European Study Groups with Industry (ESGI), established in the UK in the 1960s, is a flagship mathematics conference series connecting industry professionals with academic mathematical scientists. Each ESGI is a 5-day meeting open to all. At the start of the event industry partners present unsolved challenges to participants, who then form teams to work in equal partnership with the industry representatives over the 5 days, in an inclusive, IP- and NDA-free environment. There are regular check-in times for different groups to connect, discuss their progress, gain new insights and bring in fresh expertise. This mechanism is a unique, proved and tested method, facilitating consultancy and academic interactions with industry professionals.

For ESGI 195, due to take place 20–24 July 2026 in Exeter, we have secured a challenge on the Schoof–Elkies–Atkin (SEA) algorithms for counting points on elliptic curves from Kestrel Institute (a non-profit organisation), have garnered interest from the Donkey Sanctuary (a local charitable organisation), and are reaching out to Chessable (on a data driven gender-related research challenge), as well as the Eden project and the Met Office (on climate related challenges). We expect 8 industry partners who will each contribute at least one challenge and ~80 academic mathematical and data scientists.

In light of ESGI's **national and international role in developing industry links**, Heilbronn Institute's long-standing commitment to *advancing knowledge exchange between academia and external partners*, and the recommendation of the 2018 Bond review that *resources for workshops with industry should be broadened and increased,* we are applying to the Heilbronn Institute for £9,976 (including 1,000 for caring costs) to fund 8 ECRs (PhDs, postdoctoral and HIMR fellows, and new lecturers), with at least 4 from underrepresented communities, to attend ESGI 195.

Several mathematicians, for instance, Ashwin, Breward, Dyson, Chamberlain, Champney, Haughton, Holland, Economou, Spill, and Stephenson, who have vast experience in knowledge transfer from academic research to industry applications, will be invited, ensuring presence of high-quality mentorship.

We will promote ESGI 195 via a range of channels, for instance, the LMS Newsletter, STEM initiatives supporting underrepresented communities (the LGBTQ+ STEM project and the STEM Diversity Officers network), national and local organisations/networks (the Academy for the Mathematical Sciences, the GW4 alliance and the KE Hub), and via professional social media platforms such as LinkedIn.

ESGI 195 is expected to strongly contribute to strengthening the UK's mathematical research base by fostering innovation via collaboration on current industrial challenges. It aims to enhance and establish knowledge transfer, impact beyond academia and long-term academic–industry partnerships. It has the potential to feed into the UK government's R&D Roadmap, UKRI's 2022–2027 Research Strategy**,** and the United Nations Sustainable Development Goals, as evidenced in the 800+ peer reviewed reports from previous ESGI's published in *Mathematics in Industry Reports*, and the 2019 IMA report *Study Groups with Industry: What is the Value?*

In hosting ESGI 195, we will follow the LMS's *Code of Conduct on Creating a Positive Environment at Events* and *Environmental Policy.* Indeed, to ensure the event is accessible, we have selected a venue that offers step-free access, good lighting, and has nearby accessible restrooms. We will accommodate dietary requirements during the refreshment break, considering allergies and intolerances. To capture these, and additional accessibility needs, we will implement an inclusive registration process. Moreover, accommodation that priorities reducing energy consumption, water usage and waste generation, and which is near to the events venue, to minimise the need for daily commuting, will be used. We will also strongly encourage participants to use energy efficient modes of transport (such as walking, cycling and trains), and where flights are necessary to opt for carbon offsetting.

Specific key academic benefits of ESGI 195, particularly to ECRs, include the following.

- **Exposure to real-world problems and diverse communities:** Participants, especially ECRs, will be afforded the opportunity to work on pressing high-impact industry challenges, allowing them to build vital connections with industry partners and mathematical peers from diverse subfields at different career stages from across the UK and beyond, aligning with Heilbronn Institute's mission to *foster a diverse, collaborative and supportive environment to nurture the UK maths ecosystem and deliver high quality, impactful mathematical research,* and the LMS's 2023-2028 strategic goal *Global Community*.
- **Research innovation:** The anticipated industry problems will require participants to generate new mathematical or computational approaches/methods, extend current theories, and adapt existing frameworks. The meeting will provide tangible evidence of engagement beyond academia, helping researchers, especially ECRs, and mathematics departments demonstrate societal and economic impact – important features required in today's UKRI and European Commission funding calls.
- **Training and collaborative research environment:** The meeting will bring together mathematicians spanning pure, applied, and statistical mathematics, fostering interdisciplinary thinking and cross-pollination of ideas. Participants will gain experience in translating complex mathematical concepts into practical solutions—an increasingly valued skill. Additionally, ECRs will build transferable skills (team-based problem solving, communication, project management) in a high-intensity but supportive research setting. Hence, contributing to Heilbronn Institute's vision of *building UK mathematical capacity,* EPSRC's strategic objective of *world-class people and careers* and the Academy for the Mathematical Sciences' vision of *nurturing the people pipeline*.
- **Opportunities for publications, follow-up projects and additional funding:** Many ESGI's have led to journal articles, technical reports, PhD and MSc sponsorship and ongoing academic-industry collaborations that strengthen research portfolios. Each working group within ESGI 195 will have the opportunity to submit a scientific report to a peer-reviewed edition of the journal *Mathematics in Industry Reports*. Additionally, there are several funding calls which participants would be eligible to apply for to continue academic-industry partnerships formed during the meeting, for instance ICMS's follow-on grant, KE Hub's UK–Post-Study-Group Impact Scheme and the Royal Society's Industry Fellowship.

Examples of success stories highlighting that the above impact is possible, can be seen in Philip Aston's book *More UK Success Stories in Industrial Mathematics*, Springer (2025), and the IMA report *Study Groups with Industry: What is the Value?* (2019). The topics covered include climate, engineering, healthcare, pharmaceuticals, animal welfare, business and finance, energy and food.

Breakdown of costs requested – Total: £9,976

Caring Costs:	£1,000
Accommodation*:	£130 x (6 nights) x (8 participants) = £6,240
Subsistence* (Lunch and Dinner)	(£12 + £45) x (6 nights) x (8 participants) = £2,736

* Accommodation and subsistence rates are based on the University of Exeter Expense Policy.

Thus far, the KE Hub have offered matched funding of £10,000 and the estimated cost of the event is £55,000.