

## SFI-Defence Organisation Innovation Challenge Webinar

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An Roinn Cosanta Department of Defence





## **SFI Challenge Portfolio**

- €27M (spent or planned, incl. o/h) in current programmes
- Up to 64 interdisciplinary teams supported to-date





## SFI-Defence Organisation Innovation Challenge Background

- Growth of SFI challenge-based funding portfolio collaboration and partnership central component.
- National Grand Challenges Programme announced by Minister Harris that will see mission-oriented challenges used to incentivise researchers to deliver tangible impact for society in areas such as health, agriculture and climate.
- Feasibility Study for the Establishment of a Research, Technology & Innovation (RTI) Capability for the Defence Organisation concludes establishment of such a capability is *"feasible and would deliver a range of benefits to the DefOrg and would contribute to national prosperity through an economic multiplier effect"*.







## SFI-Defence Organisation Innovation Challenge Ambition & Objectives

• Overarching Ambition - develop new technologies aligned with national defence policy that also have potential to deliver significant societal impact in Ireland.







## SFI-Defence Organisation Innovation Challenge Challenge-Based Funding

- What is it? Solution-focused approach to research funding that uses a combination of grants, competition, incentive prizes and strict timelines to direct research activities at specific, often complex, problems.
- Our Approach







## SFI-Defence Organisation Innovation Challenge Challenges and Disruptive Ideas

- Under this call, **five challenges** have been proposed:
  - Enhance the efficiency and effectiveness of the fire extinguishing capability of rotary-wing aircraft.
  - 2. Cyber-physical system to assist in, or potentially automate, manoeuvring of aircraft between a hangar and apron.
  - 3. Recovery of Rigid Hull Inflatable Boats (RHIBs) at sea.
  - 4. Prevention and detection of water ingress to vessels.
  - 5. Reduce the environmental impact of Defence Forces aircraft, land vehicles and vessels.



• **Disruptive Ideas** – ICT, peacekeeping, climate & sustainability, disaster relief, medical technologies.



## 1. Enhance the efficiency and effectiveness of the fire extinguishing capability of rotary-wing aircraft.

- Under this challenge, applicants are invited to address the following:
  - Develop and demonstrate the feasibility of a solution that significantly enhances the efficiency and effectiveness of the fire extinguishing capability of a rotary-wing aircraft.
  - As part of this solution, applicants may wish to consider **several aspects individually or in combination**, including (but not limited to):
    - Environmentally safe flame-extinguishing solutions;
    - Suspension fire extinguishing system design;
    - Mission planning (including weather conditions);
    - Water targeting systems.





# 2. Cyber-physical system to assist in, or potentially automate, manoeuvring of aircraft between a hangar and apron.

- Under this challenge, applicants are invited to address the following:
  - Develop a cyber-physical system that will **assist**, **or potentially automate**, **the manoeuvre of aircraft** between a hangar and apron.
    - The system must be adaptable to **different types of aircraft** with minimal or no human intervention.
    - The system must be capable of **significantly reducing the time** needed to manoeuvre an aircraft from hangar to apron **without damage to the aircraft**, hangar or apron infrastructure, while **maintaining or increasing safety** for personnel.





## 3. Recovery of Rigid Hull Inflatable Boats (RHIBs) at sea.

- Under this challenge, applicants are invited to address the following:
  - Develop a system that enables safe retrieval of rigid hull inflatable boats (RHIBs) to the deck of a moving vessel while both vessels are at sea. Retrieval should be undertaken safely and with minimal human intervention.





## 4. Prevention and detection of water ingress to vessels.

- Under this challenge, applicants are invited to address one of the following:
  - Develop **methods capable of preventing or significantly reducing** water ingress to vessels.
  - Develop new approaches to **detect and locate in real-time water ingress** to vessels.
  - Develop **new technologies to reduce or eliminate the effects of corrosion** on vessels.
  - Develop methods to capture data, analyse trends and predict issues relating to equipment.





## 5. Reduce the environmental impact of Defence Forces aircraft, land vehicles and vessels.

- Under this challenge, applicants are invited to address one of the following:
  - Investigate the applicability of novel technologies (including designs) to enhance efficiency and reduce carbon footprint including inter alia hydrogen technology, electricity, fuel cells.
  - Identify and integrate sustainable **bioenergy solutions** that can reduce the carbon footprint of naval vessels, aircraft and heavy land vehicles.
  - Optimise mission design, across all domains, with a view to minimise fuel consumption and carbon footprint.



### **Disruptive Ideas**

Information and Communications Technologies (ICT) including: Wireless Communications; Artificial Intelligence (incl. Machine Learning); Virtualisation and Simulation (incl. Cyber-physical systems) and Cybersecurity.

#### Peacekeeping

including: Imaging Systems – Imaging systems capable of operating in a range of settings and environments during day and night; Drone Technologies – Drone and other aerial platforms for detection tasks.

#### Climate Change and Sustainability

including: Novel energy storage strategies and systems; Robust, portable and efficient solar panel technologies.

#### **Disaster Relief**

including: Water Systems - High-performance, low-cost water purification, detection, storage and supply systems; Survivor Detection - Remote or at-distance technologies capable of detecting survivors in a range of land and/or water-based scenarios; Humanitarian Aid Delivery – Systems to support and assist in the delivery and management of humanitarian aid.

#### Medical Technologies

including: Diagnostics – Rapid, portable, low-cost disease diagnostics capable of reliably operating in low-resource or challenging environments; Virtual health – Tele-health/medicine, mobile apps and other technology-based solutions enabling patient health to be managed remotely over large distances; Wearables – Unintrusive or small form factor devices that may be worn or integrated with personal equipment to monitor physical activity, health or bio-signals.





## SFI-Defence Organisation Innovation Challenge Who Can Apply?

- Call is open to interdisciplinary and collaborative STEM-led research teams based at any eligible Research Body.
- Teams encompass a range of technical (both scientific and engineering) and non-technical skills to address activities associated with problem understanding and solution development.
- Applications will be accepted from core (applicant) teams comprising two researchers.
- Women are <u>strongly encouraged</u> to apply to this programme.
- NB Unlike other challenges, a Societal Impact Champion is <u>not</u> required to be part of the core (applicant) team (i.e. a Societal Impact Champion does not need to be identified at the time of application).



## SFI-Defence Organisation Innovation Challenge Who Can Apply?

- Eligibility
  - Member of academic staff (permanent or with a contract that covers the period of the award)

or

• **Contract researcher** (contract that covers the period of the award or contract may be subject to receipt of the award),

and

- Hold a PhD\* (\*In certain cases, SFI will accept applications from teams where the Co-Applicant does not hold a PhD or equivalent.)
- *NB* Applications will <u>not</u> be accepted where the lead applicant or co-applicant is a postgraduate researcher (e.g., MSc, MEng or PhD student). Applications from postdoctoral researchers must be accompanied by a LoS.



## SFI-Defence Organisation Innovation Challenge Funding & Phased Structure

• Teams can apply for funding up to €220k and will compete for overall Prize Award of €1M.





## SFI-Defence Organisation Innovation Challenge Engagement with Irish Defence Forces

- Applicants should discuss ideas, challenges/opportunities with Irish Defence Forces in advance of application submission.
- Webinar series with Irish Defence Forces Subject Matter Experts (SMEs).
- Open day(s) at Irish Defence Forces installations currently being planned to provide applicants with access to equipment and SMEs. Details to follow on call webpage.
- If you would like to learn more about a challenge or discuss opportunities contact <u>challenges@sfi.ie</u> or <u>RTI@defence.ie</u>.
- Following successful application, a **Defence Organisation Liaison** will be assigned to each team and will work as a member of the team throughout the challenge programme.



### SFI-Defence Organisation Innovation Challenge Application Form



- Separate application forms for Challenges and Disruptive Ideas (overall structure similar).
- Key element of application form is requirement to **demonstrate engagement** with Irish Defence Forces.
- Application form is short (max. 6-pages)



## SFI-Defence Organisation Innovation Challenge Application Process

- Applications to the programme call must be submitted through SESAME. Application process involves combination of information input to SESAME and documentation upload. SESAME will be open for applications on July 30<sup>th</sup>.
- Application forms can be downloaded from SFI website. Should be completed by applicants and uploaded as part of proposal submission on SESAME. Separate application forms for Challenges and Disruptive Ideas.



## SFI-Defence Organisation Innovation Challenge Application Review

- Applications will be reviewed against the following (equally weighted) criteria by a panel of independent international experts:
  - **Team** Quality, experience and ambition of the applicant team
  - **Challenge/Problem** Significance of the challenge
  - Solution Novelty of the proposed solution, including its potential to deliver disruptive innovation
  - Impact Transformative impact potential of the solution
  - **Feasibility** Feasibility of execution within the budget and timeframe permitted
- Review at each subsequent stage employs the same criteria to assess progress. Review is undertaken by panels of independent international experts. Review at Concept and Seed/Prize Phases are interview-based.



## SFI-Defence Organisation Innovation Challenge Timeline

- Call Launch
- SESAME Open for Applications
- Webinars
- Open Day(s)
- Application Deadline
- Funding Decision
- Award Start Date
- Prize Award Start Date

July 6, 2021 July 30, 2021 July 20 & August 10, 2021, 14:00 Dublin Local Time September, 2021 (Details TBC) **October 1, 2021, 13:00 Dublin Local Time** November, 2021 January 1, 2022



### SFI-Defence Organisation Innovation Challenge Further Information



 For further information please refer to the SFI-Defence Organisation Innovation Challenge website (<u>https://www.sfi.ie/funding/funding-calls/future-innovator-defence/</u>) or contact <u>stephen.odriscoll@sfi.ie</u> / <u>challenges@sfi.ie</u> / RTI@defence.ie