Press Release and Extended Outline

“Situational Awareness for the Environment: seeing the unseen… beyond perception”

An international, multi-year scientific tour carried out through a series of events across the U.S. and Europe, hosted by top universities, research centers, cultural institutions, embassies, and consulates. Designed to explore how we perceive and respond to complex systems, the tour promote a deeper understanding of the concept of situational awareness, with a particular focus on the environmental challenges our planet is facing and on the tools that allow us to push the boundaries of human perception. Focusing on urgent environmental challenges, such as pollution disasters, eco-crimes, floods, wildfires, earthquakes, coastal ecological crises the tour spotlights the power of technological innovation, interdisciplinary science, and situational awareness to support informed, data-driven decisions and foster sustainable solutions. By bridging diverse fields like environmental, forensic and aerospace engineering, and organic chemistry, the initiative reveals how collaboration across domains unlocks what remains invisible within individual disciplines. Real-world case studies and live demonstrations, such as drones with advanced sensors flying on-site, bring these concepts to life, inviting the audience to move from passive observation to actionable awareness.
Beyond raising awareness, the tour seeks to create a space for collaboration, scouting expertise and fostering new connections among scientists, professionals, and institutional actors. It aims to define a new paradigm, a meeting point where the scientific community, industry, and public institutions converge to rethink how we monitor, understand, and respond to the world around us.

The Theme

“Knowledge” and “awareness” are terms often used interchangeably, yet they hold distinct meanings, especially in decision-making contexts.
This project seeks to clarify these differences by building a unified narrative that clearly defines the concept of “situational awareness.” Each stop on the tour explores how this concept can be applied across scientific fields, with a consistent emphasis on environmental issues.
A key focus is the full understanding of phenomena and the real possibilities of monitoring them and, when necessary, providing an adequate response to ensure true situational awareness. This paradigm will be presented by demonstrating its value in environmental emergencies, also through the discussion of real-world cases.
Examples of such emergencies will range from pollution-related disasters and coastal ecological crises to highly relevant natural calamities such as floods, wildfires, earthquakes, and volcanic eruptions, while also addressing environmental crimes, often hidden or underestimated threats to ecosystems and public health, by highlighting the critical role of forensic science and engineering in understanding their causes and consequences.
The event delves into the complex transition from understanding a phenomenon to achieving full awareness of its real implications, thereby aiding decisions based on actual capabilities and situational contexts.
When addressing the perception of ongoing contexts and phenomena, the event highlights humanity’s desire to extend sensory limits through innovative technologies. Historically, humans have relied on their senses to gather data and transform it into information. However, today’s technologies allow us to “see the unseen,” offering nearly superhuman perceptual abilities that must be integrated with a comprehensive understanding of the environment to become effective tools in decision-making.
With a highly interdisciplinary approach, each event in the tour explores how situational awareness, the ability to perceive, comprehend, and accurately predict unfolding events, can enhance decision-making across various domains.

The narrative further emphasizes humanity's ongoing quest to push the boundaries of perception, presenting scientific concepts, methodological approaches, research results, and technological innovations, including live demonstrations conducted on stage in direct interaction with the audience.

Key Points

The event addresses several frontier topics, including:

- **The Role of Situational Awareness in Complex Systems:** an analysis of how interdisciplinary approaches and the fusion of various forms of applied intelligence help address complex challenges.
- **The Power of Combining Remote Sensing, Proximal Sensing, and On-Site Surveys:** demonstrating how satellites, airplanes, helicopters, drones, and in-situ survey systems are used to collect data and present crucial environmental information, offering unprecedented insights into phenomena under investigation.
- **Advanced Sensor Technologies:** discussing how new sensor technologies and even nature itself, through bioindication, are used as sophisticated sensory systems to overcome the limits of human perception and conventional technologies.
- **Environmental Forensic Engineering:** a rapidly growing field that integrates scientific principles with investigative techniques to identify, analyze, and resolve environmental issues, highlighting the importance of situational awareness in addressing complex matters.

In addition to presenting these techniques and technologies, the event explores methods of representing scenarios and related phenomena through comprehensive, multi-layered synoptic views.

Speakers and Program

The program features leading experts from various fields.

Each stage opens with a keynote speech from ***Prof. Massimiliano Lega*** (Department of Engineering, University of Naples Parthenope, Italy), who successfully combines environmental, aerospace, and forensic engineering, creating new interdisciplinary roles and innovative methodologies. Prof. Lega presents how situational awareness is applied to complex environmental systems, using advanced technologies to expand the boundaries of human perception.

Following this, in a session dedicated to case studies and real-world applications, ***Prof. Roberta Teta*** (Department of Pharmacy, University of Naples Federico II, Italy) delves into the value of interdisciplinarity, offering real-world examples of how the synergy between organic chemistry (her area of expertise), engineering, and environmental forensic sciences contributes significantly to environmental awareness processes.

The stops of the tour will feature specialized focuses on topics of particular relevance to the countries visited, addressing current and pressing environmental challenges.

This section of each European event will be further enriched by the contribution of ***Eng. Fabrizio Curcio*** (Italian Prime Minister's Office – Special Government Commissioner for floods in the Emilia-Romagna, Tuscany, and Marche regions), leveraging not only his extensive experience as former Head of the Italian Civil Protection Department but also his current role as Special Government Commissioner, to present real-world case studies and offer novel insights into the use of situational awareness in the field of civil protection, highlighting how this approach enhances preparedness and emergency response.

In each stage of the scientific tour, additional speakers join the core group of permanent speakers, providing diverse insights on the topic at hand.

Additionally, the host institution is represented by the chair of the respective department or structure, ensuring a close collaboration with local expertise.

A Global Multi-Year Initiative
The tour alternates between prestigious academic and research centers and institutional venues such as embassies and consulates, which serve not only as symbolic locations but also as strategic hubs for fostering dialogue between diverse audiences. These events offer opportunities to share knowledge, present cutting-edge research, and promote innovative technologies for environmental protection.

Organizer
Prof. Massimiliano Lega is an internationally recognized expert in environmental, forensic, and aerospace engineering. With a career spanning decade, his work focuses on interdisciplinary approaches to solve complex environmental problems using cutting-edge technologies. His research and professional practice significantly contribute to pushing the boundaries of perception and situational awareness in environmental protection and sustainability.
The organization of each event is managed and supported by the host institutions and contributors, who take turns throughout the various stages of the tour.

For detailed information about the tour, including event schedules, updates, and contact details, visit the official website: www.safetour.massimilianolega.it