

Call for Innovation Fellowships: EPSRC Future Composites Manufacturing Research Hub

Call Type: Invitation for proposals

Closing Date: 31 August 2021 at 16:00

Related Themes: Manufacturing the Future

Summary

Applications are invited for a **postdoctoral Innovation Fellowship** funded by the EPSRC Future Composites Manufacturing Research Hub. Fellowships will be for a period of **up to two years** and are aimed at **early stage researchers** looking to take the first step towards an independent research career. Innovation Fellowships are open to **national and international researchers** and will be hosted by the most appropriate UK institutions to support the aims of the research. Fellows will benefit from access to facilities and expertise across existing Hub members.

Applicants are expected to develop a proposal at **TRL 1 to 3** to facilitate a fundamental step-change in **composites manufacturing** technology within the UK. The proposal should examine a subject area that is ambitious and high risk, identifying key challenges and research questions not currently being addressed. This can include the development of new manufacturing technologies, analytical studies to develop a fundamental understanding of state-of-the-art processes, or the development of process modelling and optimisation techniques. Proposals must focus on composites manufacturing, rather than the development of next-generation materials and address at least one of the five Hub priority areas.

Whilst fellowships are for a fixed period of up to two years, the successful candidate will be expected to generate additional funding to extend this period and expand their research.

Background

The EPSRC Future Composites Manufacturing Research Hub was launched in January 2017 and is a £10.3m investment to expand the national research effort towards delivering a step change in the production of polymer matrix composites, whilst training the next generation of composite engineers. The Hub is led by the University of Nottingham and the University of Bristol and includes 13 other Spokes: Brunel University London, the University of Cambridge, Cranfield University, the University of Edinburgh, Imperial College London, the University of Glasgow, the University of Manchester, the University of Southampton, Ulster University, the University of Bath, the University of Sheffield, the University of Warwick, and Wrexham Glyndwr University.

The Hub aims to be the national centre of excellence in fundamental research for composites manufacturing, building on the foundations of CIMComp, the previously funded EPSRC Centre for Innovative Manufacturing in Composites, which ran from 2011 to 2016.

The Hub will drive the development of automated manufacturing technologies to deliver components and structures for demanding applications, having identified five research priority areas with help from industry partners and the broader composites community:

1. High rate deposition and rapid processing technologies
2. Design for manufacture via validated simulation
3. Manufacturing for multifunctional composites and integrated structures
4. Inspection and in-process evaluation
5. Recycling and re-use

Over a seven year period, the Hub will underpin the growth potential of the composites sector, developing the underlying processing science and technology to enhance manufacturing robustness. This forms a key element in the UK's composites manufacturing R&D strategy.

Scope of the Call

Research must be novel and fundamental, addressing low TRL (1-3) problems. Applicants are invited to submit proposals that are complementary, but distinct, to the current research being conducted by the Hub. Proposals should also fit within the overall vision of the Hub and address one of the two Grand Challenges outlined above. Projects can include the development of new manufacturing technologies, analytical studies to develop a fundamental understanding of state-of-the-art processes, or the development of process modelling and optimisation techniques.

Proposals must be step-changing and disruptive in order to facilitate the aims of the Hub. Incremental developments on existing processes/technologies offering marginal improvements in productivity, cycle time, cost etc. will not be funded. Proposals should also focus on overcoming manufacturing related challenges, rather than material developments.

Proposals must also fit within one of the 5 priority areas:

1. High rate deposition and rapid processing technologies

Proposals in this area should focus on overcoming manufacturing related challenges to improve quality, reduce cost or increase rate. Key deliverables include fundamental understanding of primary drivers such as component complexity, automation limitations and optimal processing windows. Projects developing new feedstock materials or conducting extensive material test programmes will not be funded.

2. Design for manufacture via validated simulation

Proposals in this area should focus on the virtual design and development of composite structures, such as validated process simulations capable of predicting viability and arising component quality. These tools will support existing relevant processes, or enable new automated processes to be introduced with confidence.

3. Manufacturing for multifunctional composites and integrated structures

Proposals in this area should demonstrate cost-effective and reliable routes to produce multifunctional composite structures at high rate. Projects should focus on developing existing implementations beyond the laboratory scale to the structural scale, ensuring they are compatible with relevant composite fabrication techniques. Multifunctionality may include mass/ heat/ charge transport capabilities, but these must be delivered within structural configurations, such as doubly-curved surfaces, sandwich panels and plates with stiffeners.

4. Inspection and in-process evaluation

Proposals in this area should focus on developing or improving the capability to make in-process measurements to evaluate preform or component quality, enabling corrective action to be taken to reduce/eliminate rework and scrap. Projects developing inspection and NDT techniques for post-moulded or in-service components will not be funded.

5. Recycling and re-use

Proposals of interest in this area include demonstrating a manufacturing methodology with the potential to produce structural components from recyclates at industrial production rates, or reducing the amount of in-process waste by developing more efficient processes to minimise the use of virgin fibre. Projects characterising the properties of recyclates from new fibre recovery methods will not be funded.

Proposals must focus on the manufacturing of composite structures rather than the development of new materials. Nanomaterials or graphene are not considered to be within the scope of the Hub. Details of other Hub funded projects can be found at www.cimcomp.ac.uk/#research

For more information about EPSRC's portfolio and strategies, see: <https://www.epsrc.ac.uk/research/ourportfolio/>

Informal enquiries are welcome to check if proposal ideas are within scope. Please send these to: lee.harper@nottingham.ac.uk

Eligibility:

Applicants must have a PhD in a relevant subject and a strong publication record. Experience in modelling, manufacturing and performance of polymer composites or technical textiles would be a distinct advantage. This call is open to all national and international researchers through a peer review process. Applicants are expected to hold a PhD by the start date of the fellowship or have equivalent research experience. There are no eligibility rules based on years of post-doctoral experience or whether the applicant holds a permanent academic position. Consideration will also be given to applicants who have taken a non-standard career path after their primary degree. Applications are also welcomed from candidates who wish to re-establish themselves after a career break or other period of absence from active research.

Funding available:

Funding will be provided to cover 80% of the full economic cost of the postdoctoral researcher. Salaries will be set depending on experience and the chosen host organisation (typically £26,495 - £47,722). An annual research expenses grant will be provided, consisting of up to £3,000 for travel and £7,000 for project consumables per year.

Host institution:

The fellowship can be hosted at any UK-based university nominated by the applicant, providing the university is in agreement and is eligible to hold an EPSRC grant: <https://epsrc.ukri.org/funding/applicationprocess/fundingguide/eligibility/organisations/>

The host institution does not need to be an existing member of the Future Composites Manufacturing Research Hub, but the applicant must justify their choice, for example in terms of the track record of the academic supervisor and the facilities and equipment available at the chosen institution. The Hub reserves the right to change the host

institution if the applicant's choice is considered to be inappropriate for successfully delivering the programme of work.

Equipment:

Funding for purchasing new equipment is not permitted. However, access will be available to existing equipment at Hub and Spoke institutions, and charged at cost.

How to apply:

Applicants are required to specify a research project and provide a brief description of the proposed objectives and methodology, using the application form provided.

Applicants should send a detailed academic CV and a letter of support from the host institution, together with the completed application form to:

lee.harper@nottingham.ac.uk

Assessment Process:

Submissions will be reviewed by a panel of independent assessors and short-listed applicants will be invited for an interview. In order of importance, the evaluation criteria for applications will be:

1. Fit to call. Does the proposal address a step-change in composites manufacturing technology? Does the proposal address at least one of the five priority areas?
2. Impact. Is the proposal likely to result in high quality research, in the form of journal publications, patents etc.?
3. Novelty. How novel and timely is the work? Is it being addressed elsewhere?
4. Achievability. How likely is the project to succeed? Is the hypothesis plausible, is the approach credible and is the candidate appropriate for an early-career Innovation Fellowship?
5. Ambition. Does the proposal offer suitable levels of challenge, ambition and risk? High-risk, high return studies are encouraged.
6. Relevance. Is the proposal relevant to the interests of the industrial partners and the other stakeholders?
7. Planning. How well has the proposal been planned? Are the requested resources appropriate to deliver the proposed programme within the timeframe and have they been fully justified? Have risks been identified and have they been appropriately mitigated?

Key Dates:

Activity	Date
Call launched	13 July 2021
Closing date for applications	31 August 2021
Evaluation of applications by	27 October 2021
Grants announced and feedback given by	12 November 2021

**Contacts**

For more details, please contact the Hub Manager, Dr Lee Harper (lee.harper@nottingham.ac.uk). Applicants are asked to consult their university's research office ahead of submitting a proposal to this call, in order to be clear of the requirements for meeting the deadlines set out above.