



# FINNISH FLAGSHIPS OFFER SOLUTIONS FOR THE FUTURE





# FINNISH FLAGSHIPS CREATE FUTURE KNOW-HOW AND SUSTAINABLE SOLUTIONS TO SOCIETY'S CHALLENGES.

The Academy of Finland's Finnish Flagship Programme supports high-quality research and increases the societal impact emerging from the research. The Flagships are clusters that combine close cooperation with business and society, adaptability and a strong commitment from host organisations.

## International collaboration

The Finnish Flagships create future know-how and sustainable solutions to society's challenges, promoting economic growth by, for example, developing new business opportunities. By providing substantial long-term funding, the programme accelerates active collaboration between different actors and facilitates the development and expansion of the activities. Finnish Flagships have the courage to reform research while also engaging in deeper multidisciplinary collaboration between both Finnish and foreign parties.

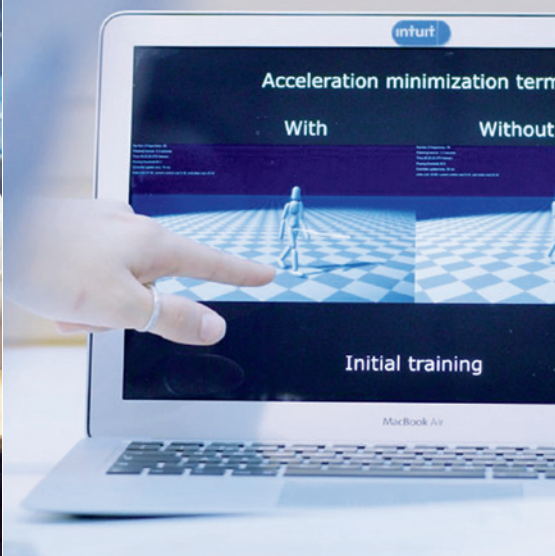
## The Flagships combine:

CUTTING-EDGE RESEARCH

HIGH AMBITION LEVEL

CLOSE COLLABORATION WITH BUSINESS, INDUSTRY AND SOCIETY

STATE-OF-THE-ART RESEARCH ENVIRONMENT



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**HIGH-LEVEL  
RESEARCH  
INFRASTRUCTURES**

**STRONG  
COMMITMENT BY  
COLLABORATORS TO  
ACHIEVING GOALS**

**EXCELLENT  
RESEARCH  
FUNDED BY THE  
ACADEMY OF  
FINLAND**

**INTERNATIONALLY  
PEER-REVIEWED  
SCIENTIFIC QUALITY  
AND DEMONSTRATED  
SOCIETAL IMPACT**



# 6G – 6G-Enabled Wireless Smart Society & Ecosystem

**The 6G Flagship focuses on developing wireless technologies as the world’s first extensive 6G research programme.**

/// The 6G Flagship is a global leader and preferred research partner in 5G adoption and 6G development. The Flagship envisions and defines the 6G-enabled digital world as we move towards the 2030s, aligned with the UN’s Sustainable Development Goals, where the physical and virtual worlds meet and wireless connectivity expands to all areas of life.

The 6G Flagship partners with several stakeholders, from research communities and policymakers to companies representing ICT developers and users in many different sectors. Together, the applications to be developed will pave the way for a data-driven society based on near-instant and unlimited wireless connectivity.

For this purpose, the Flagship’s experts will develop fundamental components of 6G technology, novel wireless solutions and business models in four interconnected research areas – wireless connectivity, devices and circuit technology, distributed computing, and sustainable, human-centric services and applications.

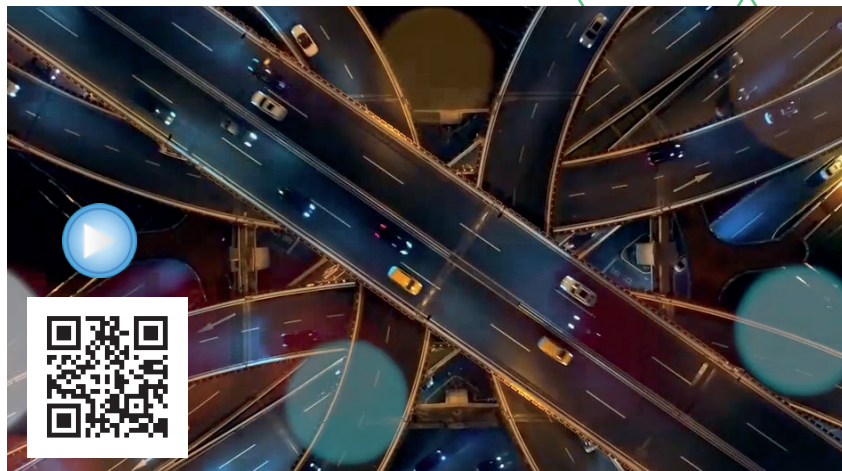
**Matti Latva-aho**  
Flagship Director, Academy Professor  
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# FCAI

## – Finnish Centre for Artificial Intelligence



**The mission of the Finnish Center for Artificial Intelligence (FCAI) is to create real artificial intelligence for real people in the real world.**

// The Finnish Center for Artificial Intelligence (FCAI) brings together cutting-edge researchers and industry and public actors to solve real-life problems with the help of artificial intelligence (AI). The objective is to create AI solutions that work in a data-efficient, trustworthy, ethical and understandable way with real people.

Research at the centre is based on top-tier expertise in machine learning. The researchers develop advanced AI tools that assist in decision-making, design and modelling. The solutions will facilitate human-AI cooperation in many areas, such as industrial and transport

planning, material design for cleaner energy production, and the design of more effective drugs, vaccines and personalised treatments.

The centre collaborates with several other actors and provides versatile training. This multidisciplinary cooperation includes partnerships with academic, industrial and societal actors, large-scale strategic initiatives and numerous smaller projects.

### **Samuel Kaski**

Flagship Director, Academy Professor  
Aalto University

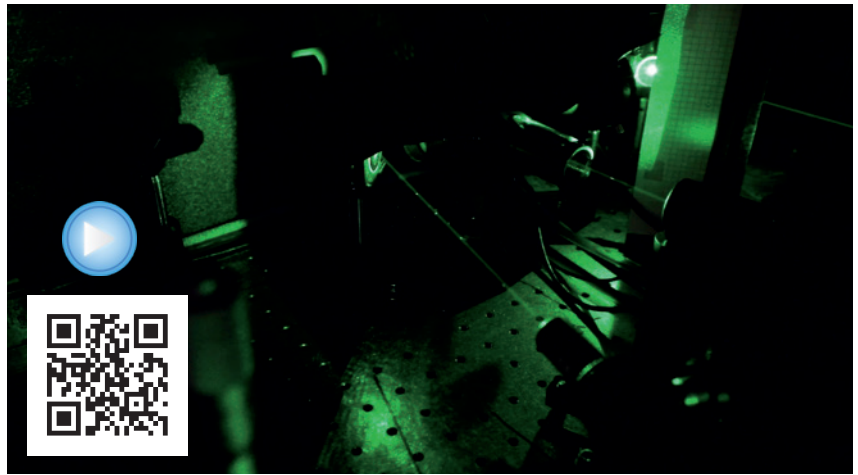


**The Language Bank of Finland is a collection of services for all researchers who use data containing language.**

The Language Bank offers a wide selection of data sets and open source tools for text and speech processing. Specific resources are also available for commercial use.

**Read more about our data sets and services:**  
[www.kielipankki.fi/language-bank/](http://www.kielipankki.fi/language-bank/)

The Language Bank is coordinated by the FIN-CLARIN consortium, the Finnish part of the European research infrastructure CLARIN ERIC.



## **PREIN** – Flagship on Photonics Research and Innovation

**The photonics Flagship PREIN focuses on light-based technologies and develops innovations for the benefit of companies and society.**

**//** PREIN is a network in which key actors in Finnish photonics research develop next-generation light-based technologies. The applications from the research by the PREIN Flagship include sensors for health monitoring, LIDAR technology for the car industry, environmental monitoring, and efficient photovoltaic solutions. PREIN advances Finnish expertise through pioneering research, expanding business opportunities, developing training programmes and raising awareness of the critical role of light-based technology in our society.

The stakeholders of PREIN are representatives of ministries, industry and funding organisations who provide feedback on the operation and impact of the Flagship. PREIN has established partnerships with Photonics Finland, Finland's national organisation of photonics companies, and the LUMA Centres for science education. These partnerships facilitate



linkages between research and business, development of the relevance of vocational education and training to working life, and science education aimed at children and young people.

### **Goëry Genty**

Flagship Director, Professor  
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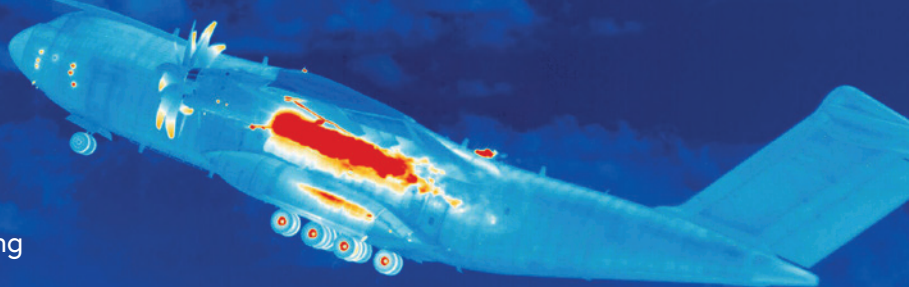
The Finnish Flagship Programme of the Academy of Finland provides a completely new way of implementing research, development and innovation policy in Finland. The programme supports high-quality research and the wide-ranging impact emerging therefrom. This supports future knowledge and know-how, and helps create solutions to societal challenges, develop new business opportunities and contribute to sustainable growth.



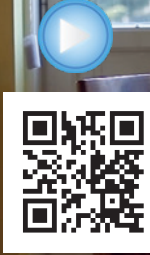
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# INVEST – Inequalities, Interventions and New Welfare State

**INVEST produces scientific knowledge on the challenges faced by families with children and adolescents and provides new tools for professionals working with families and adolescents.**

**///** The Finnish Flagship INVEST – Inequalities, Interventions and a New Welfare State – aims at providing a new welfare state model that is more equal, better targeted to problem groups, more anticipatory as well as economically and socially sustainable. Once we know the limits of wellbeing and skills development among children and youth and identify the benefit and service gaps in the current welfare state, we can develop new research-based interventions to reduce the accumulation of disadvantages and to strengthen justice in society. The INVEST Flagship will also train a new generation of welfare researchers in master’s and doctoral programmes.

In order to support children, youth and families in difficult situations and to prevent such situations, the researchers will collaborate with more than 900 schools and 100 municipalities. The intervention programmes will provide experts working with children and families with evidence-based policies to prevent problems such as bullying or early behavioural disorders. So far, the programmes have reached more than half a million children and several thousand families.

**Jani Erola**  
Flagship Director, Professor  
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Programmes:

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children and families through  
intervention and implementation  
research.**

**In collaboration with  
INVEST Child Psychiatry.**

**itla**  
Children's  
Foundation





# InFLAMES – Innovation Ecosystem Based on the Immune System

**InFLAMES identifies novel drug targets and develops new diagnostic tools to treat diseases.**

// The InFLAMES Flagship combines immunological and other related research to develop and introduce new therapies and diagnostic tools for the treatment of diseases. InFLAMES aims at drug development together with biotech and pharmaceutical companies. The diagnostic tools will be developed with a view to tailoring treatments to each individual patient. At the same time, the Flagship will intensify cooperation between academia and industry, create new business opportunities and boost the commercialisation of inventions. It will further strengthen cooperation in immunological research through the centre for immunology programme in Turku.

The Flagship's ecosystem encompasses the universities in the Turku region, Turku University Hospital, the City of Turku and business companies. Doctoral training, professors of practice and other public-private partnerships will deepen education and create new employment paths for experts in the sector.

InFLAMES aims to become an internationally acclaimed top-level centre for immunological research.

## Sirpa Jalkanen

Flagship Director, Academician of Science  
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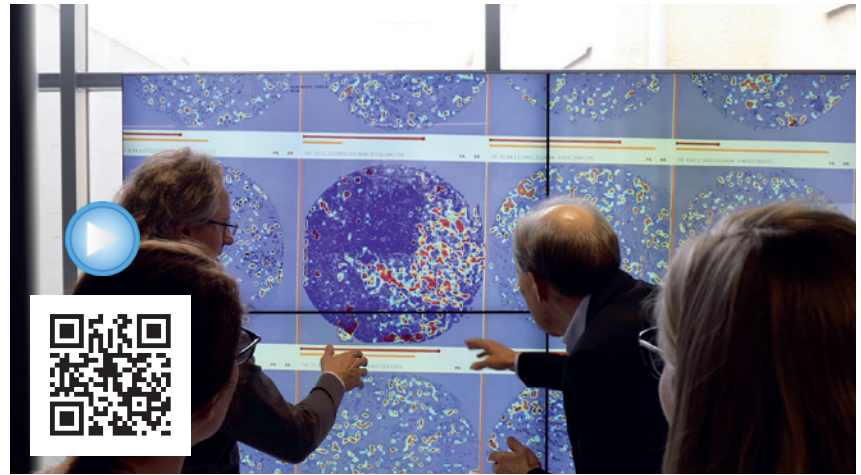
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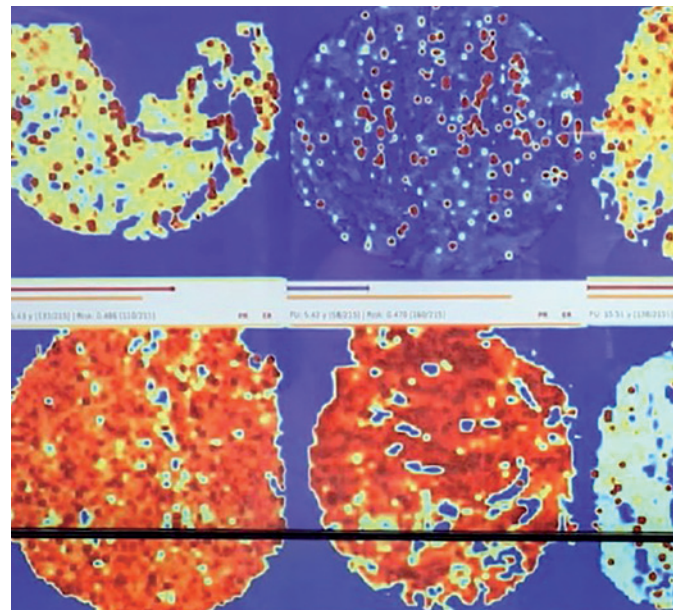


# iCAN – Digital Precision Cancer Medicine Flagship

**iCAN combines precision cancer medicine and digital health.**

// The iCAN Digital Precision Cancer Medicine Flagship is a discovery platform at the interface of precision cancer medicine and digital health. iCAN integrates detailed information from tumours with patients' other health and lifestyle data in a new way. The improved understanding of tumour development in the context of other tissues – including the immune system – enables discovery of new targets for diagnostics and treatment. The aim is to leverage these breakthroughs for improved personalised treatments and to facilitate the implementation of precision cancer medicine. The active participation of patients in planning and implementation further strengthens the impact of the results.

International collaborations and business partnerships are critical for iCAN to reach its goals. In the globally unique iCAN Flagship, which links tumour molecular profiling with patients' past and present health data, company partnerships enable inclusion of early drug leads and brings new competencies and technologies.



Finland's high-quality health data and national cancer centre provide an excellent framework for the development of the iCAN competence centre with current and new partners.

## **Kari Alitalo**

Flagship Director, Academician of Science  
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# GeneCellNano

## – Flagship for biological drugs

**The GeneCellNano Flagship develops and commercialises new biological drugs, biomarkers and diagnostics for common chronic diseases.**

// The GeneCellNano Flagship focuses on developing and commercialising new biological drugs (ATMPs), biomarkers and diagnostics innovations. Biological drugs are a completely new area of pharmaceutical development that is not yet dominated by multinational companies. The Flagship's objective is therefore to be at the forefront of this rapidly developing sector through innovative basic research, excellent production techniques, long clinical experience and numerous international contacts.



New treatments will be developed for cardiovascular diseases and age-related macular degeneration, as well as for brain, ovarian and bladder cancer. Coronavirus vaccine research based on gene transfer technology will also continue. Innovations developed in cooperation between cutting-edge research, biotech companies and clinical operators can be not only medicines but also more precise diagnostics or markers that can improve disease prediction or the choice of treatment.

**Seppo Ylä-Herttuala**  
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# FinnCERES

## – Competence Centre for the Materials Bioeconomy

**Researchers in the FinnCERES Flagship aim to develop novel bio-based materials towards industrial production.**

// The FinnCERES Flagship redefines the bioeconomy with advanced bio-based materials. These materials leverage the natural properties of wood and other raw materials, thus opening opportunities for sustainable economic growth.

The Flagship's research covers four themes: future biorefineries, clean air and water, lignocellulosics beyond plastics, and electronics, optics and energy applications. FinnCERES seeks answers to research questions related to the refining, processing and utilisation of biomass. The research addresses challenges related to resource sufficiency and climate change.

The FinnCERES Flagship is a globally networked competence centre for bio-based materials. It brings researchers and companies together in the early stage of research to accelerate industrial utilisation of the solutions.

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### **Orlando Rojas**

Flagship Director (until Apr 2022)  
Professor, Aalto University

### **Monika Österberg**

Flagship Director (from May 2022)  
Professor, Aalto University





## UNITE – Flagship for Forest-Human-Machine Interplay

**The UNITE Flagship makes use of new technologies and produces agile methods for processing data based on forest data.**

// The UNITE Flagship is a unique interdisciplinary platform that brings together world-leading research teams in forest sciences, geospatial technology, sensors and gamification. The digitalisation of forest-based value networks covers the different uses, services and opportunities provided by forests and their coordination.

The Flagship's breakthroughs will be built on, for example, gamification and mobile and laser

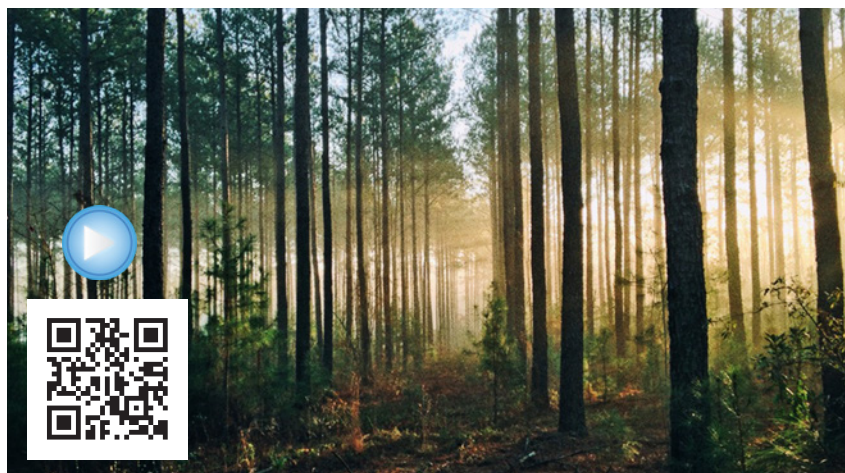
technology. The application areas include the collection and modelling of forest data, management of forest damage, wood acquisition, environmental welfare impacts and forest biodiversity.

The Flagship unites science and practice. It involves joint research, development and innovation activities and case studies with its partners. The Flagship is aiming for revolutionary business and scientific advances. Its collaborators include companies from the forest sector and the gaming industry, national and international organisations and top scientists from around the world. Join the UNITE community!

**Jyrki Kangas**  
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# ACCC – Atmosphere and Climate Competence Center

**Using research and research data, the ACCC Flagship will create opportunities for Finland, the European Union and the world to reach the Paris climate targets.**

// The aim of the ACCC Flagship is to respond to climate change and air quality challenges by producing practical solutions based on cutting-edge research. Examples of such solutions are novel measurement instruments, open data services and tailored education modules as well as verification concepts for land-based carbon sinks. Increasing the scientific understanding of different actors contributes to the creation of sustainable innovations. The Flagship's research can create potential breakthroughs in atmospheric sciences and support Finland, the EU and the world's countries in reaching climate targets.

High-quality research helps to understand the challenges associated with climate change and air quality, yet cannot alone provide comprehensive solutions. Through partnerships, the Flagship will therefore support evidence-based policy and climate-friendly development in various sectors. The Flagship collaborates with

research organisations, companies, educational institutions and the non-profit sector. Globally, the work will make use of international research and measurement networks and science diplomacy.

## **Markku Kulmala**

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# Advancing science together

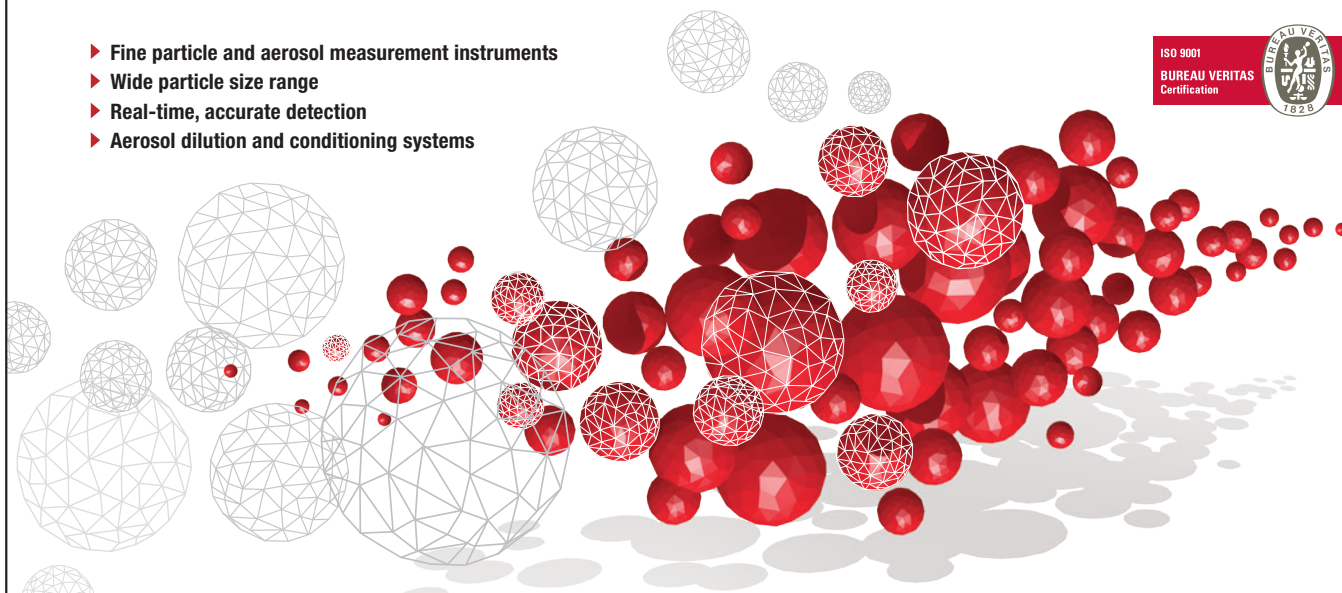
Good health is vital to all of us; as are sustainable solutions to the most pressing healthcare challenges we are facing globally. We at Pfizer are committed to applying science and our global resources to develop breakthroughs that change patients' lives, to improve health and wellbeing at every stage of life. This work is being done globally in close collaboration with the scientific community and regulatory authorities. Finland has great potential of increasing its share of global research of medicines and vaccines. We at Pfizer Finland are committed to deliver on these promises together with the Finnish research community and patients.

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## FLAGSHIP PROGRAMME



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