

Institute for Security Science and Technology

NATO Defence Innovation Accelerator for the North Atlantic (DIANA)

Presented by:

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Technology

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Presented to:

2022 NATO MODELLING & SIMULATION
GROUP (NMSG) SYMPOSIUM

Imperial College
London

INSTITUTE FOR
SECURITY SCIENCE
AND TECHNOLOGY



Our mission

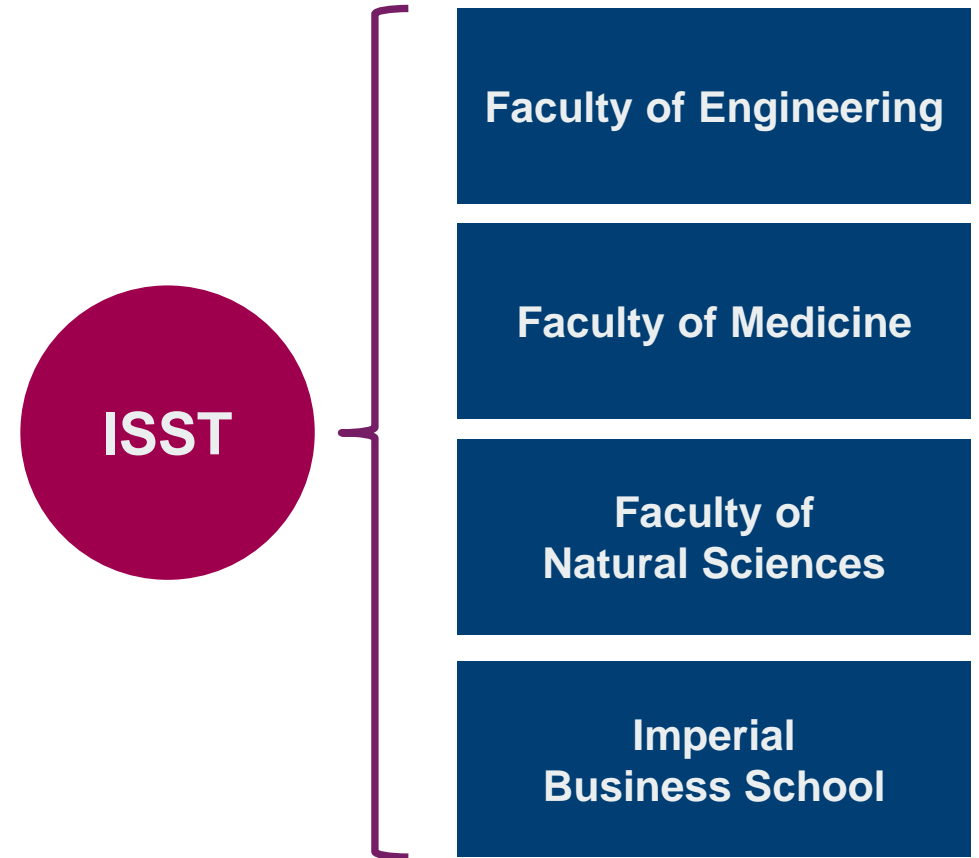
Security is often only viewed through the narrow lens of conflict and war.

Our mission at the Institute for Security Science and Technology is to challenge that perception and demonstrate the breadth and depth of a topic that touches everyone in society, wherever they are in the world.



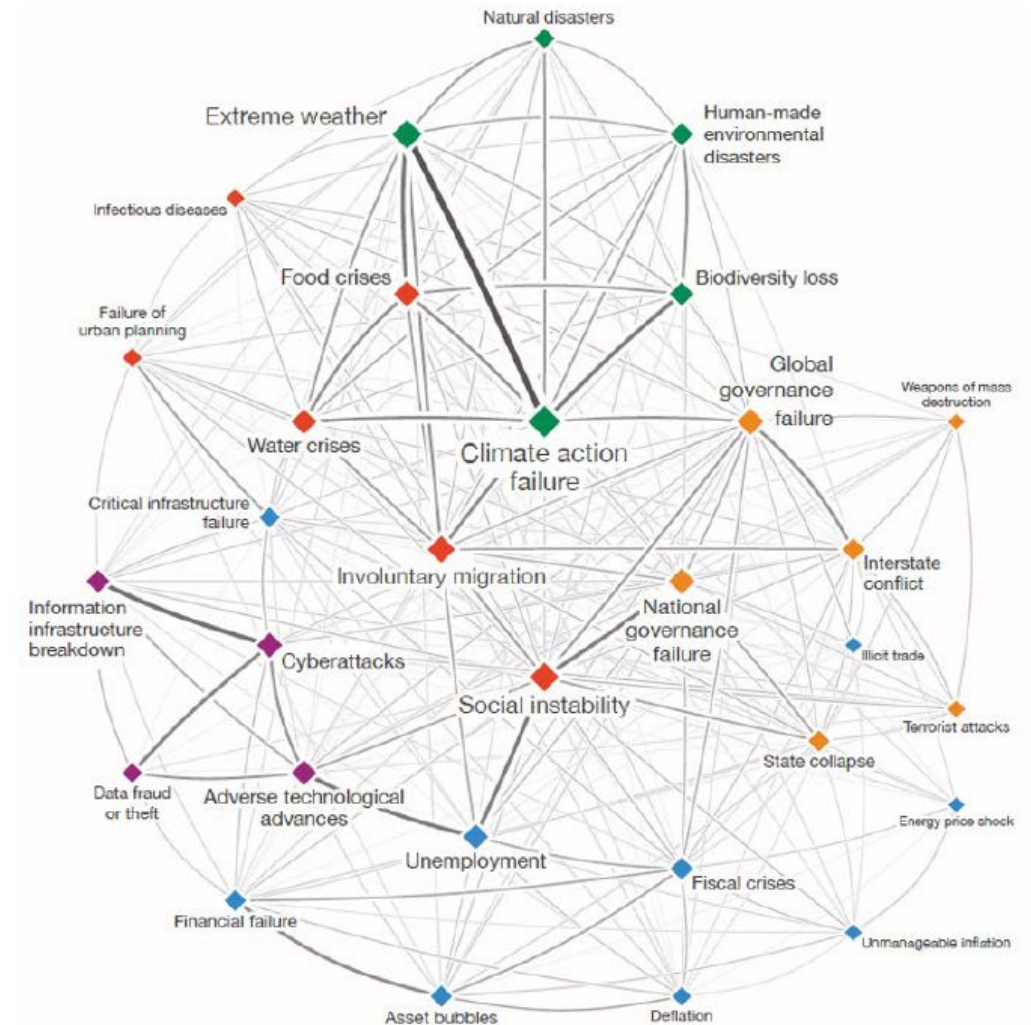
How we work

- Founded in 2008 as one of Imperial's **Global Challenge Institutes**
- ISST harnesses insights from across Imperial to develop thinking and solutions to problems in global security



Why global security?

- Insecurity is driven by complex, interrelated global challenges, e.g.
 - Scarcity of water, nutrition, natural resources
 - Economic hardship
 - Political instability
 - Hostile threats from criminals, terrorists, nation states
- Emerging and Disruptive Technologies an important driver of the emerging threat landscape and solutions
- Understanding / tackling this complexity requires world-leading science and technology



ISST Innovation Ecosystem

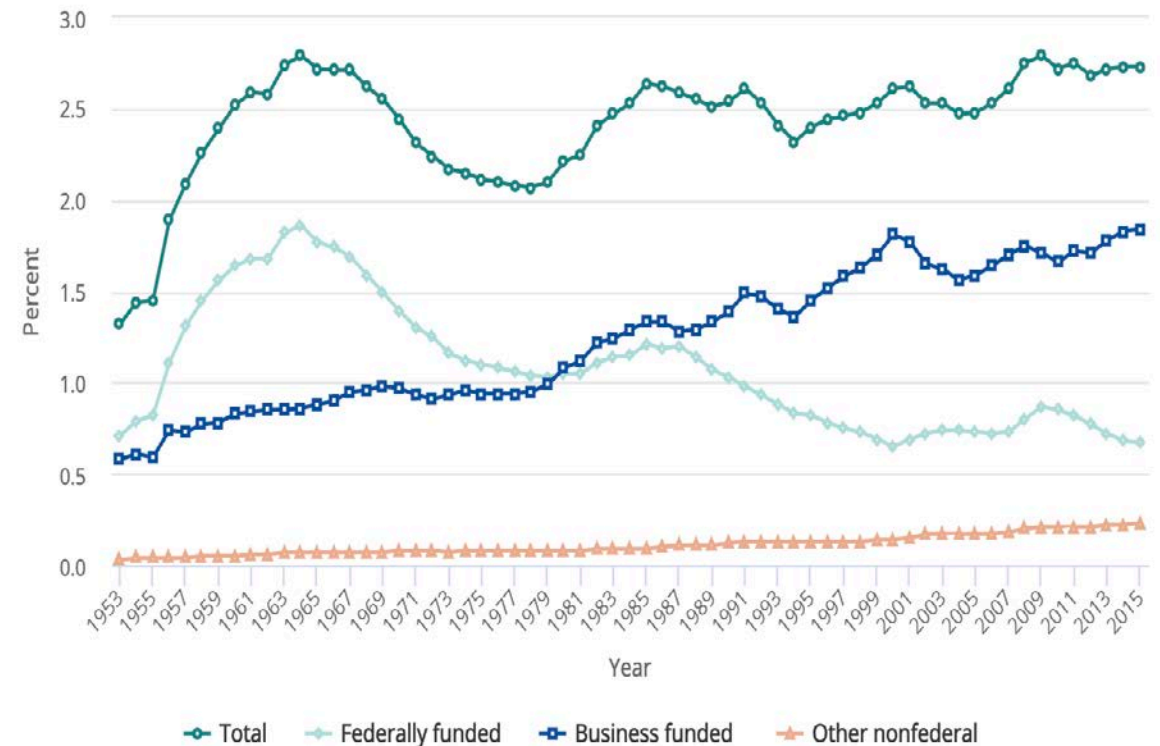
- Co-locating multiple start-up, large industry, academia and government partners (triple-helix)
- Drives new research projects and technology transfer in security and defence
- Based at our White City campus



Defence technology challenges

- Track developments at the cutting edge and those over the horizon.
- Identify priority areas for focus; from the perspectives of both opportunities and risks
- Technical literacy amongst Government bodies is lacking in many countries
- Securing the talent pipeline for the future
- Tech development and adoption is occurring at an unprecedented pace
- Shift from Governments' housing leading technology to multi-national corporations is well established

Ratio of U.S. R&D to gross domestic product, by roles of federal, business, and other nonfederal funding for R&D: 1953–2015

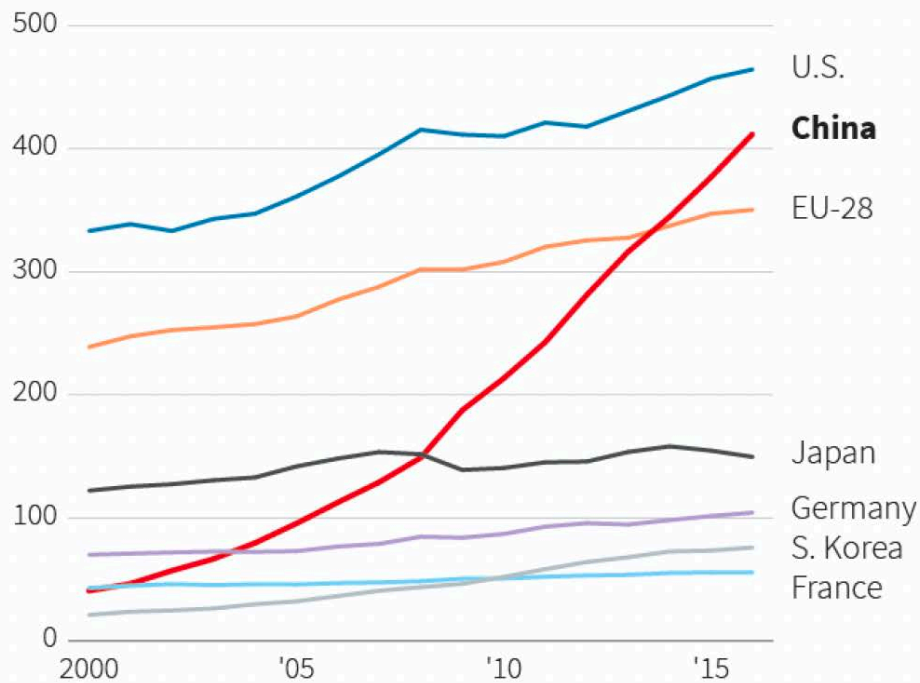


<https://www.nsf.gov/statistics/2018/nsb20181/assets/1038/research-and-development-u-s-trends-and-international-comparisons.pdf>

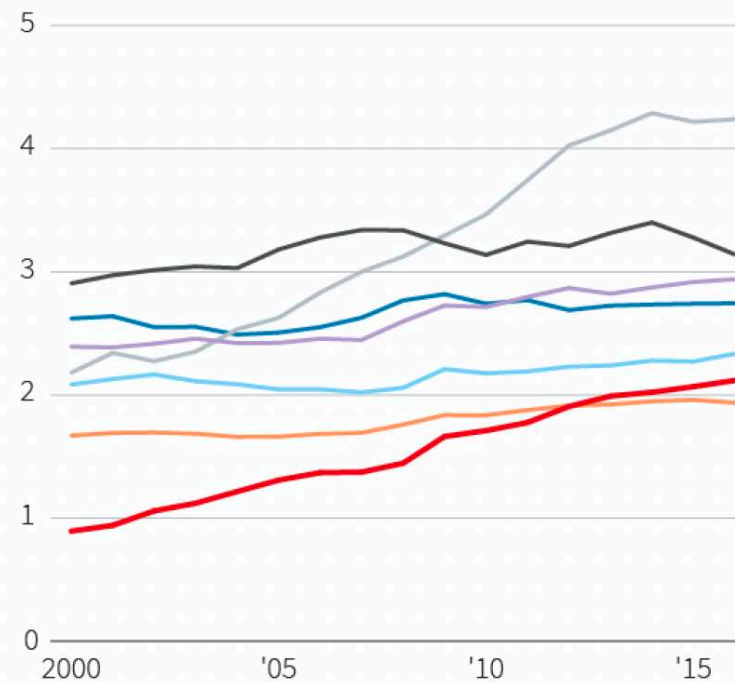
Research spending

China's spending on research and development in science and technology, surged ten-fold since 2000, while the U.S. spending grew a modest 39 percent in the same period.

SPENDING IN R&D - In million U.S. dollars



AS PERCENT OF GDP



Source: Organisation for Economic Cooperation and Development

C. Inton, 13/04/2017



A key role for NATO

- Establish agreements and principles of use for emerging technologies in the defence and security domain for the purposes of coherence.
- House innovation coordination mechanisms to enable the maintenance of a leading edge in technology development and pull-through
- Combine the excellence in STEM-B that is distributed throughout it's unique multinational membership
- Establish a technology transfer pipeline to ensure continuity of technical excellence and attract the next generation of high calibre talent
- **Co-develop, Invest, Edify**



[210303-EDT-adv-grp-annual-report-2020.pdf \(nato.int\)](https://www.nato.int/docu/edtd/2020/210303-EDT-adv-grp-annual-report-2020.pdf)

DIANA & NATO Innovation Fund



"At the Brussels Summit, NATO leaders committed to strengthening our Alliance, including by promoting and protecting transatlantic innovation", the Secretary General said. "Today we are delivering on that commitment. And together we will keep our people safe in a rapidly changing world", he added.

Defence Accelerator for NATO: DIANA

DIANA'S ELEMENTS INCLUDE:

TEST CENTRES

A transatlantic network of over 63 technology Test Centres to enable innovators to engage in co-development with operational end-users and to conduct testing, evaluation, verification and validation of their proposed solutions

ACCELERATOR NETWORK

A transatlantic Accelerator Network leveraging over nine accelerator sites to boost the development of technological solutions by innovators through a competitive deep tech start-up accelerator program.

TRUSTED CAPITAL DATABASE

Trusted Capital Database to match vetted Allied innovators with trusted investors;

RAPID ADOPTION SERVICE

Rapid Adoption Service to leverage NATO as a contracting vehicle to rapidly procure technological solutions;

What will DIANA do?

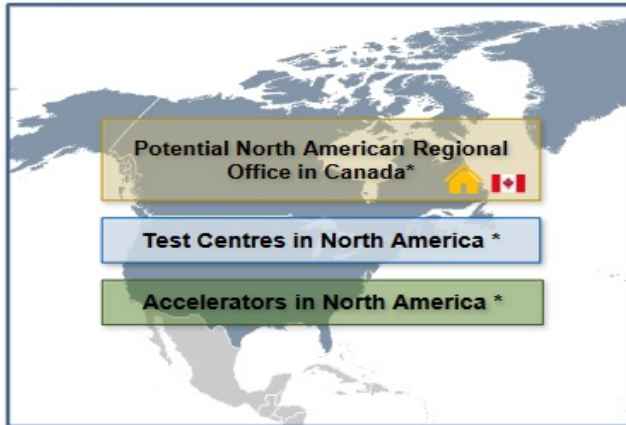


- Convene triple-helix stakeholders: government | industry | academia
- Fund research, development and translation in key Emerging & Disruptive Technologies (EDTs)
- Open up network of accelerators, prototyping and test facilities from across Allies (see map on next slide)
- Operational timeline: partially operational by 2023, fully operational by 2025

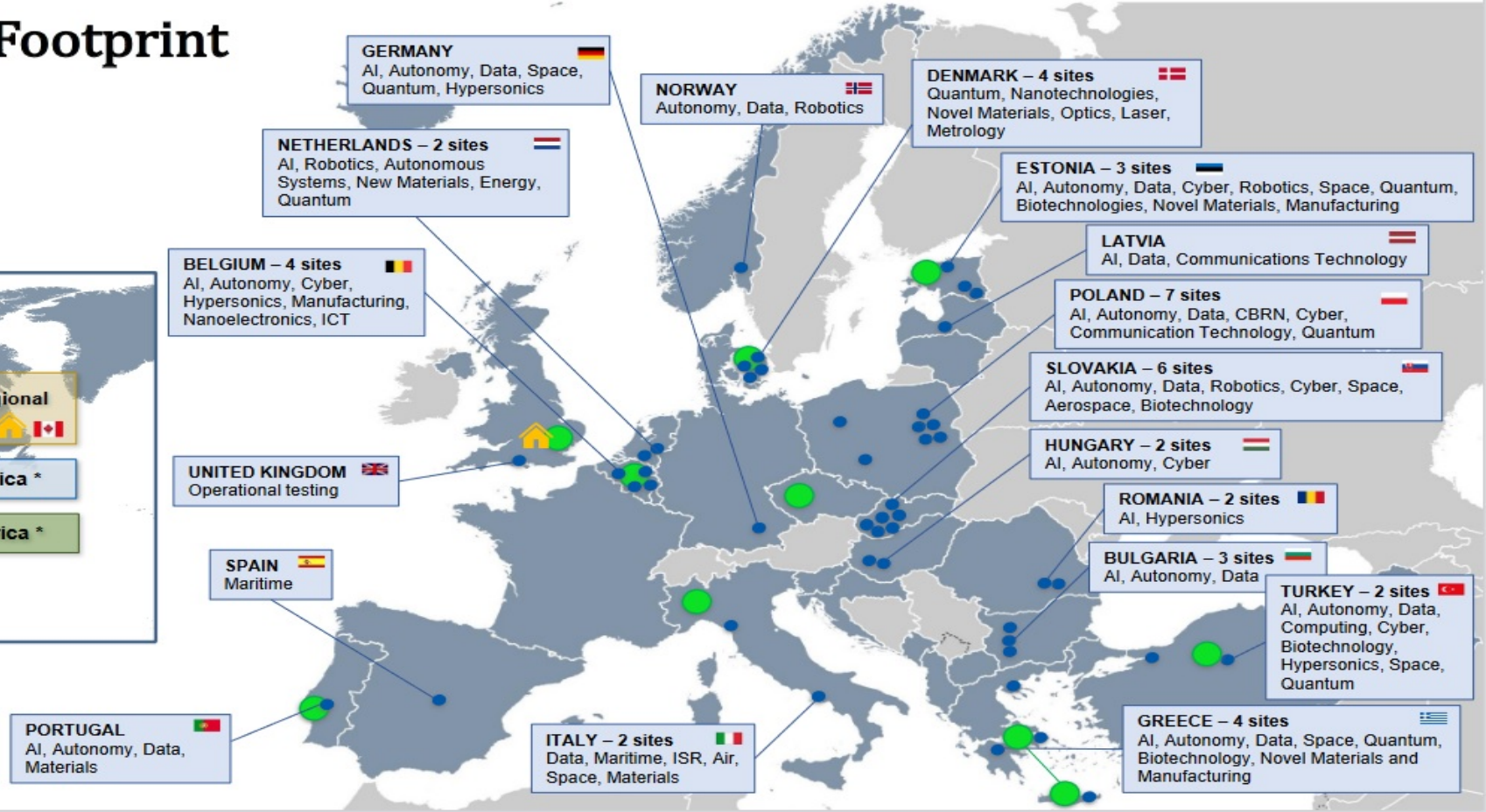
Initial DIANA Footprint

Key

- Regional Offices (2)
- Test Centres (47)
- Accelerators (9)



* Precise locations to be confirmed



<https://www.gov.uk/government/news/uk-to-host-world-leading-nato-defence-innovation-headquarters>

<https://www.imperial.ac.uk/news/235454/imperials-white-city-campus-named-location/>

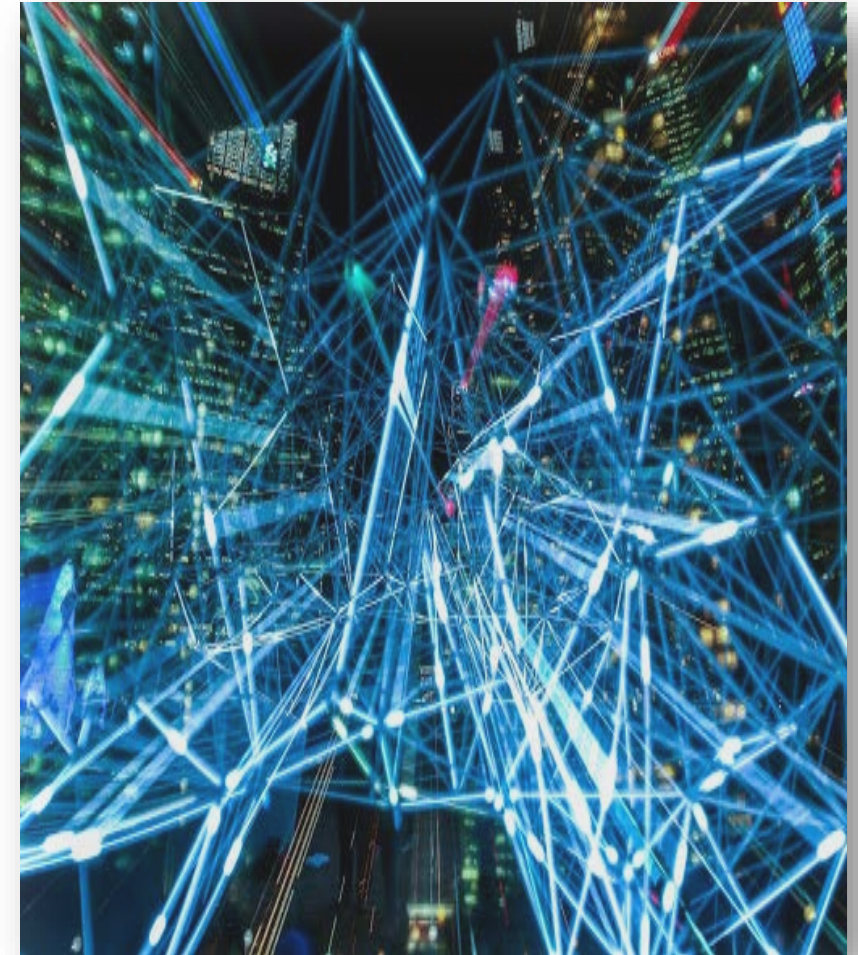
NATO Innovation Fund: NIF

- EUR 1 billion VC fund: strategic investments in start-ups developing dual-use emerging and disruptive technologies critical to Allied security.
- World's first multi-sovereign venture capital fund.
- Focus on early-stage investments, and able to invest in other deep-tech funds that align with the three strategic objectives:
 - to seek out cutting-edge technological solutions that solve the Alliance's defence and security challenges;
 - to bolster deep-tech innovation ecosystems across the Alliance; and
 - to support the commercial success of its deep-tech start-up portfolio.



Technologies and Domains

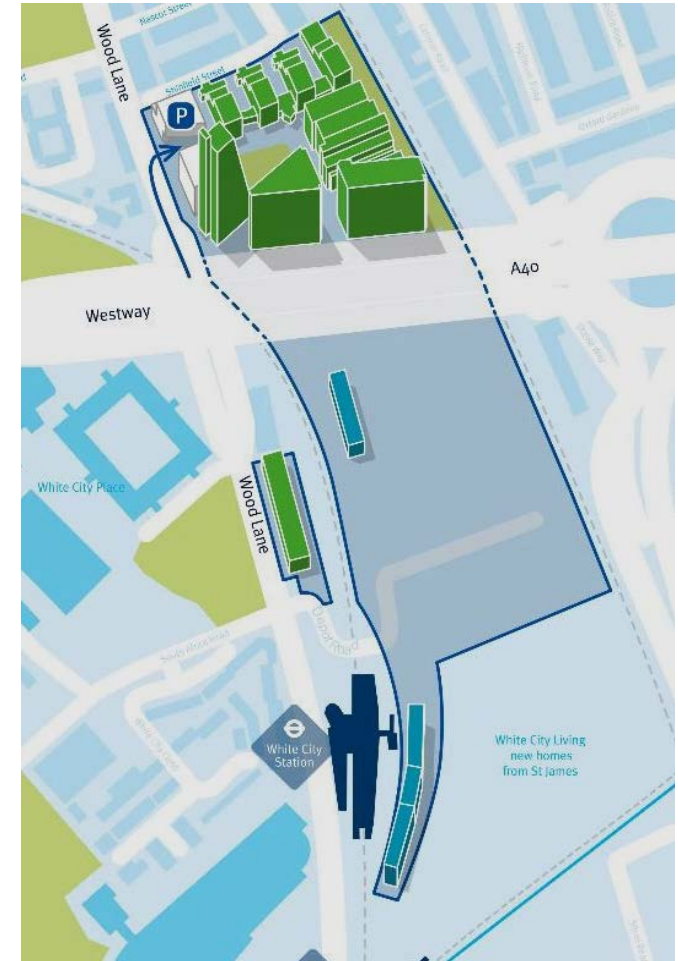
- NATO's innovation activities currently focus on nine key areas:
 - **Artificial Intelligence**
 - **Data and Computing**
 - **Autonomy**
 - **Quantum-enabled technologies**
 - **Hypersonic Technologies**
 - **Space**
 - **Novel Materials and Manufacturing**
 - **Energy and Propulsion**
 - ...
- **Focus** on 'dual-use' technologies addressing societal resilience challenges, not just defense



[NATO - Topic: Emerging and disruptive technologies](#)

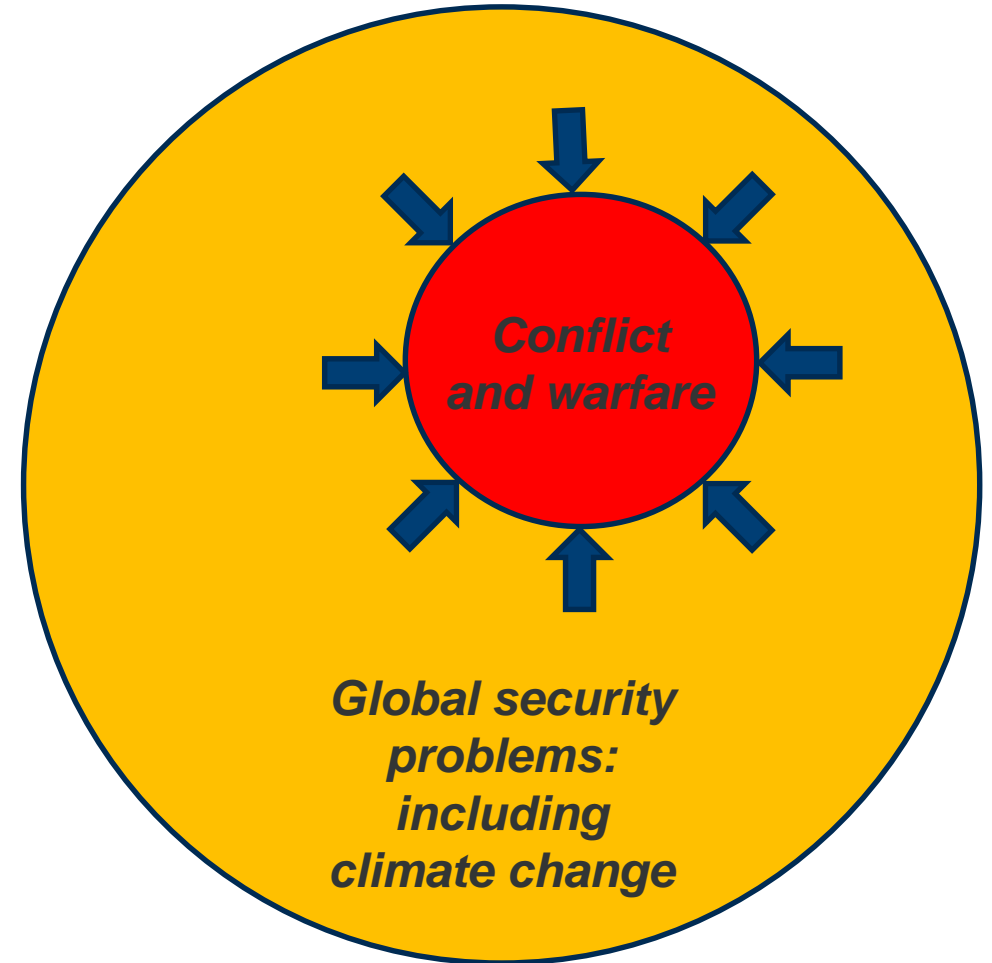
Features of this technology engine

- Administrative heavy practices → **agility and flexibility**
- **Protected** environment to mitigate risks of technology loss to undesirable markets/investors or adversaries
- Enable greater **inclusivity and diversity** in the mission of NATO -- appealing to future talent
- End-to-end horizon scanning, development and implementation portal for the alliance; dovetailing with and augmenting domestic efforts
- Game changing proposition for a world that is being transformed by game changing technology
- Establish a more **responsive and dynamic** technology system that is able to react to shifting challenges
- **Engineering serendipity**



Global insecurity, warfare and dual-use

- Examining problems of warfare and issues related to broader global insecurity challenge the former is a subset of the later
- Primary defence mission should be to make the conflict subset as small as possible for sustainable security
- Deploying technology to better understand human activity can serve a dual use:
 - Assets can enable us with our short-term, hopefully short-duration, conflict campaigns
 - Same assets can provide the means by which we can monitor and mitigate drivers of conflict – eg drivers being climate change





Global awareness for dual-use: an example of data and our oceans

500 nm
JAN 7, 2021 - FEB 5, 2021

50.5746 -289.4069
Google | Marine Regions

<https://globalfishingwatch.org/our-map/>

Contact Us

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www.linkedin.com/showcase/imperial-isst



[@imperial_isst](https://twitter.com/imperial_isst)

