Manufacturing with Light

Call type: Call for Participants

Closing date to register: 12:00 (Noon) Wednesday 24th July 2013

‘Concept Audition’ dates:  
Tuesday 30th July 2013 (Heriot-Watt)

Thursday 1st August 2013 (Nottingham)

Wednesday 7th August 2013 (Southampton)

Summary

EPSRC would like invite applicants to participate in a funding initiative to explore the potential of Manufacturing with Light.

The concept of Manufacturing with Light is to revolutionise the use of light in all forms to provide a step-change in the capability, efficiency, performance and versatility of manufacturing processes and technologies (i.e. moving beyond established techniques, for example using lasers for manufacturing, etching, cutting & measuring).

There will be up to £3M available for this call to fund a number of small, feasibility-style projects (up to £300K and 18-months duration) that help develop innovative, exciting ideas on non-traditional uses of light for manufacturing.

Given the speculative nature of the opportunity, the peer review process will consist of two separate interview stages; the first stage being a ‘concept audition’ and the second stage resembling a ‘Big-Pitch’ style of extended panel interview.

This format should encourage adventurous and innovative concepts to be developed and enhanced through the auditions and subsequent proposal development to establish a portfolio of EPSRC-funded research that underpins the impact of light in manufacturing.

Background

Light and its properties has fascinated scientists and philosophers for thousands of years particularly with the recognition, in the great years of the quantum revolution, of its dual wave-particle nature and the consequent potential of this nature. Understanding how light is generated, the way it travels and its interaction with different substances has been a subject of great interest, both for basic science and for technological applications. In particular, the manipulation of light with engineered materials forms the basis for much of the technology around us, ranging from eyeglasses to fiber-optic cables to lasers.
The speed of light also plays a special role, offering both limits and potential in many aspects of physics and engineering. The fact that light travels at different speeds in different materials helps to understand and exploit the interaction between light and matter, including the development of devices harnessing the tuning of refractive index for manipulation of optical properties. The quantised nature of light also offers huge potential in designing materials in which the control of electronic energy levels offers access to variable wavelength emission and absorption, with huge applications in sensing and control. The tools and techniques employed to explore the subtle and often surprising interplay between light and matter include lasers, low-temperature techniques (cryogenics), low-noise electronics, optics, sensor design, and nanofabrication.

Manufacturing with Light originated as a concept from the Frontier Manufacturing retreat, hosted by EPSRC's Manufacturing the Future theme in June 2011. During the retreat it was identified that there are a wide range of active topics at the frontier of modern physical and applied sciences that relate to light and there was potential to advance the exciting core science towards engineering and manufacturing to enhance and improve industrial processes in the future.

This call is particularly timely, building on a series of recently awarded major grants in this general area, including Programme and large collaborative grants as well as the EPSRC Centres for Innovative Manufacturing, offering the potential to build a portfolio of excellent EPSRC-funded science underpinning the impact of light in manufacturing.

Scope of Call

The call aims to encourage adventurous research ideas to explore how to generate, collect, manipulate, control and transmit light to transform and shape our future manufacturing industry.

Research ideas should have the potential to revolutionise production processes or develop new and profound technological applications, where a consideration of the pathway to manufacture (in the context of products, production at scale or the industrial system) is necessary.

The proposed research should endeavour to bring the physics, materials, engineering and manufacturing research communities closer together and to support the device development community.

Some examples of innovative areas that fall within the scope of the call are:

- Non-traditional uses of light in manufacturing processes and/or technologies;
- Developing new sources of light that are applicable to manufacturing;
- Manufacturing with light outside traditional spectral range;
- Innovative interactions between materials and light*1;
- Novel metrology and inspection concepts that exploit the properties and characteristics of light;
- Manufacturing with photons;
- New manufacturing technology for production of devices (that use light) *2
- Manufacturing applications of quantum physics or quantum devices
- Quantum physics or laser science for new manufacturing processes *3
• New applications that arise from wavelength-tuning of light sources (for example, biological and medical applications).

*1 Not developing metamaterials, but rather using light to enhance functionality, structure and compatibility of materials in the context of manufacturing.
*2 Not manufacturing devices that depend on light (for example, we do not want research on the manufacture of solar cells – there is already an active and well-funded research community in this area).
*3 Not just laser ‘physics’.

Funding available

EPSRC are committing up to £3M into the call to support a number of projects. These grants should focus on developing research ideas and not exceed £300K and be no longer than 18-months duration.

EPSRC will review the Manufacturing with Light portfolio after approximately 12 months from the start of the grants in order to explore the opportunity to provide further funding to extend the research in progress and enhance the impact of the initiative.

Eligibility

For information on the eligibility of organisations and individuals to receive EPSRC funding, see the EPSRC Funding Guide.

As this call is a targeted funding opportunity provided by EPSRC, higher education institutions and independent research organisations are eligible to apply, where appropriate. A list of eligible organisations to apply to EPSRC is provided at http://www.rcuk.ac.uk/research/Pages/Eligibilityforrcs.aspx

How to apply

There are two stages in the assessment process:

1 – ‘Concept Audition’

Initial ideas for potential research projects should be pitched to a panel in what will be an ‘audition-style’ environment consisting of a short 2-minute verbal pitch (without powerpoint or visual aid tools) followed by 10-minutes of questions. This audition will essentially serve as an expression of interest stage for the initiative, so is compulsory for applicants who wish to participate in the initiative. We expect only the main applicant to attend the audition.

These auditions will be hosted by three of our EPSRC Centres for Innovative Manufacturing across the UK:

• EPSRC Centre for Innovative Manufacturing in Laser-Based Production Processes (Heriot-Watt University) - Tuesday 30th July 2013
To participate, applicants should register their intent to participate and pitch at one of these concept auditions using the ‘Intention to Participate’ form. The form must be emailed by 12:00 Noon Wednesday 24th July to ManufacturingWithLight@epsrc.ac.uk.

The one-page ‘Intention to Participate’ form contains the following sections:

- Brief Statement of Concept (no more than 30 words to summarise the idea in mind);
- Applicant & Affiliation;
- Audition date & location (which audition date/location you would prefer to attend + a reserve choice)

Please note, that there are limited number of spaces for each of these auditions. Whilst we will attempt to enable all potential applicants to attend the audition day and location of choice, if demand is significant we may need to refer to the applicant’s reserve choice or operate on a first-come, first served basis.

EPSRC will confirm with all applicants who submit the Intention to Participate form the exact location and time for their audition by Friday 26th July 2013 at the latest.

At each audition, an EPSRC panel (with independent academic and industry representation) will be present to hear each pitch and question the applicants. The panel may ask about the potential for the research to impact manufacturing or explore potential methods to enhance or optimise the proposed research if the initial concept has merit. Each audition should last approximately 15 minutes (including the 2-minute applicant pitch and approximately 10 minutes for questions). The panel will short-list the applicants based on how the ideas proposed resonate with the scope of the call and the potential for the research to develop into exciting research.

EPSRC and the audition panels reserve the right to reject proposals that are substantially outside the scope of the call or wholly beyond the remit of EPSRC.

Shortlisted applicants will then be invited into the next stage, where the idea should be enhanced and developed into a research project that will be assessed at the main interview panel. During this phase, there will be the opportunity to implement any of the panel’s suggestions (which may include taking advice from ‘expert mentors’, or encouraging applicants to combine similar ideas into a single project) to enable a variety of adventurous ideas to be developed before the interview panel.

2 – Interview Panel

After the short-listing process, successful applicants will be notified and invited to submit a (short) proposal via Je-S and attend a further interview panel to
determine recommendations for funding. The proposal will need to be submitted via Je-S in Late September and the interview panel will take place at the end of October at Polaris House, Swindon. **We will send further details on this process, including firm deadlines for the J-eS submission and interview panel dates, with the invitations to submit full proposals.**

The proposal will follow the standard EPSRC proposal structure [www.epsrc.ac.uk/funding/guidance/preparing/Pages/writing.aspx](http://www.epsrc.ac.uk/funding/guidance/preparing/Pages/writing.aspx) with the exception of a shorter four-page limit on the Case for Support (which should include up to two-pages for track record of the applicant(s) and two-pages for the description of the research proposed).

The proposals will not be assessed by reviewers, but will be assessed directly by the interview panel. The panel will assess the projects on the information given in the proposal and further scientific and management criteria determined via interview which will include:

- Scientific quality and excellence
- Potential impact for manufacturing
- Creativity of approach
- Management of risks
- Cost-effectiveness and justification of the resources
- What measures have been put into place as recommended by the audition panel and/or mentors (if applicable).

Please note that EPSRC reserves the right to reject a proposal where the details are substantially different from those indicated in the audition or where there have been unsolicited changes to the project.

**Equipment**

Where possible, researchers are asked to make use of existing facilities and equipment, including those hosted at other universities. If equipment is needed as part of the research proposal, applicants must follow EPSRC’s rules for requesting equipment over £10,000 in value. Individual items of equipment up to the current OJEU (Official Journal of the European Union) procurement threshold can be included on research proposals submitted through this call, but research organisations will be expected to make a contribution to the cost. All requests for single items of equipment above the current OJEU threshold will need to go through a separate process which will assess the strategic need for the equipment and how to ensure maximum usage. These proposals will be assessed through the separate Strategic Equipment peer review process.

**Further guidance**

**Guidance for applicants**

Information for applicants preparing full proposals can be found at: [http://www.epsrc.ac.uk/funding/guidance/preparing/Pages/proposal.aspx](http://www.epsrc.ac.uk/funding/guidance/preparing/Pages/proposal.aspx)

**Peer Review**

General information about the EPSRC peer review process can be found at: [http://www.epsrc.ac.uk/funding/peerrev/Pages/peer.aspx](http://www.epsrc.ac.uk/funding/peerrev/Pages/peer.aspx)

**Additional grant conditions**

In addition to the standard terms and conditions for grants, successful applicants will be required to:
(a) have a signed collaboration agreement between HEIs in place before the grant starts.
(b) have a signed collaboration agreement with any project partner before that specific collaboration begins.

Specific grant conditions in relation to reporting, and to ensuring access to the equipment to benefit a range of research, will also apply where appropriate.

**Key dates**

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<td>Call launched on web</td>
<td>25 June 2013</td>
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<tr>
<td>Closing date for registration</td>
<td>24 July 2013</td>
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<tr>
<td>Concept Auditions held</td>
<td>30th Jul, 1st Aug, 7th Aug 2013</td>
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<td>Shortlisted applicants notified by</td>
<td>9th August 2013</td>
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<td>Call opens in J-eS</td>
<td>Mid-August 2013</td>
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<td>Deadline for completed proposals</td>
<td>Late September 2013</td>
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<td>Interview Panel</td>
<td>Late October 2013</td>
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<td>Grants Announced</td>
<td>December 2013</td>
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<td>Grants Start</td>
<td>February 2013</td>
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**Contacts**

If you have any questions about the call, please contact:

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**Change log**

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