

# SESSION FUTURE DISRUPTIVE DEFENCE TECHNOLOGIES

INFODAY AND BROKERAGE EVENT  
11 APRIL 2019

European Union's Preparatory Action on Defence Research - PADR programme has received Union's funding

This communication or publication related to the implementation of the entrusted tasks made by EDA reflects only the author's view and that the Commission is not responsible for any use that may be made of the information it contains.





# CALL TEXT PRESENTATION RA TOPIC TOPIC PADR-FDDT-EMERGING-03-2019

## Emerging Game-Changers

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# PADR-FDDT-EMERGING-03-2019 – CHALLENGE

## Emerging Game-Changers

- Several technology areas covered
- Anticipated and ongoing advances substantial impact on the defence sector
- Need to:
  - Explore and consolidate emerging technological directions
  - Analyse and exploit their disruptive potential on the defence sector
- Wider European pool of expertise
- Stimulating the emergence of a European innovation eco-system with:
  - Strong relations with defence sector around new technological paradigm
  - Well beyond the world of research alone, including military end-users

# PADR-FDDT-EMERGING-03-2019 – SCOPE (1/7)

## Emerging Game-Changers

### Proposals sought for

- Cutting-edge high-risk/high-reward research projects
- Aiming to demonstrate a new technological paradigm
- within the scope of one or more of the following sub-topics:
  1. Autonomous positioning, navigation and timing;
  2. Artificial Intelligence (AI) for defence;
  3. Quantum technologies for defence applications;
  4. Long-range effects;
  5. Augmenting soldier capacity.

# PADR-FDDT-EMERGING-03-2019 – SCOPE (2/7)

## Emerging Game-Changers

### Proposals on Autonomous positioning, navigation and timing:

- Global Navigation Satellite Systems (GNSS) impact military positioning, navigation and timing (PNT) services
- Critically depending on reliable satellite signals
- Availability of signals cannot be assured under all conditions
  - GNSS denied/contested environments
  - Physical limitations of the current technology
- A promising complementary device would be autonomous PNT sources, used without position or timing updates
- Relevant factors for considered solutions should be:
  - low drift
  - small scale
  - power-efficiency
  - integrability

# PADR-FDDT-EMERGING-03-2019 – SCOPE (3/7)

## Emerging Game-Changers

### Proposals on **Artificial Intelligence (AI)** for defence:

- AI solutions are expected to play an important role in critical fields:
  - Cyber defence
  - C4ISR systems
  - Intelligent and autonomous unmanned systems and swarms
  - Electronic warfare
  - Data fusion
  - Logistics and maintenance optimization
  - Information processing and intelligence analysis
  - Mission planning and control
  - War gaming and training
- Radically accelerating the cycle of military operations
- Deeply influence the military practices

# PADR-FDDT-EMERGING-03-2019 – SCOPE (4/7)

## Emerging Game-Changers

Proposals **Quantum technologies** for defence applications:

- Quantum information processing
- Quantum communication
- Quantum key distribution
- Quantum sensing technologies
- These technologies will produce a paradigm shift in fields as:
  - C4ISR
  - Navigation
  - Object and chemical detection

# PADR-FDDT-EMERGING-03-2019 – SCOPE (5/7)

## Emerging Game-Changers

### Proposals Long-range effects:

- Radical solutions for cost-efficient long-range precision strike
- Separate or combined use of:
  - Electromagnetic railguns
  - Guided ammunition
  - Hypervelocity projectiles



# PADR-FDDT-EMERGING-03-2019 – SCOPE (6/7)

## Emerging Game-Changers

### Proposals on **Augmenting soldier capacity**:

- Soldiers' equipment becomes increasingly heavier and more complex
- Adding to the challenge of accomplishing their missions in a better, faster and more efficient way
- Potential solutions for augmenting the capacity of the soldiers to perform:
  - Enhancement of physical capacities by using exoskeletons and robotic systems
  - Applying augmented reality for increased situational awareness
- Radically increase the capacity of the modern soldiers to perform physically demanding or mentally exhausting tasks

# PADR-FDDT-EMERGING-03-2019 – SCOPE (7/7)

## Emerging Game-Changers

- The implementation of this topic is intended to target TRL 3-4.
- EU contribution: EUR 1 500 000.
- The Commission intends to fund the highest ranked proposal per subtopic.
- **Deadline for applications: 28/08/2019.**

# PADR-FDDT-EMERGING-03-2019 – EXPECTED IMPACT

## Emerging Game-Changers

- **Scientific and technological contributions** to the **development of a new future technology** with target applications in the area of defence;
- Potential for **future social or economic impact** or **market creation**;
- Building **leading defence research** and **innovation capacity** across Europe by involvement of key actors that can make a difference in the future;
- **Convincing demonstration of the potential of EU-funded research** for defence applications.

**Type of Action:** Research Action (RA)

# THE GENERAL ANNEXES

## Annex F: Evaluation (2)

Scoring and weighing:

- For topics **PADR-EMS-03-2019** and **PADR-US-03-2019** Annex F is applicable (each criterion scored out of 5, threshold for individual criterion: 3, overall threshold: 10)
- For topics **PADR-FDDT-EMERGING-03-2019** and **PADR-FDDT-OPEN-03-2019** specific criteria, scoring and threshold apply.
  - Different Award sub-criteria for:
    - Excellence
    - Impact
    - Quality and efficiency of the implementation

# THE GENERAL ANNEXES

## Annex F: Evaluation – EMERGING – AWARD CRITERIA

### Excellence

- Clarity of the radical vision of a science-enabled technology and its differentiation from current paradigms.
- Novelty and ambition of the proposed science-to-technology breakthrough that addresses this vision.
- Range of and added value for opening up new areas of research; non-incrementality of the research proposed.
- High-risk, plausibility and flexibility of the research approach.

**Threshold: 4/5, Weight: 50%**

# THE GENERAL ANNEXES

## Annex F: Evaluation – EMERGING – AWARD CRITERIA

### Impact

- The extent to which the outputs of the project would contribute to the expected impacts listed in the work programme under this topic.

**Threshold: 4/5, Weight: 30%**

# THE GENERAL ANNEXES

## Annex F: Evaluation – EMERGING – AWARD CRITERIA

### Quality and efficiency of the implementation

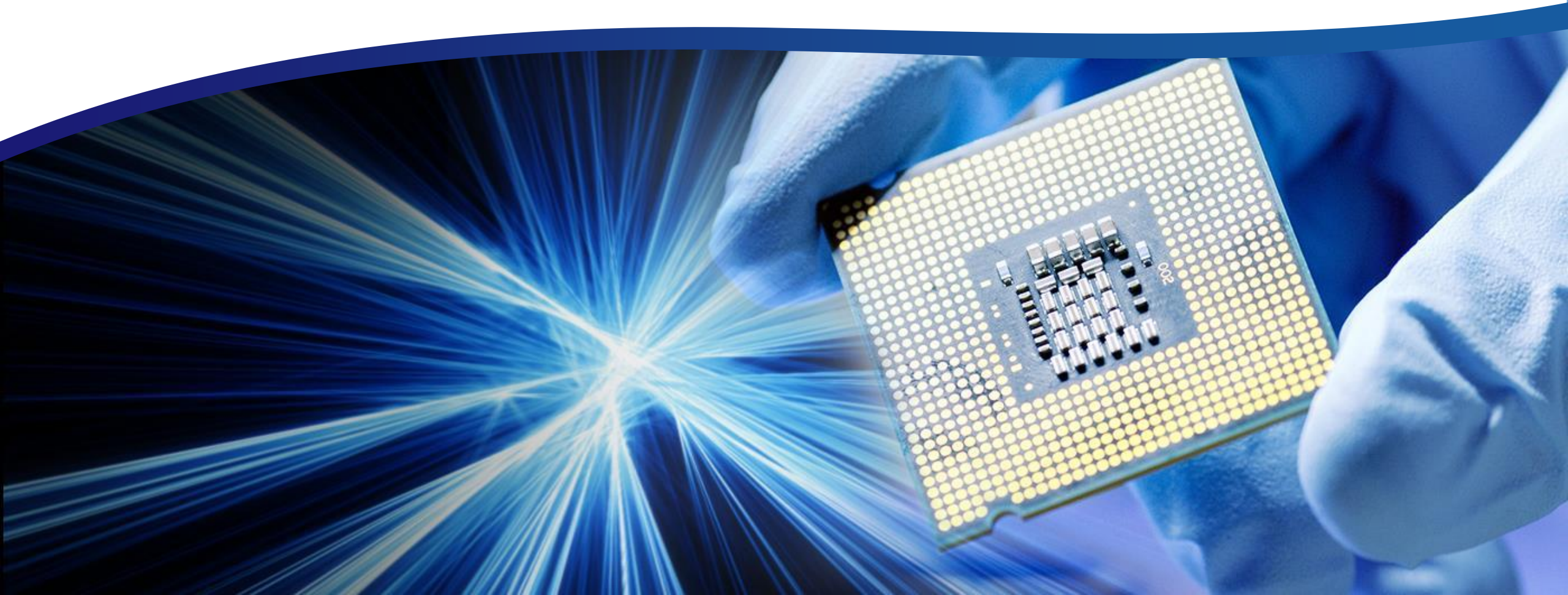
- Coherence and effectiveness of the research methodology and work plan to achieve project objectives and impacts, including adequate allocation of resources to tasks and partners.
- Role and complementarity of the participants and extent to which the consortium as a whole brings together the necessary expertise.

**Threshold: 3/5, Weight: 20%**





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# THANK YOU – Q&A

PLEASE BE INFORMED THAT THE Q&A SESSIONS WILL BE AUDIO RECORDED, AND THE QUESTIONS AND ANSWERS WILL BE INCLUDED IN THE RELEVANT Q&A FILE, PUBLISHED IN THE CALL WEB. YOUR NAMES WILL NOT BE INCLUDED. HOWEVER, IF YOU HAVE ANY OBJECTION TO THIS, PLEASE AVOID TO STATE YOUR NAME BEFORE ASKING THE QUESTIONS