

Mentimeter – Responses

Using ONE word please describe how you FEEL about KE

16

30

Most popular

interested

4

Also prominent

unsure

3

curious

2

growth

2

hopeful

2

Other responses

challenging

confused

development

encouraging

fun

interdisciplinary

intimidated

love

mutual

mysterious

opportunities

opportunity

pressured

sceptical

share

uncertain

unknown



Innovate
UK

Business
Connect



Innovate
UK

Introduction to the Innovate UK System

Dr Dawn Geatches | Knowledge Transfer Manager for
Mathematical and Computational Sciences | Innovate UK
Business Connect dawn.geatches@iukbc.org.uk

14th January, 2025

UK Research and Innovation

Works with the government to invest over £7 billion a year in research and innovation by partnering with academia and industry to make the impossible, possible. Through the UK's nine leading academic and industrial funding councils, we create **knowledge with impact.**



**UK Research
and Innovation**

Innovate UK System



Innovate UK



Business Connect

1 of 60+ products
and services



Innovate UK System



Innovate UK

Innovate UK is the UK's innovation agency: a non-departmental public body operating at arm's length from the Government as part of UKRI.



Business Connect

Innovate UK Business Connect exists to connect innovators with new partners and new opportunities beyond their existing thinking - accelerating ambitious ideas into real-world solutions.



Business Growth

Innovate UK Growth empowers innovation-driven businesses to grow at pace and achieve their industry- and society-transforming ambitions.

Our Network – Business Connect



46,229
Unique
Organisations

72%
Small

15%
Medium

13%
Large

335,478
innovators

**Every university
in the UK**

IUK Business Connect Outputs

66%

introduced by IUK Business Connect go on to **collaborate**

42%

reach outcomes **faster** (1-2 years)

60%

increased **investment** in R&D direct result from IUK Business Connect engagement

£100m

per year increased **investment** in R&D



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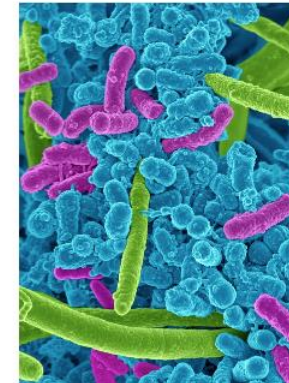
<https://iuk-business-connect.org.uk>

Our Work

Explore the diverse range of UK industries supported by KTN.

- AgriFood →
- Chemistry →
- Design →
- Electronics →
- Geospatial →
- Industrial Maths →
- Manufacturing →
- Photonics →
- Robotics & AI →
- Sensors →
- Transport →
- Covid-19 →
- Innovation →
- Knowledge Transfer Partnerships →
- Biotechnology →
- Creative Industries →
- Digital →
- Energy →
- Health →**
- Infrastructure →
- Materials →
- Quantum →
- Security & Defence →
- Space →
- Water →
- Global Alliance →
- Investment →
- Sustainability →

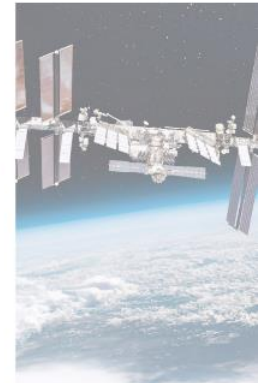
Featured Sector Information



Exploring Microbiome Innovation: Insights from the Microbiome One Health Conference

Over 100 microbiome researchers and innovators gathered in Glasgow in March 2023 for the...

[Read more →](#)



Funding Opportunities



https://www.ukri.org/opportunity/?keywords=&filter_council%5B%5D=822&filter_status%5B%5D=open&filter_status%5B%5D=upcoming&filter_order=publication_date&filter_submitted=true



UK Research and Innovation

[Apply for funding](#) [Manage your award](#) [What we do](#) [News and events](#) [Who we are](#) [Our councils](#)

[Funding finder](#) [Before you apply](#) [Develop your application](#) [Studentships and doctoral training](#)
[How we make decisions](#) [Improving your funding experience](#) [Horizon Europe](#)

Search

Funding council

- Arts and Humanities Research Council
- Biotechnology and Biological Sciences Research Council
- Economic and Social Research Council
- Engineering and Physical Sciences Research Council
- Innovate UK

Funding finder

Sorted by publication date (newest first)

[Sort by opening date \(oldest to newest\)](#)

[Sort by closing date \(oldest to newest\)](#)

29 opportunities found using the current filters

CAM pathfinder one, feasibility studies

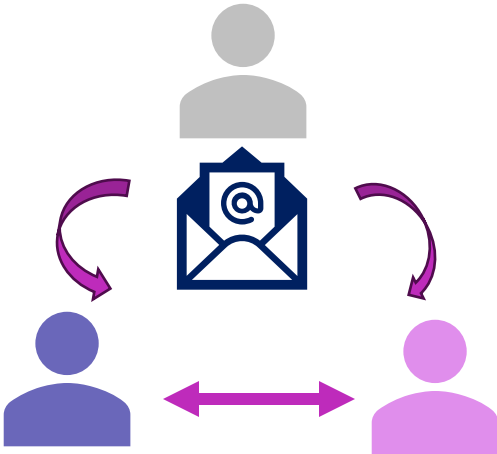
UK registered organisations can apply for a share of up to £2 million for feasibility studies which target early commercial connected and automated mobility (CAM) opportunities.

Opportunity status: Open
Funders: [Innovate UK](#)

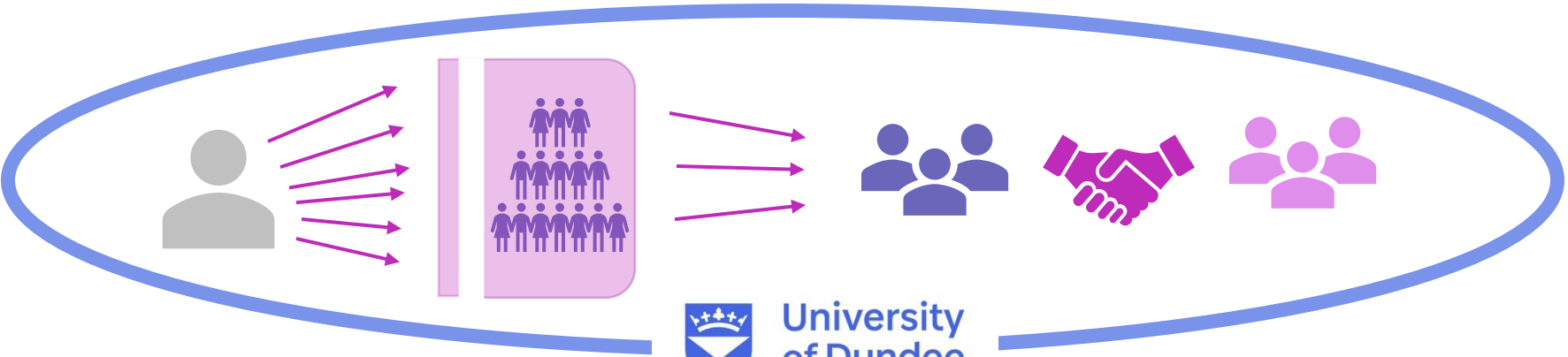
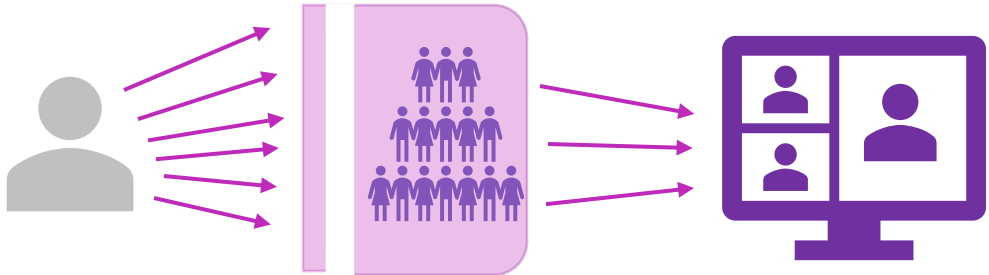


How we connect and convene

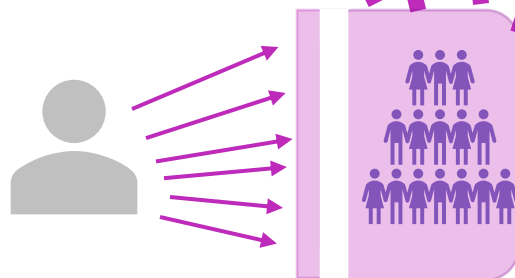
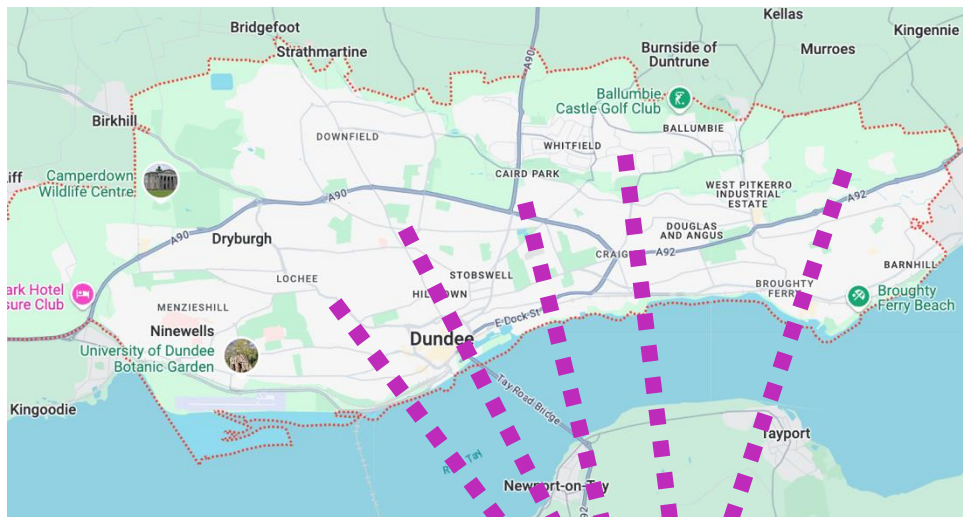
Personal introductions



General invitations to an event



Building a KE Workshop at the University of Dundee



University
of Dundee



Innovate UK
KTN

Collaborate to Innovate: Meet Maths @Dundee

15th September 2023, in-person workshop at the University of Dundee, School of Science and Engineering, Mathematical Sciences and Computational Physics Research Cluster.

Workshop Aims:

- Building connections and expanding networks;
- Show-casing skills, tools and experience of academics;
- Discussing and exploring company's challenges-to-innovation



University
of Dundee



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Mathematical Science Activities and Support

Direct Connections to other organisations



- Summer/Masters/PhD projects
- (Mini-KTPs)/KTPs

Participating in Advisory Groups



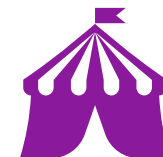
46,000+ contacts



Providing Letters of Support



Support to organise and run KE/KT events



AI in Energy Systems

24 September 2024

Dr. Caroline Chibelushi
Lead AI at Innovate UK Business Connect

www.iuk.ktn-uk.org



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We Only Need CONFIDENCE

“From boardroom meetings to casual work chats, women in business often find themselves **holding back opinions** and **sidestepping opportunities**.”

Why? **It's the confidence gap**. And it's affecting your professional life more than you might realise”

Source: <https://www.comerica.com/insights/business-finance/how-to-boost-your-confidence-as-a-woman-in-business.html>



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Enhancing Women Confidence



- **Positive self-talk**
- **Set goals**
- **Use positive affirmations**
- **Avoid comparisons**
- **Etc. etc. etc.**



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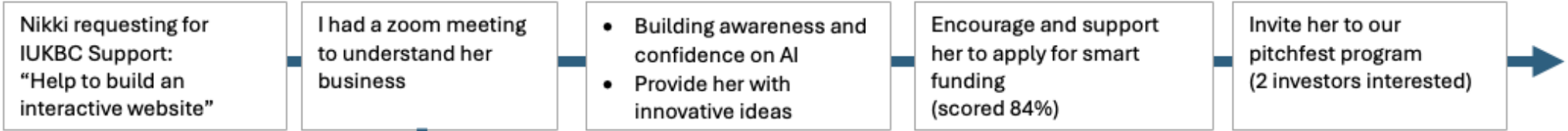
Why is
the
change
very
slow?



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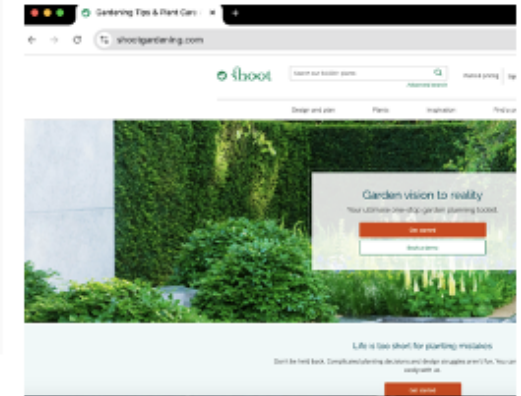
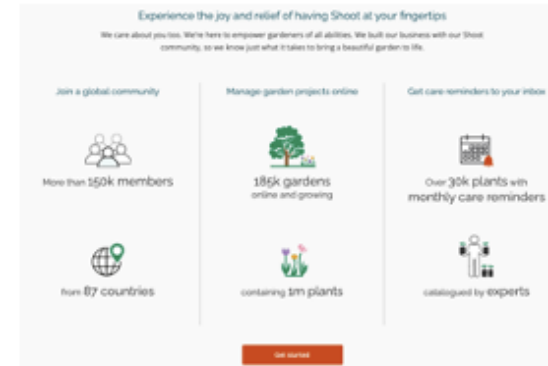
B
C

Possible Solution: A Case study



Data

- All flower plants and their characteristics
- Types of soils in all parts of the UK
- Types of flowers which survive/die in some part of UK
- Images of leave for disease identification/or species
- Image for positioning
- Types of fertilizer used
- Etc. etc. etc.



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THANK YOU



<https://iuk.ktn-uk.org/>



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Mentimeter - Responses

What does Knowledge Exchange mean to you? (and who/what might it involve)

14

15

Collaboration

Academics working with business for the mutual transfer of skills in similar areas

Collaborating with industry to create real world change. Public engagement too.

Humanity, everyone

Interface between applied industry and research, but not very sure what it actually references

Transfer and application of knowledge

Collaboration with experts from different field and thrive.

Peers talking about a common goal, reviewing multiple points of view.

I still don't fully understand how it works or what it involves.

Speaking to friends, colleagues, academics, professionals

Working with non academic institutions

Identifying collaborations where each party brings something new in a supportive environment

a new interesting way

Nothing

I never heard of it before. I presume bridging knowledge gaps between people in industry and academia



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What is Knowledge Exchange?

What is Knowledge Exchange?

**Two-way sharing of
expertise to advance
research and maximise
impact**

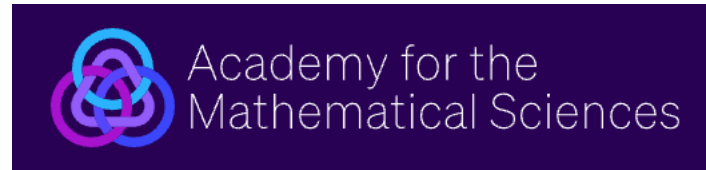


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WHERE to find Knowledge Exchange opportunities

Connections across mathematical sciences



Advisory
Committee on
Mathematics
Education

INSTITUTE OF MATHEMATICS & ITS APPLICATIONS

THE OPERATIONAL RESEARCH SOCIETY

The Council for the Mathematical Sciences

ROYAL STATISTICAL SOCIETY
DATA | EVIDENCE | DECISIONS

EDINBURGH MATHEMATICAL SOCIETY

LONDON MATHEMATICAL SOCIETY
EST. 1865

Knowledge Exchange Hub for Mathematical Sciences

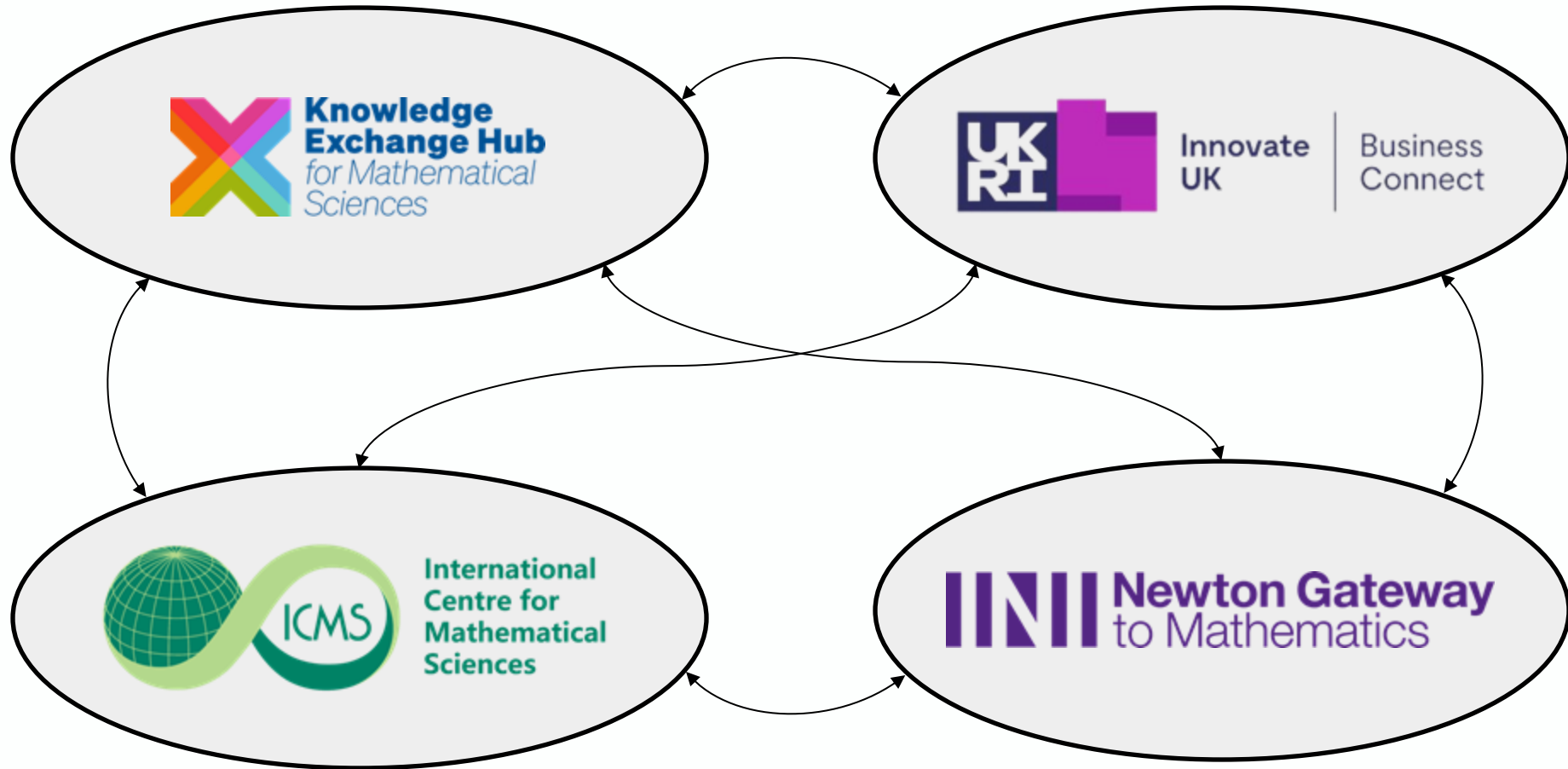
UKRI Innovate UK Business Connect

ICMS

INI Newton Gateway to Mathematics





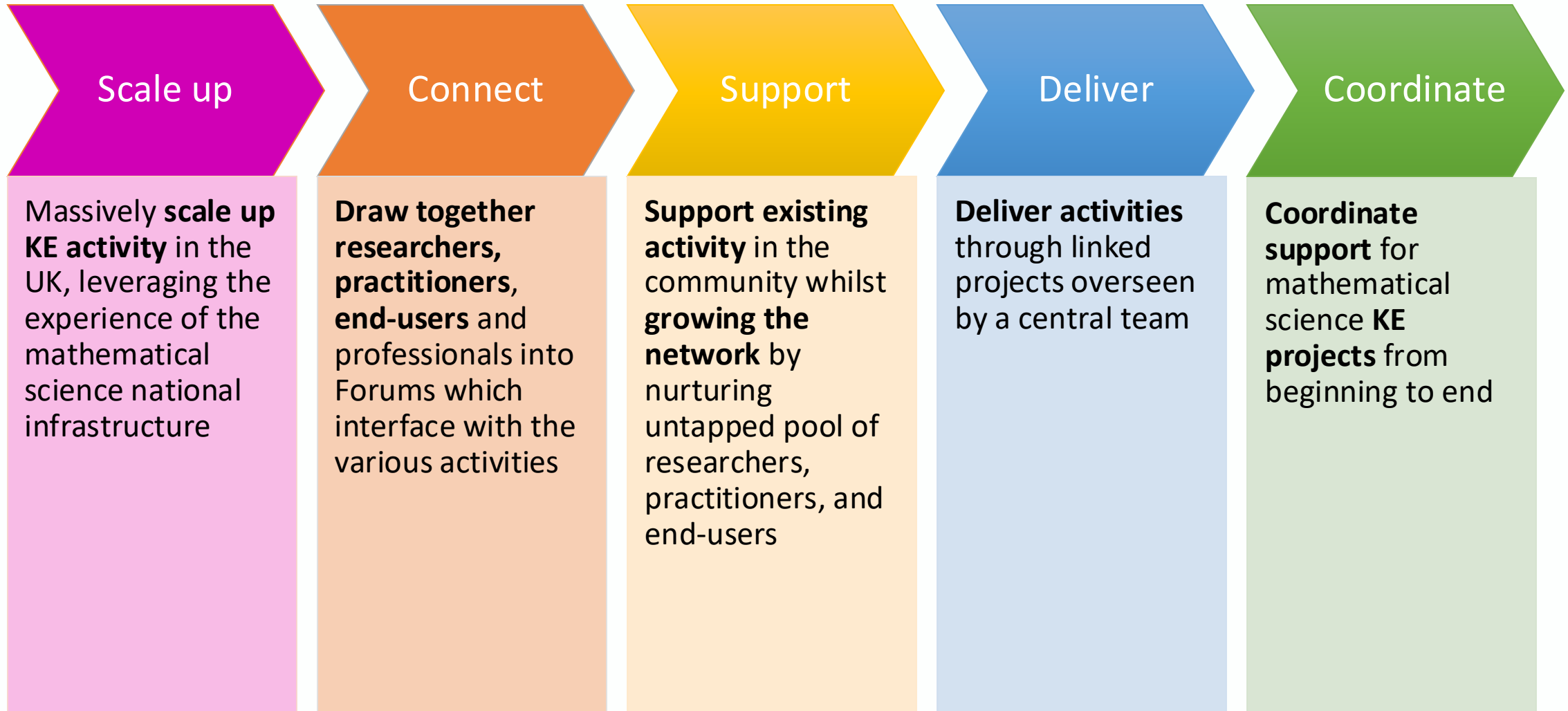


Together we make a **connected network**



**Knowledge
Exchange Hub**
*for Mathematical
Sciences*

<https://www.kehubmaths.co.uk/>



B.I.G Partners

Practitioners,
innovators and users of
mathematical sciences
in Business, Industry
and Government

KE Professionals Forum

Facilitators at the
interface between
academia and
business, industry
and government

KE Champions

Academics in the
mathematical
sciences from
across UK

50+ B.I.G. Partners signed up so far

40 KE Champions representing 35 institutions

33 KE Professionals from across the UK



Knowledge Exchange for the Mathematical Sciences

<https://gateway.newton.ac.uk/>

- The impact initiative of the Isaac Newton Institute for the Mathematical Sciences (INI)
- Engage with the users of mathematics
- Help to bridge the gap between those engaged in frontier mathematical research and those working in more applied areas
- Develop and deliver activities for mathematical sciences Knowledge Exchange
- KE support/impact for Isaac Newton Institute Research Programmes



The Isaac Newton Institute



A national and international visitor research institute

- Part of the UK's mathematics research infrastructure (with ICMS, Heilbronn)
- Themed programmes of 1, 4 or 6 months duration
- Programmes span the mathematical sciences broadly interpreted
- Located in Cambridge and part of the Centre for Mathematical Sciences



**International
Centre for
Mathematical
Sciences**

<https://www.icms.org.uk/>

About the ICMS



Joint venture between **Heriot-Watt** and **Edinburgh**

Stimulates and **promotes** the mathematical sciences

Offers **funding** and **support** for running events

Based in the **Bayes Centre** in Edinburgh city centre

Bespoke facilities:

Lecture theatre and seminar room

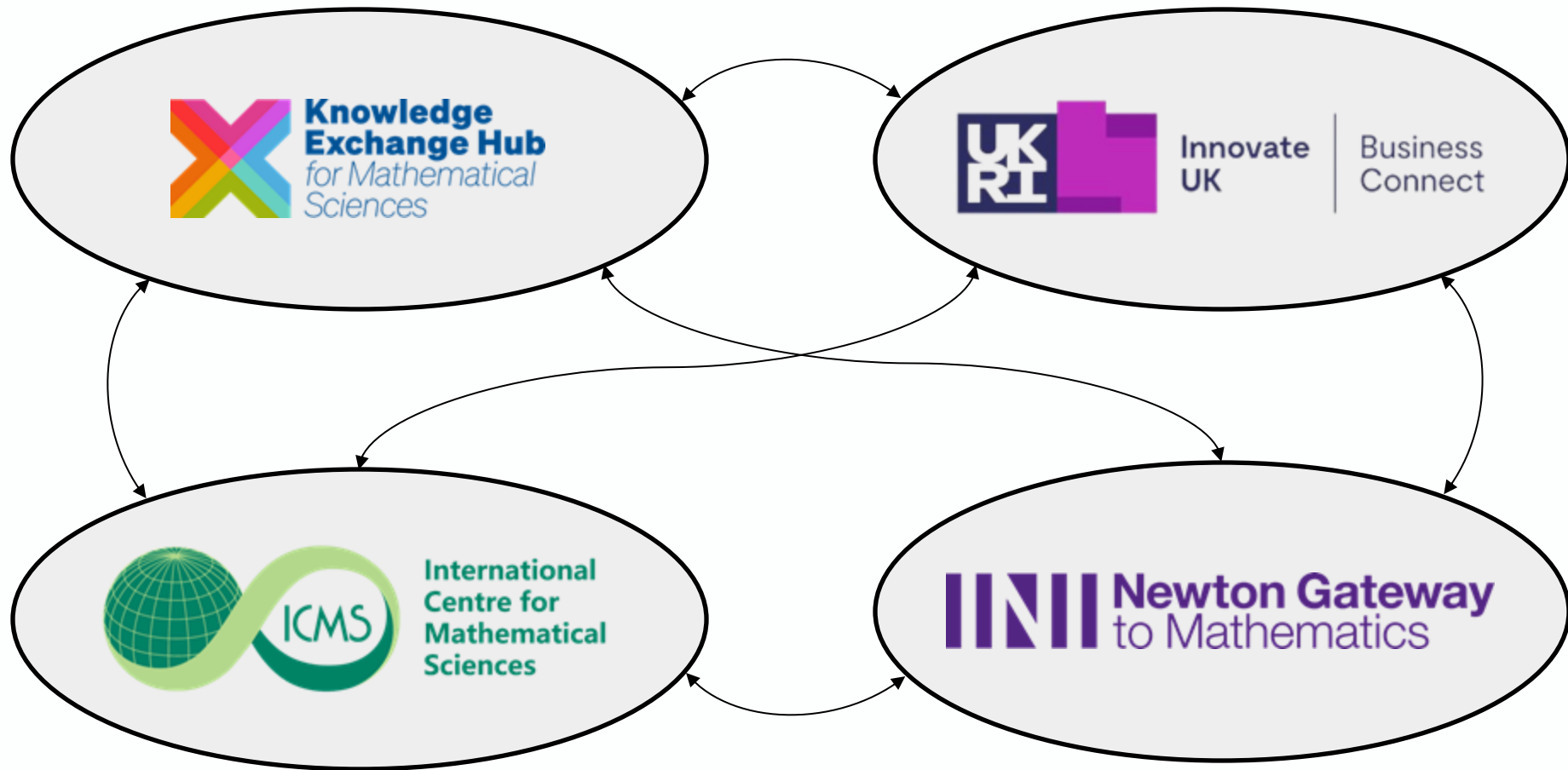
Hybrid and **recording** capabilities

Breakout space with panoramic views

Many **blackboards!**

Further space available at **14 India Street** with additional space coming soon in **Edinburgh Futures Institute**





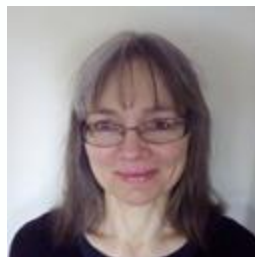
We all work together – talk to one, talk to all!

Contact us



TBD

kehub@newton.ac.uk



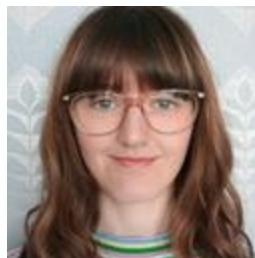
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Lauren Hyndman

Knowledge Exchange Manager
lauren.Hyndman@icms.org.uk

How to engage in Knowledge Exchange opportunities



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How to engage in Knowledge Exchange opportunities

Some mechanisms:

- Internships (MSc and PhD)
- Centres for Doctoral Training (CDTs)
- Co-sponsored PhD studentships
- Knowledge Transfer Partnerships (KTPs)
- Joint grant applications
- Contract research
- Consultancy
- Study groups

How to engage in Knowledge Exchange opportunities

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- **Study groups**



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Study groups and modelling camps

Study groups are multi-day workshops

- Industry representatives present challenges
- Academics form team to develop solutions
- Each team presents their progress

Modelling camps

- Similar format to study groups
- Training exercise for students
- Every year:
INI UK Graduate Modelling Camp
ICMS Modelling Camp

European Study Groups with Industry (ESGI)

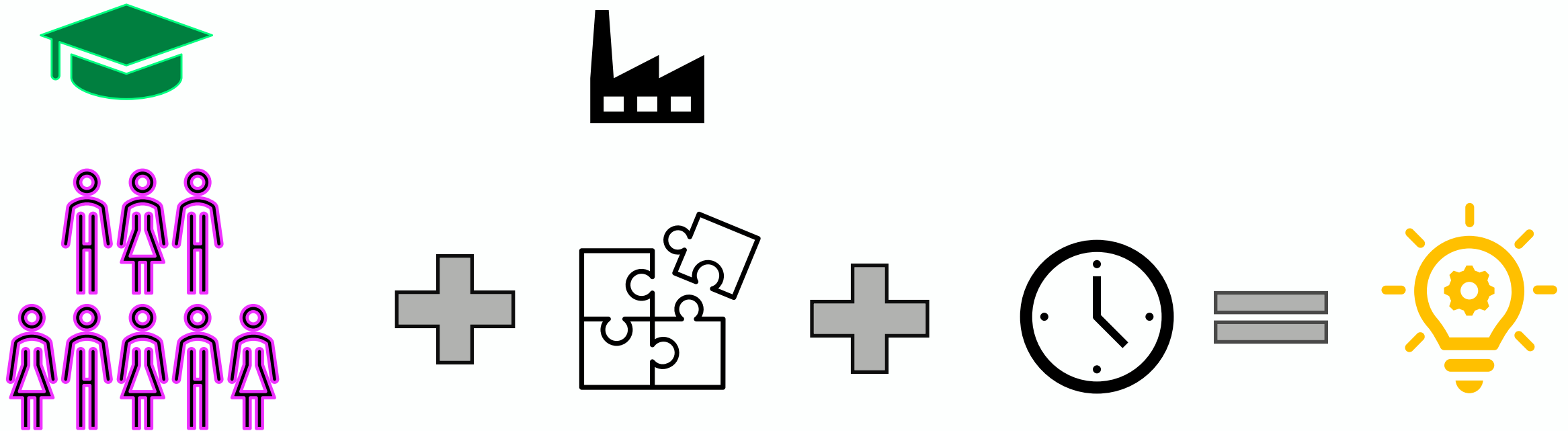
- Held several times a year all across Europe
- One annual UK ESGI
- This year: **ESGI 187 Bristol, 14th to 18th July**



HOW to engage in Knowledge Exchange

STUDY GROUPS

What are study groups?



“...a unique method of facilitating consultancy and academic interaction that provides benefits lasting many years after the study group.”

Anonymous Study Group Feedback (2019)

<https://cdn.ima.org.uk/wp/wp-content/uploads/2019/12/Study-Groups-with-Industry-from-MT-Dec19.pdf>



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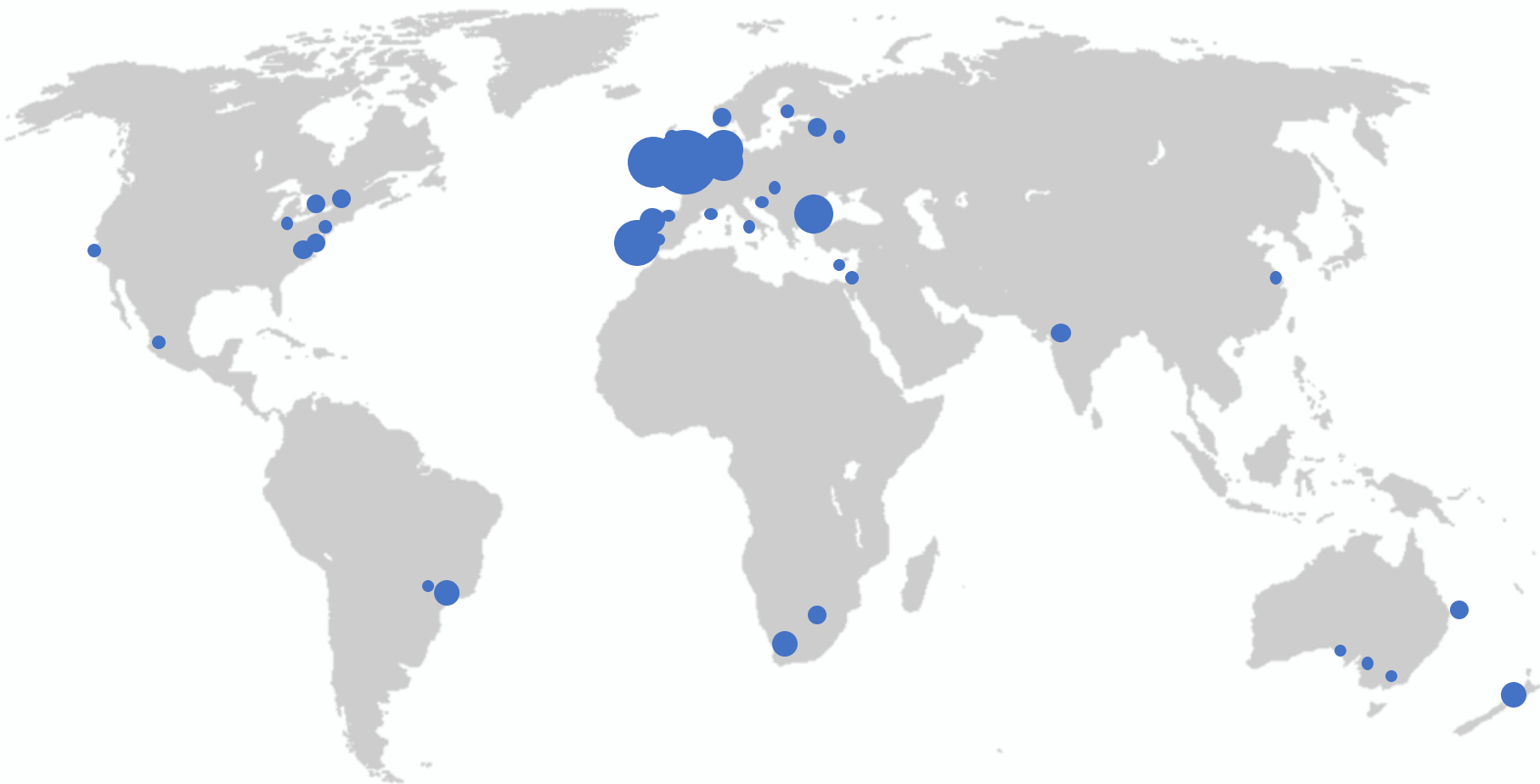
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Origins of Study Groups

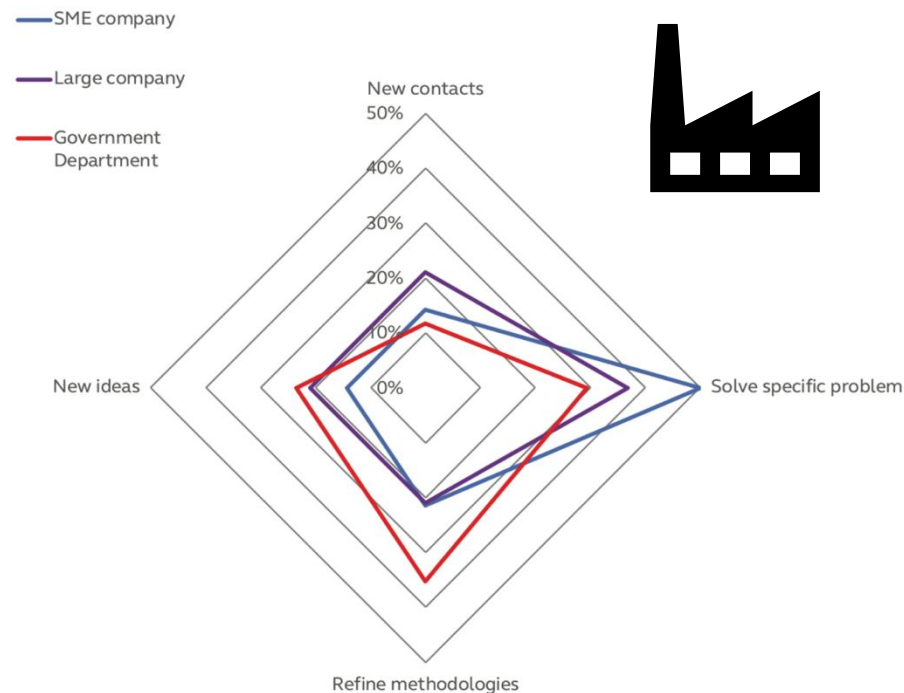
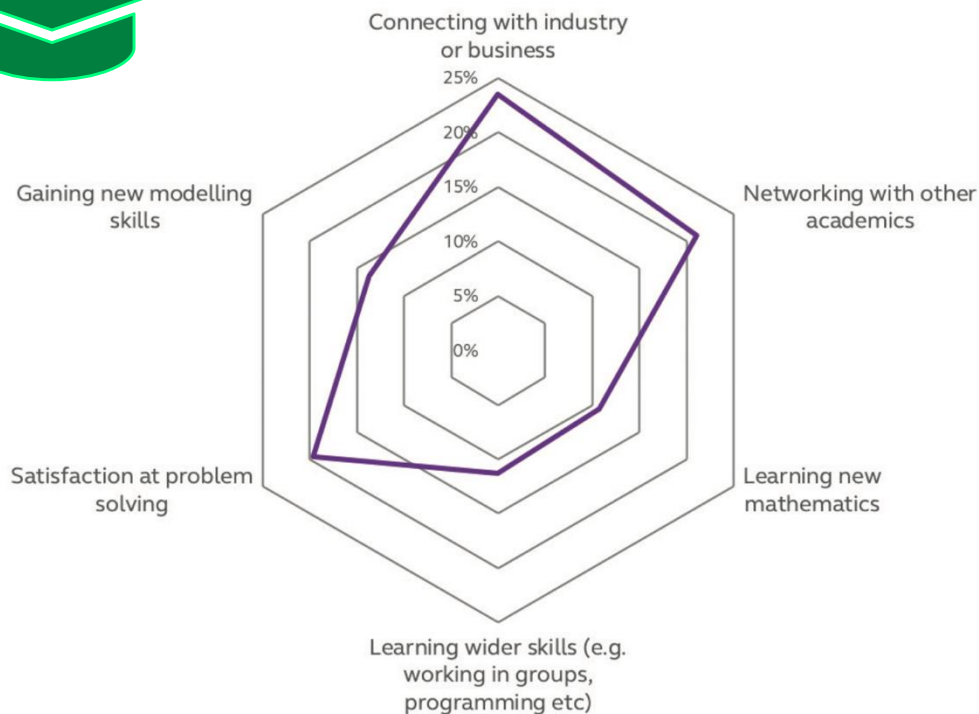
First Mathematics Study Group with Industry: Oxford, 1968

- Mr Herne from the **National Coal Board**, Harrow, came to discuss the problem of the analysis of moving granular material and, in particular, the **motion of large quantities of coal** in a bunker.
- Dr Huggill, from **ICI Wilmslow**, had a problem concerning the **injection moulding of a circular disc of plastic**.
- Mr Paull, from **Rolls Royce** Bristol, was concerned with **viscous flows** in situations such as internal flows where standard boundary layer computations were inappropriate.
- Mr Brereton from **CEGB, Computing Branch** had a problem concerning the **dynamics of steam generation in a nuclear-fired once-through boiler**.
- Mr Cardwell from **British Railways**, Derby was concerned with the **dynamic behaviour of a current collection system** for all electric locomotive.

Global Spread



Why attend Study Groups?



1. Discovering new problems and research areas with practical applications.
2. The possibility of further projects and collaboration with industry.
3. The opportunity for future funding.

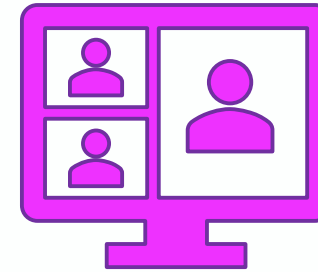
1. The possibility of a quick solution to their problem, or at least guidance on a way forward.
2. Mathematicians can help to identify and correctly formulate a problem for further study.
3. Access to state-of-the-art techniques.
4. Building contacts with top researchers in a given field

Study Group Formats



In-person European SG with Industry (ESGI)

Companies pay to present their challenge
(and/or receive subsidies to attend)



Virtual Study Groups (VSGs)

Big Society Challenges



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- One annual UK ESGI
- This year: **ESGI 187 Bristol, 14th to 18th July**



European Study Group with Industry (ESGI)



<https://sites.google.com/view/180esgi/home>

☰  180 ESGI



I didn't know much about the study group process before this week, and I have been bowled over by the experience. Working with a range of people was great. The ability to talk through ideas within the team and with other organisations helped me to see new worlds of opportunity.
Public Health Scotland

Study group provided an excellent opportunity to us to develop modelling ideas using Abagold data. This also provided an excellent networking opportunity, to be able to explore other avenues to support Abagold. Overall, a very fulfilling experience. Abagold –Abalone Farm

European Study Group with Industry (ESGI)



<https://www.cambridge.org/engage/miir/event-details/650a051eb927619fe77215ee>

Hospitality

Working Paper

Tourism Forecasting and Environment

Ann Smith, Markus Dablander, Constantin Octavian Puiu, Brady...

39 Downloads

Biomedical & Healthcare

Working Paper

Pulsatile flow for enhanced blood filtration in dialysis

Tarek Acila, Ankush Aggarwal, Matthew Durey, Torin Fastnedge...

49 Downloads

Materials processing

Working Paper

Mathematical modelling of a silicon carbide (SiC) pilot furnace

James Andrews, Aitor Azemar, Atrayee Bhattacharya, Charlie E...

39 Downloads

Electronics

Working Paper

Solution of drift-diffusion models for Organic Light Emitting Diodes (OLEDs)

Will Clarke, Simon Urbainczyk, Gergana V. Velikova, Maxim Zys...

90 Downloads

Food and Drink

Working Paper

Microwave cooking of thin potato discs

Chris J. Budd OBE, Paulo S. Piva, Matthew D. Shirley, Robert J....

57 Downloads

Biomedical & Healthcare

Working Paper

Developing The Public Health Scotland Whole System Model: A Report

Gbeminiyi Joshua Oyedele, Jeremy Budd, Daire Byrne, Xander ...

57 Downloads



A Study Group in Data-Driven Biophysical Modelling with Industry and Clinicians

BIOREME have teamed up with [Innovate UK Business Connect](#) and [SofTMech](#) to host a study group in mathematical modelling for respiratory medicine.

We are delighted to invite participants to register for our upcoming mathematical study group. Summaries of the industry and clinical challenges can be found below and further details [here](#).

When: 17th - 21st June 2024

Where: University of Glasgow

Cost: There is no cost to participate. Lunch and refreshments are provided throughout the event. Accommodation in University of Glasgow Student Accommodation can be provided at no cost. Please indicate this on your registration form.

Deadline: 17th May 2024 (unless capacity is reached before this date).

•[Challenge 1](#): Can audio recordings be used to detect leaks and coughs during mechanical insufflation exsufflation (MI-E) treatment.

Submitted by [BREAS Medical](#)

•[Challenge 2](#): Using data collected from Structured Light Plethysmography to differentiate Breathing Pattern Disorder from normal breathing.

Submitted by Dr [Emily Fraser](#) and Mathew Bulpett, Oxford University Hospitals

•[Challenge 3](#): Searching for exhaled breath volatile biomarkers: How can we correct for environmental contamination?

Submitted by [Dr Ran Wang](#), University of Manchester

Virtual Forum for Knowledge Exchange in Mathematical Sciences (V-KEMS)



<https://www.vkemsuk.org/>

The International Centre for Mathematical Sciences (ICMS), Isaac Newton Institute (INI), Newton Gateway to Mathematics and Innovate UK Business Connect have worked with various representatives from the mathematical sciences community to develop a Virtual Forum for Knowledge Exchange in the Mathematical Sciences (V-KEMS).

The main aim is to:

identify a range of virtual approaches that will **help address BIG SOCIETAL challenges** from business and industry, the third sector, and other groups outside academia.

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3 *Virtual Study
Groups (VSGs)
per year

3 days per VSG

3 challenges per
VSG

Applying Maths and AI to the Judicial System



Maths For Justice Virtual Study Group



Themes

1. **Modelling** throughput through the justice system (associated papers: [Abstract](#))
2. **Statistical** study of possible bias in jury selection/sentencing (data gaps) (associated papers: [Abstract](#), [Paper](#), [Sentencing questions](#) and [Theft MCSS](#))
3. **The role of AI** in the justice system; opportunities, dangers and ethics (associated papers: [Abstract](#))

Applying Maths to reduce Food Waste



Food Security – Virtual Study Group

Food Waste

- Reducing the carbon footprint of food waste.
- Minimising food waste.



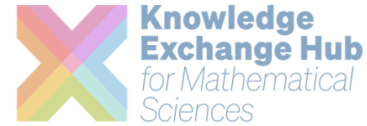
Aims and Objectives:

to bring those working in mathematical sciences and mathematical modelling, agriculture, healthcare and other disciplines together to solve crucial challenges in food security.

Zero Waste Scotland

The challenge focused **on estimating food waste produced by the public sector.** Before we can tackle food waste, we need to understand how much is being generated and by who. Our understanding of food waste from the public sector and hospitality is based on outdated and unrepresentative data.

Can we use publicly available data sets about the size and composition of the public and hospitality sectors to build bottom-up estimates of food waste to inform where to focus our efforts to reduce food waste?



Virtual Study Group -*The Future of the High Street*

Scottish City Centre Recovery-

This virtual study group will focus on three broad challenges to explore the development and regeneration of city centres.



Virtual Forum for Knowledge Exchange
in Mathematical Sciences V-KEMS

V-KEMS is a joint initiative involving all 4 organisations and academics from the mathematical sciences community

We deliver **virtual study groups** to address challenges from outside of academia themed around societal issues



Water Sector meets Maths
4th to 6th March (TBC)

Subscribe to V-KEMS mailing list:

<https://www.jiscmail.ac.uk/cgi-bin/webadmin?SUBED1=VKEMS&A=1>



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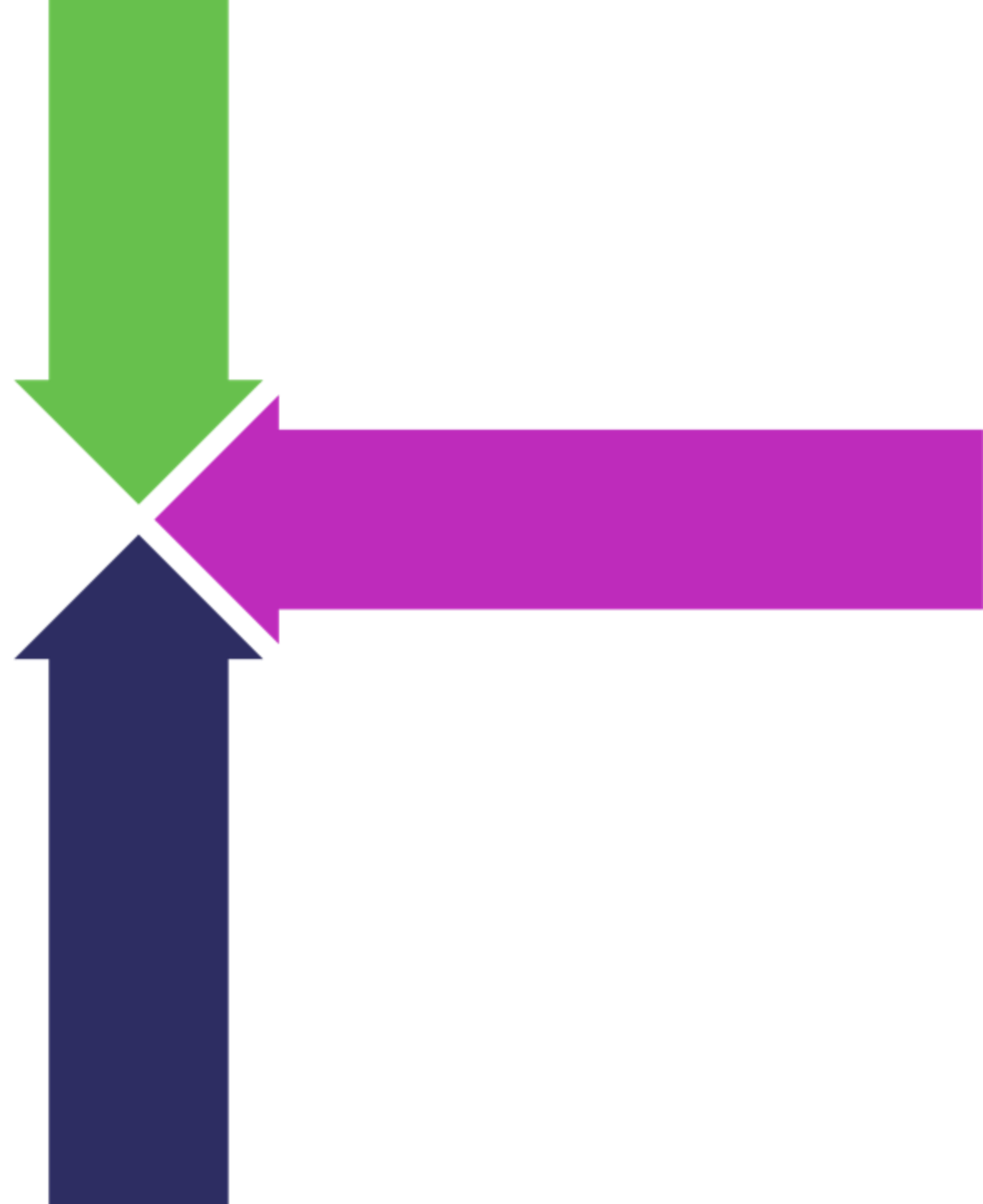
INI Newton Gateway
to Mathematics



International
Centre for
Mathematical
Sciences

Industrial Partnerships – Opportunities to collaborate with KTP

<https://iuk-ktp.org.uk/>



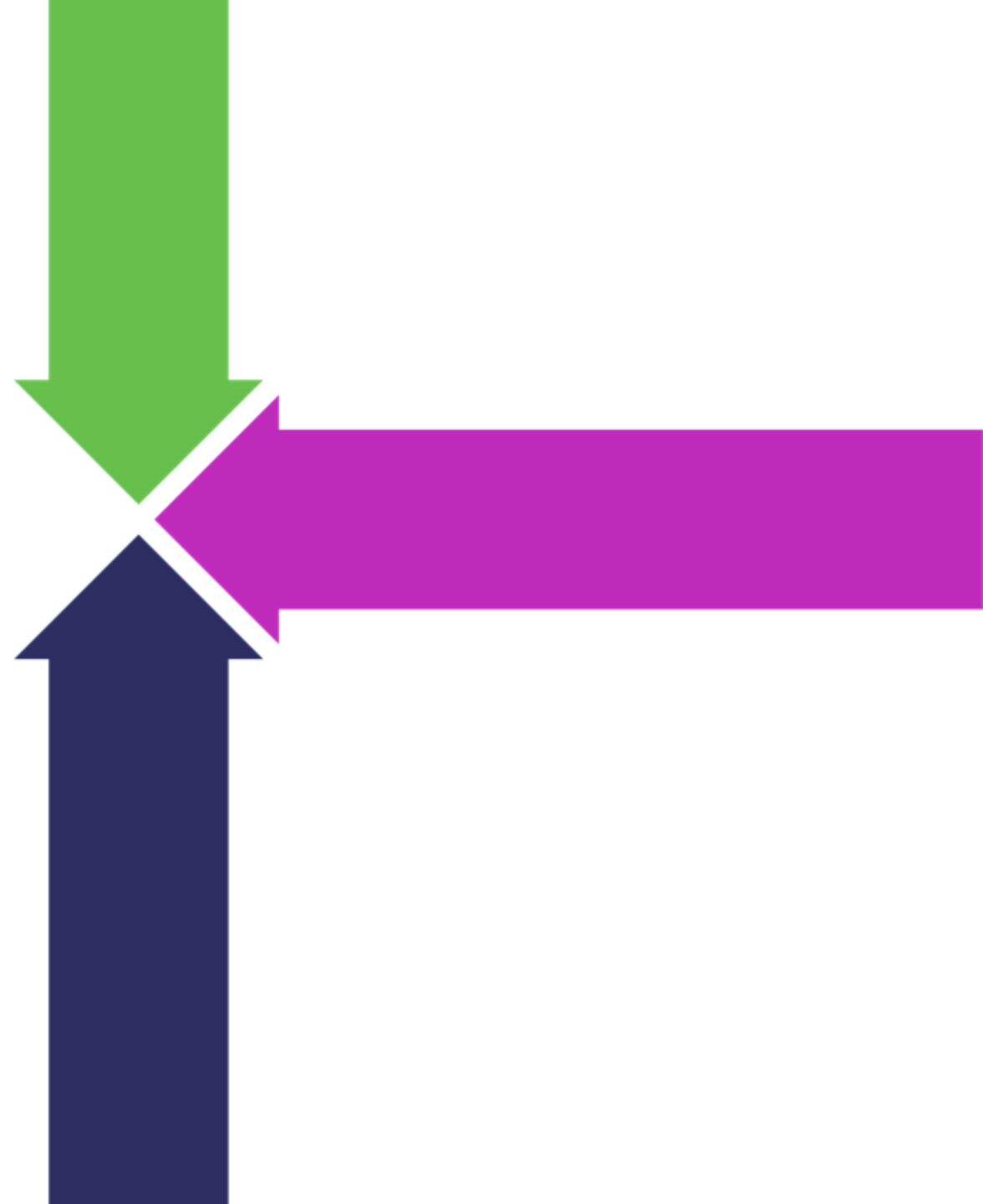
A Knowledge Transfer Partnership is:

A **three-way collaboration** that provides:

- **expertise** to innovate
- **funding** to enable
- **resource** to deliver transformational positive change

This change can be economic, societal and environmental

Managed by UK Research and Innovation, through Innovate UK and Innovate UK Business Connect



Knowledge Transfer Partnerships



<https://www.ktp-uk.org/>



A partnership between:

- A successful, growing, UK-based **Business/ not-for-profit organisation** (including social enterprises and charities) that needs specific, innovative knowledge to make further positive impact.
- A university, college, research and technology organisation or Catapult in the UK (**A knowledge base**)
- Post/graduate (**An Associate**) who transfers and embeds the knowledge

Benefits to the University

- Apply academic knowledge to solve commercial problems
- Enriches teaching
- Placement for industrial student projects (Undergrad and Post Grad)
- Source of valuable research income
- Contributes to REF / Impact
- Creates ongoing industrial collaborations through trusted partnerships
- Generates high quality journal and conference papers
- Steppingstone for early career researchers



Benefits to an Organisation (Business)

Solves a strategic commercial challenge that cannot be done 'inhouse'

Dedicated innovation team – innovation may be product, process, service or management.

Embeds new knowledge, expertise and ways of working.

Fosters a culture change.

Increases competitive advantage.

May create IP

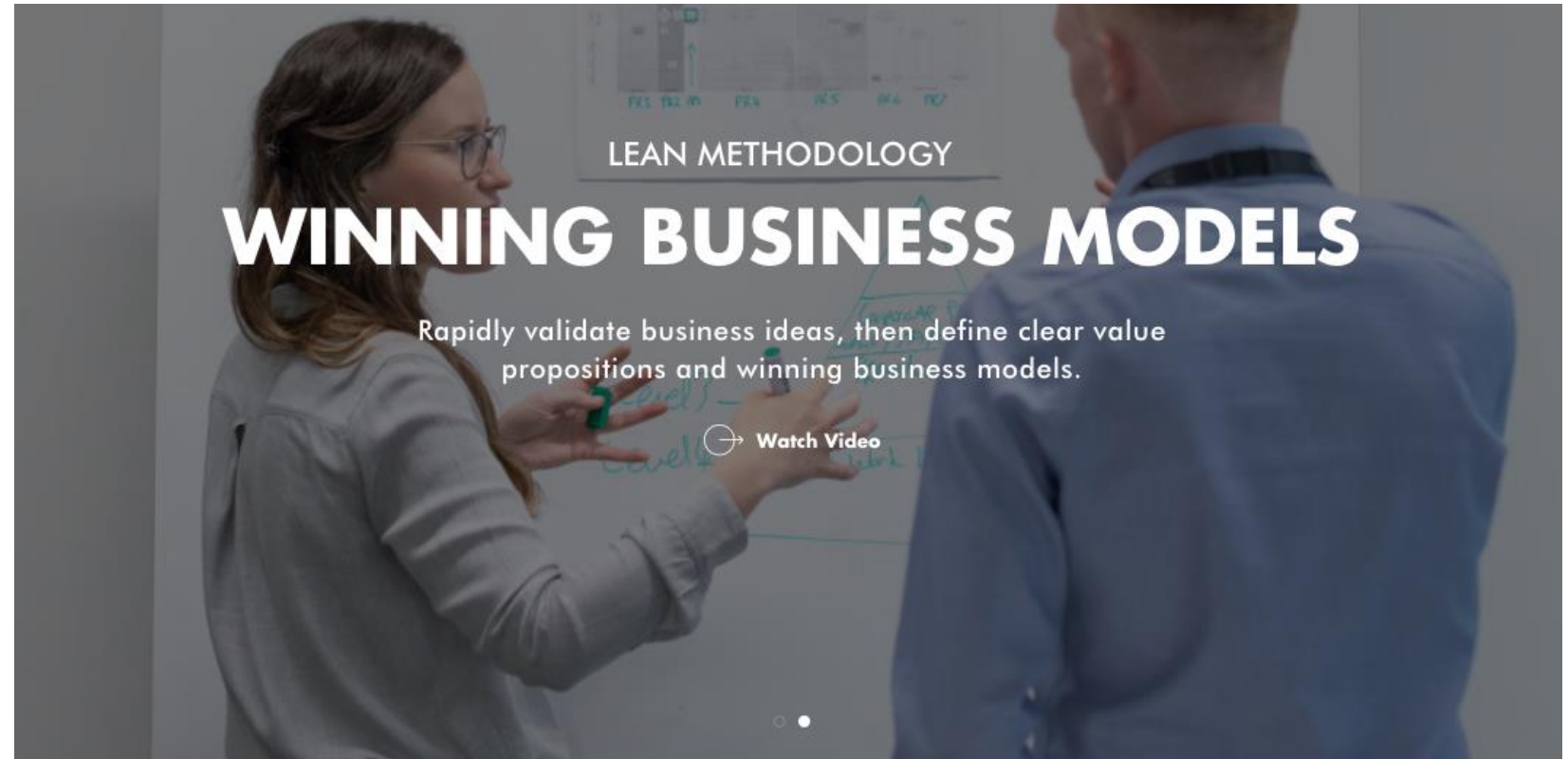
Increase revenue / net profit



iCURE Program



<https://www.icureprogramme.com/>



What is Innovate UK ICURE?

Innovate UK ICURE is a pre-accelerator programme for researchers. This programme is designed to help explore the commercial application and potential of UK research.

Within the ICURE programme, we have developed a range of funding and commercialisation training with industry experts, and this is delivered via our 4 key programmes; ICURE Engage, ICURE Discover, ICURE Explore and ICURE Exploit.



iX Challenges



<https://www.ktninnovationsexchange.co.uk/>

Alternative methods for loading & securing ISO containers



The UK Ministry of Defence (MoD), through Support Capability Strategic Command, is seeking to enhance the loading, securing, and unloading of front-loaded ISO containers using standard EURO pallets, aligning with Defence and Industry regulations. The current approach relies on manual loading and bespoke wooden dunnage, resulting in a labour-intensive and time-consuming process. Dstl invites suppliers to propose innovative methods to reduce manpower, loading times, and overall costs. Proposals should consider training needs, environmental impacts, and waste management and provide rough cost estimates. Solutions must be scalable and either currently deployable or nearing readiness for deployment. Key considerations include: - Maximum weight supported - Potential sizes of 'voids' to be filled - Speed of load securing - Product lifespan and reusability - Compliance with regulations (UK movement of dangerous good regulations) - A low training burden for a solution is required - Solutions should be low-cost and can be disposable or reusable Promising solutions will be invited to demonstrate their products at a showcase event. Context of the challenge Currently, MoD cannot meet the capability targets for the efficient movement of energetic materials to operational global locations at speed. There is a need to do this faster and with fewer people. Making the systems more efficient and cost-effective with a desire to scale at orders of magnitude. Key Information Competition opens 12th December 2024 Competition closes 30th January 2025

23 days
remaining



SELECT CHALLENGE

Super-app for Education and Career Development in Creative Industries



Building on their success in Ukraine, the CASES team aims to establish a collaborative educational ecosystem in the UK. The team is seeking industry partners with which to scale their product and facilitate UK market adaptation and adoption.

35 days
remaining



SELECT CHALLENGE

Cyber Security Adoption

What are the benefits of engaging in Knowledge Exchange?

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- Development of communication skills
- Inspires generation of new ideas
- Access to data, equipment and funding
- Chance to address 'real world' problems



Innovate
UK

Business
Connect

What are the benefits of engaging in Knowledge Exchange?

- Development of communication skills
- Inspires generation of new ideas
- Access to data, equipment and funding
- Chance to address 'real world' problems
- Increases research impact
- Strengthens academic profile
- Industry experience benefits future careers
- Opportunity to make a difference



Innovate
UK

Business
Connect



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Thank you

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