

Centre for Nature Inspired Engineering (CNIE): Open Call for “Inspiration” Grants

This is a call for “Inspiration” Grants to initiate new collaborative research projects between the UCL Centre for Nature Inspired Engineering, UK-based academic researchers, and industry.

Centre for Nature Inspired Engineering

Sustainable energy and increased energy efficiency, clean water, atom-selective and robust chemical transformations: these are some of the grand challenges requiring breakthrough solutions that are both economically and environmentally acceptable. The vision of the [Centre for Nature Inspired Engineering](#) (CNIE) – one of five “Frontier Engineering” Research Centres funded by EPSRC – is that *nature* can provide valuable guidance in finding radically different and potentially transformative solutions to these, and other, major challenges.

The Centre takes a nature-inspired engineering approach, which goes beyond mimicry or traditional “biomimetics”, that aims to *reveal underlying fundamental mechanisms in the natural world that can be applied in a broader context to solve similar problems in engineering*. Its research is organized into three [themes](#), each defined according to three ubiquitous natural mechanisms. They are: (T1) Hierarchical Transport Networks; (T2) Force Balancing; and, (T3) Dynamic Self-Organisation.

The Centre is highly interdisciplinary, and brings together [researchers](#) from a wide range of disciplines, from Chemical and Biochemical Engineering, to Materials Science, Computer Science, Architecture and Healthcare Engineering. In seeking to address practical engineering challenges, the Centre places a firm emphasis on partnership and collaboration. Researchers at the Centre are already engaged with an international network of leading academic and industrial partners.

CNIE “Inspiration” Grants

The aim of the Centre’s “Inspiration Grants” is to encourage collaboration and engagement between CNIE’s researchers, leading researchers across the UK, and industry. The wider aim is to grow the Centre’s engagement and outreach, further validate and promote nature-inspired approaches to engineering, and initiate new nature-inspired research projects tackling key industrial and environmental challenges.

Thanks to an extension of the CNIE Grant until November 2019, funding is now available to grant around 5-6 research projects (“Inspiration” Grants), each 3-9 months in duration (6 months being typical), which initiate new research collaborations in line with the vision of the Centre, and provide the basis for larger research programmes. The key requirements of the scheme are as follows:

- Projects should fully align to the [vision](#) of the Centre for Nature Inspired Engineering. For reference, a list of previously awarded 'Inspiration Grants' is available below.

List of previous Inspiration Grants
Nature-Inspired Water Management in Polymer Electrolyte Membrane (PEM) Fuel Cell
Nature-inspired Self-healing Materials from Plastic Waste
Novel Microfluidic Chemotaxis Screening Platform for High-Throughput Bacterial Viability Quantification
Nature Inspired 4D Printing for Biomedical Applications
An Applied, Engineered Oscillation Inspired by the Natural Oscillatory Behaviour of HIV
Nature-Inspired 'Synthetic Enzyme' for the Oxygen Reduction Reaction
Growth of Iron Sulphide through Electrochemical Control: Towards Exploitation of Nature's Remediator, Catalyst and Electron Transfer Mediator
Bioactive Aerogels: Development of a Remineralizing Toothpaste Material
Nature-Inspired Confined Jet-Mixers for Ionic Liquid-Liquid Extraction Applications
The Self-Organising Built Environment: Calibrating Relationships Across Scales
Robust Self-Healing Fabrics for Soft Robotic Applications
3D Printing Underwater: The Regenerative Marine Fishing Nets of Salps
Bioactive Aerogels: Preclinical Development of a Novel Bone Grafting Material
Pulsating Flow Inspired by Blood Circulation to Improve Fluid Dynamics in Flow
Modelling Hierarchical Transport Network of Rocks Using Multiscale Modelling and X-ray Tomography

- The project team should consist of at least one investigator from UCL **and** one or more investigators from another university in the UK **and/or** one or more industrial partner;
- Research collaborations are expected to be new ones and grants cannot be used to support or extend existing work;
- Projects should have a duration of 3-9 months;
- Funding is available to support a postdoctoral researcher's salary for up to 9 months, as well as to support reasonable travel & subsistence costs in support of the collaboration. Note that the Centre is unable to provide funding for items of equipment;
- All postdoctoral researchers supported should be based and employed at UCL. However, they are encouraged to spend periods of time at the project's partner institutions as part of the project;
- At the end of the projects, project teams are expected to continue their collaboration through, for example, applications to national and European funding bodies;
- **A progress report must be submitted at the project with details of any key outputs and funding secured as result of the grant;**
- Successful project teams will be expected to engage with the Centre and present their research at future CNIE events;

- The Centre must be acknowledged on all publications and outreach activities (the CNIE logo will be shared at the start of the grant);
- All awards should start within at most 2-3 months, once the grant has been awarded;
- All awards must finish by 28th November 2019.

How to apply

Applications should be submitted by a permanent academic member of staff at UCL. Applicants should submit a four-page proposal (Arial font size 11, 2cm margins all around), which outlines:

- The **title** of the proposed project;
- The **names** of the individuals, departments and institutions involved;
- The **track record** of the researchers involved;
- An **outline of the proposed project** in terms of background, aims & objectives, and programme & methodology;
- The potential short and long term social, economic and environmental **impacts** of the proposed research in terms of addressing key engineering challenges;
- **Future plans** for sustaining the collaboration beyond the period of the grant;
- A summary of the **resources requested** in terms of salary level (grade and UCL spine point) of the researcher to be employed and the travel & subsistence costs required;
- Details of any **additional financial contributions** to the project from partners or other sources (cash or in-kind).

Documents should be submitted in PDF format, by email, to cnie.admin@ucl.ac.uk.

Review process

Proposals will be reviewed by CNIE committee members and members of the Centre's Advisory Board. The following review criteria used will be used to shortlist applications:

- Fit to the remit of the Centre
- Fit to the aims of the call
- Track record of the project team
- Quality of the research, including novelty and methodology used
- Planning & resources
- Potential for impact
- Future plans

Further information

For further information about the call, please contact us at cnie.admin@ucl.ac.uk. Further information about the Centre can be found here:

<http://www.natureinspiredengineering.org.uk>