*Registration desk is always open from 8.00 a.m. to 6.00 p.m. in Building F - Floor 0

## Tuesday 26 September 2023



9.30 a.m.- 9.55 a.m.	<b>T.S.1 - Emergency management</b> Building F - Floor 0 - Room 22 "Tosi Belefatti"	<b>T.S.3 - Cybersecurity, artificial intelligence, data mining, big data analysis, and DSS applied to CBRNe</b> Building F - Floor 0 - Room 21 "London"	<b>T.S.8 - Radiological and Nuclear events: methods, instrumentation, protection/decontamination, and technological developments</b> Building F - Floor 0 - Room 20 "Berlin"	<b>T.S.11 - CBRNe investigation and forensic</b> Building F - Floor 0 - Room 19 "Paris"
9.55 a.m.- 10.20 a.m.				
10.20 a.m.- 10.45 a.m.	Chairpersons: S. Johnson, S. Schiaroli, M. Baleani	Chairpersons: O. Illiashenko, P. Chatterjee, R. Rossi	Chairpersons: F. d'Errico, T. Kokalova Wheldon, E. Gallego	Chairpersons: I.M.Z. Almarzouqi, A. Gloria, F. Ewann
10.45 a.m.- 11.10 a.m.				
11.35 a.m.- 12.00 p.m.	<b>Coffee break</b> Building F Floor -1 Room "Caravaggio"		<b>Industrial Exhibition</b> Building F Floor -1 Room "Caravaggio"	
12.00 p.m.- 12.25 p.m.	<b>T.S.1 - Emergency management</b> Building F - Floor 0 - Room 22 "Tosi Belefatti"	<b>T.S.3 - Cybersecurity, artificial intelligence, data mining, big data analysis, and DSS applied to CBRNe</b> Building F - Floor 0 - Room 21 "London"	<b>T.S.8 - Radiological and Nuclear events: methods, instrumentation, protection/decontamination, and technological developments</b> Building F - Floor 0 - Room 20 "Berlin"	<b>T.S.11 - CBRNe investigation and forensic</b> Building F - Floor 0 - Room 19 "Paris"
12.25 p.m.- 12.50 p.m.	Chairpersons: S. Johnson, S. Schiaroli, M. Baleani	Chairpersons: O. Illiashenko, P. Chatterjee, R. Rossi	Chairpersons: F. d'Errico, T. Kokalova Wheldon, E. Gallego	Chairpersons: I.M.Z. Almarzouqi, A. Gloria, F. Ewann
12.50 p.m.- 1.15 p.m.				

\*Permanent coffee station always available from 9.00 a.m. to 5.00 p.m. in Building F - Floor 0  
NATIONAL FIRE ACADEMY ROME

\*Registration desk is always open from 8.00 a.m. to 6.00 p.m. in Building F - Floor 0

## Tuesday 26 September 2023



1.15 p.m.- 2.15 p.m.	<b>Lunch break</b> Building F Floor -1 Room "Caravaggio"	<b>Poster Session 1</b> Building F Floor -1 Room "Caravaggio"	<b>Industrial Exhibition</b> Building F Floor -1 Room "Caravaggio"
2.15 p.m.- 3.00 p.m.	<b>Poster Session 1</b> Building F Floor -1 Room "Caravaggio"	<b>Industrial Exhibition</b> Building F Floor -1 Room "Caravaggio"	
3.00 p.m.- 3.25 p.m.	<b>Table Top Exercise - TTX</b> Building F - Floor 1 Room 22 "Tosi Belefatti"	<b>T.S.8 - Radiological and Nuclear events: methods, instrumentation, protection/decontamination, and technological developments</b> Building F - Floor 0 - Room 20 "Berlin"	<b>Summer School OPEN MONTECARLO (OpenMC)</b> Building F - Floor 1 Rooms 19 "Paris"
3.25 p.m.- 3.50 p.m.			
3.50 p.m.- 4.15 p.m.			
4.15 p.m.- 4.40 p.m.			
4.40 p.m.- 5.05 p.m.	Chairpersons: M.I. Thornton, A. Iannotti, C. Russo, R. Quaranta, G.P. Xerri	Chairpersons: F. d'Errico, T. Kokalova Wheldon, E. Gallego	Chairperson: José- María Gómez-Ros
5.05 p.m.- 5.20 p.m.	<b>Coffee break</b> Building F Floor -1 Room "Caravaggio"	<b>Industrial Exhibition</b> Building F Floor -1 Room "Caravaggio"	
5.20 p.m.- 5.45 p.m.	<b>Table Top Exercise - TTX</b> Building F - Floor 1 Room 22 "Tosi Belefatti"	<b>T.S.8 - Radiological and Nuclear events: methods, instrumentation, protection/decontamination, and technological developments</b> Building F - Floor 0 - Room 20 "Berlin"	<b>Summer School OPEN MONTECARLO (OpenMC)</b> Building F - Floor 1 Rooms 19 "Paris"
5.45 p.m.- 6.10 p.m.			
6.10 p.m.- 6.35 p.m.			
6.35 p.m.- 7.00 p.m.			
	Chairpersons: M.I. Thornton, A. Iannotti, C. Russo, R. Quaranta, G.P. Xerri	Chairpersons: F. d'Errico, T. Kokalova Wheldon, E. Gallego	Chairperson: José- María Gómez-Ros

\*Permanent coffee station always available from 9.00 a.m. to 5.00 p.m. in Building F - Floor 0  
NATIONAL FIRE ACADEMY ROME

September 26th											
Parallel sessions											
09:30	T.S.1	30.TS1	Room 22 Tosi Beleffi	T.S.3	57.TS3	Room 21 London	T.S.8	116.TS8	Room 20 Berlin	164.TS11	Room 19 Paris
09:55		31.TS1			58.TS3			117.TS8		165.TS11	
10:20		32.TS1			59.TS3			118.TS8		166.TS11	
10:45		33.TS1			60.TS3			110.TS8		167.TS11	
11:10		34.TS1						111.TS8			
11:35	Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition	
12:00	T.S.1	35.TS1	Room 22 Tosi Beleffi		Room 21 London	T.S.8	119.TS8	Room 20 Berlin		Room 19 Paris	
12:25		249.TS1					142.TS8				
12:50		244.TS1					123.TS8				
13:15-14:15	Lunch - Poster session 1 - Industrial exhibition - Room Caravaggio										
14:15-15:00	Poster session 1 - Industrial exhibition - Room Caravaggio										
15:00	Table Top Exercise - TTX		Room 22 Tosi Beleffi	T.S.1	36.TS1	Room 21 London	T.S.8	124.TS8	Room 20 Berlin	Summer School OpenMC	Room 19 Paris
15:25					38.TS1			125.TS8			
15:50					251.TS1			126.TS8			
16:15								122.TS8			
16:40								241.TS8			
17:05	Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition	
17:20	Table Top Exercise - TTX		Room 22 Tosi Beleffi		Room 21 London			Room 20 Berlin	Summer School OpenMC	Room 19 Paris	
17:45											
18:10											
18:35											
19:00	End of day 2										

Poster session 1 - 13:15-15:00 - Room Caravaggio									
182.PS1	183.PS1	184.PS1	186.PS1	187.PS1	188.PS1	189.PS1	190.PS1	191.PS1	192.PS1
193.PS1	194.PS1	195.PS1	196.PS1	197.PS1	198.PS1	199.PS1	200.PS1	201.PS1	202.PS1
203.PS1	204.PS1	205.PS1	206.PS1	207.PS1	209.PS1	211.PS1	240.PS2	245.PS1	

## DAY 3 – Wednesday 27 September 2023 - National Fire Academy (Rome)

\*Registration desk is always open from 8.00 a.m. to 6.00 p.m. in Building F - Floor 0



## Wednesday 27 September 2023

9.00 a.m.-11.30 a.m.	<b>PLENARY SESSION 2</b> Building B - Floor 3 - Room "Giorgio Mazzini" (Aula Magna)  Chairperson: Dieter Rothbacher		
11.30 a.m.-12.00 p.m.	<b>Coffee break</b> Building F - Floor -1 Room "Caravaggio"	<b>Poster Session 2</b> Building F - Floor -1 Room "Caravaggio"	<b>Industrial Exhibition</b> Building F - Floor -1 Room "Caravaggio"
12.30 p.m.-01.30 p.m.	<b>Poster Session 2</b> Building F - Floor -1 Room "Caravaggio"	<b>Industrial Exhibition</b> Building F - Floor -1 Room "Caravaggio"	
1.30 p.m.-2.30 p.m.	<b>Lunch break</b> Building F - Floor -1 Room "Caravaggio"	<b>Industrial Exhibition</b> Building F - Floor -1 Room "Caravaggio"	

\*Permanent coffee station always available from 9.00 a.m. to 5.00 p.m. in Building F - Floor 0  
NATIONAL FIRE ACADEMY ROME

\*Registration desk is always open from 8.00 a.m. to 6.00 p.m. in Building F - Floor 0



## Wednesday 27 September 2023

2.30 p.m.- 2.55 p.m.	<b>T.S.2 - Geopolitical, economical, and legal aspects related to CBRNe events and International Cooperation</b>  Building F - Floor 0 - Room 22 "Tosi Belefli"     Chairpersons: R. Trapp, C. Cupelli, D. Morea	<b>T.S.4 - CBRNe training and education: classic approaches and modern ones through virtual and augmented reality and serious games</b>  Building F - Floor 0 - Room 21 "London"     Chairpersons: D. Rothbacher, M.I. Thornton, U. Battista	<b>T.S.6 - Emergency communication and psychology</b> Building F - Floor 0 - Room 20 "Berlin"   Chairpersons: A. Hosin, A. Parrilla, N. Simone	<b>T.S.10 - Biological events and pandemics: methods, algorithms instrumentation, protection/decontamination, and technological developments</b> Building F - Floor 0 - Room 19 "Paris"   Chairpersons: S. De Sousa Lalic, C. Bartels, E. Cavalieri D'Oro
2.55 p.m.- 3.20 p.m.				
3.20 p.m.- 3.45 p.m.				
3.45 p.m.- 4.10 p.m.				
4.10 p.m.- 4.35 p.m.				
4.35 p.m.- 5.00 p.m.	<b>Coffee break</b> Building F Floor -1 Room "Caravaggio"		<b>Industrial Exhibition</b> Building F Floor -1 Room "Caravaggio"	
5.00 p.m.- 5.25 p.m.	<b>T.S.2 - Geopolitical, economical, and legal aspects related to CBRNe events and International Cooperation</b>  Building F - Floor 0 - Room 22 "Tosi Belefli"   Chairpersons: R. Trapp, C. Cupelli, D. Morea	<b>T.S.4 - CBRNe training and education: classic approaches and modern ones through virtual and augmented reality and serious games</b>  Building F - Floor 0 - Room 21 "London"   Chairpersons: D. Rothbacher, M.I. Thornton, U. Battista	<b>T.S.6 - Emergency communication and psychology</b> Building F - Floor 0 - Room 20 "Berlin"   Chairpersons: A. Hosin, A. Parrilla, N. Simone	<b>T.S.10 - Biological events and pandemics: methods, algorithms instrumentation, protection/decontamination, and technological developments</b> Building F - Floor 0 - Room 19 "Paris"   Chairpersons: S. De Sousa Lalic, C. Bartels, E. Cavalieri D'Oro
5.25 p.m.- 5.50 p.m.				
5.50 p.m.- 6.15 p.m.				

\*Permanent coffee station always available from 9.00 a.m. to 5.00 p.m. in Building F - Floor 0  
NATIONAL FIRE ACADEMY ROME

September 27th													
Time					Welcome Addresses								
9:00-11:30	Plenary 2				8.PL2	Giorgio Mazzini (Aula Magna)							
					9.PL2								
					10.PL2								
					11.PL2								
					12.PL2								
					13.PL2								
					14.PL2								
11:30-12:00	Coffee Break - Poster Session 2 - Industrial exhibition - Room Caravaggio												
12:00-13:30	Poster session 2 - Industrial exhibition - Room Caravaggio												
13:30-14:30	Lunch - Industrial exhibition - Room Caravaggio												
Parallel sessions													
14:30	T.S.2	39.TS2	Room 22 Tosi Beleffi	T.S.4	61.TS4	Room 21 London	T.S.6	88.TS6	Room 20 Berlin	T.S.10	143.TS10	Room 19 Paris	
14:55		40.TS2			62.TS4			89.TS6			144.TS10		
15:20		41.TS2			63.TS4			90.TS6			145.TS10		
15:45		42.TS2			64.TS4			91.TS6			146.TS10		
16:10		43.TS2			65.TS4			92.TS6			147.TS10		
16:35	Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			
17:00	T.S.2	44.TS2	Room 22 Tosi Beleffi	T.S.4	66.TS4	Room 21 London	T.S.6	93.TS6	Room 20 Berlin	T.S.10	148.TS10	Room 19 Paris	
17:25		47.TS2			67.TS4			94.TS6			149.TS10		
17:50					68.TS4			95.TS6			246.TS10		
18:15	End of Day 3												

Poster session 2 - 11:30-13:30 - Room Caravaggio									
185.PS1	212.PS2	213.PS2	214.PS2	215.PS2	216.PS2	217.PS2	218.PS2	219.PS2	220.PS2
221.PS2	222.PS2	223.PS2	224.PS2	225.PS2	226.PS2	227.PS2	228.PS2	229.PS2	230.PS2
231.PS2	232.PS2	233.PS2	234.PS2	235.PS2	236.PS2	237.PS2	238.PS2	239.PS2	



**DAY 4 – Thursday 28 September 2023 - National Fire Academy (Rome)**

\*Registration desk is always open from 8.00 a.m. to 6.00 p.m. in Building F - Floor 0

**Thursday 28 September 2023**



9.30 a.m.- 9.55 a.m.	<b>T.S.2 - Geopolitical, economical, and legal aspects related to CBRNe events and International Cooperation</b> Building F - Floor 0 - Room 22 "Tosi Beleffi"  Chairpersons: R. Trapp, C. Cupelli, D. Morea	<b>T.S.4 - CBRNe training and education: classic approaches and modern ones through virtual and augmented reality and serious games</b> Building F - Floor 0 - Room 21 "London"  Chairpersons: D. Rothbacher, M.I. Thornton, U. Battista	<b>T.S.6 - Emergency communication and psychology</b> Building F - Floor 0 - Room 20 "Berlin"  Chairpersons: A. Hosin, A. Parrilla, N. Simone	<b>T.S.10 - Biological events and pandemics: methods, algorithms instrumentation, protection/decontamination, and technological developments</b> Building F - Floor 0 - Room 19 "Paris"  Chairpersons: S. De Sousa Lalic, C. Bartels, E. Cavalieri D'Oro
9.55 a.m.- 10.20 a.m.				
10.20 a.m.- 10.45 a.m.				
10.45 a.m.- 11.10 a.m.				
11.10 a.m.- 11.35 a.m.	<b>Coffee break</b> Building F - Floor -1 Room "Caravaggio"		<b>Industrial Exhibition</b> Building F - Floor -1 Room "Caravaggio"	
11.35 a.m.- 12.00 p.m.	<b>T.S.2 - Geopolitical, economical, and legal aspects related to CBRNe events and International Cooperation</b> Building F - Floor 0 - Room 22 "Tosi Beleffi"  Chairpersons: R. Trapp, C. Cupelli, D. Morea	<b>T.S.4 - CBRNe training and education: classic approaches and modern ones through virtual and augmented reality and serious games</b> Building F - Floor 0 - Room 21 "London"  Chairpersons: D. Rothbacher, M.I. Thornton, U. Battista	<b>T.S.6 - Emergency communication and psychology</b> Building F - Floor 0 - Room 20 "Berlin"  Chairpersons: A. Hosin, A. Parrilla, N. Simone	<b>T.S.10 - Biological events and pandemics: methods, algorithms instrumentation, protection/decontamination, and technological developments</b> Building F - Floor 0 - Room 19 "Paris"  Chairpersons: S. De Sousa Lalic, C. Bartels, E. Cavalieri D'Oro
12.00 p.m.- 12.25 p.m.				
12.25 p.m.- 12.50 p.m.				
12.50 p.m.- 1.15 p.m.				
1.15 p.m.- 2.15 p.m.	<b>Lunch break</b> Building F - Floor -1 Room "Caravaggio"		<b>Industrial Exhibition</b> Building F - Floor -1 Room "Caravaggio"	

\*Permanent coffee station always available from 9.00 a.m. to 5.00 p.m. in Building F - Floor 0  
NATIONAL FIRE ACADEMY ROME

\*Registration desk is always open from 8.00 a.m. to 6.00 p.m. in Building F - Floor 0

**Thursday 28 September 2023**



2.15 p.m.- 2.40 p.m.	<b>T.S.9 - Chemical and explosive events: methods, instrumentation, protection/decontamination, algorithms and technological developments</b> Building F - Floor 0 - Room 22 "Tosi Beleffi"  Chairpersons: P. Gaudio, F. Duschek, J.L. Pérez Diaz	<b>T.S.5 - CBRNe medical emergencies, first aid, and pandemics management</b> Building F - Floor 0 - Room 21 "London"  Chairpersons: V. Vasilou, G. Manenti, M. D'Arienzo	<b>T.S.7 - Safety, security, and strategies to protect critical infrastructures, numerical simulation, and methods for risk assessment and reduction</b> Building F - Floor 0 - Room 20 "Berlin"  Chairpersons: T. Lopes, D. Di Giovanni, F. Garzia	<b>T.S.12 - CBRNe new risks and challenges provoked by climate change, war, terrorism, local conflicts and food security</b> Building F - Floor 0 - Room 19 "Paris"  Chairpersons: R. Karkalic, B. Allert, S. Stienstra
2.40 p.m.- 3.05 p.m.				
3.05 p.m.- 3.30 p.m.				
3.30 p.m.- 3.55 p.m.				
3.55 p.m.- 4.20 p.m.	<b>Coffee break</b> Building F - Floor -1 Room "Caravaggio"		<b>Industrial Exhibition</b> Building F - Floor -1 Room "Caravaggio"	
4.20 p.m.- 4.45 p.m.	<b>T.S.9 - Chemical and explosive events: methods, instrumentation, protection/decontamination, algorithms and technological developments</b> Building F - Floor 0 - Room 22 "Tosi Beleffi"  Chairpersons: P. Gaudio, F. Duschek, J.L. Pérez Diaz	<b>T.S.5 - CBRNe medical emergencies, first aid, and pandemics management</b> Building F - Floor 0 - Room 21 "London"  Chairpersons: V. Vasilou, G. Manenti, M. D'Arienzo	<b>T.S.7 - Safety, security, and strategies to protect critical infrastructures, numerical simulation, and methods for risk assessment and reduction</b> Building F - Floor 0 - Room 20 "Berlin"  Chairpersons: T. Lopes, D. Di Giovanni, F. Garzia	<b>T.S.12 - CBRNe new risks and challenges provoked by climate change, war, terrorism, local conflicts and food security</b> Building F - Floor 0 - Room 19 "Paris"  Chairpersons: R. Karkalic, B. Allert, S. Stienstra
4.45 p.m.- 5.10 p.m.				
5.10 p.m.- 5.35 p.m.				
9.00 p.m.	<b>Conference Dinner in Villa Parco della Vittoria</b>  <b>3 Best POSTER AWARDS Ceremony</b>			

\*Permanent coffee station always available from 9.00 a.m. to 5.00 p.m. in Building F - Floor 0  
NATIONAL FIRE ACADEMY ROME

September 28th												
Parallel sessions												
09:30	T.S.2	45.TS2	Room 22 Tosi Beleffi	T.S.4	71.TS4	Room 21 London		Room 20 Berlin	T.S.10	151.TS10	Room 19 Paris	
09:55		46.TS2			72.TS4					152.TS10		
10:20		48.TS2			73.TS4					153.TS10		
10:45					74.TS4					150.TS10		
11:10	Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition		
11:35			Room 22 Tosi Beleffi	T.S.4	70.TS4	Room 21 London		Room 20 Berlin	T.S.10	154.TS10	Room 19 Paris	
12:00					29.TS4					252.TS10		
12:25					69.TS4					155.TS10		
12:50					75.TS4					156.TS10		
13:15-14:15	Lunch - Industrial exhibition - Room Caravaggio											
14:15	T.S.9	128.TS9	Room 22 Tosi Beleffi	T.S.5	77.TS5	Room 21 London	T.S.7	96.TS7	Room 20 Berlin	T.S.12	168.TS12	Room 19 Paris
14:40		129.TS9			78.TS5			97.TS7			169.TS12	
15:05		130.TS9			79.TS5			98.TS7			170.TS12	
15:30		137.TS9			80.TS5			99.TS7			171.TS12	
15:55	Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition		
16:20	T.S.9	132.TS9	Room 22 Tosi Beleffi	T.S.5	81.TS5	Room 21 London	T.S.7	243.TS7	Room 20 Berlin	T.S.12	172.TS12	Room 19 Paris
16:45		133.TS9			82.TS5			100.TS7			173.TS12	
17:10		131.TS9			86.TS5			101.TS7			175.TS12	
17:35	End of day 4											
21:00	Conference Dinner - Villa Parco della Vittoria 3 Best POSTER AWARDS Ceremony											



## DAY 5 – Friday 29 September 2023 - National Fire Academy (Rome)

\*Registration desk is always open from 8.00 a.m. to 6.00 p.m. in Building F - Floor 0

## Friday 29 September 2023



9.30 a.m.- 9.55 a.m.	<b>T.S.9 - Chemical and explosive events: methods, instrumentation, protection/decontamination, algorithms and technological developments</b> Building F - Floor 0 - Room 22 "Tosi Belefri"	<b>T.S.5 - CBRNe medical emergencies, first aid, and pandemics management</b> Building F - Floor 0 - Room 21 "London"	<b>T.S.7 - Safety, security, and strategies to protect critical infrastructures, numerical simulation, and methods for risk assessment and reduction</b> Building F - Floor 0 - Room 20 "Berlin"	<b>T.S.12 - CBRNe new risks and challenges provoked by climate change, war, terrorism, local conflicts and food security</b> Building F - Floor 0 - Room 19 "Paris"
9.55 a.m.- 10.20 a.m.				
10.20 a.m.- 10.45 a.m.				
10.45 a.m.- 11.10 a.m.	Chairpersons: P. Gaudio, F. Duschek, J.L. Pérez Díaz	Chairpersons: V. Vasiliou, G. Manenti, M. D'Arienzo	Chairpersons: T. Lopes, D. Di Giovanni, F. Garzia	Chairpersons: R. Karkalic, B. Allert, S. Stienstra
11.10 a.m.- 11.35 a.m.				
11.35 a.m.- 12.00 p.m.	<b>Coffee break</b> Building F - Floor -1 Room "Caravaggio"		<b>Industrial Exhibition</b> Building F - Floor -1 Room "Caravaggio"	
12.00 p.m.- 12.25 p.m.	<b>T.S.9 - Chemical and explosive events: methods, instrumentation, protection/decontamination, algorithms and technological developments</b> Building F - Floor 0 - Room 22 "Tosi Belefri"	<b>T.S.5 - CBRNe medical emergencies, first aid, and pandemics management</b> Building F - Floor 0 - Room 21 "London"	<b>T.S.7 - Safety, security, and strategies to protect critical infrastructures, numerical simulation, and methods for risk assessment and reduction</b> Building F - Floor 0 - Room 20 "Berlin"	<b>T.S.12 - CBRNe new risks and challenges provoked by climate change, war, terrorism, local conflicts and food security</b> Building F - Floor 0 - Room 19 "Paris"
12.25 p.m.- 12.50 p.m.				
12.50 p.m.- 1.15 p.m.				
1.15 p.m.- 1.40 p.m.	Chairpersons: P. Gaudio, F. Duschek, J.L. Pérez Díaz	Chairpersons: V. Vasiliou, G. Manenti, M. D'Arienzo	Chairpersons: T. Lopes, D. Di Giovanni, F. Garzia	Chairpersons: R. Karkalic, B. Allert, S. Stienstra

\*Permanent coffee station always available from 9.00 a.m. to 5.00 p.m. in Building F - Floor 0  
NATIONAL FIRE ACADEMY ROME

\*Registration desk is always open from 8.00 a.m. to 6.00 p.m. in Building F - Floor 0

## Friday 29 September 2023



1.40 p.m.-3.00 p.m.	<b>Lunch break</b> Building F - Floor -1 Room "Caravaggio"	<b>Industrial Exhibition</b> Building F - Floor -1 Room "Caravaggio"
3.00 p.m.-5.30 p.m.	<b>PLENARY SESSION 3</b> Building B - Floor 3 - Room "Giorgio Mazzini" (Aula Magna) Chairperson: Prof. Anthony M. Hooker  <b>Best Presentation Awards</b> 1 Award for each Technical Session  <b>CBRNe Master Courses - Diploma Ceremony</b> <b>First and Second Level Master CBRNe</b> Building B - Floor 3 - Room "Giorgio Mazzini" (Aula Magna)	
5.30 p.m.-6.00 p.m.	<b>Closing remarks</b>	<b>Departure</b>

\*Permanent coffee station always available from 9.00 a.m. to 3.30 p.m. in Building F - Floor 0  
NATIONAL FIRE ACADEMY ROME

September 29th												
Parallel sessions												
09:30	T.S.9	134.TS9	Room 22 Tosi Beleffi	T.S.5	247.TS5	Room 21 London	T.S.7	102.TS7	Room 20 Berlin	T.S.12	174.TS12	Room 19 Paris
09:55		135.TS9			85.TS5			103.TS7			176.TS12	
10:20		136.TS9			83.TS5			104.TS7			177.TS12	
10:45		138.TS9			87.TS5			105.TS7			178.TS12	
11:10		139.TS9			84.TS5			106.TS7			179.TS12	
11:35	Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition			Coffee Break - Industrial exhibition		
12:00	T.S.9	140.TS9	Room 22 Tosi Beleffi			Room 21 London	T.S.7	250.TS7	Room 20 Berlin	T.S.12	180.TS12	Room 19 Paris
12:25		141.TS9						181.TS12				
12:50		127.TS9										
13:15-15:00	Lunch - Industrial exhibition - Room Caravaggio											
15:00-17:30					Plenary 3	Welcome Addresses	Giorgio Mazzini (Aula Magna)					
						16.PL3						
						17.PL3						
						254.PL3						
						15.PL3						
						253.PL3						
						18.PL3						
						19.PL3						
						20.PL3						
						21.PL3						
17:30-18:00	Closing remarks and departure											

## DAY 6 – Saturday 30 September 2023 – University of Rome Tor Vergata

## Saturday 30 September 2023



9.00 a.m.-11.00 a.m.	<b>Summer School OPEN MONTECARLO (OpenMC)</b> Chairperson: José-María Gómez-Ros Room Montalcini Faculty of Medicine and Surgery University of Rome Tor Vergata Via Montpellier 1, 00133 Rome
11.00 a.m.-11.30 a.m.	<b>Coffee break</b>
11.30 p.m.-1.30 p.m.	<b>Summer School OPEN MONTECARLO (OpenMC)</b> Chairperson: José-María Gómez-Ros Room Montalcini Faculty of Medicine and Surgery University of Rome Tor Vergata Via Montpellier 1, 00133 Rome
1.30 p.m. - 2.30 p.m.	<b>Lunch break</b>
2.30 p.m. - 5.30 p.m.	<b>Summer School OPEN MONTECARLO (OpenMC)</b> Chairperson: José-María Gómez-Ros Room Montalcini Faculty of Medicine and Surgery University of Rome Tor Vergata Via Montpellier 1, 00133 Rome

UNIVERSITY OF ROME TOR VERGATA

## PLENARY SESSIONS

### PLENARY SESSION 1

#### HOW OLD AND NEW DANGERS CAN THREAT THE WORLD: DISCUSSIONS AND PROPOSALS TO REDUCE RISKS

25th September 2023

11.30 a.m. - 1.30 p.m.

Room "Giorgio Mazzini" (Aula Magna)

Building B - Floor 3

#### **KEYNOTE OPENING**

**On. Guido CROSETTO**

MINISTER OF DEFENCE

Italian Ministry of Defence, (ITALY)

#### **WELCOME ADDRESSES**

**Pref. Laura LEGA**

HEAD OF THE DEPARTMENT OF FIREFIGHTERS, PUBLIC RESCUE AND CIVIL DEFENCE

Italian Ministry of Interior

Italian Ministry of Interior, (ITALY)

**Ing. Carlo DALL'OPPIO**

HEAD OF THE NATIONAL CORP OF THE ITALIAN FIREFIGHTERS

Italian Ministry of Interior, (ITALY)

**Prof. Nathan LEVIALDI GHIRON**

RECTOR

University of Rome Tor Vergata (ITALY)

**Gen. Alberto MANENTI**

Former Director Italian External Intelligence Agency (AISE)

President of the National Scientific Committee of SICC Series - CBRNe Conference 2023 (ITALY)

**Brigadier Salem Abdulah BIN BARRAK AL DHAHERI**

GENERAL DIRECTOR

Abu Dhabi Civil Defence Authority (UNITED ARAB EMIRATES)

#### **Chairperson PLENARY SESSION 1**

**Prof. Guglielmo MANENTI**

Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome (ITALY)

## ORAL CONTRIBUTIONS

### 1.PL1. HESAR for CBRNe safety and security.

**Alba Iannotti**<sup>(1,2)</sup>

1. President of HESAR - Health Safety Environmental Research Association Rome, Italy
2. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy

It is been just 7 years from the foundation of HESAR – Health Safety Environmental Research Association Rome and we already achieved many goals such as an official cooperation agreement with the International Master courses in Protection against CBRNe events of the University of Rome Tor Vergata, NGO member of Chemical weapons convention (CWC) program under the coordination of the Organisation for the prohibition of the chemical weapons (OPCW), the participation in a number of international and national research programs for CBRNe safety and security, the organization of full scale, functional and tabletop exercises for universities (Tor Vergata, Pisa, and Yale), the OPCW, the Abu Dhabi National authority. All these are just a part of our mission which is completed by the organization of national and international events like the SICC Series, CBRNe conference 2023.

### 2.PL1. CBRNe education: 15 years of “International Master Courses in Protection Against CBRNe events – Prof. Carlo Bellecci” at the University of Rome Tor Vergata.

**Colomba Russo**<sup>(1,2)</sup>

1. Deputy President of HESAR - Health Safety Environmental Research Association Rome, Italy
2. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy

The educational project called “International Master Courses in Protection Against CBRNe events – Prof. Carlo Bellecci” started in 2008 with the cooperation between Italian Army (Corpo degli Ingegneri dell'Esercito) and the University of Rome Tor Vergata. Over the years this project became International with National, International and Supranational cooperation all over the world. The CBRNe staff of the University of Rome Tor Vergata group composed by Engineers, Physicists, Biologists, Jurists, and Political Scientists has pursued, over the years, the Vision of the beloved Prof. Carlo Bellecci, funding father of the MasterCBRNe: “Let CBRNe became an academic discipline”.

### 3.PL1. LECTIO MAGISTRALIS. Security Research at German Aerospace Center (DLR).

**Thomas Dekorsy**<sup>(1,2)</sup>

1. German Aerospace Center (DLR), Director of the Institute of Technical Physics, Stuttgart, Germany
2. President of the International Scientific Committee of the SICC Series - CBRNe Conference 2023

The German Aerospace Center is one of German largest research organizations with more than 10,000 co-workers distributed over 55 institutes and 33 locations. Beside aviation, space, energy, and transportation research, research on security is a core competence of DLR which horizontally connects all research areas. Typically, security research is pursued in interdisciplinary projects involving several DLR institutes as well as in projects with national and international partners. The Institute of Technical Physics is a DLR Institute located in Stuttgart and Lampoldshausen with one focus in the field of CBE stand-off detection using laser spectroscopy and the development of new detection schemes for explosives in personal controls. The talk will highlight activities in DLR security research and research topics of the Institute of Technical Physics.

### 4.PL1. An overview of the main activities I have done to face different emergencies in Italy and abroad.

**Guido Bertolaso**<sup>(1)</sup>

1. Councillor for Welfare of the Lombardy Region, Lombardy Region, Italy

The emergencies have been part of my working activities since day 1. I have been involved in the coordination of major emergencies like earthquake, floods, and I have been involved (both at National and International Level) to face the COVID-19 pandemic event. In this talk I will present the main activities I have done to face the emergencies and contribute to the recovery of normality.

#### 5.PL1. On the Ground 9/11.

**Richard Fontana**<sup>(1)</sup>

*1. City of New Haven CT, Office of Emergency Management & Homeland Security, Emergency Operations Center, New Haven, CT, United States of America*

On September 11, 2001, a morning filled with sunshine, the vibrant area surrounding the World Trade Center as workers made their way, some with coffee in their hand ascending the beautiful Twin Towers. Across the street at the Hilton Millennium Hotel, breakfast sat on most tables as the day was just beginning. Our world changed on Tuesday morning at 8:46 AM EST when terror struck America, as the first plane struck the north tower of the WTC. Seventeen minutes later the second plane hit the south tower at WTC. In one of the most horrific attacks in American history, our world has changed forever, the word terrorism is now etched in our minds. Our world is much different today. It would be the last day that 343 FDNY heroes would not go home after their shift, it would be the last day the 72 Law Enforcement Officers would go home after their shift. Although 2,977 perished, it would prove to be the greatest American Rescue in History. Firefighters from all over the country would make their way to New York City in the days, weeks, and months ahead to try to lend a hand. Although many did not make it to “Ground Zero”, they had to go, they had to know in their hearts and minds they needed to support the brotherhood and sisterhood in their profession of firefighting. Fifteen firefighters from the West Haven CT, USA, Fire Department arrived at Ground Zero on 9/14, while the debris was still burning. It was less than 2 hours including the drive, that we were working in pile in search of recovering anything that could provide dignity to those who perished. Years after the attack and recovery at Ground Zero, the medical evaluations, the anguish, the frustration, and the dauntless task of NEVER FORGETTING 9/11. The fight against global terrorism remains today throughout our world, the women and men in the armed forces defending each and every one of us and protecting our constitution. In America, the Patriot Act was passed in just 45 days after 9/11. The change in the expansion of authority and laws to allow surveillance in phone, email communications and bank records to combat terrorism. Foreign and domestic surveillance to protect against possible attacks. The U.S. Department of Homeland Security, Transportation Security Administration (TSA) now has a workforce of 60,000 to keep the American transportation systems and the travelling public safe. With a budget of 9.7 Billion (FY2023) keeping foreign and domestic terrorists is expensive but required to keep the transportation system strong and safe to prevent another 9/11 from occurring.

#### 6.PL1. SICC Series CBRNe Conference: an initiative of the University of Rome Tor Vergata in cooperation with HESAR.

**Andrea Malizia**<sup>(1)</sup>

*1. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy*

The CBRNe activities started in 2008 with the Master CBRNe. We have started with 1 day conference back in 2009 at the National Institute of Geophysics and Vulcanology back in 2009 and we have organized since then 1 conference per year. Back in 2017 we have organized the first conference of 3 days and we have named the conference Scientific International Conference in CBRNe. During this talk I will show the growth of the SICC Series CBRNe Conference over the years and the main differences with other CBRNe symposiums, conferences or workshops organized worldwide.

#### 7.PL1. Keynote Remarks of the United States Under Secretary of State for Arms Control and International Security.

**Bonnie Denise Jenkins**<sup>(1)</sup>

*1. United States Under Secretary of State for Arms Control and International Security, United States of America*

PLENARY SESSION 2  
IS IT POSSIBLE THAT NATURAL EVENTS AND NATURAL DISASTERS CAN ACT AS  
TRIGGER FOR CBRNe EMERGENCIES?

27th September 2023  
9.30 a.m. - 11.30 a.m.  
Room "Giorgio Mazzini" (Aula Magna)  
Building B - Floor 3

**WELCOME ADDRESSES**

**Pref. Laura LEGA**

HEAD OF THE DEPARTMENT OF FIREFIGHTERS, PUBLIC RESCUE AND CIVIL DEFENCE  
Italian Ministry of Interior  
Italian Ministry of Interior, (ITALY)

**Ing. Carlo DALL'OPPIO**

HEAD OF THE NATIONAL CORP OF THE ITALIAN FIREFIGHTERS  
Italian Ministry of Interior, (ITALY)

**Prof. Nathan LEVIALDI GHIRON**

RECTOR  
University of Rome Tor Vergata (ITALY)

**Dr. Danilo ARAGNO**

National Federation of Chemists and Physicists

**Chairperson PLENARY SESSION 2**

**Dr. Dieter ROTHBACHER**

CBRN Protection (AUSTRIA)



## ORAL CONTRIBUTIONS

### 8.PL2.LECTIO MAGISTRALIS.

#### **Natural risks as the byproduct of physical gradients.**

**Carlo Doglioni**<sup>(1,2)</sup>

*1. Sapienza University, Rome, Italy*

*2. President of the Istituto Nazionale di Geofisica e Vulcanologia (INGV), Rome, Italy*

Any process on Earth is generated by a physical or chemical gradient. The higher the gradient, the larger the energy involved. The surface of the planet is featured by complex geological patterns produced by both endogenous and exogenous gradients. Any gradient may generate natural risks such as earthquakes, volcanism, landslides, floodings, hurricanes, Earth's degassing, etc. Therefore, a cascade of chemical, physical, and electromagnetic gradients dictates Earth's geodynamics and evolution. The lack of direct investigations still makes the Earth's interior poorly understood and prevents complete clarification of the deep gradients and the mechanisms ruling the Earth's vitality. We still don't know what move tectonic plates, hence most of the Earth's phenomena controlled by geodynamics, both internal and astronomical processes. Most gradients are natural, but some may be anthropogenic. The earthquakes are the dissipation of elastic or gravitational pressure gradients, and they have been and always will be an unavoidable ingredient of our life. The same is for volcanic eruptions, which are determined by pressure gradients in the magma chamber, where the rock melting is generated by thermal and compositional gradients in the Earth's mantle. Anthropogenic degassing in the atmosphere generated a perturbing gradient determining climate warming, producing relevant risks that we must face. The knowledge of gradients is the key for valuable structural and non-structural prevention.

### **9.PL2. Navigating the Australian Black Summer Bushfires – A Personal Perspective on Australia's Response and Recovery.**

**Anthony M. Hooker**<sup>(1)</sup>

*1. Centre for Radiation Research, Education, and Innovation, The University of Adelaide, Adelaide, South Australia, Australia*

The 2019-2020 Australian bushfires, known as the "Black Summer," caused significant devastation. They resulted in over 30 deaths, destroyed thousands of homes and structures, decimated wildlife, and habitats, and led to hazardous air quality due to smoke. The fires had a catastrophic impact on Australia's unique ecosystems. It's estimated that over 18 million hectares (44.5 million acres) of land were burned across the country. This led to significant habitat loss, endangering numerous plant and animal species, some of which are found nowhere else on Earth.

The Australian Incident Information Management System (AIIMS) played a crucial role in managing the emergency response during the bushfires. AIIMS is a standardized framework that ensures a coordinated approach among various agencies, such as fire services, police, and medical teams. It facilitated real-time information sharing, clear communication, resource allocation, and decision-making. AIIMS enabled responders to effectively manage logistics, implement evacuation plans, and provide timely public information. The disaster highlighted the need for improved preparedness, response coordination, climate change awareness, and community resilience.

As expected, the response to the bushfires was a massive and coordinated effort and involved thousands of firefighters, international assistance, evacuations, and community support. Evacuations were executed to ensure public safety, and evacuation centres provided shelter and support. Emergency management agencies collaborated to allocate resources, manage logistics, and coordinate response efforts. The establishment of the National Bushfire Recovery Agency focused on long-term recovery. Community support and donations played a vital role, reflecting the collective determination to address the disaster's impact. The response highlighted the importance of efficient communication, collaboration, and preparedness in managing such catastrophic events.

This presentation will give an overview of the response from a personal perspective as someone who lived in area affected by the bushfires.

**10.PL2. Unveiling Disaster: Exploring Dam Failures and CBRNe Events in Brazil and Beyond.****Susana De Souza Lalic**<sup>(1,2,4)</sup>, Elí Cristina Caçador<sup>(2,3)</sup>, Veridiana Teixeira de Souza Martins<sup>(3)</sup>, Francesco d'Errico<sup>(1,2,4,5)</sup>*1. Physics Department - Federal University of Sergipe - São Cristóvão, SE, Brazil**2. CBRNe Program, University of Rome - Tor Vergata, Rome, Italy**3. Instituto de Geociências, Universidade de São Paulo - São Paulo, SP, Brazil**4 Scuola di Ingegneria - Università di Pisa (UNIP) - Pisa, Italy**5. Yale Center for Emergency Preparedness and Disaster Response – Yale University - New Haven, CT, USA*

Over the past six years, Brazil has witnessed two significant CBRNe events resulting from unforeseen and unintentional releases of mining tailings. These incidents have led to a cascade of social, environmental, and financial consequences, posing formidable challenges for both first responders and decision-makers in their efforts to restore equilibrium and effectively manage the aftermath. One of these pivotal occurrences took place on November 5, 2015, when the catastrophic breach of the Fundão dam in Mariana unleashed a colossal wave of sludge. The accident claimed 19 lives and became Brazil's most extensive environmental catastrophe involving chemical and biological aspects. Just a few years later, on January 25, 2019, Brumadinho fell victim to yet another dam breach, resulting in a staggering death toll of 270 individuals. This lecture aims to delve into the mechanics of these dam failures within Brazil, providing an analysis of their unfolding. Additionally, it will spotlight analogous global incidents, elucidating their reverberating impacts and consequent detriments. Focusing on the Brazilian context, the discourse will expound upon the measures instituted to minimize the repercussions and it will highlight the legislative amendments that followed these calamities. A comparative exploration of emergency protocols for dam failures and other CBRNe-related emergencies will also be undertaken, shedding light on their distinct attributes and commonalities.

**11.PL2. Lessons learned from responding to the nuclear disaster - Feedback to natural disaster response on information/communication, wide-area evacuation and training/education.****Nakahiro Yasuda**<sup>(1,2)</sup>*1. The research institute of nuclear engineering, University of Fukui, Fukui, Japan**2 The Great East Japan Earthquake and Nuclear Disaster Memorial Museum, Fukushima, Japan*

A massive earthquake of magnitude 9.0 occurred off the Sanriku coast in 2011. According to the Reconstruction Agency in Japan, 19,759 people have died so far, including disaster-related deaths, 2,553 people are still missing, and 122,006 houses have been completely destroyed. Twelve years later, 31,438 people are still living as evacuees. The project for housing reconstruction and community development is almost complete. Existing and new roads are being developed and the JR Joban Line is fully open. Production facilities in the three affected prefectures (Iwate, Miyagi, and Fukushima) have mostly been restored. Looking at the agriculture and fisheries industries, it is possible to resume farming in 95% of the tsunami damage records. The seafood processing industry in the three affected prefectures resumed operations at 98% of the facilities that requested reopening. Due to the release and diffusion of radioactive materials caused by the accident at the TEPCO Fukushima Daiichi Nuclear Power Station, some of the six towns and villages around the nuclear power plant are still designated as evacuation zones. Japan's disaster management system covers all stages of disaster prevention, mitigation, preparedness and emergency response, recovery and reconstruction. It also defines the roles and responsibilities of national and local governments and involves public and private stakeholders. This approach has allowed us to quickly and effectively recruit personnel from various organizations in a wide range of areas outside the disaster area even during the disaster. In order to prepare for possible mega-disasters in the future, regional disaster prevention plans have been reviewed and new measures have been proposed. This presentation will provide information from the following three perspectives: 1) Issues in information and communication under disasters, 2) Issues in wide-area evacuation plans in the event of a severe disaster, and 3) Development of disaster prevention personnel training and nuclear disaster prevention in school education. For the information and communication, it will address the lack of real-time information about local conditions and coordination among stakeholders, and the loss of critical public records critical to recovery. The wide-area evacuation plan that spans administrative districts is being considered, assuming hundreds of thousands of evacuees. Especially in recent years, disaster prevention plans are being considered not only for nuclear disasters, but also for Tokyo inland earthquake, Mount Fuji eruption and flood damage in various cities. The estimation of evacuation time to improve the efficiency of evacuation of residents is advancing its own evolution in consideration under these disasters. Lastly, training on radiation countermeasures for disaster prevention personnel

(administrator, medical personnel, and firefighters) and nuclear disaster prevention in school education will be mentioned.

## 12.PL2. The DISASTER paradigm for responding to chemical, biological, radiological, nuclear and trauma/burn mass casualty incidents.

**Francesco d'Errico**<sup>(1,2,3)</sup>, Vasilis Vasilou<sup>(2)</sup>, James Paturas<sup>(3)</sup>, Joseph Albanese<sup>(3,4)</sup>

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

2. Yale School of Public Health, New Haven, Connecticut, USA

3. Yale Center for Emergency Preparedness and Disaster Response, New Haven, Connecticut, USA

4. Yale School of Medicine New Haven, Connecticut, USA

This presentation outlines how the DISASTER paradigm was utilized to formulate a series of clinical directives aimed at aiding hospitals in their readiness efforts to manage incidents involving chemical, biological, radiological, nuclear events, or explosive devices that lead to trauma/burn mass casualty incidents (MCIs), as well as their initial response to such occurrences. The DISASTER paradigm, crafted by the National Disaster Life Support Education Foundation (NDLSEC), serves as a blueprint for out-of-hospital emergency response, encompassing the following components: (1) Detection; (2) Incident command system; (3) Security and safety; (4) Assessment; (5) Support; (6) Triage and treatment; (7) Evacuation; and (8) Recovery. The acronym 'DISASTER' is formed from the initial letters of these crucial emergency response elements, serving as a memory aid. Descriptive insights were gathered from project-related observations and records. The expertise provided by a team of disaster medicine specialists at the Yale New Haven Health System Center for Emergency Preparedness and Disaster Response (YNHHS-CEPDR) was harnessed to draft the clinical guidelines. Analogous to NDLSEC's approach for on-site activities, the YNHHS-CEPDR clinical guidelines employ the letters in the term 'disaster' as a mnemonic to recollect the principal components necessary for managing MCIs within the hospital's emergency department.

## 13.PL2. An AI-powered patient triage platform for future viral outbreaks using COVID-19 as a disease model.

Georgia Charkoftaki<sup>(1)</sup>, Reza Aalizadeh<sup>(2)</sup>, Alvaro Santos-Neto<sup>(3)</sup>, Wan Ying Tan<sup>(1,4†)</sup>, Emily A. Davidson<sup>(1,5)</sup>, Varvara Nikolopoulou<sup>(2)</sup>, Yewei Wang<sup>(1)</sup>, Brian Thompson<sup>(1)</sup>, Tristan Furnary<sup>(1,6†)</sup>, Ying Chen<sup>(1)</sup>, Elsie Wunder<sup>(7)</sup>, Andreas Coppi<sup>(8)</sup>, Wade Schulz<sup>(8,9)</sup>, Akiko Iwasaki<sup>(10,11)</sup>, Richard W. Pierce<sup>(12)</sup>, Charles S. Dela Cruz<sup>(13)</sup>, Gary V. Desir<sup>(14)</sup>, Naftali Kaminski<sup>(13)</sup>, Shelli Farhadian<sup>(15,16,17)</sup>, Kirill Veselkov<sup>(1,18)</sup>, Rupak Datta<sup>(19,20)</sup>, Melissa Campbell<sup>(15)</sup>, Nikolaos S. Thomaidis<sup>(2)</sup>, Albert I. Ko<sup>(7,21,22)</sup> Yale IMPACT Study Team, David C. Thompson<sup>(1)</sup>, **Vasilis Vasilou**<sup>(1)</sup>

1. Department of Environmental Health Sciences, Yale School of Public Health, Yale University, New Haven, CT, USA

2. Laboratory of Analytical Chemistry, Department of Chemistry, National and Kapodistrian University of Athens, Greece

3. São Carlos Institute of Chemistry, University of São Paulo, São Carlos 13566-590, SP, Brazil

4. Internal Medicine Residency Program, Department of Internal Medicine, Norwalk Hospital, CT, USA

5. Department of Cellular and Molecular Physiology, Yale University School of Medicine, New Haven, Connecticut, USA

6. Harvard Medical School, Harvard University, Boston, MA, USA

7. Department of Epidemiology of Microbial Diseases, Yale School of Public Health, Yale University, New Haven, CT, USA

8. Center for Outcomes Research and Evaluation, Yale-New Haven Hospital, New Haven, CT, USA

9. Department of Laboratory Medicine, Yale University School of Medicine, New Haven, CT, USA

10. Department of Immunobiology, Yale University School of Medicine, New Haven, CT, USA

11. Howard Hughes Medical Institute, Chevy Chase, MD, USA

12. Department of Pediatrics, Yale School of Medicine, New Haven, CT, USA

13. Section of Pulmonary, Critical Care and Sleep Medicine, School of Medicine, Yale University, New Haven, CT, USA

14. Department of Internal Medicine, Section of Nephrology, Yale School of Medicine - New Haven, CT, USA

15. Department of Internal Medicine, Section of Infectious Diseases, Yale School of Medicine, New Haven, CT, USA

16. Department of Neurology, Yale School of Medicine, New Haven, CT, USA

17. Department of Epidemiology of Microbial Diseases, Yale School of Public Health, Yale University, New Haven, CT, USA

18. Department of Surgery and Cancer, Imperial College London, South Kensington Campus, London, UK

19. Veterans Affairs Connecticut Healthcare System, West Haven, Connecticut, USA

20. Department of Internal Medicine, Yale School of Medicine, New Haven, Connecticut, USA

21. Department of Medicine, Yale University School of Medicine, New Haven, Connecticut, USA; Department of Medicine, Veterans Affairs Connecticut Healthcare System, West Haven, Connecticut, USA

22. Instituto Gonçalo Moniz, Fundação Oswaldo Cruz, Brazilian Ministry of Health, Salvador, Brazil

† Current address

Throughout the past century, outbreaks and pandemics have surfaced at unsettlingly regular intervals, underscoring the importance of proactive readiness and well-coordinated responses. In this context, we have developed an advanced predictive machine learning model for gauging the severity of diseases and the duration of hospital stays in COVID-19 cases. This model lays the groundwork for addressing potential future viral outbreaks. Our methodology involved amalgamating untargeted metabolomics data extracted from plasma samples of COVID-19 patients (n=111) during their hospitalization, alongside samples from healthy controls (n=342). Coupled with clinical and comorbidity data (n=508), we have established a patient assessment framework comprising three key components: Clinical Decision Tree: Among a range of biomarkers, our clinical decision tree pinpointed elevated eosinophil levels as a potent prognostic indicator of disease severity. This discovery presents a potential novel biomarker with remarkable accuracy (AUC=0.974). Hospitalization Duration Estimation: Our model accurately predicts the duration of patient hospitalization with a minimal margin of error ( $\pm 5$  days) ( $R^2=0.9765$ ). Severity Prediction and Intensive Care Unit Transfer: We've also created a mechanism for forecasting disease severity and determining the necessity of transferring patients to the intensive care unit. Notably, patients requiring positive airway pressure oxygen and/or intubation exhibited significantly diminished serotonin levels. Additionally, our research revealed elevated levels of metabolites like 5-hydroxy tryptophan, allantoin, and glucuronic acid in COVID-19 patients, collectively offering predictive potential for disease progression. The significance of swiftly identifying patients at risk of life-threatening illness cannot be overstated. Such early identification enables optimized allocation of medical resources and the implementation of highly effective interventions. We strongly advocate that this same methodology holds promise for guiding hospital triage procedures during future viral outbreaks. By doing so, hospitals can enhance patient outcomes, ensure resource efficiency, and effectively address the challenges posed by emergent infectious diseases.

#### **14.PL2. Emilia Romagna Flood – Main activity and intervention of National Fire and Rescue Service and related CBRN risk.**

**Sergio Schiaroli**<sup>(1)</sup>, Damiano Zurlo<sup>(1)</sup>

*1. National Fire and Rescue Service - Central Directorate of Emergency, Rome, Italy*

The purpose of this work is to illustrate the intervention work of the National Fire and Rescue Service during the recent natural disaster that involved Emilia Romagna, in particular by analyzing the direct and collateral interventions, including CBRN ones. In the first days of May, in a few hours, part of the Region was affected by exceptional rainfall causing the overflowing and breaking of the banks of numerous rivers, canals and streams, resulting in mud and debris flow, flooding of anthropized areas, basin of stagnant water and sewers overflow. Collaterally, the flood caused chemical and biological risks to the primary scenarios, this significantly influenced the choice of PPE. On the biological and sanitary side, contamination by sewage water, the movement of abandoned waste and the putrefaction of animal carcasses were found, elements which could have favored the transmission of pathogenic microorganisms. Although no epidemics have been recorded, the Romagna Health Authority has nevertheless set up field vaccination centers for Tetanus and Hepatitis A. The flood scenario has also caused chemical risks due to environmental contamination in those industrial plants that produce and/or use chemical additives or that generate biogas through the processing and transformation of food waste for the production of energy. In this context, sampling and detection were carried out on the water deposited near the industrial areas affected by the floods. Furthermore, always on the chemical side, where there were LPG tanks, above ground or underground, due to hydrostatic pressure they were uprooted or re-emerged by floating, numerous breakages of the pipes occurred with consequent loss of LPG. The chemical risk also occurred a few weeks after the calamitous event, when lithium batteries present in landfills and piles of waste caught fire from a chemical reaction. The concurrence of interventions to face aquatic risk with the rescue of people and goods and interventions to face CBRN risk has made the management of this natural disaster more complex and challenging.

**PLENARY SESSION 3**  
**INTERNATIONAL COOPERATION, COUNTER PROLIFERATION, COMMUNICATION AND**  
**TECHNICAL SOLUTIONS TO PREVENT CBRNe DANGEROUS SCENARIOS**

*29th September 2023*

*3.00 p.m. - 5.30 p.m.*

*Room "Giorgio Mazzini" (Aula Magna)*

*Building B - Floor 3*

**WELCOME ADDRESSES**

**On. Antonio TAJANI**

MINISTER OF INTERNATIONAL COOPERATION AND FOREIGN AFFAIRS  
Italian Ministry of International Cooperation and Foreign Affairs (ITALY)

**Pref. Laura LEGA**

HEAD OF THE DEPARTMENT OF FIREFIGHTERS, PUBLIC RESCUE AND CIVIL DEFENCE  
Italian Ministry of Interior  
Italian Ministry of Interior, (ITALY)

**Ing. Carlo DALL'OPPIO**

HEAD OF THE NATIONAL CORP OF THE ITALIAN FIREFIGHTERS  
Italian Ministry of Interior, (ITALY)

**Prof. Nathan LEVIALDI GHIRON**

RECTOR  
University of Rome Tor Vergata (ITALY)

***Chairperson PLENARY SESSION 3***

**Prof. Anthony M. HOOKER**

Centre for Radiation Research, Education, and Innovation, The University of Adelaide, Adelaide, South Australia  
(AUSTRALIA)

## **ORAL CONTRIBUTIONS**

### **16.PL3. LECTIO MAGISTRALIS**

#### **The Role of International Cooperation in Enhancing CBRNe Safety & Security, An IAEA Perspective.**

**Mark Ladd**<sup>(1)</sup>

##### ***1. International Atomic Energy Agency (IAEA), Vienna International Centre, Vienna, Austria***

The International Atomic Energy Agency (IAEA) is the world's center for cooperation in the peaceful use of nuclear science and technology. In the current IAEA Nuclear Security Plan 2022-2025, our Member States underlined the importance of keeping pace with evolving challenges and threats to nuclear security using scientific and technological innovations and have affirmed the important role of science, technology, and engineering in understanding and addressing such challenges and threats.

While addressing the RN component of the CBRNe threat spectra is clearly within IAEA's nuclear security and safety wheelhouse, the application of nuclear science and technology to deal with the other aspects of WMD is less well known. In the presentation, IAEA efforts applicable to addressing the complete CBRNe threat spectrum will be discussed. An integrated and coordinated approach using application of basic security principles combined with innovative use of science and technology is needed to effectively deter, detect, and mitigate current and evolving CBRNe threats. While science and technology play an important role in addressing CBRNe threats, successful research, development, and deployment efforts require international cooperation. Opportunities for cooperative work with the IAEA will be discussed to further enhance global efforts to minimize the CBRNe threat.

### **17.PL3. To Counter the Proliferation of Weapons of Mass Destructions (WMD).**

**Alberto Manenti**<sup>(1)</sup>

##### ***1. Former Director Italian External Intelligence Agency (AISE), Italy***

Besides international treaties and conventions that ban weapons of mass destruction, countries rely on multilateral informal agreements to prevent the development and production of WMD: 1) Voluntary basis; 2) Specific rules and actions to control the transfer of technologies/materials/equipment; 3) Technical help for third countries wishing to establish effective export control and cooperation. In this talk I will explain the lessons learned during my work experience.

### **254.PL3. Disarmament, arms control and non-proliferation efforts to prevent the re-emergence of the use of WMDs.**

**General Directorate for Political Affairs and Security**<sup>(1)</sup>

##### ***1. Ministry of Foreign Affairs and International Cooperation, Italy***

At a time when the entire disarmament and non-proliferation architecture proves to be strained by manifold and crosscutting challenges, the global effort aimed at combating the re-emergence of the use of WMDs echoes as a universal reminder of our common investment in global security. Since the use of CBRNe agents is a high-consequence transnational threat, monitoring and limiting illegal activities to develop such weapons is critical. The spread of innovative technology, expertise, and increased know-how represents another major challenge for our countries. WMDs pose a serious threat and we deem it paramount to invest in prevention mechanisms and enhance our collective security. Italy is actively involved in several CBRNe initiatives, fully shares the goal of a world free of

WMDs and is firmly committed to disarmament, arms control and non-proliferation as essential components of its foreign policy.

**15.PL3. Efforts to eliminate chemical weapons must continue.**

**Beatrix LAHOUE**<sup>(1)</sup>

***1. Organization for the Prohibition of Chemical Weapons (OPCW), The Hague, The Netherlands***

As the implementing body for the Chemical Weapons Convention (CWC), the Organisation for the Prohibition of Chemical Weapons (OPCW) with its 193 Member States oversees the global endeavour to eliminate permanently the chemical weapons worldwide. Since the Convention's entry into force in 1997, it is the most successful disarmament treaty eliminating an entire class of WMDs. For its extensive efforts in eliminating the chemical weapons, the OPCW received the 2013 Nobel Peace Prize.

OPCW recently confirmed that the last chemical weapon from the stockpiles declared by all States Parties was verified as destroyed. The end of the destruction of all the declared chemical weapons is an important milestone for the Organisation.

Recent uses and threats of the use of toxic chemicals as weapons illustrate that preventing re-emergence will remain a longer-term priority. Through its International Cooperation and Assistance Programme, OPCW support's States Parties national efforts in this context.

**253.PL3. The aftermath of the Beirut Port Explosion: International Cooperation and Assistance.**

**Andrea Gloria**<sup>(1)</sup>

***1. General Directorate for Political Affairs and Security, Ministry of Foreign Affairs and International Cooperation, Italy***

On 4 August 2020, an explosion occurred in the city of Beirut, reportedly caused by 2.750 tonnes of ammonium nitrate stored in a warehouse in the port of the city. According to the Lebanese Ministry of Public Health and the United Nations, the blast resulted in more than 220 casualties and 6.500 injured people. Buildings and infrastructures were significantly damaged, particularly in the areas surrounding the port as well as further afield. About 300.000 people lost their houses, with an estimated cost of more than three billion dollars. The blast put the entire Lebanese Health System in crisis, as hospitals across the country were overwhelmed and three main hospitals in Beirut were severely damaged. Following the immediate humanitarian support provided by the European Union through the EU Civil Protection Mechanism, United Nations, foreign countries, National Agencies and several NGOs, the response efforts shifted towards reconstruction and recovery synergies. This lecture addresses the aftermath of the Beirut Port explosion underlining global efforts and international initiatives to prevent such kind of events.

**18.PL3. On the importance of educating journalists on RN events.**

**Luca Romano**<sup>(1,2)</sup>

***1. L'Avvocato dell'Atomo, Italy***

***2. Lecturer at the International Master Courses in Protection Against CBRNe event, Italy***

We have known for a long while that one of the key issues during radiological and nuclear events is psychology. Gathered evidence amongst survivors of the atomic bombings in '45, people affected by the Chernobyl disaster and Japanese evacuees from the Fukushima nuclear meltdown shows that the psychological effects of radiological events are deep and widespread and may sometimes even have consequences on public health that trump the ones directly



attributable to radiation. In order to fight the stigma associated with radiation exposure as well as implementing better emergency procedures without disruptions caused by mass panic, it is pivotal to educate the press about the fundamentals of radiation protection and nuclear safety. This presentation will present some lessons learned from the recent crisis at the Zaporizhzhia Nuclear Power Station, stemmed by the war in Ukraine.

### **19.PL3. Standoff detection of natural and anthropic events by use of laser technology.**

**Pasquale Gaudio**<sup>(1)</sup>

*1. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy*

Laser absorption spectroscopy and scattering techniques have been of great interest in several applications like sample analysis, environmental protection, agriculture monitoring, and safety and security applications. These techniques are characterised by real-time detection capable of giving immediate alarms by measuring changes in a signal measured that indicates a change in one of the characteristics of the sample under investigation. The lidar technique is the dominant laser technique in remote atmospheric detection, which shows high sensitivity but low specificity to variations in the characteristics of the sample under investigation. The latter technique, in fact, is very sensitive to variations in the density of the medium through which the laser beam passes but has low specificity as it fails to identify its nature. The lidar technique has been used in various applications for both civil and industrial use, demonstrating the high speed of response and the ability to detect a possible alarm in real-time, then transferring the position and evolution of the latter to more sophisticated analysis systems for substance identification. Undoubtedly, the ability of lidar systems to identify possible causes of alarm is very rapid, and continuous technological evolution allows the design of increasingly compact and manageable systems with lower costs also. The open problem remains the identification of the threat. In the case of chemicals, there are two possible ways to proceed. The first is that which uses dial systems, which are more complex of previous one, where research is spent in determining the fingerprints of the different substances to be identified in addition to improving sensitivity in measuring the concentration profile. The second is using low-cost, low weight, and low-power consumption systems, which can be realised with sensor arrays capable of performing chemical classification measurements using specific algorithms. Such systems can be suitable for use on autonomous vehicles (UAVs/drones) so that they can be sent to the point where the release/alarm was measured. Some examples of applications to natural events, such as fire detection and smoke/leak detection of lidar systems, will be shown as well as their evolution over time. Threat identification systems that can be combined with lidar to make a complete system for remote detection and identification of chemicals substances will also be shown.

### **20.PL3. Performance Evaluation Metrics and Advances for Standoff CBRN Detection.**

**Frank Duschek**<sup>(1)</sup>

*1. Institute of Technical Physics, DLR (German Aerospace Center), Hardthausen, Germany*

The identification of CBRN (Chemical, Biological, Radiological, Nuclear) materials plays a pivotal role in assessing threats, ensuring protection in the aftermath of incidents, and aiding in forensics. Optimal selection of detection equipment is essential for effective performance. The Defense Advanced Research Projects Agency (DARPA) in the United States has defined key performance metrics for CB sensors. These metrics encompass sensitivity, probability of detection, false positive rate, response time, as well as other factors like unit cost, operational expenses, mean time between maintenance and failures, and SWAP considerations (size, weight, and power consumption).

Recent years have witnessed substantial advancements in capabilities related to detecting and identifying threat agents. Notably, CBRN point sensors have reached a level of maturity. Complementing conventional detection technologies, several standoff sensors have been either developed or are now available in the market. Within this presentation, we delve into representative examples of DLR systems designed for CBRN detection, evaluated against the aforementioned criteria. Furthermore, we provide an outlook on forthcoming developmental strides aimed at surmounting technological hurdles and enhancing the overall maturity of these systems.

### **21.PL3. Enhancing Preparedness and Response to CBRNe Accidents through European funding: Collaborative Research Projects.**

**Daniele Di Giovanni**<sup>(1,3)</sup>, **Riccardo Quaranta**<sup>(1,2)</sup>

1. University of Rome Tor Vergata, Department of Industrial Engineering, Rome, Italy

2. The American University of Rome, Rome, Italy

3. Unicamillus-Saint Camillus International University of Health Sciences, Rome, Italy

In recent years, incidents involving Chemical, Biological, Radiological, Nuclear, and explosive (CBRNe) substances have witnessed a concerning escalation, underscoring the need for robust preparedness and efficient response strategies. This surge in CBRNe accidents necessitates innovative approaches to mitigate their potential catastrophic consequences, nevertheless strategic measures to enhance preparedness and response capabilities. One such approach involves employing European funding as a strategic tool to bolster preparedness and to make more effective response mechanisms. European funding holds a key position in promoting collaborative research initiatives with the goal of addressing CBRNe incidents. By uniting expertise and resources from across the continent, these projects collectively work towards enhancing emergency response capabilities, minimizing casualties, and curbing environmental damage. This presentation sheds light on the effectiveness of such collaborations by presenting some successful examples: eNOTICE, Melody, Vertigo and others.

### ***Best Presentation Awards***

*1 Award for each Technical Session*

### ***CBRNe Master Courses - Diploma Ceremony***

*First and Second Level Master CBRNe*

### ***CLOSING REMARKS***

**Dr. Alba IANNOTTI**

President of HESAR

Health Safety Environmental Research Association Rome, Italy  
(ITALY)

## TECHNICAL SESSIONS

### Technical Session 1 - Emergency management

Chairpersons:

**Lt. Col. Stephen Johnson**

UK Army - UK Ministry of Defence, (UNITED KINGDOM)

**Cmd. Sergio Schiaroli**

Head of the CBRN Risk office - Italian Fire Fighters - Italian Ministry of Interior, (ITALY)

**Col. Marco Baleani**

Commander 7th Regiment CBRN Defence "Cremona" - Italian Army - Italian Ministry of Defence, (ITALY)

After a Chemical, Biological, Radiological, Nuclear or explosive event, whether intentional or not, the importance of a rapid and correct response by the emergency management team is vital, to reduce the magnitude of the effects to a minimum and to save lives. The correct response in such a crisis can only be achieved by following previously defined and well-rehearsed standard operating procedures, and a prompt and correct communication flow at both the strategic and operational levels. It is equally crucial that these procedures involve a clear focus on inclusive operations, accounting for differences in life-saving measures required in response to vulnerable members of society (the disabled, children, elderly people, etc.). A well-defined command and control workflow is the best basis for good management of such an emergency, both from a civilian and military standpoint, thus highlighting the duality approach in such an event.

This session will host the work of the experts that will reflect those concepts.

#### 22.TS1. 7th CBRN def. regiment Role, Capabilities and Operations.

**Marco Baleani(1)**

1. 7th CBRN def. regiment Commander, Italian Ministry of Defence, Civitavecchia, Italy

#### 23.TS1. Italian military CBRN educational and training capabilities.

**Riccardo Fambrini(1)**

1. Commander NBC School of Rieti, Italian Ministry of Defence, Rieti, Italy

#### 24.TS1. The new police internal communication in CBRNE incidents management.

**Francesco Guarasci(1)**

1. Police State Department, Italian Ministry of Interior, Italy

#### 25.TS1. Bergamo poison control center role in hazmat disaster prevention, planning and training.

**Mariapina Gallo(1), Giuseppe Bacis(1)**

1. Bergamo Poison Control Center ASST Ospedale Papa Giovanni XXIII, Bergamo, Italy

#### 26.TS1. Standard Operation Procedures (SOPs) for the Selection of Toxic Industrial Chemicals (TICs) handheld detection equipment for the federal Civil Defence Force in the United Arab Emirates.

**Ahmed Gamal Ibrahim(1) and Khaled Ibrahim Al Atrash(2)**

1. HotZone Solution Group, Doctor Kuiperstraat 5, 2514 BA Den Haag, Netherlands

2. Civil Defence General Head Quarter, AL Nahyan, Abu Dhabi, United Arab Emirates

#### 27.TS1. Management of a fire in a municipal solid waste landfill.

**Gaetano Vallefuoco(1)**

1. Director of the General Direction of Firefighter, Public Rescue and Civil Defence of Sicily, Ministry of Interior, Italy

#### 28.TS1. Modelling dispersion of radionuclides during public events.

**Edoardo Cavalieri d'Oro(1,2), Andrea Malizia(3), Michele Lupoli(1), Riccardo Benedetto(1), Cristina Pozzi(4)**

1. Italian National Fire and Rescue Services, Italian Ministry of Interior, Italy

2. Department of Industrial Engineering, Tor Vergata University, Rome, Italy

3. Department of Biomedicine and Prevention, Tor Vergata University, Rome, Italy

4. Arianet s.r.l, Italy

### 30.TS1. The national plan for the management of radiological and nuclear emergencies.

**Francesco Geri(1)**

1. Presidency of the Council of Ministers– Department of Civil Protection, Rome, Italy

### 31.TS1. Development of a Counter CBRN professional development program.

**Steve Johnson(1), Matthew Healy(2), David Crouch(2)**

1. UK Ministry of Defence, United Kingdom

2. Cranfield University, United Kingdom

### 32.TS1. Design and use of a multiparametric simulator for integrating patient metadata with genetic data on pathogens with pandemic potential: a step forward in pandemic preparedness and response.

**Maxime Bonjean(1), Jérôme Ambroise(1), Jean-Luc Gala(1)**

1. Centre de Technologie Moléculaire Appliquée (CTMA), Woluwe-Saint-Lambert, Belgium

### 33.TS1. Modification of emergency management systems based on experiences in the civil protection systems of Germany and Ukraine.

**Maksym Kustov(1), Volodymyr Andronov(1), Christian Buscham(2)**

1. National University of Civil Defence of Ukraine, Kharkiv, Ukraine

2. European Organization for Nuclear Research CERN, Geneva, Switzerland

### 34.TS1. Emergency management of nuclear and radiological events in Slovakia.

**Klara Richtarechova(1)**

1. CEO & Director of DESYRE, Dubnica nad Váhom, Slovakia

### 35.TS1. CBRN response under the European flag.

**Ida Cosentino(1)**

1. DG ECHO, European Commission

### 36.TS1. Operating in CBRN Environments – a snapshot of Australia’s defence research programs.

**Antony M. Hooker(1), Axel Bender(2), Nicholas FitzGerald(2), Jia-Yee Lee(3)**

1. Centre for Radiation Research, Education, and Innovation, The University of Adelaide, Adelaide, South Australia, Australia

2. Operating in CBRN Environments STaR Shot, Australian Department of Defence, Edinburgh, South Australia, Australia

3. Centre for Advanced Defence Research and Enterprise (CADRE-OCE), University of Melbourne, Melbourne, Victoria, Australia

### 37.TS1. Comparative study of the management of CBRN risk in two major European urban agglomerations: Paris - Milan.

**Caterina Zampieri(1), Sergio Albarello(2), Edoardo Cavalieri d’Oro(3)**

1. Brigade de sapeurs-pompiers de Paris, France

2. Armed Forces Medical Corps, Ministry of Health and Prevention, Paris, France

3. Italian National Fire and Rescue Services, CBRN unit in the region of Lombardy, Italy

### 38.TS1. Beirut Port Explosion: Post-blast Management Operations.

**Andrea Gloria(1)**

1. Head of the Technical Operational Unit - National Authority for the implementation of the CWC, Disarmament, arms control and non-proliferation Office, General Directorate for Political Affairs and Security, Ministry of Foreign Affairs and International Cooperation, Italy

### 244.TS1. The potential and the power of a Table-Top Exercise.

**Michael Ian Thornton(1)**

1. INAC, International Alliance CBRN, UK

2. HESAR - Health Safety Environmental Research Association Rome, Italy

### 248.TS1. Joint Centre of Studies for Military Applications (CISAM): a great opportunity for all IT MoD Defence Agencies.

**Mauro Galliussi(1), Andrea Cini(1), Massimiliano Russo(1), Riccardo Fantini(1)**

1. Joint Centre of Studies for Military Applications (CISAM), Pisa, Italy

### 249.TS1. The Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence and Emergency Management.

**Linda Varekova(1) Warren Deatcher(1)**

1. Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence, Vyškov, Czech Republic

### 251.TS1. Airborne and ground-based multidisciplinary monitoring for man-made and natural environmental hazard mitigation purposes.

**Massimo Chiappini(1)**

1. Istituto Nazionale di Geofisica e Vulcanologia (INGV), Rome, Italy

## Technical Session 2 - Geopolitical, economical, and legal aspects related to CBRNe events and International Cooperation

Chairpersons:

**Dr. Ralf Trapp**

Consultant CBW arms Control and Disarmament, (FRANCE)

**Prof. Cristiano Cupelli**

Department of Biomedicine and Prevention - University of Rome Tor Vergata, (ITALY)

**Prof. Donato Morea**

Department of Mechanical, Chemical and Material Engineering - University of Cagliari, (ITALY)

In an ever-changing international scenario, with non-conventional and CBRNe threats on the rise, the need for Global Partnership focused on Safety and Security is essential. Cooperation among international entities is a key aspect of the preparedness and ability to counteract CBRNe events, whose effects could often cross borders, jeopardizing the safety of the population of different countries. Non-Proliferation and Disarmament initiatives are a fundamental means of reducing the risks connected to the proliferation and potential use of CBRNe agents. International Response Systems allow improved public Safety and Security in these situations. CBRNe is a multidiscipline field, which requires a high level of commitment from law and policymakers to define sound political and legal instruments to effectively deal with the subject. The “old” threat represented by the military use of chemical, biological, radiological/nuclear, and explosive agents has rapidly evolved due to a constantly changing world, compounded by cyber-related issues as well as technological and dual-use implications. Moreover, to guarantee the rapid movement of people and goods worldwide, there is a clear need for strong and easily applicable legal regimes. At the same time, CBRNe and Cyber threats must be examined carefully from the economical perspective since many assets may be the target of CBRNe or Cyber-attacks. Moreover, economic investigations and business continuity represent useful tools and can provide additional information related to the illicit trade of CBRNe materials worldwide. This session will host the work of the experts that will reflect those concepts.

### 39.TS2. Criminal law during (and after) the pandemic.

**Cristiano Cupelli**(1)

1. Department of Biomedicine and Prevention, University of Rome "Tor Vergata", Rome, Italy

### 40.TS2. Development of Joint CBRN Response Capability in South Asia: Current Status & Future Prospects.

**Saman Choudary**(1), **Muhammad Usman Ashgar**(2), **Ansar Jamil**(3)

1. Department of Communication, Pompeu Fabra University, Barcelona, Spain

2. Department of Peace and Conflict Studies, National Defence University, Islamabad, Pakistan

3. Department of Strategic Studies, National Defence University, Islamabad, Pakistan

### 41.TS2. For A New Foundation of Nuclear Law in Those Countries Who Abolished It: Administrative and Criminal Law Aspects.

**Francesco Camplani**(1,2), **Gianluca Briganti**(1,2)

1. Università degli Studi di Macerata, Macerata, Italy

2. AIN-INYG Member, Italy

### 42.TS2. JCBRN Defence COE - Civil - Military & NATO - EU Cooperation.

**Wolfgang Karl-Heinz Reich**(1)

1. JCBRN Defence COE, Vyskov, Czech Republic

### 43.TS2. Production, transport and distribution processes of chemicals as potentially dangerous events - legal aspects and case studies.

**Paulina Flasińska**(1)

1. Łukasiewicz Research Network - Institute of Industrial Organic Chemistry, Warsaw, Poland

### 44.TS2. Investigating the use of chemical and biological weapons - technical and legal challenges of attributing responsibility.

**Ralph Trapp**(1)

1. International Disarmament Consultant, Consultant of CBWNet, Chessenaz, France

**45.TS2. Major accident hazard: the application of the Seveso directive in external emergency planning.**

**Francesco Geri(1)**

1. Presidency of the Council of Ministers– Department of Civil Protection, Rome, Italy

**46.TS2. Project Financing as a Possible Tool for the Economic and Financial Sustainability of Investment Projects in CBRNe Field.**

**Donato Morea(1)**

1. University of Cagliari, Department of Mechanical, Chemical and Materials Engineering, Cagliari, Italy

**47.TS2. Innovations to counter hybrid threats: emphasis on Critical Infrastructures and related Data Governance dimensions.**

**Gabriel Pestana(1), Souzanna Sofou(2), Dimitris Diagourtas(2), Antonis Kostaridis(2)**

1. INOV – Instituto de Engenharia de Sistemas e Computadores Inovação, Lisbon, Portugal

2. SATWAYS Ltd, Athens, Greece

**48.TS2. The Certification of the Italian Fire Corps CBRN Detection Module under the EU Civil Protection Mechanism: capabilities and goals achieved.**

**Francesco Pilo(1), Sergio Schiaroli(2), Edoardo Cavalieri D'Oro(3), Salvatore Corrao(4), Damiano Zurlo(2), Fabio Mazzarella(4), Michele Lupoli(5)**

1. National Fire Corps – Venezia Fire HQ, Mestre, Italy

2. National Fire Corps CBRN Central Office, Rome, Italy

3. National Fire Corps-Milano Fire HQ, Milan, Italy

4. National Fire Corps – Roma Fire HQ, Rome, Italy

5. National Fire Corps – Torino Fire HQ, Turin, Italy

### Technical Session 3 - Cybersecurity, artificial intelligence, data mining, big data analysis, and DSS applied to CBRNe

Chairpersons:

**Prof. Oleg Illiashenko**

National Aerospace University - "KhAI" – Kharkiv, (UKRAINE)  
Institute of information science and technologies "A. Faedo" (ISTI-CNR), (ITALY)

**Prof. Parag Chatterjee**

National Technological University (Universidad Tecnológica Nacional), Buenos Aires, (ARGENTINA)  
Dept. of Biological Engineering, University of the Republic (Universidad de la República), (URUGUAY)

**Dr. Riccardo Rossi**

Department of Industrial Engineering - University of Rome Tor Vergata, (ITALY)

Cybersecurity is becoming crucial, as more information and advanced technology are being made available in cyberspace. As recent events have demonstrated, cyberspace must be considered the new theatre of warfare and has the potential to undermine the stability of a country. New terms, such as cyberwarfare and cyberterrorism, were coined to better describe this threat and there is growing concern among governments, that they are not ready to fully face such an emerging menace. More critical infrastructures today are remotely controlled via software systems that, while increasing efficiency, determine new vulnerabilities. Otherwise, innovative technologies such as Artificial Intelligence, Machine Learning, and Big Data Analysis allow for improving risk mitigation in systems' cybersecurity. In this scenario, CBRNe Intelligence plays an extremely important role in preventing the malicious use of, an otherwise beneficial, asset. A Decision Support System (DSS) can be seen as both a tool to help the decision-making process in the aftermath of a CBRNe event, as well as a tool to optimize the planning and management of operations. Today, DSSs are essential instruments in coping with problems that may not have been identified in advance and are changing rapidly, or when dealing with large amounts of data. DSSs are interactive software-based systems intended to help decision-makers to gather useful information from a combination of raw data, documents, and personal knowledge. Therefore, DSSs greatly assist in the identification and solving of problems, hence the decision-making process. In this regard, DSSs can be extremely helpful when applied to CBRNe Prediction, Planning, and Emergency Management.

This session will host the work of the experts that will reflect those concepts.

#### 49.TS3. Dependable robotic-biological systems for detection and identification of explosive ordnances: IDEM project.

**Vyacheslav Kharchenko**(1), **Herman Fesenko**(1), **Gennadiy Fedorenko**(1), **Volodymyr Pavlikov**(2), **Igor Kliushnikov**(1), **Oleg Illiashenko**(1,3), **Igor Tolkunov**(4)

1. Computer Systems, Networks and Cybersecurity Department, National Aerospace University KhAI, Kharkiv, Ukraine

2. National Aerospace University KhAI, Kharkiv, Ukraine

3. Institute of Information Science and Technologies "Alessandro Faedo", Area della Ricerca CNR di Pisa, Pisa, Italy

4. Pyrotechnics and Special Training Department, National University of Civil Defence of Ukraine, Kharkiv, Ukraine

#### 50.TS3. The influence of the environment on the diffusion of COVID-19 using advanced statistics and causality detection techniques.

**Andrea Murari**(1,2), **Riccardo Rossi**(3) and **Michela Gelfusa**(3)

1. Consorzio RFX (CNR, ENEA, INFN, Università di Padova, Acciaierie Venete SpA), Padova, Italy

2. Istituto per la Scienza e la Tecnologia dei Plasmi, CNR, Padova, Italy

3. Department of Industrial Engineering, University of Rome "Tor Vergata", Rome, Italy

#### 51.TS3. Importance of Artificial Intelligence and Robotics lap for Implementation Excellence in Fire Station on Industrial Area in Abu Dhabi.

**Abdulla Alhmoudi**(1)

1. Abu Dhabi Civil Defence Authority, United Arab Emirates.

#### 52.TS3. Machine and Deep Learning Tools applied to CBRNe Events: An Overview of QEP Research Group Activities.

**Riccardo Rossi**(1), **Luca Martellucci**(1), **Alessandro Puleio**(1), **Novella Rutigliano**(1), **Ivan Wyss**(1), and **Pasquale Gaudio**(1)

1. Department of Industrial Engineering, University of Rome "Tor Vergata", Rome, Italy



**53.TS3. Improving cyber security awareness: a crucial measure to prevent cyber attacks.**

**Marco Campanini**(1), **Claudio Paganelli**(1)

1. Avv. Marco Campanini, Rome, Italy

**54.TS3. Evidence-based cybersecurity assessment of programmable systems to ensure the protection of CBRNe IT infrastructure.**

**Oleg Illiashenko**(1,2), **Vyacheslav Kharchenko**(1), **Eugene Babeshko**(2), **Oleksandr Letychevskiy**(3), **Oleg Odarushchenko**(4)

1. Department of computer systems and networks, National Aerospace University "KhAI", Kharkiv, Ukraine

2. Software Engineering & Dependable Computing Laboratory, Institute of Information Science and Technologies "A.Faedo"—ISTI CNR, Pisa, Italy

3. Digital automata theory department, V.M. Glushkov Institute of Cybernetics of NAS of Ukraine, Kyiv, Ukraine

4. Research and Production Enterprise RPC Radics LLC, Kropyvnytskyi, Ukraine

**55.TS3. Hierarchical BBN-based approach for SMR digital infrastructure dependencies assessment under MUPSA framework.**

**Eugene Brezhnev**(1), **Vyacheslav Kharchenko**(1), **Oleksandr Gordiev**(2)

1. National Aerospace University (KhAI), Department of Computer Systems, Networks and Cybersecurity, Kharkiv, Ukraine

2. Lutsk National Technical University, Software Engineering Department, Lutsk, Ukraine

**56.TS3. Robots as a Mobile Sensors Platform: Decision Support and Decision Augmentation for CBRNe Emergency.**

**Carmine Grelle**(1), **Alessandro Zacchei**(2), **Claudio Chieppa**(3), **Anna Kostihova**(4,5), **Roberto Fiorito**(4,6)

1. Chief Executive Officer SHIELD REPLY, Rome, Italy

2. Chief Technology Officer EUROLINKS SYSTEM, Rome, Italy

3. Senior Consultant CONCEPT REPLY, Turin, Italy

4. Tor Vergata University of Rome, Faculty of Medicine and Surgery – Master International Security/Safety, Global Strategies and Medical Maxi-Emergency in the Non-Conventional Events: Analyses and Management, Rome, Italy

5. ASST Santi Paolo e Carlo, Milano, Emergency Department, Milan, Italy

6. Tor Vergata University of Rome, Faculty of Medicine and Surgery – Department of Biomedicine and Prevention, Rome, Italy

**57.TS3. The AI Act: its impact on Cybersecurity and privacy domains between the definition of "artificial intelligence system" and the risk-based approach.**

**Nicola Fabiano**(1,2,3)

1. Studio Legale Fabiano - Rome, Italy

2. University of Ostrava - Rome, Italy

3. International Institute of Informatics and Systemics - USA, United States of America

**58.TS3. Artificial Intelligence and Predictive Healthcare in CBRNe incidents.**

**Parag Chatterjee**(1)

1. University of the Republic, Uruguay

**59.TS3. Digital Twins-based Intelligent Systems of Monitoring Critical Objects: Methodology and Models of Availability Assessment.**

**Vyacheslav Kharchenko**(1), **Olga Morozova**(1), **Vladislav Shcheglov**(1), **Vitalii Gaievskiy**(2)

1. Department of Computer Systems, Networks and Cybersecurity of National Aerospace University "KhAI", Kharkiv, Ukraine

2. LLC SPE RAILWAYAUTOMATIC, Kharkiv, Ukraine

**60.TS3. CISReF: Regional Health and Pharmacovigilance Information Dashboard.**

**Daniele Distefano**(1), **Rossana Moroni**(2), **Antonio Parrilla**(3), **Michele Tricarico**(4)

1. Ministero dell'Istruzione – Ufficio Scolastico Territoriale di Milano, Milan, Italy

2. Ministero della Salute - Direzione generale della digitalizzazione, del sistema informativo sanitario e della Statistica, Rome, Italy

3. Presidenza del Consiglio dei Ministri – Dipartimento per lo Sport, Servizio III – Comunicazione, eventi sportivi, studi e ricerche, Rome, Italy

4. AIFA – Settore ICT, Rome, Italy

## Technical Session 4 - CBRNe training and education: classic approaches and modern ones through virtual and augmented reality and serious games

Chairpersons:

**Dr. Dieter Rothbacher**  
CBRN Protection, (AUSTRIA)

**Dr. Michael Ian Thornton**  
INAC - HESAR ASSOCIATION, (UNITED KINGDOM)

**Dr. Umberto Battista**  
STAM, (ITALY)

The evolution of an increase in Safety and Security threats requires an improvement of the emergency systems to deal with crises, including those connected to ordinary and non-conventional events. In every industrial country, there are multiple entities with highly specialized teams in specific fields, but the complexity of the events requires professionals that not only have CBRNe know-how, but also expertise in the relevant areas. To face an emergency properly highly specialized first responders and CBRNe advisors to the decision makers require comprehensive competencies in the field of CBRNe safety and security. Active learning is a key element to CBRNe awareness and preparedness and represents two critical factors that need to be improved. Training in a virtual environment appears as a valuable tool to improve the know-how and speed-up the affordable cost of the learning and preparations of a wide range of operators working in emergencies. Moreover, Augmented reality gives rise to the ability to interact in a virtual environment. Similarly, CBRNe education through digital technologies improves risk awareness and can be a useful tool to increase societal engagement and resilience in the prevention, recognition, response, and recovery phases of a disaster.

This session will host the work of the experts that will reflect those concepts.

### 29.TS4. Realistic CBRN Live Agent Training in Austria.

**Johannes Neuwirth**<sup>(1)</sup>, **Dieter Rothbacher**<sup>(2)</sup>

1. Director CBRN Academy Seibersdorf Academy, Seibersdorf Laboratories Seibersdorf Laboratories GmbH, Austria

### 61.TS4. Advisors of Decision Makers and First Responders: how the University is contributing to the education of the experts involved in CBRNe emergencies.

**Colomba Russo**<sup>(1,2)</sup>, **Alba Iannotti**<sup>(1,2)</sup>, **Riccardo Quaranta**<sup>(2)</sup>, **Grace P. Xerri**<sup>(2)</sup>, **Daniele Di Giovanni**<sup>(2)</sup>, **Pasquale Gaudio**<sup>(2)</sup>, **Guglielmo Manenti**<sup>(3)</sup>, **Leonardo Palombi**<sup>(3)</sup>, **Ombretta Picchioni**<sup>(3)</sup>, **Francesco d'Errico**<sup>(4)</sup>, **Andrea Malizia**<sup>(3)</sup>

1. HESAR - Health Safety Environmental Research Association Rome, Atina, Frosinone, Italy

2. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy

3. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy

4. School of Engineering, University of Pisa, Pisa, Italy

### 62.TS4. Preparing for the Age of Resilience.

**Dave Hoff**<sup>(1)</sup>

1. Staff officer at the Defense Expertise Center CBRN of the Netherlands, Vught, The Netherlands

### 63.TS4. 7th CBRN def. regiment New methods to face forthcoming and future CBRN Threats.

**Daniele Del Gaudio**<sup>(1)</sup>

1. 7th CBRN def. regiment Commander, Italian Ministry of Defence, Civitavecchia, Italy

### 64.TS4. Virtual Reality Training for CBRN Events.

**Georg Regal**<sup>(1)</sup>, **Grace Xerri**<sup>(2)</sup>, **Daniele Di Giovanni**<sup>(2)</sup>, **Massimo Migliorini**<sup>(3)</sup>, **Francesca Scarrone**<sup>(3)</sup>, **Massimiliano Guarneri**<sup>(4)</sup>, **Paola Tessari**<sup>(5)</sup>, **Federica Genna**<sup>(6)</sup>, **Andrea D' Angelo**<sup>(6)</sup>, **Schrom-Feiertag Helmut**<sup>(1)</sup>, **Markus Murtinger**<sup>(1)</sup>

1. AIT Austrian Institute of Technology, Vienna, Austria

2. University of Rome 'Tor Vergata', Rome, Italy

3. Fondazione LINKS, Turin, Italy

4. ENEA Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Frascati, Italy

5. Istituto Affari Internazionali, Rome, Italy

6. Fondazione SAFE - Security and Freedom for Europe, Verona, Italy

**65.TS4. Enhancing Quality in Commercially Used Explosives Detection Dogs.**

**Christopher Becher**(1), **Peter Kaul**(1,2)

1. Institut für Sicherheitsforschung (ISF), Hochschule Bonn-Rhein-Sieg, Rheinbach, Germany
2. Institut für Detektionstechnologien, (IDT), Fachbereich Angewandte Naturwissenschaften, Rheinbach, Germany

**66.TS4. SAFE-CITIES: A Novel Approach Based on Serious Gaming and Simulation for Urban Security.**

**Umberto Battista**(1)

1. Stam S.r.l., Genoa, Italy

**67.TS4. The SAFE-CITIES security and vulnerability assessment framework for protecting European public spaces.**

**Athanasios Sfetsos**(1), **Ioannis Tsourounakis**(1), **Danila Longo**(2), **Serena Orlandi**(2), **Sylwester Mieszczyk**(3), **Malgorzata Wolbach**(4), **Jarmo Puustinen**(5), **Daniel Breucha**(5), **Alexander Frank**(6), **Rodolfo Coceancig**(7), **Giorgio Tardito**(8), **Umberto Battista**(8), **Eirini Barri**(9), **Giorgios Kioumourtzis**(9), **Panos Veltsistas**(10), **Marco Muzzatti**(11), **Luca Sacellini**(11), **Ramona Velea**(12)

1. NCSR Demokritos, Greece
2. Alma Mater Studiorum - Universita Di Bologna, Italy
3. Provincial Police Headquarters in Gdańsk, Poland
4. Polish Platform for Homeland Security, Poland
5. Finnish Police, Finland
6. Confederation of European Security Services
7. Italian Red Cross - branch of Gorizia, Italy
8. STAM SRL, Italy
9. IANUS Consulting LTD, Cyprus
10. Thridium Limited, UK
11. Gorizia Municipality, Italy
12. ISIG, Italy

**68.TS4. RIID, machine learning and a new nuclear educational tool.**

**Carl Wheldon**(1)

1. School of Physics and Astronomy, University of Birmingham, Edgbaston, Birmingham, United Kingdom

**69.TS4. Identification of shielded, moderated and masked SNM for nuclear threats in complex scenario.**

**Giacomo Mangiagalli**(1), **Massimo Morichi**(1), **Paola Garosi**(1), **Cristiana Del Bene**(1), **Francesco Pepe**(1)

1. CAEN S.p.A., Viareggio, Lucca, Italy

**70.TS4. Extended Reality Applications and Serious Games in the CBRNe Domain: Opportunities, Challenges and Future Perspectives.**

**Elif Süre**(1)

1. Graduate School of Informatics, Middle East Technical University, Ankara, Turkey

**71.TS4. Development of a Counter CBRN Wargame.**

**Stephen Johnson**(1)

1. Cranfield University, United Kingdom
2. British Army, United Kingdom

**72.TS4. CONTACT: A United Nations project to inhibit the illegal trafficking of radiological and nuclear material.**

**Michael Ian Thornton**(1)

1. Senior Fellow UNICRI, Torino TO, Italy

**73.TS4. Game-based methodologies for Safety and Security Culture Assessment.**

**Carlo Rusconi**(1)

1. Sogin, Rome, Italy

**74.TS4. Virtual reality training platforms for CBRN operators and healthcare professionals.**

**Marina Nadalin**(1), **Francesca Scarrone**(1), **Elios De Maio**(1), **Simone Anfuso**(2), **Federico De Lorenzis**(2), **Massimo Migliorini**(1), **Fabrizio Lamberti**(2)

1. LINKS Foundation, Turin, Italy
2. Politecnico di Torino, Italy

**75.TS4. MELODY: A harmonised CBRN training curriculum for first responders and medical staff.**

**Riccardo Quaranta**(1), Mariachiara Carestia(1), Carlos Rojas Palma(2), Ahmed Nagy(2), Tom Clarijs(2), Svenja Stöven(3), David Sjöberg(3), Annika Johansson(3), Satish Strömberg(3), MELODY Project Consortium(1,2,3,4,5,6,7,8,9,10)

1. Department of Industrial Engineering, University of Rome Tor Vergata, Italy

2. SCK CEN, Belgium

3. European CBRNE center, Umea University, Sweden

4. The National Institute for Public Health and the Environment (RIVM), The Netherlands

5. TNO, The Netherlands

6. Campus Vesta, Belgium

7. EODHu - The Rapid Response and Special Police Services, Hungary

8. ISEMI, Slovakia

9. University of Lodz, Poland

10. ESTWFi - Emergency Services Training Centre of Western Finland, Finland

## Technical Session 5 - CBRNe medical emergencies, first aid, and pandemics management

Chairpersons:

**Prof. Vasilis Vasiliou**

Department Chair of Epidemiology (Environmental Health Sciences), Director of the Yale Superfund Research Center, Yale University, (UNITED STATES OF AMERICA)

**Prof. Guglielmo Manenti**

Department of Biomedicine and Prevention - University of Rome Tor Vergata, (ITALY)

**Dr. Marco D'Arienzo**

Medical Physics Section - ASL Roma 6, (ITALY)

Whereas first aid plays a key role in an effective response to a CBRNe emergency, proper medical management is equally crucial to successfully respond to pandemic events. Hospitals and other health services represent critical infrastructure that must be prepared and resilient in case of CBRNE incidents and attacks. This means having plans, procedures, equipment, and trained personnel, on the one side, and smooth cooperation among first responders and stakeholders on the other. An increasing number of research and innovation projects addressing the issue of medical management and first aid in the framework of CBRNE events testifies to the growing need to find new and smart solutions in terms of materials, equipment, procedures, communication, and general management. This session will host the work of the experts that will reflect those concepts.

### 77.TS5. CBRN defence capabilities within the biological defence domain based on Covid-19 lessons learned.

**Bernd Allert**(1)

1. German Armed Forces, Joint CBRN Defence Centre of Excellence, Vyskov, Czech Republic

### 78.TS5. Fire scenario in a nuclear medicine department: an impact assessment.

**Marco D'Arienzo**(1,2), **Gian Marco Contessa**(2,3), **Maria Antonietta D'Avanzo**(4), **Massimo Mattozzi**(4), **Sandro Sandri**(5), **Edoardo Cavalieri d'Oro**(6), **Francesco Campanella**(4)

1. Medical Physics Section, ASL Roma 6, Rome, Italy

2. UniCamillus International Medical University, Rome, Italy

3. Italian National Institute of Health (ISS), Rome, Italy

4. INAIL - Dipartimento Medicina, Epidemiologia, Igiene del Lavoro e Ambientale, Italy

5. Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Italy

6. CBRN Unit and Laboratories of the Lombardy Region, Italian National Fire and Rescue Service, Milan, Italy

### 79.TS5. Military Pharmaceutical Chemical Plant - Quality and security from 170 years.

**Gabriele Picchioni**(1)

1. Military Pharmaceutical Chemical Plant, Florence, Italy

### 80.TS5. Radiological Dispersal Device: A Risk for the Human species.

**Susanna Ferrero**(1)

1. Clinica Valle Giulia, GENERALIFE, Rome, Italy

### 81.TS5. CBRNE medicine Procedures: CBRNE Point of Care Testing – A new procedure for rapid detection and identification of hazardous materials for Emergency Departments and Medical Hubs in Poland.

**Arkadiusz Trzos**(1), **Karol Łyziński**(1)

1. Jagiellonian University Medical College, Faculty of Medicine, Chair of Anaesthesiology and Intensive Care, Department of Disaster Medicine and Emergency Care, Kraków, Poland

### 82.TS5. Monitoring of Evolution of *Vibrio cholerae* O1 associated with cholera outbreaks in the Democratic Republic of the Congo.

**Lonid M. Irengé**(1), **Jérôme Ambroise**(1), **Jean-Luc Gala**(1)

1. Centre de Technologies Moléculaires Appliquées (CTMA), Woluwe-Saint-Lambert, Belgium

**83.TS5. Role of emergency medical care and emergency health care system in CBRNe management and new medical - biological emergency.**

**Anna Kostihova**(1,2), **Roberto Fiorito**(1,3), **Livio Colombo**(2), **Clemente Verrusio**(2,4), **Carmine Grelle**(5), **Alessandro Zacchei**(6), **Claudio Chieppa**(7)

1. Tor Vergata University of Rome, Italy, Faculty of Medicine – Master International Security/Safety, Global Strategies and Medical Maxi-Emergency in the Non-Conventional Events: Analyses and Management, Rome, Italy

2. ASST Santi Paolo e Carlo, Milano, Emergency Department, Milan, Italy

3. Tor Vergata University of Rome Italy, Facoltà di Medicina e Chirurgia, Dipartimento di Biomedicina e Prevenzione, Rome, Italy

4. ASST Santi Paolo e Carlo, Milano, General Surgery, Milan, Italy

5. SHIELD REPLY, Rome, Italy

6. EUROLINKS SYSTEM, Rome, Italy

7. CONCEPT REPLY, Turin, Italy

**85.TS5. Diagnostic Department of the Hospital Policlinico Tor Vergata (PTV) and Specialization School of Nuclear Medicine of the Tor Vergata University: my experience as Medical Doctor and Professor during normal days and emergencies**

**Guglielmo Manenti**(1)

1. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy

**86.TS5. Effects of low dose radiation on acute immunological and physiological outcomes in vivo.**

**Dani-Louise Dixon**(1,2,3), **James McEvoy-May**(1,2), **Stephanie Puukila**(2,3), **Stacey Muise**(2,3), **Sujeenthath Tharmalingam**(3), **Samual Jobson**(2), **Douglas Boreham**(3), **Antony M. Hooker**(1,2)

1. Centre for Radiation Research Education and Innovation (CRREI), University of Adelaide

2. College of Medicine and Public Health, Flinders University, South Australia

3. NOSM University, Ontario, Canada

**87.TS5. CBRN Ambulance during Pandemic.**

**Mahmoud Alblooshi**(1)

1. Abu Dhabi Civil Defence Authority, Abu Dhabi, UAE

**247.TS5. Wastewater Surveillance for Public Health using Advanced Analytical Approaches.**

**Aikaterini Galani**(1), **Athina Markou**(1), **Anastasia Zafeiriadou**(1), **Marios Kostakis**(1), **Alessandro Zulli**(3), **Jordan Peccia**(3), **Vasilis Vasiliou**(1,2), and **Nikolaos S. Thomaidis**(1,2)

1. Laboratory of Analytical Chemistry, Department of Chemistry, National and Kapodistrian University of Athens, Athens, Greece

2. Department of Environmental Health Sciences, Yale School of Public Health, New Haven, CT, USA

3. Department of Chemical and Environmental Engineering, Yale University, New Haven, CT, USA

## Technical Session 6 - Emergency communication and psychology

Chairpersons:

**Prof. Amer Hosin**

Abu Dhabi Civil Defence Authority, (UNITED ARAB EMIRATES)

**Dr. Antonio Parrilla**

Italian Prime Ministry Office - Certified Infodemic Manager WHO, (ITALY)

**Dr. Nicola Simone**

CREA - Council for Research in Agriculture and Economics - Research Center for Engineering and Agro-Food Processing, (ITALY)

Clear communication strategies and effective psychological approaches are significant aspects to improve the quality of the prevention and management of CBRNe events. Reducing the effects and consequences on the population as well as operators in the field. First responders are the primary contact with the victims of a CBRNe emergency as well as with the components of other teams on the hotspot. Sound knowledge of the issues affecting the psychology of those involved and communication at strategic, operational, and tactical levels is a key aspect of an effective response. Mastering emergency communication is essential to avoid the spread of incorrect or inappropriate information that may cause, panic, or lead the population to underestimate the gravity of the situation. Thus, Raising Awareness in the population is another fundamental aspect on which emergency communication and psychology are focused. In this regard, the investigation of the public perception of risks is an essential element to improve the effectiveness of communication.

This session will host the work of the experts that will reflect those concepts.

### 88.TS6. People behavior concerning communication of alerts through mass media.

**Nicola Simone**(1), **Pietro Crescenzo**(2,3)

1. CREA - Council for Research in Agriculture and Economics - Research Center for Engineering and Agro-Food Processing, Italy

2. Nucleo Attività Psicologiche Corpo Militare Volontario della Croce Rossa Italiana, Rome, Italy

3. Dipartimento di Scienze della Formazione, Psicologia e Comunicazione, Università degli Studi di Bari "Aldo Moro", Bari, Italy

### 89.TS6. Will They Panic? The Effect of Fake News and Risk Communication on Public Behavior to Non-Conventional Terrorism.

**Moran Bodas**(1), **Morel Ragoler**(2), **Yossi Rabby**(3), **Esther Krasner**(3)

1. Department of Emergency & Disaster Management, School of Public Health, Faculty of Medicine, Tel-Aviv University, Tel-Aviv-Yafo, Israel

2. The Gertner Institute for Epidemiology and Health Policy Research, Sheba Medical Center, Tel Hashomer, Ramat-Gan, Israel

3. CBRN Defense Division, Ministry of Defense, HaKirya, Tel-Aviv-Yafo, Israel

### 90.TS6. Building Resiliency among Staff of Emergency Settings: Mind the Psychological Wellbeing, Stress Reactions, and Secondary Traumatization.

**Amer Hosin**(1)

1. Abu Civil Defence Authority, Abu Dhabi, United Arab Emirates

### 91.TS6. Psychological reactions of CBRN incidents.

**Sajad Shiri**(1)

1. International Master Courses in Protection Against CBRNe events, University of Rome Tor Vergata, Roma, Italy

### 92.TS6. CBRN emergencies, cybersecurity and information influence operations: why an overall vision is important.

**Antonio Parrilla**(1)

1. Presidenza del Consiglio dei Ministri - Dipartimento per lo Sport, Rome, Italy

### 93.TS6. Individual police officers' thoughts and attitudes towards CBRNe in terms of knowledge and training, response and investigation.

**Thomas Rhys Creek** (1,2)

1. University of Rome Tor Vergata, Rome, Italy

2. HM Forces (Army) - Adjutant General's Corps (Royal Military Police), Cardiff, United Kingdom



**94.TS6. Risk Assessment and Psychology: how can we make our brains better at math?**

**Luca Romano** (1,2)

1. L'Avvocato dell'Atomo, Italy

2. International Master Courses in Protection Against CBRNe events, University of Rome Tor Vergata, Italy

**95.TS6. The cost of exposure to deaths: The distress of Auxiliary Components of the Armed Forces of the Italian Red Cross volunteers employed during the Covid-19 emergency.**

**Pietro Crescenzo**(1,2), **Livio Tarchi**(1,3), **Venusia Covelli**(4), **Kristian Talamonti**(1), **Francesco Chirico**(5,6)

1. Psychological Activities Unit (NAP), Italian Red Cross Voluntary Military Corps, Ministry of Defense, Rome, Italy

2. Department of Educational Sciences, Psychology and Communication, University of Bari "Aldo Moro", Bari, Italy

3. Psychiatry Unit, Department of Health Sciences, University of Florence, Florence, Italy

4. Faculty of Psychology, eCampus University, Como, Italy

5. Università Cattolica del Sacro Cuore, Post-Graduate School of Occupational Health, Rome, Italy

6. Health Service Department Italian State Police, Centro Sanitario Polifunzionale di Milano, Ministry of Interior, Milan, Italy

## Technical Session 7 - Safety, security, and strategies to protect critical infrastructures, numerical simulation, and methods for risk assessment and reduction

Chairpersons:

**Col. Thiago Lopes**

Commander of the Firefighters Regiment of Lisbon - Regimento De Sapadores Bombeiros, (PORTUGAL)

**Prof. Daniele Di Giovanni**

Department of Industrial Engineering - University of Rome Tor Vergata, (ITALY)

**Prof. Fabio Garzia**

School of Security Engineering - University of Rome La Sapienza, (ITALY)

CBRNe events may disperse harmful agents into the air, water, or soil. The capability to predict where these materials may be diffused is essential for prevention, and response and to reduce the impact of the event. To achieve these goals, Modelling, and Simulation tools can be used to estimate both the location and concentration of volatile, resuspended, dispersed, or deposited material. Innovative Risk Assessment methodologies can help in the definition and mitigation of the risks associated with critical infrastructure, soft targets, human activities, and in the assurance of business continuity. The use of mathematical models, such as Computational Fluid Dynamics (CFD), as a basis for simulations, has been applied to simulate the dispersion of harmful substances, such as chemical compounds, and radioactive materials, as well as biological warfare agents. By coupling clinical models to numerical simulations, it is possible to get accurate information about the potential effects on human health following a CBRN event. This session will host the work of the experts that will reflect those concepts.

### 96.TS7. Sentiment & Emotion Analysis and Risk Perception Assessment for Safety, Security and Emergency Management.

**Fabio Garzia**(1)

1. Safety&Security Engineering Group – DICMA SAPIENZA - University of Rome, Via Eudossiana 18, 00184 Rome, Italy

### 97.TS7. Risk Assessment and Sustainability: Abu Dhabi Emirate approach towards building resilient communities in the wake of emergency and crisis situations.

**Ibrahim Almarzouqi**(1)

1. Abu Dhabi Civil Defence Authority ADCDA, United Arab Emirates

### 98.TS7. 2021 G20 Rome summit: the fire and CBRN prevention and monitoring apparatus put in place during the High Visibility Event (HVE).

**Salvatore Corrao**(1), **Fabio Mazzarella**(1), **Fabrizio Gargano**(1)

1. National Fire Corps – Roma Fire HQ – Rome, Italy

### 99.TS7. Toward Biodefence: A Framework for the Mitigation of Malicious Biological Threats to Livestock Production Enterprises in Australia.

**Deborah Evans**(1), **Michael Coole**(1), **David Brooks**(1)

1. School of Science, Edith Cowan University, Joondalup, Western Australia, Australia

### 100.TS7. Critical Infrastructure Monitoring in CBRNe Scenarios: A reliable and robust communication network for distributed multimodal sensors.

**Sebastian Sporrer**(1), **Norman Nieman**(1), **Kostyantyn Konstantynovskiy**(1), **Christof Hammer**(1)

1. German Aerospace Center (DLR), Institute for the Protection of Terrestrial Infrastructures, Sankt Augustin, Germany

### 101.TS7. The combination of HotSpot code and MATLAB to simulate radiological events and solutions to shield the population.

**Riccardo Quaranta**(1,4), **Riccardo Rossi**(1), **Guglielmo Manenti**(2), **Francesco d'Errico**(3), **Andrea Malizia**(2)

1. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy

2. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy,

3. School of Engineering, University of Pisa, Pisa, Italy

4. The American University of Rome, Rome, Italy

#### 102.TS7. Biological risk in 189 Italian prison facilities: the evaluation of the spread of Covid-19 for the set up of a predictive tool.

**Cristiano Franchi**(1), **Riccardo Rossi**(1), **Pasquale Gaudio**(1), **Andrea Malizia**(2), **Alessandro Albano**(3), **Giovanni Suriano**(3), **Mauro Palma**(3), **Daniele Di Giovanni**(4)

1. University of Rome Tor Vergata, Dept. of Industrial Engineering, Rome, Italy
2. Dept. of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy
3. Office of the National Guarantor for the rights of persons deprived of personal liberty, Rome, Italy
4. School of Medicine and Surgery, Unicamillus-Saint Camillus International University of Health Sciences, Rome, Italy

#### 103.TS7. An analysis on Terrorist Attacks to Essential Services, Infrastructures and Facilities during the period 2000-2020 for G7 Nations.

**Marco Carbonelli**(1), **Claudio Todaro**(2), **Vincenzo Iavarone**(2)

1. Presidency of the Council of Ministers, Rome, Italy
2. O.S.S.I.S.Na., Rome, Italy

#### 104.TS7. An analysis of terrorist attacks on soft and hard targets in the period 2000-2019.

**Marco Carbonelli**(1), **Riccardo Quaranta**(2,5), **Andrea Malizia**(3), **Pasquale Gaudio**(2), **Daniele Di Giovanni**(2,4)

1. Presidency of the Council of Ministers, Rome, Italy
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3. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy
4. Unicamillus-Saint Camillus International University of Health Sciences, Rome, Italy
5. The American University of Rome, Rome, Italy

#### 105.TS7. RadHawk: a smart UAV for radioactivity hunting.

**Matteo Corbo**(1), **Massimo Morichi**(1), **Francesco Rogo**(1), **Bruno Angelucci**(1), **Matteo Alberi**(2), **Enrico Chiarelli**(2), **Kassandra Giulia Cristina Raptis**(2), **Virginia Strati**(2), **Fabio Mantovani**(2)

1. CAEN S.p.A., Viareggio, Lucca, Italy
2. Dipartimento di Fisica e Scienze della Terra - Università di Ferrara, Ferrara, Italy

#### 106.TS7. Luminescent sensors with differential fading for Nuclear Safeguards.

**Gianpaolo Roina**(1), **Débora Siqueira Nascimento**(1), **Riccardo Ciolini**(1), **Francesco d'Errico**(1)

1. University of Pisa, Department of Industrial and Civil Engineering, School of Engineering, Pisa, Italy

#### 243.TS7. Improving operators and first responders preparedness and responsiveness of to CBRN events hitting a critical infrastructure.

**Daniele Di Giovanni**(1,3), **Andrea Chierici**(1,2), **Marta Di Giacinto**(1), **Andrea Micozzi**(1), **Riccardo Quaranta**(1,4), **Pasquale Gaudio**(1), **Andrea Malizia**(5)

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5. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy

#### 250.TS7. Enhancing Security Measures for Religious Buildings in Europe: The Need for a Coordinated Effort Against Terrorism.

**Massimo Cozzolino**(1,2)

1. Europe Islamic Association, Piazza Pace, 2, 20155 - Milano
2. Università degli Studi di Roma 3, Via Gabriello Chiabrera n°199, 00145 Roma RM

## Technical Session 8 - Radiological and Nuclear events: methods, instrumentation, protection/decontamination, and technological developments

Chairpersons:

**Prof. Francesco d'Errico**

Department of Civil and Industrial Engineering - University of Pisa, (ITALY)

**Prof. Tzany Kokalova Wheldon**

Director of the Positron Imaging Centre - University of Birmingham, (UNITED KINGDOM)

**Prof. Eduardo Gallego**

Nuclear Engineering Department - UPM (Technical University of Madrid), (SPAIN)

This session deals with both, fundamental and applied research and reviews regarding the design, construction, and use of instrumentation, methodologies, and techniques for the detection of nuclear radiation generated by natural and artificial radionuclides or by nuclear reactions used in several application fields (energy, medicine, industry, security, and safety). The works can be oriented also on: the design and construction of systems for innovative nuclear measurements; the measurements and instrumentation for nuclear plants; the measurements and instrumentation used in nuclear decommissioning or waste management; the applications of radioisotopes in industrial and non-industrial fields; the detection of environmental radioactivity and nuclear metrology; safety and protection from radiation (Radio Protection); the geological, archaeological and environmental dating; methods and detection techniques for radio-ecology; the sensing techniques and instrumentation for biomedical application; radiometric measurements including gamma and particle emissions; the development and performance of nuclear instrumentation including radiation spectrometry, dosimetry, and novel counting systems.

This session will host the work of the experts that will reflect those concepts.

### 107.TS8. Preparing for nuclear and radiological emergencies: workshops of the spanish society for radiological protection.

**Eduardo Gallego**(1,2), **Milagros Montero**(2,3), **Alegria Montoro**(2,4)

1. Energy Engineering Departament, Escuela Técnica Superior de Ingenieros Industriales, Universidad Politécnica de Madrid (UPM), Madrid, Spain
2. Sociedad Española de Protección Radiológica (SEPR), Madrid, Spain
3. Departamento de Medio Ambiente, CIEMAT, Madrid, Spain
4. Biodosimetry Laboratory. Radiological Protection Service. La Fe University Hospital, Valencia, Spain

### 108.TS8. Emergency management in a Nuclear Medicine Department: flooding scenario.

**Gian Marco Contessa**(1), **Maria Antonietta D'Avanzo**(2), **Marco D'Arienzo**(3), **Massimo Mattozzi**(2), **Sandro Sandri**(4), **Francesco Campanella**(2)

1. National Center for Radiation Protection and Computational Physics, Italian National Institute of Health (ISS), Rome, Italy
2. Italian Workers' Compensation Authority (INAIL), Monte Porzio Catone, Italy
3. ASL Roma 6, Rome, Italy
4. Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Italy

### 109.TS8. Remote detection of alpha radioactivity by using rotary-wing unmanned aerial systems.

**Arturo Vargas**(1), **Maria Amor Duch**(1), **Pablo Royo**(2), **Tania Guillot**(2), **David Saiz**(2), **Jonathan Pichel**(2), **Daniel Rabago**(3), **Maksym Luchkov**(4), **Volker Dangendorf**(4), **Faton Krasniqi**(4)

1. Institute of Energy technologies, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain
2. Castelldefels School of Telecommunications and Aerospace Engineering, Universitat Politècnica de Catalunya (UPC), Castelldefels, Spain
3. Laboratory of Environmental Radioactivity, University of Cantabria (LaRUC), Santander, Spain
4. Physikalisch-Technische Bundesanstalt (PTB), Braunschweig, Germany

### 110.TS8. Lessons learned from radiation protection according to ICRP reference levels after the accident at Fukushima.

**Nakahihiro Yasuda**(1,2), **Ken Tashiro**(1), **Kanoko Yoshida**(1)

1. The research institute of nuclear engineering, University of Fukui, Fukui, Japan
2. The Great East Japan Earthquake and Nuclear Disaster Memorial Museum, Fukushima, Japan

### 111.TS8. Visualization of spatio-temporal variation of air dose rate due to precipitation and development of rapid alert method in case of nuclear disaster.

**Kanoko Yoshida**(1), **Nanami Nakao**(1), **Yusuke Yuge**(1), **Ken Tashiro**(1), **Nakahihiro Yasuda**(1,2)

1. The research institute of nuclear engineering, University of Fukui, Fukui, Japan
2. The Great East Japan Earthquake and Nuclear Disaster Memorial Museum, Fukushima, Japan

#### 112.TS8. New devices for neutron monitoring and radiation protection.

José-María Gómez-Ros(1), Roberto Bedogni(2), Carles Domingo(3), Montserrat Moraleda(1), Antonino Pietropaolo(4)

1. CIEMAT, Madrid, Spain

2. INFN-LNF, Frascati, Italy

3. UAB, Physics Department, Bellaterra, Spain

4. ENEA, Frascati, Italy

#### 113.TS8. Decision Support System to simulate some of the consequences of a Radiological Dispersion Device in an urban environment.

Riccardo Quaranta(1,5), Edoardo Cavalieri d'Oro(1,2), Guglielmo Manenti(3), Andrea Chierici(4), Francesco d'Errico(4), Andrea Malizia(3)

1. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy

2. Department of Firefighters, Italian Ministry of Interior, Rome, Italy

3. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy,

4. School of Engineering, University of Pisa, Pisa, Italy

5. The American University of Rome, Rome, Italy

#### 114.TS8. An Autonomous IoT Monitoring Unit for Radiological and Nuclear Emergency Management.

Andrea Chierici(1), Riccardo Ciolini(1) Debora Siqueira Nascimento(1,2) Francesco d'Errico(1)

1. University of Pisa, Department of Industrial and Civil Engineering, School of Engineering, Pisa, Italy

2. Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy

#### 115.TS8. Calibration HPGe detector using IAEA-U source for CBRNe.

Debora Siqueira Nascimento(1), Andrea Chierici(2), Riccardo Ciolini(2), Stefano Chiappini(1), Francesco d'Errico(2,3), Massimo Chiappini(1)

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2. Scuola di Ingegneria, Università di Pisa, Pisa, Italy

3. Yale Center for Emergency Preparedness and Disaster Response, New Haven, CT, United States of America

#### 116.TS8. The TEST RED Exercise of the INCLUDING project.

Luigi De Dominicis(1), Nicola Ranieri(2), Marco Sbrana(2), Stathes Hadjiefthymiades(3), Kasia Panagidi(3), Massimiliano Guarneri(1), Kostis Gerakos(3), Ralph Hedel(4), Marcel Heckel(4), Monica Cimino(1), Ilario Morriello(2), Antonio Di Pietro(2), Spyros Kolovos(5)

1. ENEA Agency for New Technologies, Energy and Sustainable Economic Development, Frascati, Italy

2. ENEA Agency for New Technologies, Energy and Sustainable Economic Development, Rome, Italy

3. NKUA National and Kapodistrian University of Athens, Greece

4. Fraunhofer Institute for Transportation and Infrastructure Systems IVI, Dresden, Germany

5. Hellenic Ministry of Defence, Athens, Greece

#### 117.TS8. My Nuclear Power Plant Neighbor.

Richard Fontana(1)

1. City of New Haven CT, Office of Emergency Management & Homeland Security, 200 Orange St, Emergency Operations Center, New Haven, CT 06516, United States of America

#### 118.TS8. Two new neutron sources for nuclear applications.

Tzany Kokalova Wheldon(1)

1. School of Physics and Astronomy, University of Birmingham, Birmingham, United Kingdom

#### 119.TS8. Radiochemical Purification and Primary Standardisation of Pratactinium-231 for Nuclear Forensics Applications.

Peter Ivanov(1)

1. National Physical Laboratory, Teddington, United Kingdom

#### 120.TS8. An assessment on safety measures in modern nuclear power stations.

Luca Romano(1)

1. L'Avvocato dell'Atomo, Italy

2. International Master Courses in Protection Against CBRNe events, University of Rome Tor Vergata, Italy

#### 121.TS8. Smartphones as support tools for emergency preparedness and disaster response.

Francesco d'Errico(1,2,3)

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

2. Yale School of Public Health, New Haven, Connecticut, United States of America

3. Yale Center for Emergency Preparedness and Disaster Response, New Haven, Connecticut, United States of America

#### 122.TS8. Natural phenols as radioprotectors: structural features and possible mechanisms.

Nadia Mulinacci(1), Lisa Giovannelli(1)

1. Dept. NEUROFARBA, Pharmaceutical and Nutraceutical Section, University of Florence, Sesto Fiorentino, Italy

#### 123.TS8. Application of the JRODOS decision support system in the preparedness to a nuclear emergency.

Milagros Montero(1)

1. CIEMAT – Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas. Department of Environment, Madrid, Spain

**124.TS8. Evaluation of a possible dirty bomb explosion scenario: enforcement of d.lgs. 101/2020, of NBCRe civil defence plan and of lombardy guide lines.**

**Roberta Corrao**(1), Andrea Malizia(2), Giovanni Magrotti(3), Paolo Peerani(3), Lorenzo Di Cesare(3)

1. Department of Hygiene and Health Prevention, ATS Insubria, Varese, Italy

**125.TS8. Recent developments in measurement and modelling of thermal neutron cross sections for radiation shielding and moderation.**

**Margherita Simoni**(1), Giovanni Romanelli(1), Marco Martellucci(2), Roberto Senesi(1,3)

1. Dipartimento di Fisica and NAST Centre, University of Rome Tor Vergata, Rome, Italy

2. Mardel Srl, Rome, Italy

3. Istituto ISM-CNR, Rome, Italy

**126.TS8. The Italian Fire Brigade and new data transmission technologies in the National Alerting Network and detection of radioactive fallout.**

**Michele M. La Veglia**(1), Matteo Diaco(2)

1. National Fire and Rescue Service, Campania regionale Office, Naples, Italy

2. National Fire and Rescue Service, Fire Fighting Training Schools, Rome, Italy

**142.TS8. Uranium carbide oxidation and self-ignition monitored with advanced microscopy.**

**Claudia Gasparrini**(1), Renaud Podor(2), Olivier Fiquet(3), Michael J.D. Rushton(1,4), William E. (Bill) Lee(1,4)

1. Department of Materials & Centre for Nuclear Engineering, Imperial College London, London, United Kingdom

2. ICSM, University Montpellier, CNRS, CEA, ENSCM, Site de Marcoule, Bagnols sur Ceze, France

3. CEA, DES, IRESNE, DEC, SA3E, LCU, CEA Cadarache, Saint-Paul-Lez-Durance, France

4. Nuclear Futures Institute, Bangor University, Bangor, Gwynedd, United Kingdom

**241.TS8. SP2: An innovative all-in-one neutron spectrometer. Test results at the Paul Scherrer Institute reference and high-energy neutron fields.**

Marcello Ballerini(1), Luca F. Ferrante Vero(1), Michele Lorenzoli(1), Giacomo P. Manessi(1), **Gabriele Zorloni**(1)

1. ELSE NUCLEAR S.r.l., Busto Arsizio, Italy

## Technical Session 9 - Chemical and explosive events: methods, instrumentation, protection/decontamination, algorithms and technological developments

Chairpersons:

**Prof. Pasquale Gaudio**

Department of Industrial Engineering - University of Rome Tor Vergata, (ITALY)

**Dr. Frank Duschek**

Institute of Technical Physics - German Aerospace Center (DLR), (GERMANY)

**Prof. José Luis Pérez Díaz**

Politechnical School of Engineering - University of Alcalá (SPAIN)

Chemical agents and explosives are widely used in the industrial world; they are often easily available on the open market and therefore may be used deliberately to cause harm. Under this premise, it is clear how important Chemical and Explosive Safety and Security are for first responders and other involved professionals, civilian and military organizations, and the population. New instruments and algorithms to detect, classify and identify chemical agents play a significant role to improve chemical monitoring and ensure prompt and conscious actions to face these events. Moreover, innovative technologies and methods to improve protection and decontamination systems, countermeasure actions, and treatments are crucial to ensure efficient mitigation and prevention. This section discusses all instrumentations, materials, devices, techniques, algorithms, and methodologies that aim at improving safety and security in the field of chemical hazards. Furthermore, this section also deals with all the technologies, methodologies, and strategies designed to counteract the malevolent use of explosives. This session will host the work of the experts that will reflect those concepts.

### 127.TS9. Non destructive evaluation on old chemical weapons.

**Antonio Battista**(1,2)

1. Comando Logistico dell'Esercito - Centro Tecnico Logistico interforze NBC (CETLI NBC), Civitavecchia (Rome), Italy

### 128.TS9. Detecting explosives from incident prevention to aftermath forensics: comparison of technologies, methodologies, and security applications.

**Frank Duschek**(1), Kostyantyn Konstantynovskiy(2)

1. German Aerospace Center (DLR), Institute of Technical Physics, Hardthausen, Germany

2. German Aerospace Center (DLR), Institute for the Protection of Terrestrial Infrastructures, Rheinbach, Germany

### 129.TS9. Dry decontamination for immediate and operational (emergency) decontamination in case of chemical incidents involving Chemical Warfare Agents and Toxic Industrial Chemicals.

**Dieter Rothbacher**(1)

1. CBRN Protection GmbH, Vienna, Austria

### 130.TS9. Real Time Detection of Chemical Warfare Agents at Clearance Decontamination Levels for Surface Contamination: A Technological Challenge.

**Dieter Rothbacher**(1)

1. CBRN Protection GmbH, Vienna, Austria

### 131.TS9. A New Hand-held FT-IR Spectrometer for Field-based Identifications of Vapor Phase Threats.

**Duane Sword**(1)

1. RedWave Technology, Danbury, CT, United States of America

### 132.TS9. Chemical agent detection by laser photoacoustic spectroscopy.

**Luca Fiorani**(1), Florinda Artuso(1), Sofia Bertolami(2), Claudio Ciceroni(1), Franco Di Paolo(2), Stefano Fantauzzi(2), Isabella Giardina(1), Ivano Menicucci(1), Marcello Nuvoli(1), Fabio Pollastrone(1), Lorenzo Valletti(2)

1. FSN-TECFIS-DIM, ENEA, Frascati, Italy

2. Department of Electronic Engineering, University of Rome Tor Vergata, Rome, Italy



**133.TS9. Development and test of a laser cutting system with control-relevant sensor technology for mobile use on objects with energetic materials.**

**Matthias Muhr**(1), Emre Ünal(1), Peter Kaul(1)

1. Institut für Sicherheitsforschung (ISF), Rheinbach, Germany

**134.TS9. Smart swab for rapid on-site SERS detection followed by laboratory forensic analysis of biological and chemical threats.**

Adriana Puiu(1), **Antonia Lai**(1), Roberto Viola(2), Matteo Gaspari(2), Nicola Liberatore(2), Sandro Mengali(2)

1. ENEA C.R. Frascati, Frascati, Italy

2. Consorzio CREO, L'Aquila, Italy

**135.TS9. Versatile ion-exchange resins as catalysts for the oxidative degradation of highly hazardous chemical and biological contaminants.**

Stefano Econdi(1,3), Chiara Bisio(1,2), Fabio Carniato(2), Matteo Alberti(3), Alessandro Caselli(3), Simona Tomaselli(1), Laura Ragona(1), Davide Mileto(4), Miriam Cutrera(4), Micol Bianchi(4), **Matteo Guidotti**(1)

1. CNR-SCITEC, Milan, Italy

2. University of Eastern Piedmont, DISIT, Alessandria, Italy

3. University of Milan, Dept. of Chemistry, Milan, Italy

4. University Hospital, "Luigi Sacco", Milan, Italy

**136.TS9. Remote detection of CBE threats with use of unmanned vehicles.**

**Bartłomiej Jankiewicz**(1), Bartosz Bartosewicz(1), Bogusław Budner(1), Miron Kaliszewski(1), Krzysztof Kopczyński(1), Malwina Liszewska(1), Jarosław Młyńczak(1), Maksymilian Włodarski(1), Martin Sabo(2), Mateusz Szala(3)

1. Institute of Optoelectronics, Military University of Technology, Warsaw, Poland

2. Slovak University of Technology, MaSa Tech, s.r.o., Bratislava, Slovakia

3. Faculty of Advanced Technologies and Chemistry, Military University of Technology, Warsaw, Poland

**137.TS9. The Centro Tecnico Logistico Interforze NBC.**

**Giuseppe Damato**(1)

1. Comando Logistico dell'Esercito - Centro Tecnico Logistico interforze NBC (CETLI NBC), Civitavecchia (Rome), Italy

**138.TS9. Recent Improvements in the novel approach to the fast detection of surface contaminations.**

**Frank Wilsenack**(1), Fabian Meyer(1), Mario Adelhardt(1), Marko Härtelt(2)

1. Bundeswehr Research Institute for Protective Technologies and CBRN Protection, Germany

2. Fraunhofer Institute for Applied Solid State Physics, Germany

**139.TS9. Effective and efficient counteraction of SO2 gas clouds: an experimental validation.**

**José Luis Pérez Díaz**(1), Francisco Javier Pérez Del Álamo(1), Juan Sánchez García-Casarrubios(2), Pablo Mendez-Vigo(1), Álvaro García-Agudiez(1), Elisa María Ruiz-Navas(2), Cristina Del-Álamo-Toraño(3), Julio Cesar Saavedra-González(3)

1. Counterfog, Valdemoro Spain

2. EPS Universidad Carlos III de Madrid, Spain

3. EPS, Universidad de Alcalá, Alcalá de Henares, Spain

**140.TS9. Risk for the population related to lack of knowledge and expertise in the analysis of process and plant design and risk assessment.**

**Gianumberto Giurin**(1), Tommaso Pappalardo(2)

1. National federation of chemists and physicists, Rome, Italy

2. Regional Order of Chemists and Physicists of Trentino Alto Adige, Italy

**141.TS9. Acoustic Waves based sensors and e-noses for VOC detection.**

**Fabio Di Pietrantonio**(1)

1. Institute for Microelectronics and Microsystems, National Research Council, Rome, Italy

## Technical Session 10 - Biological events and pandemics: methods, algorithms instrumentation, protection/decontamination, and technological developments

Chairpersons:

**Prof. Susana de Souza Lalic**

Physics Department - Universidade Federal de Sergipe, (BRASIL)

**Dr. Cornelius Bartels**

Federal Ministry for Environment, Nature Conservation and Nuclear Safety (DLR), (GERMANY)

**Dr.Eng. Edoardo Cavalieri D'Oro**

Head of CBRN for Lombardia Region - Italian Firefighters - Italian Ministry of Interior (ITALY)

Recent years have shown us that the risk of the spreading of a biological agent is very prominent. The recent pandemic, caused by the spread of the SARS-CoV-2 virus, has demonstrated the fundamental role played by emergency plans, preparedness, and monitoring to contain it (Epidemic Intelligence). Especially today, when globalization implies the increased interconnectedness and interdependence of peoples and countries, a single and far-distant outbreak may become a pandemic. Moreover, in today's scenario, Biosecurity and Biosafety play a key role in tackling any emergence and re-emergence of biological agents, which may have a natural origin and spread or may have an intentional engineering and a malicious dispersion for offensive purposes, such as the use of BWAs by a rogue nation, or bio-terrorist attacks. In this setting, therefore, the following issues assume a fundamental role:

- The possibility of promptly identifying and classifying the dispersion, the nature, and possibly, the origin of biological agents (also thanks to new detection technologies and NGS techniques).
- The preparedness to face such events (by means of civil and military contingency plans, infrastructures, and capability),
- The research for the containment, monitoring, and epidemiological prediction of such events (also through mathematical modelling of outbreaks).
- The use of appropriate personal protection equipment (through planning and proper communication).

This session aims to deepen the current risks related to the spread of biological agents: providing an overview of what are the new technologies that are useful for the detection and analysis of biological agents, exploring the lessons learned from the current pandemic and from past events to address this type of risk as well as illustrating the progress in planning for the preparedness and rapid response to such events.

This session will host the work of the experts that will reflect those concepts.

### 143.TS10. Evaluation of the environmental and economic impact deriving from the adoption of a reuse strategy for disposable FFP2 during pandemic events.

Samuele Giovanardi(1), Edoardo Cavalieri D'Oro(2), Mariapia Pedferri(1)

1. Politecnico di Milano, Milan, Italy

2. Corpo nazionale dei Vigili del Fuoco, Milan, Italy

### 144.TS10. Ricin detection using single domain antibodies.

Omar Nyabi(1), Benjamin Smits(1), Nawfal Chibani(1), Malo Leuch(1), Süreyya Cavusoglu(1), Quentin Pagneux(2), Sabine Szunerits(2), Jean-Luc Gala(1)

1. Centre for Applied Molecular Technologies (CTMA), Institute of Clinical and Experimental Research, Université Catholique de Louvain, Brussels, Belgium

2. Univ. Lille, CNRS, Centrale Lille, Univ. Polytechnique Hauts-de-France, Lille, France

### 145.TS10. Laser induced fluorescence technologies applied for the standoff detection of bioaerosols.

Lea Fellner(1), Arne Walter(1) Frank Duschek(1)

1. German Aerospace Center (DLR), Institute of Technical Physics, Hardthausen, Germany

### 146.TS10. Stand-off detection of biological hazards on common surfaces by laser-induced fluorescence (LIF): Improved localization and classification routines.

Jonas Grzesiak(1), Marian Kraus(1) Lea Fellner(1) Arne Walter(1) Frank Duschek(1)

1. German Aerospace Center (DLR), Institute of Technical Physics, Hardthausen, Germany

**147.TS10. Determination of spectral fluorescence cross-sections of bacteria aerosols: Achievements, challenges, and limitations.****Karin Gruenewald(1)**, Thomas Hall(1) Lea Fellner(1) Arne Walter(1) Marian Kraus(1) Frank Duschek(1)

1. German Aerospace Center (DLR), Institute of Technical Physics, Hardthausen, Germany

**148.TS10. Emerging biological threats disrupt both society and military operations.****Stef Stienstra(1)**

1. SME CBRN Dutch Armed Forces, Beek-Ubbergen, The Netherlands

**149.TS10. Assessing Cytogenetic Endpoints in Allium cepa Roots Exposed to radiation: Implications for Radiological and Nuclear Emergency Response.****Magno N. Xavier(1)**, Iasmim F. Santos(1), July Anne T. Novaes(1), Débora S. Nascimento(2), Riccardo Ciolini(2), Francesco d'Errico(2), **Susana O. Souza(2)**

1. Federal University of Sergipe, Brazil

2. Pisa University, Pisa, Italy

**150.TS10. Experimental Assessment of Counterfog Bio Aerosol Fast Sampler for Virus Detection and Decontamination.****José Luis Pérez-Díaz(1)**, Cristina Del-Álamo-Torano(1), Julio Cesar Saavedra-González(1), Pablo Mendez-Vigo(2), Juan Sánchez García-Casarrubios(2), Francisco Javier Pérez Del Álamo(2), Álvaro García-Agudiez(2), María Pilar Del-Álamo-Lobo(2), Antonio Alcamí-Pertejo(3), Ángela Vázquez-Calvo(3), Gil Rodríguez-Caravaca(3)

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2. Counterfog SL, Valdemoro Spain

3. Centro de Biología Molecular Severo Ochoa, CSIC, Madrid, Spain

4. Hospital Universitario Fundación Alcorcón, Alcorcón, Spain

**151.TS10. Nutraceutical recommendations for CBRN and emergency first responders during an airborne biological release incident.****Jean-Marie Zimmer(1,2)**, Stefania Moramarco(2), Mariachiara Carestia(2)

1. Corps grand-ducal d'incendie et de secours (CGDIS), Groupe d'intervention spécialisé (GIS) NRBC, Luxembourg, Grand Duchy of Luxembourg

2. University of Rome Tor Vergata, 2nd Level International Master Courses in Protection against CBRNe Events, Industrial Engineering Department, Rome, Italy

**152.TS10. Preventive nutraceutical support for first responders during and after a bio-incident****Jean-Marie Zimmer(1,2)**, Stefania Moramarco(2), Mariachiara Carestia(2)

1. Corps grand-ducal d'incendie et de secours (CGDIS), Groupe d'intervention spécialisé (GIS) NRBC, Luxembourg, Grand Duchy of Luxembourg

2. University of Rome Tor Vergata, 2nd Level International Master Courses in Protection against CBRNe Events, Industrial Engineering Department, Rome, Italy

**153.TS10. Advancing Early Detection of Biological Events by Digital Holography and Simulation of Microorganism.****Alessandro Molani(1)**, Béla Mihalik(2), Francesca Pennati(1), Praveen Rahi(3), Andrea Aliverti(1), Györgyi Béla(2)

1. Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, P.zza L. da Vinci, 32, 20133 Milan, Italy

2. Ideas Science Ltd., Budapest, Hungary

3. Biological Resource Center of Institut Pasteur (CRBIP), Institut Pasteur, Université Paris Cité, Paris, France

**154.TS10. The CAMFID Confidence Chamber.****Vincenzo Balloni(1)**, Maria Paola Menaguale(1)

1. CAMFID S.r.l., Teramo, Italy

**155.TS10. Field application experience of advanced sanitation in hospital settings.****Francesco De Caro(1)**, Claudio Giordano(1), Giuseppina Moccia(1)

1. Università degli Studi di Salerno Dipartimento di Medicina, Chirurgia e Odontoiatria "Scuola Medica Salernitana", Salerno, Italy

**156.TS10. Applications of Ozone in the CBRN Environment from the Perspective of Italian Firefighters.****Edoardo Cavalieri D'Oro(1)**

1. Italian National Fire and Rescue Service, CBRN Unit and Laboratories of the Lombardy Region, Milan, Italy

**246.TS10. Prevention is better than healing. Clinical and economic implications of oral antiviral agents in Covid 19: a prospective study.****Filomena Pietrantonio(1,2)**, **Francesco Rosiello(2,3,4)**, Fabio Vinci(1), Michela Delli Castelli(1), Angela Ciamei(1), Marise Sabato(4), Aurelio Spartà(4), Davide Acco(4), Maria Sofia Cattaruzza(4), Matteo Ruggeri(2,5), Marco Materazzo(6,7), Vincenzo Mirko La Fazia(8,9), Nicola Pierucci(11), Rosa Iodice(11), Luca Fortunato(11), Francesco Scordamaglia(11), Giuseppe Granvillano(12), Lamberto Carlo Maria Cicerchia(13,14), Massimo Maurici(15), Antonio Vinci(16), Margherita Lordi(1), Enrica Cipriano(1)

1. UOC Medicina Interna, Ospedale dei Castelli, ASL Roma 6, Ariccia, Italy

2. St Camillus International University of Health Sciences, Rome, Italy

3. Department of Histological, Anatomical Sciences and Legal Medicine, Sapienza-University of Rome, Rome, Italy

4. Department of Infectious Disease and Public Health, Sapienza University of Rome, Rome, Italy

5. National Institute for Statistics, Rome, Italy
6. Breast Unit, Department of Surgical Science, Policlinico Tor Vergata University, Rome, Italy
7. PhD Program in Applied Medical-Surgical Sciences, Breast Oncoplastic Surgery, University of Rome Tor Vergata, Rome, Italy
8. Texas Cardiac Arrhythmia Institute, St. David's Medical Center, Austin, Texas, USA
9. Division of Cardiology, Department of Systems Medicine, Tor Vergata University, Rome, Italy
10. Department of Clinical Internal, Anesthesiologic and Cardiovascular Sciences, Sapienza University of Rome, Rome, Italy
11. Studio Legale Fortunato, Roma, Italy
12. Department of Medical and Surgical Sciences and Advanced Technologies "GF Ingrassia", University of Catania, Catania
13. Corso Formazione Specifica in Medicina Generale AREA DIDATTICA 4 (ASL Latina) Triennio 2021– 2024, Latina, Italy
14. ASL ROMA5 Distretto G5, Palestrina, Italy
15. Department of Biomedicine and Prevention, University of Rome "Tor Vergata", Rome, Italy
16. Doctoral School in Nursing Science and Public Health, University of Rome Tor Vergata, Rome, Italy

## **252.TS10. Enhancing Performance in Public Health Emergencies: Rapid Operational Response, Technological Innovation, and Just-in-Time Training in a Mobile Analytical Capacity**

**Jean-Luc Gala**(1)

1. Centre for Applied Molecular Technologies (CTMA), Institute of Clinical and Experimental Research, Université Catholique de Louvain, Brussels, Belgium

### Technical Session 11 - CBRNe intelligence and forensic aspects

Chairpersons:

**Col. Ibrahim Mohamed Zainal Almarzouqi**

Abu Dhabi Civil Defence Authority, (UNITED ARAB EMIRATES)

**Lt. Col. Andrea Gloria**

Office V – Disarmament, Armaments control, Nonproliferation, CWA, Italian Ministry of Foreign Affairs and International Cooperation (ITALY)

**Prof. Fanny Ewann**

Bioterrorism Prevention Unit CBRNE and Vulnerable Targets Sub-Directorate, INTERPOL (ITALY)

The proliferation and diffusion of CBRN agents and their possible means of delivery combined with the possibility that States and Non-State actors will develop or acquire them are some of the main threats to global security. Attacks with WMD and CBRN agents is a high-consequence transnational threat. The increased CBRN know-how, the spread of the appropriate technology and expertise and the growing capabilities represent a serious threat. Evidences of acquisition, production or theft of nuclear fissile materials, radiological sources, chemical agents, toxins and biological agents that can be used in attacks involving CBRN materials are some of the indicators that can identify clandestine CBRN programs. A comprehensive fusion of information about States and Non-State actors CBRN developments, performance and operational capabilities linked with potential hazards from research facilities, industrial plants, nuclear power plants and other potential sources of toxic releases is necessary.

CBRNe attacks, as any other crime scene, require a first aid intervention to save human lives and to ensure the safety of first responders. Secondly, there is the need to recover the corpses, or their fragments, and to conduct an analysis of the victims to obtain their identification. The corpses or their remains are usually stored in cooled units or morgues where the analyses are performed. Three strategies are the most common and are suitable for specific cases: fingerprint analysis, the odontology approach, and DNA typing. Moreover, a novel research field is focused on the harmonization of techniques involved in the detection, collection, and analysis of CBRNe samples and forensic requirements in terms, for example, of evidence collection and preservation, chain of custody, sample storage and results in reliability. This last issue is crucial to utilize laboratory results both as legal proof in Courtrooms and in international disputes.

- Starting from a CBRNe scenario, this session aims at providing up-to-date knowledge and experience in:
- CBRNe attacks prevention through the processing of data and information;
- DVI issues, with a multi-disciplinary approach (first responders' point of view, forensic pathology, forensic genetics, forensic chemistry, physical anthropology, etc.);
- Crime scene investigation (evidence documentation and collection);
- Samples analysis in accredited and designated laboratories.

This session will host the work of the experts that will reflect those concepts.

#### 157.TS11. Collection of information to prevent malicious events and reduce risks: my experience.

**Alberto Manenti(1)**

1. Former Director Italian External Intelligence Agency (AISE), Italy

#### 158.TS11. Multi-disciplinary challenges of biological incidents investigation.

**Fanny Ewann(1)**

1. Bioterrorism Prevention Unit, CBRNE and Vulnerable Target Sub-directorate, INTERPOL, Lyon, France

#### 159.TS11. The murder at MATHY BAR - how CBRN's point of view can solve a homicide case without any cooperative bystander.

**Massimo Pedemonte(1)**

1. C.C.I. Agency, Italy

**160.TS11. Preparation of IED (Improvised Explosives Devices) with H.M.E. (Home Made Explosives) in terrorist attacks starting from explosive precursors. EU regulation and control on explosive precursors.**

**Maria Cristina Pigo**(1), Antonietta Lombardozzi(1), Damiano Ricci(1)

1. C.C.I. Ministry of Interior – Department for Public Security Central Anticrime Directorate of the Italian State Police– Forensic Science Police Service III Division – Explosives and Ignitable liquids Investigation Unit, Rome, Italy

**161.TS11. Forensic Aspects of CBRNe Incidents.**

**Enrico A. Risso**(1), Chantal Milani(2)

1. Forensic Pathologist - Deputy Chief Medical Examiner, Office of the Chief Medical Examiner - Edmonton, Alberta, Canada

2. Forensic Anthropologist and Odontologist, Italian Society of Forensic Odontology (Board of Directors), Italy

**162.TS11. Evaluation of the permanence of benzene on solid material with gc-ms analytical techniques, at time intervals.**

**Claudio De Maio**(1)

1. Italian National Fire and Rescue Service, Italian Ministry of Interior, Italy

**163.TS11. Evaluation of the permanence of diesel and gasoline on solid material with gc-ms analytical techniques, at time intervals.**

**Claudio De Maio**(1)

1. Italian National Fire and Rescue Service, Italian Ministry of Interior, Italy

**164.TS11. CBRN-E Forensic point of view.**

**Davide Cutrino**(1)

1. Technical Operational Unit - National Authority for the implementation of the CWC, Disarmament, arms control and non proliferation Office, General Directorate for Political Affairs and Security, Ministry of Foreign Affairs and International Cooperation, Italy

**165.TS11. CBRNe Intelligence.**

**Andrea Gloria**(1)

1. Head of the Technical Operational Unit - National Authority for the implementation of the CWC, Disarmament, arms control and non-proliferation Office, General Directorate for Political Affairs and Security, Ministry of Foreign Affairs and International Cooperation, Italy

**166.TS11. Digital Chain of Custody Innovation Management Roadmap.**

**Gabriel Pestana**(1), **Souzanna Sofou**(2)

1. INOV – Instituto de Engenharia de Sistemas e Computadores Inovação, Lisbon, Portugal

2. SATWAYS Ltd, Athens, Greece

**167.TS11. Investigation of explosive traces in pre-blast contamination scenarios using optimized wet swab sampling.**

**Christopher Becher**(1), Peter Kaul(1,2)

1. Institut für Sicherheitsforschung (ISF), Rheinbach, Germany

2. Institut für Detektionstechnologien, (IDT), Rheinbach, Germany

**242.TS11. The central laboratory for the national DNA Database.**

**Ilenia Pietrangeli**(1), Daniela Caputo(1)

1. Laboratorio centrale per la banca dati nazionale del DNA – Direzione generale detenuti e trattamento – DAP, Rome, Italy

## Technical Session 12 - CBRNe new risks and challenges provoked by climate change, war, terrorism, local conflicts and food security

Chairpersons:

**Col. Prof. Radovan Karkalic**

University of Defence - Military Academy Serbia, (SERBIA)

**Col. Bernd Allert**

German Army, (GERMANY)

**Cmd. Stoffer Stienstra**

Royal Dutch Navy, (THE NETHERLANDS)

Climate change is considered by many experts to be one of the major problems humankind is currently facing. The possible consequences of intense climate change, which are constantly being monitored, are continually updated as new data become available but the possibility of the emergence of new risks including CBRN hazards that need to be managed is ever more substantial and presents many new challenges. The relationship between climate change and CBRN threats is already shown in many instances such as in the case of extreme weather events in highly industrialized areas or mosquito-borne diseases affecting areas previously considered safe. Radiological hazards due to extreme weather events and climate-related disasters not only in nuclear power plants but also in hospitals and in many industries should be considered and possibly implemented into risk management policies, and adaptation strategies should be included in the safety and emergency plans. Moreover, the current international frictions increase the chance of intentional or accidental releases of CBRNe agents both in war-thorn areas and as acts of terrorism. In this complex multifaceted scenario, the emerging CBRNe risks need to be addressed and the challenges they pose must be faced and treated with advanced education, training, and technologies. In recent years, the occurrence of different kind of disasters and emergencies has risen worldwide, resulting in large numbers of communities affected, causing victims, food crisis, refugees and people displaced. CBRN events can have devastating impacts on the four dimensions of food security (availability, access, utilization and stability) and health (morbidity and mortality patterns), impacting health services and living environment. As a direct result, impaired or jeopardized nutritional status of population is likely to occur, feeding a vicious circle of malnutrition and outbreaks of infectious diseases, ending into famine and mortality.

This session will host the work of the experts that will reflect those concepts.

### 168.TS12. New methodology for testing of CBRN body cooling systems physiological suitability in the field conditions

**Radovan Karkalic(1), Dalibor Jovanovic(2), Pavel Otrisal(3), Stanislav Florus(4), Dusan Rajic(5), Zlate Velickovic(1), Sveta Cvetanovic(6)**

1. University of Defence, Military Academy, CBRN Department, Belgrade, Republic of Serbia

2. Organization for the Prohibition of Chemical Weapons, The Hague, The Netherlands

3. Faculty of Physical Culture, Palacky University, Olomouc, Czech Republic

4. University of Defence, NBC Defence Institute, Vyskov, Czech Republic

5. Innovation Center of the Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Republic of Serbia

6. University of Nis, Faculty of Occupational Safety, Belgrade, Republic of Serbia

### 169.TS12. rescEU-CBRN-DSIM-IT: A new paradigm for the design of CBRN extra capacities aimed to respond to High Impact Low Probability scenarios in Europe.

**Edoardo Cavalieri D'Oro(1)**

1. Italian National Fire and Rescue Service, CBRN Unit and Laboratories of the Lombardy Region, Milan, Italy

### 170.TS12. CBRN Surveys in a post conflict environment, Iraq 2018.

**Jeffrey Brodeur(1)**

1. Rigaku Analytical Devices, Wilmington, MA, United States of America

### 171.TS12. Shared virtual ecosystem for research and training in the energy sector.

**Viktor Gurieiev(1), Jiang Qin(1), Amir Sanhinov(2)**

1. School of Energy Sciences and Engineering, Harbin Institute of Technology, Harbin, China

2. G.E. Pukhov Institute for Modelling in Energy Engineering of NAS of Ukraine, Kyiv, Ukraine



**172.TS12. Five certified reference materials (CRMs) for a better preparedness towards biological toxin incidents.**

**Reinhard Zeleny**(1), Katrien Busschots(1), Bettina Kampa(2), Sylvia Worbs(2), Martin Skiba(2), Tom Van Nieuwenhuysen(3), Anne Puustinen(4), Paula Vanninen(4), Christine Rasetti-Escargueil(5), Marie-Anne Nahori(5), Emmanuel Lemichez(5), Anne-Sophie Mierzala(6), François Becher(6), Hervé Volland(6), Stéphanie Simon(6), Yacine Nia(7), Jacques-Antoine Hennekinne(7), Jasmin Weisemann(8), Nadja Krez(8), Beate Winter(8), Andreas Rummel(8), Tomas Bergström(9), Jonas Näslund(9), Daniel Jansson(9), Christian Müller(10), Marc-André Avondet(10), Matthias Wittwer(10), Roland Josuran(11), Andreas Wenger(11), Christiane Zaborosch(11), Sabina Gerber(11), Brigitte Gertrud Dorner(2)

1. European Commission, Joint Research Centre, Directorate F – Health and Food, Reference Material Unit, Geel, Belgium
2. Robert Koch Institute, Center for Biological Threats and Special Pathogens, Biological Toxins, Berlin, Germany
3. Sciensano, Foodborne Pathogens, Brussels, Belgium
4. Finnish Institute for the Verification of the Chemical Weapons Convention (VERIFIN), Department of Chemistry, University of Helsinki, Helsinki, Finland
5. Institut Pasteur, Unité des Toxines Bactériennes, Paris, France
6. CEA-Saclay, Direction de la recherche fondamentale, Institut des sciences du vivant Frédéric-Joliot, Service de Pharmacologie et Immunoanalyse, Gif-sur-Yvette, France
7. ANSES, Laboratory for Food Safety, Université Paris-Est, Maisons-Alfort, France
8. Toxologics UG, Hannover, Germany
9. Swedish Defence Research Agency, Umeå, Sweden
10. Bundesamt für Bevölkerungsschutz, Labor Spiez, Spiez, Switzerland
11. Zürcher Hochschule für Angewandte Wissenschaften, Life Sciences und Facility Management, Fachstelle Biochemie und Bioanalytik, Wädenswil, Switzerland

**173.TS12. How familiar is the population of southeast Serbia with the biosafety procedures for collecting, preparing and preserving wild plants from their surroundings.**

**Dragana Jovanović**(1), **Biljana Koturević**(1), **Ana Branković**(1)

1. Department of Forensic Engineering, University of Criminal Investigation and Police Studies, Belgrade, Serbia

**174.TS12. Food safety and nutritional quality for the prevention of non-communicable diseases: the Nutrient, hazard Analysis and Critical Control Point process (NACCP).**

**Paola Gualtieri**(1) and **Laura Di Renzo**(1)

1. Section of Clinical Nutrition and Nutrigenomics, Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy

**175.TS12. Drive to a better tomorrow: Electric Mobility's role in ensuring safety, security, sustainability and social equity in the energy transition.**

**Luigi Antonio Poggi**(1)

1. Head of Marketing & Sales, Strategy, Communications - Ewiva (Joint Venture between Enel X Way and Volkswagen Group), Italy

**176.TS12. CBRNe Threat: the dual use of Remotely Piloted Aircraft System.**

**Pasquale Spanò**(1)

1. Department of Public Security, Italian Ministry of Interior, Italy

**177.TS12. Natech risk management for plants with major accident risk: a case study.**

**Francesco Geri**(1)

1. Presidency of the Council of Ministers– Department of Civil Protection, Rome, Italy

**178.TS12. The evolution of CBRN threats.**

**Paola Tessari**(1)

1. IAI - Istituto Affari Internazionali, Rome, Italy

**179.TS12. Space Sustainability for CBRNe risk mitigation.**

**Loredana Santo**(1), **Fabrizio Quadri**(1)

1. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy

**180.TS12. Laboratory methodology for the characterization of drinking water pollutants to identify possible terrorist attack.**

**Chiara Telloli**(1)

1. ENEA - Fusion and Technology for Nuclear Safety and Security Department (FSN), Nuclear Safety, Security and Sustainability Division (SICNUC), Methods and Techniques for Nuclear Security, Monitoring and Traceability Laboratory (TNMT), Bologna, Italy

**181.TS12. Promoting Responsible Chemistry: Risk Mitigation & Countering Chemical Terrorism.**

**Muhammad Athar Javed**(1)

1. Director General, Pakistan House, Islamabad, Pakistan

## POSTER SESSIONS

### Poster Session 1

#### 182.PS1. Low-cost gas sensors array and Machine Learning approaches for detection and classification of chemical agents.

**Luca Martellucci<sup>1</sup>**, Daniele Di Giovanni<sup>1,2</sup>, Andrea Malizia<sup>3</sup>, Alessandro Puleio<sup>1</sup>, Riccardo Rossi<sup>1</sup>, Ivan Wyss<sup>1</sup>, Pasqualino Gaudio<sup>1</sup>

1. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy
2. Unicamillus-Saint Camillus International University of Health Sciences, Rome, Italy
3. Department of Biomedicine and Prevention, University of Rome "Tor Vergata", Rome, Italy

#### 183.PS1. Public Transportation Protection And Awareness.

**Sultan Alkaabi<sup>1</sup>**

1. Abu Dhabi Civil Defence Authority, Abu Dhabi, United Arab Emirates

#### 184.PS1. Role of medical system in CBRNE events. A systematic review of literature.

**Giulia Allegrini<sup>1</sup>**, Matteo Bartolomei<sup>2</sup>

1. SET 118 Ausl Modena, Hospital of Vignola, Italy
2. Nurse direction Emergency Department at Hospital Maggiore of Bologna, Italy

#### 186.PS1. Optical detection and comparison of CWAs simulant using handheld forensic light source.

**Mattia Bianchelli<sup>1</sup>**, Damiano Giuseppe Ferrari<sup>1</sup>, Antonio Battista<sup>2</sup>, Fabrizio D'Amico<sup>3</sup>

1. NBC School of Rieti, Italy
2. Centro Tecnico Logistico Interforze NBC, Civitavecchia, Italy
3. Comando Logistico dell'Esercito – Comando Tecnico, Rome, Italy

#### 187.PS1. Natural and synthetic clays: versatile tools against highly toxic compounds.

**Stefano Marchesi<sup>1</sup>**, Stefano Econdi<sup>2</sup>, Fabio Carniato<sup>1</sup>, Matteo Guidotti<sup>3</sup>, **Chiara Bisio<sup>1,3</sup>**

1. Department of Science and Technological Innovation, University of Piemonte Orientale, Alessandria, Italy.
2. Department of Chemistry, University of Milan, Milan, Italy.
3. CNR-SCITEC Istituto di Scienze e Tecnologie Chimiche "Giulio Natta", Milan, Italy.

#### 188.PS1. Eat, or not to eat, that is the question. Let the microscope answer.

**Danijela Milinčič<sup>1</sup>**, Milica Gajić<sup>1</sup>, Biljana Koturević<sup>1</sup>, **Ana Branković<sup>1</sup>**

1. Department of Forensic Engineering, University of Criminal Investigation and Police Studies, Belgrade, Serbia

#### 189.PS1. The Article 452-sexies of the Italian Penal Code and the Dangers of Atomic Energy. A Legal Analysis.

**Francesco Camplani<sup>1</sup>**

1. Università degli Studi di Macerata, Macerata, Italy

#### 190.PS1. Building Risk Assessment Method for Explosive and Non-Conventional Terrorist Attacks.

**Marco Carbonelli<sup>1</sup>**, Laura Gratta<sup>1</sup>, Riccardo Quaranta<sup>2,5</sup>, Andrea Malizia<sup>3</sup>, Pasquale Gaudio<sup>2</sup>, Daniele Di Giovanni<sup>2,4</sup>, Grace P. Xerri<sup>2</sup>

1. Italian Risk Management Expert
2. Industrial Engineering Department, University of Rome Tor Vergata, Italy
3. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Italy
4. Unicamillus-Saint Camillus International University of Health Sciences, Rome, Italy
5. The American University of Rome, Italy

#### 191.PS1. Procedure and technologies for mapping a contaminated area.

**Edoardo Cavalieri d'Oro<sup>1</sup>**, Sonia Noci<sup>2</sup>

1. Italian National Fire And rescue Service, Comando Vigili del Fuoco Milano, Milan, Italy
2. Italian National Fire And rescue Service, Comando Vigili del Fuoco, Genoa, Italy

#### 192.PS1. A Gibbs energy approach to describes sulphate attack in cementitious materials for low level waste repositories.

**Nicola Cefis<sup>1</sup>**, Luca d'Imperio<sup>1</sup>, Chiara Moletti<sup>2</sup>, Roberto Fedele<sup>1</sup>

1. Politecnico di Milano - Dipartimento di Ingegneria Civile e Ambientale, Milan, Italy
2. Politecnico di Milano - Dipartimento di Chimica, Materiali e Ingegneria Chimica "Giulio Natta", Milan, Italy

#### 193.PS1. The plagues in history and the Italian firefighters in unconventional operations (1806-2021).

**Michele M. La Veglia<sup>1</sup>**

1. National Fire and Rescue Service, Campania regional Office, Naples, Italy

#### 194.PS1. Development of a Methodology for Pooling Resources and Optimising Investments in the Field of CBRN Training and Capacity Building.

**Saman Choudary**<sup>1</sup>, Grace P. Xerri<sup>2</sup>, Mariachiara Carestia<sup>3</sup>, Elif Surer<sup>4</sup>, Olga Vybornova<sup>5</sup>, Jean-Luc Gala<sup>5</sup>, Maaïke F. Van De Vorst<sup>6</sup>, Luc Calluy<sup>6</sup>, Wolfgang Karl-Heinz Reich<sup>7</sup>, Tomas Michalcik<sup>7</sup>, Therese Habig<sup>8</sup>, Eugen Schmidt<sup>8</sup>, Elizabeth Benson<sup>9</sup>, Rob Bunday<sup>9</sup>, Daniele Di Giovanni<sup>2,10</sup>

1. Department of Communication, Pompeu Fabra University, Barcelona, Spain
2. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy
3. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy
4. Department of Modeling and Simulation, Graduate School of Informatics, Middle East Technical University, Ankara, Turkey
5. Center for Applied Molecular Technologies, Université catholique de Louvain, Belgium
6. Autonoom provinciebedrijf Campus Vesta, Belgium
7. Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence, Czech Republic
8. Safety Innovation Center, Germany
9. National CBRN Centre, Counter Terrorism Policing, West Midlands Police, United Kingdom
10. Unicamillus-Saint Camillus International University of Health Sciences, Rome, Italy

#### 195.PS1. Waste Management for a possible Nuclear Fusion Power Plant.

**Francesca Apicella**<sup>1</sup>, Michele Lungaroni<sup>1</sup>, Simone Noce<sup>1</sup>, Michela Gelfusa<sup>1</sup> and Pasquale Gaudio<sup>1</sup>

1. Department of Industrial Engineering, University of Rome "Tor Vergata", Rome, Italy

#### 196.PS1. Considerations in Modelling UAV-Borne Gamma Radiation Detection for Diverse Scenarios.

**Timothy Doughney**<sup>1,2</sup>, John Gillam<sup>2</sup>, Aithan Roufus<sup>1</sup>, Antony M. Hooker<sup>1</sup>, Christopher Kalnins<sup>1</sup>, Nigel A. Spooner<sup>1</sup>

1. University of Adelaide, Adelaide, Australia
2. Defence Science and Technology Group, Melbourne, Australia

#### 197.PS1. Artificial Intelligence applied to cytogenetic bio-dosimetry: current status and future possibilities.

**Chiara Ferrari**<sup>1</sup>, Andrea Malizia<sup>2</sup>, Guglielmo Manenti<sup>2</sup>

1. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy
2. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy

#### 198.PS1. Gender and diversity considerations for Counter CBRN capability.

**Steve Johnson**<sup>1</sup>

1. UK Ministry of Defence, United Kingdom

#### 199.PS1. Acute poisoning in a chemical plant: the "unexpected" carbon monoxide.

**Mariapina Gallo**<sup>1</sup>, Andrea Giampreti<sup>1</sup>, Maria Gioia Contessa<sup>1</sup>, Georgios Eleftheriou<sup>1</sup>, Giuseppe Bacis<sup>1</sup>

1. Bergamo Poison Control Center ASST Ospedale Papa Giovanni XXIII, Bergamo, Italy

#### 200.PS1. Relational Databases as Decision Support Tools for the Management of Infection Clusters and Patterns of Antibiotic Resistance.

**Claudio Gelfusa**<sup>1</sup>, Andrea Murari<sup>1,2,3</sup>, Gian Marco Ludovici<sup>1</sup>, Cristiano Franchi<sup>1</sup>, Michela Gelfusa<sup>1</sup>, Andrea Malizia<sup>4</sup>, Pasquale Gaudio<sup>1</sup>, G. Farinelli<sup>5</sup>, G. Panella<sup>5</sup>, C. Gargiulo<sup>5</sup>, K. Casinelli<sup>5</sup>

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3. Istituto per la Scienza e la Tecnologia dei Plasmi, CNR, 35100 Padua, Italy.
4. Department of Biomedicine and Prevention, University of Rome "Tor Vergata", 00133 Rome, Italy.
5. ASL and Fabrizio Spaziani, Frosinone Hospital, 03100 Frosinone, Italy.

#### 201.PS1. Laser photoacoustic spectroscopy detection of the nerve agent simulant dimethyl methylphosphonate (DMMP).

**Isabella Giardina**<sup>1</sup>, Florinda Artuso<sup>1</sup>, Claudio Ciceroni<sup>1</sup>, Luca Fiorani<sup>1</sup>, Ivano Menicucci<sup>1</sup>, Marcello Nuvoletti<sup>1</sup>, Fabio Pollastrone<sup>1</sup>

1. FSN-TECFIS-DIM, ENEA Frascati, Italy

#### 202.PS1. Facing pandemic threats in aviation and transportation systems.

**Henrik Gröbner**<sup>1</sup>, Julian Soltau<sup>2</sup>, Bruno Pavletic<sup>3</sup>, Franca Arndt<sup>3</sup>, Yen Ly<sup>3</sup>, Andreas Kohl<sup>4</sup>, Florian Webner<sup>4</sup>, Iman Talai<sup>5</sup>, Diaoulé Diallo<sup>6</sup>, Tobias Hecking<sup>6</sup>, Andreas Schreiber<sup>6</sup>, Frank Duschek<sup>2</sup>, Karin Grünwald<sup>2</sup>, Frank Meller<sup>5</sup>, Jörn Biedermann<sup>5</sup>, Frank Rinderknecht<sup>6</sup>, Werner Kraft<sup>6</sup>, Daniel Schmeling<sup>4</sup>, Andreas Westhoff<sup>4</sup>, Ralf Möller<sup>3</sup>

1. German Aerospace Center - Institute of Vehicle Concepts, Stuttgart, Germany
2. German Aerospace Center - Institute of Technical Physics, Lampoldshausen, Germany
3. German Aerospace Center - Institute of Aerospace Medicine, Köln, Germany
4. German Aerospace Center - Institute of Aerodynamics and Flow Technology, Göttingen, Germany
5. German Aerospace Center - Institute of System Architectures in Aeronautics, Hamburg, Germany
6. German Aerospace Center - Institute for Software Technology, Köln, Germany

**203.PS1. Standoff detection of biological hazards by laser-induced fluorescence (LIF): benefits of triple wavelength excitation in the UV.**

**Jonas Grzesiak<sup>1</sup>**, Lea Fellner<sup>1</sup>, Peter Mahnke<sup>2</sup>, Matthias Damm<sup>2</sup>, Arne Walter<sup>1</sup>, Frank Duschek<sup>1</sup>

1. German Aerospace Center (DLR) Institute of Technical Physics, Hardthausen, Germany

2. German Aerospace Center (DLR) Institute of Technical Physics, Stuttgart, Germany

**204.PS1. Fast recovery rates of semiconductor gas sensors through the optimized use of laser irradiation: A new approach for a proven technology.**

**Eva-Louisa Hefler<sup>1</sup>**, Dr. Dominik Wild<sup>2</sup>, Dr. Gerhard Schäfer<sup>2</sup>

1. German Aerospace Center (DLR), Sankt Augustin, Germany

2. German Aerospace Center (DLR), Rheinbach, Germany

**205.PS1. The epidemiology of Ebola virus disease, its anthropological aspects and Italian Minister of Defence's role in the evacuation of overseas compatriots in case of emergency.**

**Davide Levanto<sup>1</sup>**

1. Italian army general staff, Rome, Italy, Italian Ministry of Defence, Italy

**206.PS1. The UNIDEC Team: Ares 118's new organizational model for responding to NBCR events.**

**Stefano Innocenzi<sup>1</sup>**, Danilo Casciani<sup>1</sup>, Cecilia Maroncelli<sup>1</sup>, Michelangelo Cesare Rinella<sup>1</sup>, Daniela Di Rienzo<sup>1</sup>, Chiara Lotti<sup>1</sup>, Federico Federighi<sup>1</sup>, Antonio Ientile<sup>1</sup> and Maria Paola Corradi<sup>1</sup>

1. Azienda Regionale Emergenza Sanitaria 118, Rome, Italy

**207.PS1. Molecular Dynamics Simulations of A-series nerve agents.**

**Michail Chalaris<sup>1</sup>**, Antonios Koufou<sup>2</sup>

1. Department of Chemistry, International Hellenic University, Agios Loukas, Kavala, Greece

2. Department of Chemistry, International Hellenic University, Agios Loukas, Kavala, Greece

**209.PS1. Analytical study the unique icon of St. Joseph with the Child at Virgin Mary Church in Haret Zuwaila, Cairo, Egypt.**

**Emil Henin<sup>1</sup>**

1. Ministry of Tourism and Antiquities, Egypt

**211.PS1. Microscopic and Mineralogical Investigation of Gold and Associated Elements at El Urf - Um Balad Region, Egypt: A Quantitative Sustainability Assessment.**

**Mahmoud Abd El-Rahman Hegab<sup>1</sup>**

1. National Authority for Remote Sensing and Space Sciences (NARSS), Egypt

**240.PS2. A rapid parametric tool for strategic building vulnerability assessment with regard to CBRNe and hybrid threats.**

**Vincenzo Puccia<sup>1</sup>**

1. National Fire and Rescue Service, Padova, Italy

**245.PS1. An interoperable CBRN system to enhance critical infrastructure security.**

**Natalie Schütz<sup>1</sup>**

1. WoePal GmbH, Trier, Germany

## Poster Session 2

### 185.PS1. SAFE-CITIES "risk-based Approach For the protection of public spaces in European CITIES".

**Umberto Battista**<sup>1</sup>

1. Stam S.r.l., Genoa, Italy

### 212.PS2. The bright side of radiations in nuclear energy: a review on radioisotope power systems for Space exploration.

**Fabio Marturano**<sup>1</sup>

1. International Master Courses in Protection Against CBRNe Events, Tor Vergata University of Rome, Italy

2. Italian Defence General Staff, 3rd Department – Military Policy, Arms Control, Verification and Counter-proliferation Office, Head of Counter-proliferation Section, Italy

### 213.PS2. Effects of virtual reality on rehabilitation in patients with heart failure: a protocol for a randomized controlled trial.

**Valentina Micheluzzi**<sup>1,4</sup>, **Gavino Casu**<sup>1</sup>, **Giuseppe Damiano Sanna**<sup>1</sup>, **Paolo Iovino**<sup>2</sup>, **Gabriele Caggianelli**<sup>3</sup>, **Ercole Vellone**<sup>4,5</sup>

1. Clinical and Interventional Cardiology, University Hospital, Sassari, Italy

2. Health Sciences Department, University of Florence, Florence, Italy

3. San Giovanni Addolorata Hospital, Rome, Italy

4. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy

5. Department of Nursing and Obstetrics, Wrocław Medical University, Wrocław, Poland

### 214.PS2. Analytical first screening (biological, chemical and radiometric) on various samples by Italian Department of Firefighters Public Rescue and Civil Defense – National Fire Corps – advanced CBRN team of Venice. Present approach, possible new skills acquisition and goals for the future.

**Salvatore Minghetti**<sup>1</sup>, **Giovanni Battista Bolzon**<sup>1</sup>, **Diego Simoncelli**<sup>1</sup>, **Francesco Pilo**<sup>1</sup>

1. Ministry of Interior - Department of Firefighters - Provincial Firefighters Headquarter of Venice – C.B.R.N. advanced interregional team of Venice, Venice, Italy

### 215.PS2. CBRN scenarios, history, evolution of gears (production technologies, textile solutions and materials), uniforms and personal protective equipment (PPE).

**Andrea Morucci**<sup>1</sup>, **Stefano Zordan**<sup>2</sup>, **Giuseppe Matteo Contessa**<sup>3</sup>, **Laura Milanese**<sup>4</sup>, **Ettore Lucci**<sup>5</sup>, **Chantal Milani**<sup>6</sup>

1. Riserva Selezionata Arma dei Carabinieri, Rome, Italy

2. Uff. Coordinamento e pianificazione delle Forze di Polizia, Arma dei Carabinieri, Italy

3. Scuola Interforze per la Difesa NBC, Uff. Addestramento Sez. Esperienze e Normative, Esercito Italiano, Rieti, Italy

4. Direzione Armamenti Terrestri, Esercito Italiano, Rome, Italy

5. Ufficio Tecnico Territoriale Armamenti Terrestri, Esercito Italiano, Nettuno, Italy

6. Forensic anthropologist and odontologist, SIOF (Italian Society Forensic Odontology), Italy

### 216.PS2. Sensor monitored drop hammer experiments of HMTD of different aging levels with accompanying measurements of HMTD via PTR-TOF-MS.

**Matthias Muhr**<sup>1</sup>, **Emre Ünal**<sup>1</sup>, **Peter Kaul**<sup>1</sup>, **Thomas Klapötke**<sup>2</sup>

1. Institut für Sicherheitsforschung (ISF), Rheinbach, Germany

2. Department of Chemistry, Ludwig-Maximilians Universität, Munich, Germany

### 217.PS2. Influence of geopolitical, economic, educational and legal aspects on training strategy and technique - experiences.

**Grażyna Oleksa**<sup>1</sup>, **Zbigniew Krasnodębski**<sup>1</sup>, **Paulina Flasińska**<sup>1</sup>

1. Łukasiewicz Research Network - Institute of Industrial Organic Chemistry, Warsaw, Poland

### 218.PS2. Quick assessment of radon risk in caves and basements for the first responder, environmental detection and absorbed dose.

**Maria Paluccio**<sup>1</sup>

1. Italian National Fire and Rescue Service – Regional Directorate of Calabria, Italy

### 219.PS2. Safe access to clandestine conventional and unconventional explosives laboratories for forensic examination.

**Maria Cristina Pigro**<sup>1</sup>, **Antonietta Lombardozzi**<sup>1</sup>, **Morela Strano**<sup>1</sup>, **Claudio Guidotti**<sup>1</sup>, **Chiara Germani**<sup>1</sup>, **Damiano Ricci**<sup>1</sup>, **Monica Macchi**<sup>1</sup>, **Daniela Panetta**<sup>1</sup>

1. Ministry of Interior – Department for Public Security Central Anticrime Directorate of the Italian State Police – Forensic Science Police Service III Division – Explosives and Ignitable Liquids Investigation Unit, Rome, Italy

## 220.PS2. Non-destructive decontamination and modification of traditional forensic methods in a CBRN facility.

**Alessandro Previero<sup>1</sup>**, Katleen De Meulenaere<sup>1</sup>, Benoît Augustyns<sup>1</sup>, Isabelle Radgen-Morvant<sup>2</sup>

1. Belgian Defence Laboratories (DLB), Vilvoorde (Peutie), Belgium

2. Ecole des Sciences Criminelles (School of Criminal Justice)

Université de Lausanne, Switzerland

## 221.PS2. Exploring the Efficacy of Deconvolutional Neural Networks (DCNN) for Reconstructing Chemical Dispersion Maps from Sensor Grids: Preliminary Investigations.

**Alessandro Puleio<sup>1</sup>**, Luca Martellucci<sup>1</sup>, Daniele Di Giovanni<sup>1</sup>, Riccardo Rossi<sup>1</sup>, Novella Rutigliano<sup>1</sup>, Ivan Wyss<sup>1</sup>, Pasqualino Gaudio<sup>1</sup>

1. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy

## 222.PS2. The connection between road police procurement and risk prevention of CBRNe.

**Carola Puleo<sup>1</sup>**

1. Central Directorate for the Road, Railway, Communications Police and for the Special Departments of the State Police. Traffic Police Service, Rome, Italy

## 223.PS2. An expeditious radio-epidemiology analysis of the propagation of radiation following a dirty bomb by means of free-code tools.

**Riccardo Quaranta<sup>1,3</sup>**, Gian Marco Ludovici<sup>1</sup>, Andrea Malizia<sup>2</sup>

1. University of Rome Tor Vergata, Department of Industrial Engineering, Rome, Italy

2. University of Rome Tor Vergata, Department of Biomedicine and Prevention, Rome, Italy

3. The American University of Rome, Rome, Italy

## 224.PS2. ATM attack perpetrated with explosives. Evolution in criminal strategies.

**Maria Cristina Pigro<sup>1</sup>**, Antonietta Lombardozi<sup>1</sup>, **Damiano Ricci<sup>1</sup>**, Domenico Del Vacchio<sup>1</sup>, Alessandro Ruscitti<sup>1</sup>

1. Ministry of Interior – Department for Public Security, Central Anticrime Directorate of the Italian State Police – Forensic Science Police Service, III Division – Explosives and Ignitable Liquids Investigation Unit, Rome, Italy

## 225.PS2. Design and implementation of a lidar system in horizontal configuration for environmental monitoring through alarm detection.

**Novella Rutigliano<sup>1</sup>**, Daniele Di Giovanni<sup>1,2</sup>, Luca Martellucci<sup>1</sup>, Alessandro Puleio<sup>1</sup>, Riccardo Rossi<sup>1</sup>, Ivan Wyss<sup>1</sup>, Pasqualino Gaudio<sup>1</sup>

1. University of Rome Tor Vergata, Department of Industrial Engineering, Rome, Italy

2. Unicamillus-Saint Camillus International University of Health Sciences, Rome, Italy

## 226.PS2. Emergency evacuation system called "FIRE BAG".

**Matteo Spasiano<sup>1</sup>**, Francesco Geri<sup>2</sup>

1. Firebag Srl, Rome, Italy

2. Department of Civil protection, Rome, Italy

## 227.PS2. Online tools and courses for strengthening global health security.

**Robert-Jan ten Hove<sup>1</sup>**, Diederik Adriaan Bleijs<sup>2</sup>, Joris Sprokholt<sup>1</sup>, Iris Marina Vennis<sup>1,2</sup>, Saskia Annemarie Rutjes<sup>1,2</sup>

1. Centre for Infectious Disease Control, RIVM, Bilthoven, The Netherlands

2. Biosecurity Office, RIVM, Bilthoven, The Netherlands

## 228.PS2. Investigation of laser-initiation of graphite spray-coated TATP accompanied by sensor-safe surveillance and analytical monitoring using Microphone and PTR-ToF-MS.

**Emre Ünal<sup>1</sup>**, Matthias Muhr<sup>1</sup>, Thomas Klapötke<sup>2</sup>, Peter Kaul<sup>1</sup>

1. Institut für Sicherheitsforschung (ISF), Rheinbach, Germany

2. Department of Chemistry, Ludwig-Maximilians Universität, Munich, Germany

## 229.PS2. Toolkit with guidelines, protocols and resources on biosafety and biosecurity for first responders, clinical staff and laboratory personnel during cross-border responses.

**Pierre Vandenberghe<sup>1</sup>**, Jean-Luc Gala<sup>1</sup>

1. Centre de Technologie Moléculaire Appliquée (CTMA), Woluwe-Saint-Lambert, Belgium

## 230.PS2. Fast and safe detection of sensitive explosives via pulsed raman spectroscopy.

**Dominik Wild<sup>1</sup>**, Cathrin Theiß<sup>2</sup>, Kostyantyn Konstantynovskii<sup>1</sup>

1. German Aerospace Center (DLR), Institute for the Protection of Terrestrial Infrastructures, St. Augustin, Germany

2. Institute of Detection Technologies IDT, Bonn-Rhein-Sieg University of Applied Sciences, Rheinbach, Germany

**231.PS2. Development of a Liquid-to-Solid Approach for Improved Stability in a Prototype LIBS Apparatus.**

**Ivan Wyss<sup>1</sup>**, Alessandro Puleio<sup>1</sup>, Riccardo Rossi<sup>1</sup>, Novella Rutigliano<sup>1</sup>, Luca Martellucci<sup>1</sup>, Luigi Lazzari<sup>2</sup> and Pasquale Gaudio<sup>1</sup>

1. University of Rome Tor Vergata, Department of Industrial Engineering, Rome, Italy

2. University of Pisa, Department of Civil and Industrial Engineering, Pisa, Italy

**232.PS2. Exploring the use of experiential learning methods to increase CBRNe awareness and emergency preparedness of children.**

**Grace P. Xerri<sup>1</sup>**, Riccardo Quaranta<sup>1,4</sup>, Andrea Malizia<sup>2</sup>, Daniele Di Giovanni<sup>1,3</sup>, Pasqualino Gaudio<sup>1</sup>

1. University of Rome Tor Vergata, Department of Industrial Engineering, Rome, Italy

2. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy

3. Unicamillus-Saint Camillus International University of Health Sciences, Rome, Italy

4. The American University of Rome, Rome Italy

**233.PS2. Utilization and Development of Evacuation Time Estimates in Wide Area Evacuation Planning for Nuclear Disasters in Japan.**

**Teruhiko Yoneyama<sup>1</sup>**, Tomoka Koyama<sup>1</sup>, Kei Miyano<sup>1</sup>, Hiroaki Goto<sup>1</sup>, Mito Nishioka<sup>1</sup>

1. KOZO KEIKAKU ENGINEERING, Tokyo, Japan

**234.PS2. Ancona Harbour – Recovery of an Orphan Radioactive Source.**

**Damiano Zurlo<sup>1</sup>**, Roberto Alessandrini<sup>2</sup>

1. National Fire and Rescue Service – Central Directorate of Emergency, Rome, Italy

2. National Fire and Rescue Service – Fire HQ Ancona, Italy

**235.PS2. Stand off detection – 3D modeling of chemical dispersion in air with Hyperspectral Interferometry.**

**Damiano Zurlo<sup>1</sup>**, Francesco Cruciat<sup>2</sup>

1. National Fire and Rescue Service – Central Directorate of Emergency, Rome, Italy

2. National Fire and Rescue Service – Fire HQ Palermo, Italy

**236.PS2. OVERC.O.M.E. Cross-border Co-Operation in Managing Emergency. A project led by the Italian National Fire and Rescue Service.**

**Nicola Ciannelli<sup>1</sup>**, Monia D'amico<sup>1</sup>

1. Italian National Fire and Rescue Service, Pisa, Italy

**237.PS2. Laser-assisted indirect detection of bacterial endospores in suspicious macroscopic samples.**

**Konrad Kosciow<sup>1</sup>**, Natalie Hager<sup>2</sup>, Katharina Siems<sup>3</sup>, Gerhard Schaefer<sup>1</sup>, Dominik Wild<sup>1</sup>, Ralf Moeller<sup>3</sup>, Kostyantyn Konstantynovskii<sup>1</sup>

1. German Aerospace Center (DLR)

Institute for the Protection of Terrestrial Infrastructures, Rheinbach, Germany

2. University of Applied Sciences Bonn-Rhein-Sieg

Institute for Detection Technologies, Rheinbach, Germany

3. German Aerospace Center (DLR)

Institute of Aerospace Medicine, Koeln, Germany

**238.PS2. Effectiveness of ozone treatment performed on PPE and assets provided to first responders to counter the risk of COVID-19 transmission.**

**Samuele Giovanardi<sup>1</sup>**, Mariapia Peserferri<sup>1</sup>, Edoardo Cavalieri d'oro<sup>2</sup>

1 Politecnico di Milano, Milan, Italy

2 NBCR laboratories, National Fire and Rescue Service, Milan, Italy

**239.PS2. Study for the development of the Laser Photoacoustic Spectroscopy system for CBRNe detection.**

**Fabio Pollastrone<sup>1,2</sup>**, C. Ciceroni<sup>1</sup>, F. Artuso<sup>1</sup>, S. Bertolami<sup>2</sup>, F. Di Paolo<sup>2</sup>, S. Fantauzzi<sup>2</sup>, L. Fiorani<sup>1</sup>, I. Giardina<sup>1</sup>, I. Menicucci<sup>1</sup>, M. Nuvoletti<sup>1</sup>, L. Valletti<sup>2</sup>

1. ENEA, Frascati, FSN-TECFIS-DIM, Frascati, Italy

2. University of Rome "Tor Vergata", Department of Electronic Engineering, Rome, Italy



## Best Poster Award

The 2 Poster sessions are an integral part of SICC Series CBRNe conference 2023 and an important opportunity for researchers and experts at all career stages to present and discuss their work with other researchers in their field.

### ***How do poster sessions work?***

During the poster session, conference attendees can wander around the poster hall to browse the posters. The presenters are expected to stay by their poster for the duration of the session so that other participants can come and listen to them talk about their work and ask them questions.

### ***How long is the poster session?***

The 2 poster sessions of SICC Series CBRNe Conference 2023 have a duration of 90 minutes and are organized 26 of September 2023 (Poster Session 1) and 27 of September 2023 (Poster Session 2). (see the SICC 2023 Program)

### ***What are the benefits of a poster session?***

Presenting your research at a poster session is a great opportunity. These sessions are the best place to show off your research or work results results and for networking as well.

After the conference the Poster Sessions Presenters, as the Lecturers of the Plenary and Technical Sessions, can submit and publish a work on one of the Special Issues of the SICC Series CBRNe Conference (see Paper Publication SICC Series 2023)

### ***Write and submit your Abstract***

Next, you will need to write an abstract (check the deadlines) that summarizes your work and then submit it.

### ***BEST POSTER AWARDS***

3 Best Poster Awards will be assigned by a Commission of Experts to the 3 best Poster Presenters.

The Best Poster award will consist in:

- Official Certificate
- 200 €
- A full free access to SICC Series CBRNe Conference 2026

The awards will be assigned during the Conference Dinner that will be held the 28 of September 2023.

The PRESIDENT of the Best Poster Evaluation Committee is **Prof. Pasquale Gaudio**.

The members of the commission are:

Prof. Susana De Souza Lalic, Dr. Frank Duschek, Prof. Antony M. Hooker, Dr. Marco D'Arienzo, Prof. Oleg Illiashenko, Prof. Guglielmo Manenti, Dr. Dieter Rothbacher, Dr. Michael Ian Thornton, Dr. Riccardo Rossi.

## TABLE TOP EXERCISE - TTX

Dear colleagues,

The SICC Series CBRNe Conference 2023 will host as a side event a Table Top Exercise planned for the afternoon of 26th September 2023 from 3.00 p.m. to 7.00 p.m.

The TTX will be coordinated by Dr. Michael Ian Thornton with the support, as facilitators, of: Dr. Alba Iannotti, Dr. Colomba Russo, Dr. Riccardo Quaranta, and Dr. Grace P. Xerri.

The persons registered for participating in the conference can participate as PLAYER (maximum 30 players) or OBSERVER.

If you want to participate in the TTX you must complete the registration (<https://www.sicc-series.com/registration-sicc-2023/>) and send an email to: [siccseries@gmail.com](mailto:siccseries@gmail.com) by 21st September 2023 specifying if you want to be a PLAYER or an OBSERVER.

### ***Information for those who wish to experience a CBRN Table-Top Exercise.***

Those who are selected to participate, remembering that there are a limited number of places available, will be part of a team in charge of managing the response to a simulated CBRN incident.

It is not important if you have never played a TTX before, or you have played before and want to play again, all are most welcome.

You will be guided by the facilitators during the whole of the exercise, but players should take note of the following rules to get the most out of the experience.

Rules of a TTX:

Treat the exercise as real.

- Don't fight the scenario.
- There are no team leaders and everybody on the team should be treated as an equal.
- Play yourself, but also imagine how you would respond to such an incident.
- Participants will be expected to propose solutions based on their knowledge and experience.
- You are not expected to know everything, feel free to use the internet.
- Work as a team.
- Enjoy yourself.
- If you prefer, feel free to come along and just watch the action.

The TTX will take place in Building F – Floor 1 Room 22 “Tosi Beleffi.” at the National Fire Academy.

## SUMMER SCHOOL OPENMC - OPENMC - MONTE CARLO SIMULATION FOR RADIATION DOSIMETRY AND NUCLEAR TECHNOLOGY APPLICATIONS

The University of Rome Tor Vergata is the main organizing entity for the third edition of the SICCC Series - CBRNe Conference that will be held in Rome next September.

This edition will host the **SICC SERIES - SUMMER SCHOOL** in **OPENMC - Monte Carlo simulation for radiation dosimetry and nuclear technology applications**.

This summer school is organised by the CIEMAT and the University of Rome Tor Vergata and it will be possible to attend both by participating in the conference and as a single side event.

The lecturer is Dr. **José-María Gómez-Ros**.

He is Research Professor and Head of the Ionizing Radiation Dosimetry Unit in CIEMAT, Spain. With some thirty-five years of experience in radiation dosimetry and radiation physics (mainly on thermoluminescence, Monte Carlo simulation and neutron dosimetry), he published around 150 papers in scientific journals and submitted 120 contributions to international conferences. He is member of EURADOS Working Group 6 on computational dosimetry, of RSEF (Royal Spanish Physics Society) and SEPR (Spanish Society for Radiological Protection). Currently, he is also secretary of ISSDO (International Solid State Dosimetry Organization).

The didactic coordinator of the summer school is **Dr. Riccardo Rossi**, you can contact him for all the technical issues and for the registration procedure at the summer school:

- e-mail: [r.rossi@ing.uniroma2.it](mailto:r.rossi@ing.uniroma2.it)
- telephone: +39 334 808 8784

The summer school is organized in 2 days:

### DAY 1

26 September 2023

3.00 p.m. - 7.00 p.m.

National Fire Academy in Rome

### DAY 2

30 September 2023

9.00 p.m. - 5.00 p.m.

University of Rome Tor Vergata

## PROGRAM

SICC Series - Summer SchoolOpenMC - Monte Carlo simulation for radiation dosimetry and nuclear technology applications

*§ Introduction and basic concepts*

*§ Simulation of radiation transport*

*§ The OpenMC Monte Carlo simulation code*

*§ Constructive solid geometry (CSG)*

*§ Cross sections data libraries*

*§ Modelling of radiation sources*

*§ Scoring quantities (tallies)*

*§ Preliminary examples:*

- Attenuation / shielding of neutron radiation
- Response of a  $^3\text{He}$  neutron detector

*§ OpenMC Python API*

*§ Additional examples:*

- Design of a  $^3\text{He}$ -based neutron monitor
- Fusion neutronics (tritium breeding ratio TBR, energy multiplication factor, neutron wall loading, shielding, He gas production) (simplified geometry)
- Medical linear accelerator (LINAC) (simplified geometry)
- Shielding in a bunker: radiological protection quantities
- Shielding in a nuclear bomb shelter

*§ Advanced topics*

- Complex geometry (lattices, CAD-base geometries)
- Phase space
- Transport of secondary charged particles
- Variance reduction techniques

## INDUSTRIAL EXHIBITION - SICC 2023

The sponsors of SICC Series – CBRNe Conference 2023 are

### PLATINUM SPONSOR

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Design, manufacture and support Electronic Solutions and Personal Protection Equipment in the fields of Defence, Security and Emergency: Safety and operability of the person are at the heart of our mission.



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### ***Soldier equipment***

*Body Armour, CBRN  
Personal Protection,  
Headset/Microphones,  
PTT, Intra Team  
Intercom, battery  
chargers SDR HH Evo,  
C2 Hardware*



### ***Tactical Vehicles***

*Rugged computers,  
Display,  
Intercom Systems,  
CVC helmets,  
Battery Management  
Systems & other  
ancillaries*



### ***Integrated Communication System***

*CLASS and  
UNCLASS Computer  
Clients,  
Centralisation  
Systems / IPCOMMS  
voice recording &  
Terminals for voice  
users*

## DRESS CODE

### Conference:

- The dress code for civilians (Academies, Research Centre, Public Institutions, Industries) is: "**BUSSINESS ATTIRE**";
- The dress code for experts from the army, navy, air force, firefighters, police corps, civil protections corps, red crosses corps, volunteer corps and all the experts that usually use a uniform is: "**WORKING UNIFORM ATTIRE**".

The dress code is intended for all the duration of the conference.

link: <https://www.sicc-series.com/dress-code-sicc-2023/>

### Conference dinner:

- The dress code for conference dinner is "**BUSSINESS ATTIRE**" for all participants.



## INSTRUCTION FOR AUTHORS

This page provides you with all the information you need to prepare for the SICC Series CBRNe Conference 2023. Please, read it carefully.

### Program and timetable:

The website has been updated to include all the accepted abstracts. You can find the abstracts in the respective technical or poster sessions at this link: <https://www.sicc-series.com/technical-and-poster-sessions-sicc-2023/>

Each abstract has been assigned a code (such as “progressive number.session”). Please take note of the code of your abstract(s) as you will need it to know when your presentation is scheduled.

A detailed timetable of all the presentations and posters to plan your attendance to the conference has been published on the website as well <https://www.sicc-series.com/program-sicc-2023/>.

### Template:

The templates to prepare the oral presentations and the posters can be found at <https://www.sicc-series.com/instructions-for-speakers-and-template-sicc-2023/>

### Oral presentations:

The duration of the oral presentations is 20 minutes plus 5 minutes for questions. Please, make sure to stay within this time limit.

You should prepare your presentation using Microsoft PowerPoint and the official template of the conference.

### Delivery of presentations:

The PowerPoint presentation should be delivered by email at [sicc.cbrne.repository@gmail.com](mailto:sicc.cbrne.repository@gmail.com) with the object Talk\_“your abstract code” (Ex: Talk\_XXX.TS5, Talk\_YYY.PL1), by **September 18<sup>th</sup>**. It will be our care to have the presentation ready for you at the time of your session. You must name your PowerPoint file with the code of your abstract (Ex: XXX.TS1.pptx). If your presentation does not have animations or videos, pdf files are also acceptable.

As an alternative, presentations can be given to the SICC staff in the morning of the session on a USB memory.

### Posters:

You should prepare your poster using Microsoft PowerPoint and the official template of the conference. The size of the poster must be A0.

### Delivery of posters:

You can print your own poster and bring it directly to the conference on the day of your scheduled session. You will be assigned a place where to hang the poster prior to the poster session.

As an alternative, we activated a poster printing service for those who cannot/don't want to travel with a big poster. The service has a cost of 60 € and you will find your poster ready for you at the conference on the day of your scheduled session. To use this service you must pay the 60 € fee through the link <https://www.cbrngate.com/registration-sicc-cbrne-2023/> (bottom of the page) and send the poster to be printed, together with the receipt of the payment, at [sicc.cbrne.repository@gmail.com](mailto:sicc.cbrne.repository@gmail.com) with the object Poster\_“your abstract code” (Ex: Poster\_XXX.PS1, Poster\_YYY.PS2), by **September 18<sup>th</sup>**. After this deadline we cannot guarantee that your poster can be printed on time. You must name your file with the code of your abstract (Ex: XXX.PS1.pptx). Pdf files are also acceptable.

We are looking forward to welcoming you at the SICC Series CBRNe Conference 2023!

## PAPERS PUBLICATION – SPECIAL ISSUES

The scientific research produced for the SICC Series CBRNe Conference 2023 is being supported by indexed journals. The papers and oral presentations of the 3 plenary sessions, 12 technical sessions, and poster sessions will be eligible for consideration for publication in these special issues.

Presenting authors have the opportunity to submit a full paper after the conference.

The submission deadline is December 1st, 2023.

The special issues which will publish the work of the SICC 2023 conference proceedings are the following:

### 1. THE EUROPEAN PHYSICAL JOURNAL PLUS

[ SPRINGER ]

Title of the Focus Point Issue:

#### **CBRNE Events: Prevention, Mitigation, Consequences and Recovery**

Guest Editors: Prof. Andrea Malizia, Dr. Marco D'Arienzo, Dr. Gian Marco Contessa, Prof. Francesco d'Errico, Prof. Susana de Souza Lalic, Dr. Frank Duschek, Prof. Vasilis Vasiliou, Prof. Tony Hooker and Prof. Pasquale Gaudio

The scope of EPJ Plus encompasses a broad landscape of fields and disciplines in the physical and related sciences - such as covered by the topical EPJ journals and with the explicit addition of geophysics, astrophysics, general relativity and cosmology, mathematical and quantum physics, classical and fluid mechanics, accelerator and medical physics, as well as physics techniques applied to any other topics, including energy, environment and cultural heritage.

Indexed on: SCOPUS, ISI WEB of SCIENCE, PUBMED

link to the journal website: <https://epjplus.epj.org/epjplus-aims-and-scope>

### 2. INTERNATIONAL JOURNAL OF SAFETY AND SECURITY ENGINEERING

[ IJETA ]

Title of the Special Issue:

#### **CBRNe emergencies management**

Guest Editors: Prof. Andrea Malizia, Dr. Marco D'Arienzo, Dr. Gian Marco Contessa, Prof. Francesco d'Errico, Prof. Susana de Souza Lalic, Dr. Frank Duschek, Prof. Vasilis Vasiliou, Prof. Tony Hooker, Prof. Guglielmo Manenti and Prof. Pasquale Gaudio

International Journal of Safety and Security Engineering (IJSE) aims to provide a forum for the publication of papers on the most recent developments in the theoretical and practical aspects of these important fields. Safety and Security Engineering, due to its special nature, is an interdisciplinary area of research and applications that brings together in a systematic way many disciplines of engineering, from the traditional to the most technologically advanced. The Journal covers areas such as crisis management; security engineering; natural disasters and emergencies; terrorism; IT security; man-made hazards; risk management; control; protection and mitigation issues. The Journal aims to attract papers in all related fields, in addition to those listed under the List of Topics, as well as case studies describing practical experiences. The study of multifactor risk impact will be given special emphasis. Due to the multitude and variety of topics included, the List is only indicative of the themes of the expected papers. Authors are encouraged to submit papers in all areas of Safety and Security, with particular attention to integrated and interdisciplinary aspects.

Indexed on: SCOPUS, SJR, Ei GEOBASE, EBSCO HOST

### 3. SENSORS

[ MDPI ]

Title of the Topical Collection:

#### **Measurements, Instrumentation, Sensing and Simulation Techniques for the Detection of Radiation**

Guest Editors: Prof. Andrea Malizia, Prof. Tzany Kokalova Wheldon

This collection will host original papers on both, fundamental and applied research and reviews regarding the design, construction and use of instrumentation, methodologies and techniques for the detection of nuclear radiation generated by natural and artificial radionuclides or by nuclear reactions used in several application fields (energy, medicine, industry, security and safety). The papers can be oriented also on: the design and construction of systems for innovative nuclear measurements; the measurements and instrumentation for nuclear plants; the measurements and instrumentation used in nuclear decommissioning or waste management; the applications of radioisotopes in industrial and non-industrial fields; the detection of environmental radioactivity and nuclear metrology; safety and protection from radiation (Radioprotection); the geological, archaeological and environmental dating; methods and detection techniques for radioecology; the sensing techniques and instrumentation for biomedical application; radiometric measurements including gamma and particle emissions; the development and performance of nuclear instrumentation including radiation spectrometry, dosimetry and novel counting systems.

Indexed on: SCOPUS, ISI WEB of SCIENCE, PUBMED

link to the journal website:

[https://www.mdpi.com/journal/sensors/topical\\_collections/radiation\\_detection](https://www.mdpi.com/journal/sensors/topical_collections/radiation_detection)

### 4. SENSORS

[ MDPI ]

Title of the Special Issue:

#### **Advanced Sensing Technologies for UAV-Based Environmental Monitoring Applications**

Guest Editor: Prof. Pasquale Gaudio, Dr. Frank Duschek, Dr. Anja Baum

The use of unmanned flight systems has increased in recent years and currently includes many different areas of application. Drones are used, for example, for video surveillance and visual observation of systems and infrastructures and has been established for measuring meteorological parameters. In comparison, environmental monitoring with miniaturized devices or special detection systems installed on drones is a young discipline, but it promises a very high level of flexibility regarding the choice of place of use and of measurement parameters, as well as rapid operational readiness in contrast or in support to ground-based and permanently installed measuring devices. The miniaturization of high-quality measurement technology is increasingly opening opportunities to use drones to record environmental parameters and pollutants. Many of the application examples are subjects of current research. This Special Issue of Sensors aims at collecting original research papers to contribute to the discussion on the use of drones in the field of environmental monitoring: It includes the following (but is not limited to them):

- Radioactivity measurements
- Smoke, Aerosol and bio-aerosol measurements
- Measurements of hazardous substances in the air as well as on difficult to access grounds
- Measurements of meteorological parameters and air quality
- Agriculture applications
- Gas and particle measurements on volcanoes
- Data management, transfer, visualization of measurements with drones
- Post processing and data assimilation
- Miniaturization of reference methods for use on drones

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link to the journal website:

[https://www.mdpi.com/journal/sensors/special\\_issues/Sensing\\_UAV\\_Environmental\\_Monitoring](https://www.mdpi.com/journal/sensors/special_issues/Sensing_UAV_Environmental_Monitoring)

## 5. SENSORS

[ MDPI ]

Title of the Special Issue:

**Laser Based Remote Sensors for Environmental Science: Measurements and Analysis Techniques**

Guest Editor: Prof. Pasquale Gaudio, Dr. Riccardo Rossi

Laser-based remote sensing techniques are very promising methodologies, having become important, sometimes primary, devices in industrial, urban, environmental, safety, and security applications. Concerning the safety and security field, remote sensing monitoring plays a crucial role in providing fast and preventive alarms in the case of intentional (terrorism, war, etc.) or accidental (or natural) diffusions of dangerous substances, such as chemicals or pathogens. Moreover, remote sensing approaches may prevent people working directly in threatening areas, help understand the dangers involved and take appropriate countermeasures.

Pollution monitoring is also fundamental to the preservation and guarantee of a good quality of life, especially in industrial and high-traffic urban areas.

Although many remote laser-based techniques have been developed, such as Lidar, DIAL, laser-induced fluorescence (LIF), and laser-induced breakdown spectroscopy (LIBS), these instruments are usually large, heavy, and expensive, leading to the underutilization of these devices. Moreover, these techniques usually require a complicated data analysis, since they work in very variable and unpredictable environments.

This Special Issue refers to any research in the field of laser-based remote sensing applied to environmental, safety, and security fields, accepting both original research and review articles regarding not only the techniques, but also innovative experimental apparatus or devices and new data analysis techniques.

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link to the journal website:

[https://www.mdpi.com/journal/sensors/special\\_issues/Laser\\_Sensors](https://www.mdpi.com/journal/sensors/special_issues/Laser_Sensors)

## 6. APPLIED SCIENCE

[ MDPI ]

Title of the Special Issue:

**Industrial Automation and Control System Cybersecurity in Industry 4.0 Era towards CBRNe Protection**

Guest Editor: Prof. Oleg Illiashenko, Prof. Andrea Malizia

Cybersecurity is becoming crucial, as more IACSs are being made available in cyberspace. As recent events have demonstrated, cyberspace must be considered the new theatre of warfare and has the potential to undermine the stability of a country. Cyber-warfare and cyberterrorism were coined to better describe this threat and there is growing concern among governments that they are not fully ready to face such an emerging menace. In this scenario, CBRNe intelligence will play an extremely important role in preventing the malicious use of an otherwise beneficial asset.

This Special Issue focuses on cybersecurity aspects for IACS, particularly in the context of Industry 4.0

The scope of this Special Issue includes, but is not limited to, the following topics:

- CBRNe events prediction and management for Industry 4.0 IACS;
- IACS cybersecurity threats and vulnerabilities problems and protection;
- Cyber-physical systems security for CBRNe protection (sensors, hardware, software, DSS);
- AI, DT and blockchain for enhancing cybersecurity and safety of IACS;
- IoT, AI, smart sensors and systems applications for emergencies prevention and risk reduction during disasters and post-emergency monitoring;
- AI, ML and data analytics for controlling and securing IACS: prediction, prevention, detection, tolerance, recovery, and relearning;

- IoT and AI as objects and/or tools and/or protection mechanisms for cyberattacks development;
- Privacy issues in IoT;
- CBRNe protection, including attacks detection, diagnosis, classification and response;
- Critical infrastructure risks and control, cybersecurity architectures, protocols and frameworks for IACS.

[link to the journal website:](#)

[https://www.mdpi.com/journal/applsci/special\\_issues/54TZX9MA71](https://www.mdpi.com/journal/applsci/special_issues/54TZX9MA71)

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## Conference TOPICS

- Accredited laboratories
- Active Learning
- Adaptation Strategies
- Analysis and Evaluation of CBRNe Threats
- Artificial Intelligence Towards Safety & Security
- Augmented Reality
- Bacteria
- Big Data Analysis applied to CBRNe Safety and Security
- Biological Agents (BAs)
- Biological Agents Decontamination
- Biological emerging and re-emerging threats and Epidemiology
- Biological Warfare Agents (BWAs)
- Biosafety
- Biosecurity
- Bioterrorism
- Business continuity
- CAs (Chemical Agents)
- Case and CWAs
- CBRNe Awareness and Preparedness, Technologies for teaching and education
- CBRNe Events - Prediction and Management
- CBRNe Hazard Simulation
- CBRNe Risk Mitigation
- CBRNe Risk Scenarios
- CBRNe scene vs Crime scene
- Ce (Chemicals and explosive substances) and CWA Research & Innovation
- Chemical, Biological, Radiological threats to medical management
- Civil Protection, Civil Defence, dual-use technologies
- Climate change
- Collective Protective Equipment (CPE)
- Collective Protective Equipment's (CPE) Materials, Technologies, and Systems
- Command and Control of CBRNe Events
- Conflict
- Contamination and Decontamination
- Crisis Management
- Critical Infrastructure
- Critical infrastructure risks and control
- Cybersecurity and modern cyber-warfare & cyber-terrorism
- Cyberthreats problems and protection
- Data Mining Applied to Safety & Security
- Data mining to CBRNe safety and security
- Decision Support Software (DSS)
- Decision Support Systems in Safety & Security
- Decommissioning
- Decontamination of CBRNe agents
- Deep Learning
- Designated Laboratories

- Detection of CBRNe agents
- Diagnostic and Surveillance
- Diffusion and Dispersion Models
- Dirty Bombs
- Disaster Management
- Disaster Risk Reduction
- Drones
- Dual Use
- DVI units
- Economic analysis of CBRNe events
- Economic analysis of Cyber threats
- Education Methodologies
- Emergency Communication and Information
- Emergency Management
- Emergency Plans
- Emergency Psychology
- Emerging Risks
- Engaging Societies
- Engineering Applications for Ce and CW Agents Decontamination, Protection, Risks Reduction
- Environment
- Environmental Contamination
- Epidemic Intelligence
- Epidemiological models
- Evidence collection
- Evolution of the CBRNe Threats
- Experimental and Applied Physics for Ce Agents Decontamination, Protection, Risks Reduction
- Explosives and Dirty Bombs
- Explosives Ordinance Disposals (EOD)
- Extended Reality
- First Response in Case of CBRNe Events
- Forensic Microbiology
- Food safety
- Food security
- Food war
- Global Partnerships for Safety and Security
- Hazardous materials – hazmat
- ICT Vulnerabilities and Computational Aspects of Safety & Security
- Improved nuclear safety and security
- Improvised Explosive Device (IED)
- Inclusive Disaster Risk Management
- Inclusive Resilience
- Industrial Accidents
- Innovative materials for medical applications
- Intelligent Systems in Risk Management
- International Cooperation and Response
- International legal framework governing Cyber related issues: gaps and opportunities
- International legal frameworks governing CBRNe: gaps and opportunities
- Internet of Things and Artificial Intelligence to prevent emergencies and reduce risks during disasters
- Machine Learning
- Mass Disasters



- Medical countermeasures: vaccines, antimicrobial and antiviral drugs, blood products and antibodies, devices including diagnostic tests
- Medical management and the role of medical management in CBRNe safety and security
- Microbiological Pathogens
- Mixed Reality
- Modelling and Simulation
- Nanotechnologies and Nanomaterials for Safety & Security
- New technologies and applications for detection
- New technologies for Biological agents detection
- Non-Conventional Threats (NCT)
- Non-Proliferation and Disarmament
- Non-proliferation and disarmament regimes
- Nuclear Measures and Instrumentations
- Nuclear Power Plants, R/N risks
- Onus probandi in Courts and International disputes
- Pandemic
- Personal Protective Equipment (PPE) Materials, Technologies, and Systems
- Predictive Analytics in Risk Management
- Privacy Issues in IoT, AI and Smart Systems
- Protection
- Public Health emergencies management
- Public Risk Perception
- R/N Emergency Preparedness Response
- R/N Modelling and simulation
- R/N Protection and Decontamination
- R/N Risk analysis
- R/N risk assessment
- R/N technologies dual use
- Radiation Protection
- Raising Awareness
- Risk Assessment
- Risk Awareness
- Safety vs Security
- Serious Games applied to CBRNe
- Software and ICT Tools for Safety & Security
- Software and Tools for Safety & Security
- Technical Challenges on Ce CWA
- Terrorism and Terrorist Threats
- Toxins
- Triage
- Unmanned Vehicles
- Unmanned Vehicles applications
- Virtual Reality
- Viruses
- Vulnerable Citizens