

Knowledge Exchange in Mathematical Sciences

Retreat for Women in Applied Mathematics 2026

Activity: Paired discussion

In pairs, take a few minutes to discuss what comes to mind when you hear the phrase "knowledge exchange"

Knowledge Exchange (KE)
is the ways in which
mathematical ideas, tools and expertise
move between
people, disciplines, sectors and society
and how that exchange shapes
research, practice and impact

Benefits to academia

- Access to data and equipment
- Chance to address live challenges
- Increases impact of research
- Strengthens academic profile
- Inspires generation of new ideas
- Gain industrial experience

Benefits to partners

- Access to wider knowledge base
- Cutting edge ideas and expertise
- In-depth research conducted
- Exposed to different approaches
- Inspires company research staff
- Recruitment opportunity

Introduction



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Knowledge Exchange Manager
International Centre for Mathematical Sciences



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Knowledge Transfer Manager – Mathematical Sciences
Innovate UK Business Connect

This session aims to:

- Introduce the concept of Knowledge Exchange
- Explore together what KE means in various contexts
- Understand the importance of KE
- Inform where KE opportunities can be found
- Allay any fears/misconceptions around KE

Examples of KE

Pre-postdoc level



Internships (e.g., MSc and PhD)
Centres for Doctoral Training (CDTs)
Co-sponsored PhD studentships
Study groups

Collaborations with colleagues:

- same department/discipline
- across departments/institutions/disciplines

Joint grant applications

Knowledge Transfer Partnerships (KTPs)

Funding application calls of Innovate UK

Contract research

Consultancy

Study groups

Collaborations with colleagues:

- same department/discipline
- across departments/institutions/disciplines



Postdoc level and beyond

Activity: Menti 1

The first of two Mentis explores your thoughts, feelings and experiences of KE including any challenges and or barriers you may have faced.

Please go to <https://www.menti.com/al8cobxctw4z>

and insert code **1747 6362** at the prompt,

or use the QR code →



Activity: Breakout groups

In groups, read a case study and produce a 1-minute summary for different audiences

Peer

What did you contribute mathematically?

Cares about: rigour, novelty, contribution

Emphasise: mathematical idea/technique, what is new, how it connects to existing research, limitations/open questions

De-emphasise: oversimplified motivation or impact claims

B.I.G. Partner

How could this help us?

Cares about: usefulness, risk, implementation

Emphasise: problem solved, decision improved, practical benefits, what is required to apply the results, evidence it works

De-emphasise: generalisation unless it supports robustness or scalability

Funder

Why was/is this worth funding?

Cares about: value, outcomes, impact

Emphasise: why problem matters, what improved, evidence of success, follow-on opportunities, alignment with priorities

De-emphasise: technical detail unless it supports novelty or feasibility

General public

Why should I care and can I understand it?

Cares about: relevance, clarity, meaning

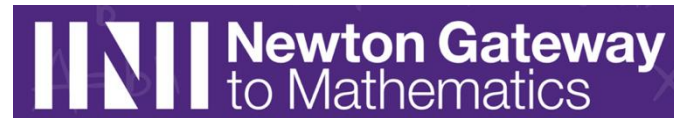
Emphasise: real-world story, concrete example or analogy, why it affects people, what it reveals/predicts/changes

De-emphasise: jargon, notation, technical detail

KE landscape and opportunities

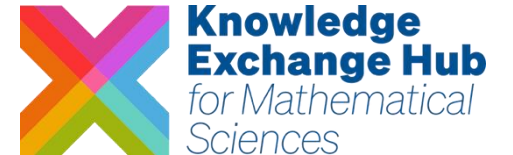
Please note that on the following pages the logos are active links as is BLUE UNDERLINED TEXT

The KE infrastructure



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UK

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European Study Groups with Industry

Virtual Forum for Knowledge Exchange in Mathematical Sciences

Mathematics-Driven Innovation Centre

KE event fund – next deadline: 2 Mar 26

For workshops that **bring together** academics and external partners

No prescribed format but should aim to maximise **downstream action**

Should involve **active** participation, **interactive** discussion and **collaborative** sessions

Goal is for events to create/sustain **relationships** and catalyse **future activity**

KE follow-on fund - open call

For activities aiming to **maximise impact** and **enhance output** of ICMS KE events

For example: follow up meetings, travel support for site visits, very short scoping projects



Annual week-long **training workshop** for PhD students to **tackle live challenges** presented by external partners

Format:

- Mon Challenges presented by external partners, students put into groups, group work begins
- Tue – Thu Group work with guidance from academic mentor, short updates presented at end of day
- Fri Final presentations

Students gain experience by **actively engaging** in KE

Valuable for **developing skills** in teamwork, communication, coping outside comfort zones, delivering presentations

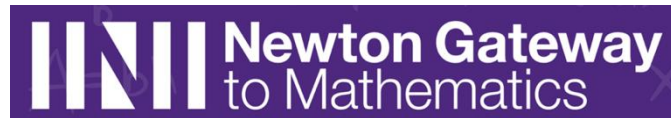
Registration now open for next modelling camp in Apr 26!

Deadline: 6 Feb 26



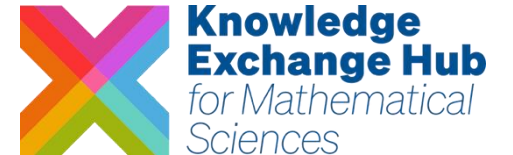
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Impact initiative of the INI

Develop and **deliver** activities for mathematical sciences knowledge exchange

Open for Business

Events that bring in industrial, commercial and government organisations

Organised in conjunction with INI research programmes

Can also be standalone events

Mathsci-comm

Network for people who communicate mathematics to non-expert audiences

Next event on 29 Jan: *“Listening and responding to public interest”*

Isaac Newton Institute:

Visitor research centre in Cambridge

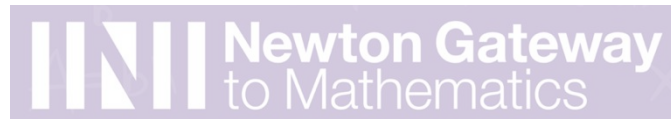
Sister organisation to ICMS

1, 4, 6 month research programmes



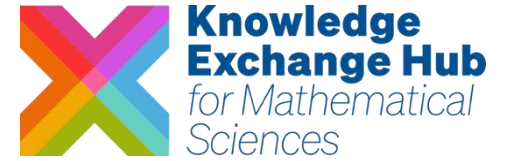
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Main service is **providing contacts** and **facilitating connections**

Primarily business-focussed but there are **funding opportunities** for academics

Knowledge Transfer Partnerships

3-way collaboration between business, academic and associate

Associates embedded in company and supervised by academic

Projects last 12-36 months

Supported by Knowledge Transfer Advisor

Innovation Exchange

Businesses submit challenges

Open call for ‘innovators’ to submit solutions

Not for new research

Applying **existing expertise** to meet business need

ICURe

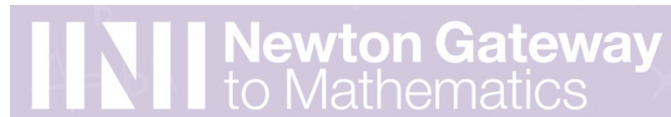
Innovation-to-**Commercialisation** of **University Research**

Helps researchers test if their idea could become a **spin-out** company

Provides **support** and **training** on aspects of commercialisation like licensing, market potential...

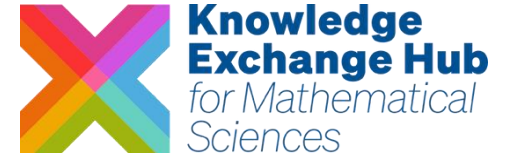
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About the KE Hub

Set up in response to review that identified need for *“a national centre in impactful mathematics for the UK”*

Key info:

Set-up phase funded by INI

Officially launched in 2023

EPSRC grant funding secured

New host institution will be Bristol

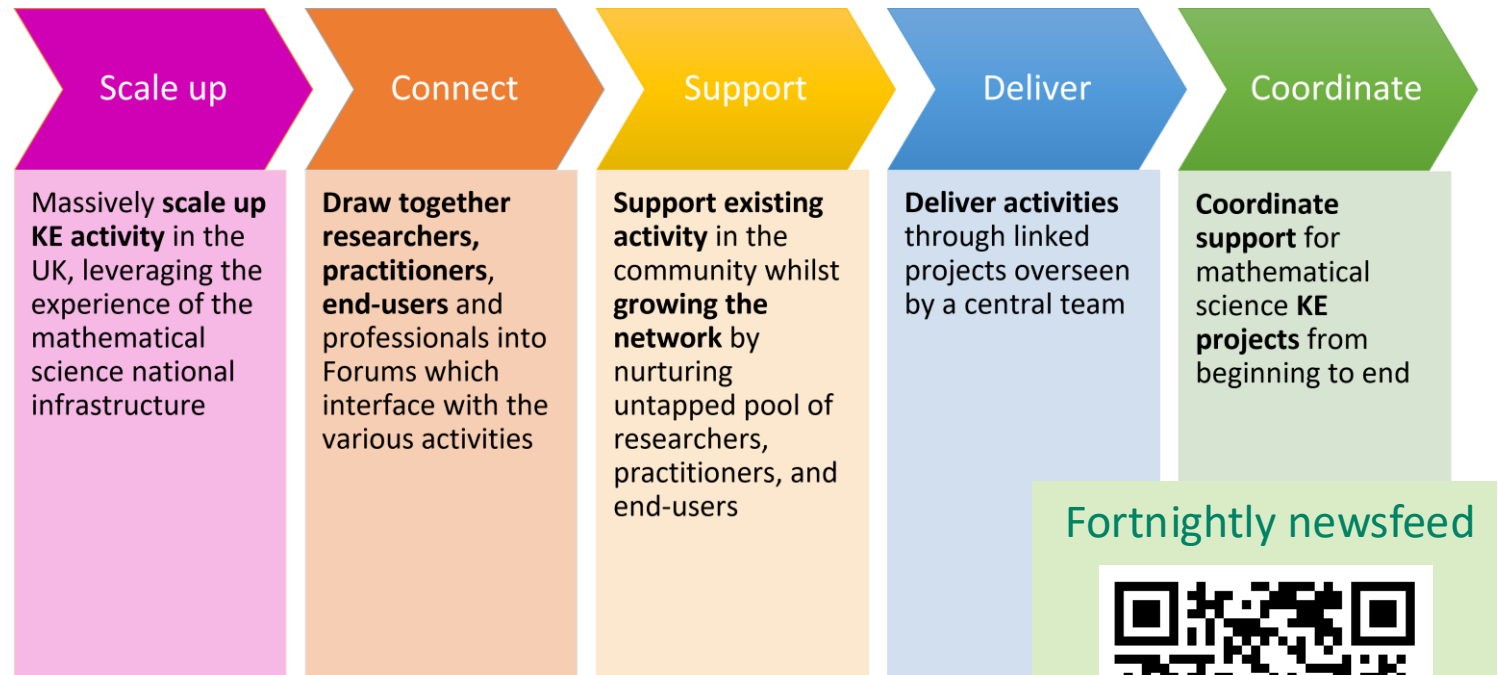
Established 3 networks:

KE Champions

KE Professionals

B.I.G. Partners

Most events take place **online** with annual in-person meeting to bring networks together



Fortnightly newsfeed



Working Groups

Long-term collaborations (min 2 years) focused on a specific mathematical technique or theme relevant to business, industry or government.

Goal to build lasting relationships, explore applied challenges and create opportunities for collaborative projects and recruitment.

Annual call, multiple deadlines

Training Courses re KE

Approximately monthly

Diverse and engaging on a wide range of mathematical subjects led by experts in their field.

Join the mailing list:

<https://www.kehubmaths.co.uk/newsfeed-sign-up-consent/>

Sandpits

2-day horizon scanning workshops for academics and B.I.G. to tackle shared challenge

For identifying major mathematical challenges and pathways to large-scale funding proposals

Next deadline: 23 Jan

Triage Workshops

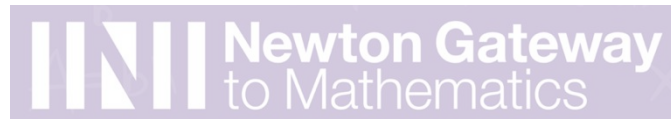
Fortnightly 1.5 hour sessions for scoping out a challenge presented by a B.I.G. Partner

Short Projects

12-week projects to address challenges from B.I.G. Partners brokered by KE Hub

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Study groups are week-long workshops with similar format to modelling camps, except:

Attended by **all career stages**

Participants can **choose** which challenge to work on and **move freely** between them

No mentors – each group nominates a **facilitator** who keeps track of everything

External partners **pay** to present challenges

ESGI started in Oxford in 1960s and spread throughout Europe

Several per year across different countries with **1 hosted annually in the UK**

KE Hub manage **ESGI steering committee** who select future hosts, share best practice, oversee each event

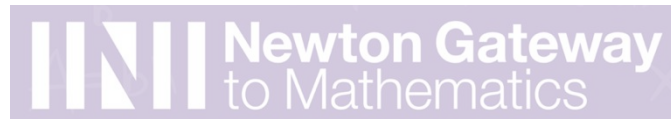
Get involved:

Take part in the next ESGI, apply to host, join steering committee

2023	Edinburgh
2024	Birmingham
2025	Bristol
2026	Exeter

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Virtual Forum for KE in Mathematical Sciences

Partnership between KE infrastructure and academic members of community

Set up in 2020 in response to pandemic when events had to be moved **online**

Virtual format is **flexible** and remains popular

V-KEMS continues to run around 3 **virtual study groups** per year

Typically **3 days** long

Topics related to **societal issues**

Tend to be more for **scoping** than problem solving

Get involved:

Take part in the next VSG, volunteer to organise future VSGs or propose topics, [sign up to mailing list](#)

Recent VSGs

Maths for Justice

Food Security

Future of the High Street

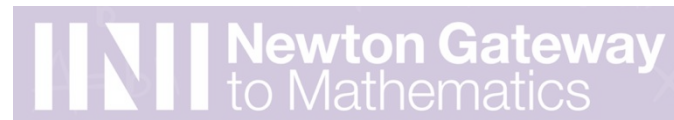
The Water Sector

Archaeology and Museum Collections

Higher Education Funding

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M-DICE set up by **Heriot-Watt** last year and officially launched in December

Local hub to connect external partners with mathematical expertise at the university

Similar centres already exist at **Bath** (IMI) and **Warwick** (CAMaCS)

Employ **PDRAs 'for hire'** (known as INEs, MIRAs or InRAs)



Mathematical Innovators in the Digital Space

Bath, Warwick, Belfast and KE Hub awarded NetworkPlus funding

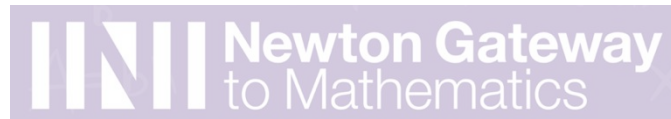
Get involved: [Flexible fund](#) where universities can apply for support to develop InRA capacity

Aim is to build nationwide network and expand as another career path for PDRAs



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Activity: Menti 2

The second of two Mentis explores how you feel about KE and any actions you might take in the next few months

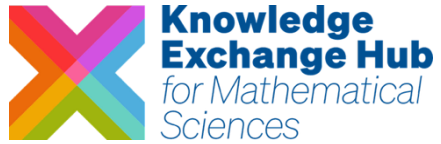
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