Theme 1: Materials for Digital Devices 2024

Overview

We are excited to announce a funding opportunity for innovative research projects that explore the use of **emerging materials, or novel applications of existing materials, for digital devices**. This funding call seeks to support groundbreaking projects that integrate materials into interactive systems to transform how we design, interact with, and experience technology.

New and emerging materials will drive innovation in digital devices. However, there is currently a significant gulf between those with expertise in developing new materials and those who can deploy those materials into the design of novel interactive devices. Outside of large multi-national companies, this gulf presents an insurmountable challenge for most designers. The overarching goal of this call is to reduce the entry barrier to exploring and using emerging materials.

Funding Call Priorities

What materials or novel applications of materials are appropriate for this call?

We encourage proposals that push the boundaries of current material use by exploring **emerging materials** (those not currently in common usage) or repurposing materials not traditionally associated with digital devices. This includes materials harvested from unexpected sources or industries, adapted for interactive technology applications, such as carbon fibre, microcapsules, active polymers, conductive and active inks derived from natural sources.

The emerging material(s) could be utilised to create **new sensors, displays, actuators**, and **new form factors** that enhance functionality and interactivity within digital devices. For instance, these materials could enable the development of interactive wearable devices that respond to user gestures, shape-changing devices that adapt their form in different contexts, or haptic feedback systems that provide tactile sensations, enhancing the user's interaction experience.

We also welcome proposals that explore **sustainable versions of new materials for digital devices**, emphasising eco-friendly alternatives that reduce environmental impact through biodegradable, recyclable, or energy-efficient innovations. This call is not limited to the exploration of single materials; we encourage projects that explore **the combination of multiple materials**, leveraging their unique properties to create hybrid solutions that offer new forms of interaction and expanded design possibilities.

Note that we do not necessarily expect the development of materials within these projects, instead we are keen to see the application and dissemination of materials previously developed.

Proposals must meet the following requirements:

- The proposal must involve a **multidisciplinary team** of minimum one PI and one Co-I/partner, bringing together expertise from various fields such as materials engineering, chemistry, human-computer interaction, creative design, industry, art, or innovative technology. Collaborative teams are required, with the expectation that at least one collaborator will have expertise in the material's application domain. We strongly encourage collaborations that best suit the project's goals and demonstrate the material's potential.
- The proposals must demonstrate a commitment to respecting **health and safety regulations and addressing ethical implications** throughout the project's lifecycle. This includes ensuring safe material usage, responsible innovation, and consideration of the environmental and societal impacts of the material and its applications.
- In addition to developing and/or demonstrating innovative uses of **emerging materials, the proposal must focus on enabling broader community access to these materials**. The goal is not only to facilitate novel interactive devices but also to democratise their use, making them accessible to researchers, designers, and developers. This must be achieved by addressing at least one of the following challenges, though proposals may incorporate multiple challenges as appropriate.

Challenge 1

Processes for Integrating Emerging Materials or Novel Applications of Materials into Digital Devices

Demonstrate how the material(s) can be incorporated into digital devices or combined with other materials to create functional, interactive systems. For example, this could be done by seamlessly connecting the emerging material with electronic components, complementary materials, and/or existing applications.

Challenge 2

Design Tools that Support Application Development with Emerging Material(s) or Novel Applications of Materials

Proposals would provide **comprehensive support for emerging material integration into the design process**. For example, this could be done through an innovative software tool that enables users to integrate the new materials into existing design processes for creating new uses and new applications (e.g. integration within a Computer Aided Design software tool).

Challenge 3

Processes for Scaling up Production of Devices using Emerging Material(s) or Novel Applications of Materials

Establishing a pipeline for **fabrication at scale**, such as through specialised machinery or lab setups that allow for larger-scale production. For example, modifying **existing fabrication**

equipment to accommodate new materials, or by **proposing an end-to-end method** that enables others to replicate the fabrication process.

Challenge 4

Produce Tools/Toolkits, Techniques, and Supporting Media/Documentation that Enable Non-Experts to Use Emerging Materials or Apply Materials in New Ways.

Creating accessible channels for sharing knowledge and tools is essential for fostering community involvement and knowledge transfer. This could include developing **tutorials** for working with the emerging material; offering **open-source kits** to enable others to experiment easily or; organising **hands-on workshops** to provide training on the material's use and encouraging collaboration.

Projects we would particularly like to fund

While we are keen to see any projects that address the above criteria, we are particularly keen to see proposals in the following areas:

- Toolkits that enable non-expert device designers to engage with specialist emerging materials without requiring expert knowledge (for example, functional materials, carbon fibre, etc). What would be the equivalent of the Arduino for materials?
- 3D printers and fabrication machines that go beyond filament extrusion, e.g. fabrication with sprayed active materials or liquids. Or this could be a new type of equipment that enables multi-material usage.
- Sustainable versions of active material (e.g. bio-compatible or bio-degradable conductive ink) to be used in interactive devices.

To apply, please submit your funding application form and partner letter(s) of support to admin@prosquared.org.

Materials for Digital Devices	
Maximum award	£80,000
Opening date	30th October 2024
Closing date	4th December 2024 by midnight GMT
Download	Application Form

Funding timeline

- Q&A webinar – 11th November 2024
- Application deadline – 4th December 2024
- Interviews – late January 2025
- Project start – April 2024

Guidance for Applicants

Funding Available

Each project is expected to last between 6 and 12 months and must not exceed 12 months. The total funding for this call is £300,000 (100% full economic cost), of which 80% will be funded by pro^2. The maximum amount available for each project is £80,000 (representing 80% FEC). All costs should be inclusive of VAT and/or any other applicable tax. The terms and conditions for UKRI funding apply, and can be found here. Applicants must demonstrate in the application form how the funding will be spent.

Proposals should be costed and approved by the applicant's organisation before submission. In addition, please ensure that the terms of the sub-award agreement are accepted by the applicant's organisation prior to submission. A copy of the sub-agreement can be found here.

Applicant Criteria and Descriptions

Each project must include at least one Principal Investigator (PI) and one Co-I/partner. The project team can also include staff (e.g. project managers, project administrators etc.). Please note, industry-based project partners are not eligible to receive funding and in fact, we encourage them to top-up the funding available where possible. Eligibility for the roles listed above are in line with EPSRC rules, which can be found here.

Assessment Process

Applications for funding will be assessed via an application form which you can download here and a short interview. Applications will be anonymised and assigned a unique reference number for the review process, to help eliminate unconscious bias. The criteria used in the assessment process is as follows:

- Applicability to the theme of the funding call.
- Realistic and achievable objectives and workplan.
- Clear demonstration of how the project addresses one or more of the challenges.
- Does the project include a collaborative partner? Evidence of project co-creation with them must be clear in the application.
- Adequate consideration of EDI (Equity, Diversity and Inclusivity). Bringing together individuals from different backgrounds and with different personal circumstances brings a wider range of experience, leading to improved decision-making, innovation and problem solving. We would like to see how EDI has been considered in the project from recruitment through to project outputs.
- Adequate consideration of sustainability. Environmental damage from the production and inappropriate disposal of electronics waste (e-waste) is an increasing problem1. We

would like to see how sustainability has been considered in the project, from sourcing components to the impact of your output on the environment.
- Novelty.
- Likely impact of the work and potential for wider engagement.

Project Management and Reporting Expectations

Project PIs will ultimately be responsible for ensuring that projects are carried out within the agreed timescales and budget. Where the day-to-day management of the project is carried out by another project team member, they can be assigned as a point of contact for the work.

All applicants must work with our research designer from the beginning of their projects. The research designer will work with you to find innovative ways to visualise your work and communicate it to a diverse audience. We're keen to utilise interesting and accessible ways to communicate the outputs from your work, therefore we will be exploring the most appropriate way to do this and asking for your ideas in the application form. The research designer will work with you to create the agreed format for reporting your funding outcomes.

The pro^2 team are keen to stay up to date with your progress on the project and so, we will be arranging a site visit at the mid-point and end-point of the work. This is not intended to interfere with the work, but to find out how it is going and offer advice/guidance where useful.

Intellectual Property

All intellectual property (IP) belongs to the party that generated it, however grantees must ensure that IP is freely available and used for the benefit of society. Please see the sub-award agreement for more detail on intellectual property arrangements.

Contacts

If you have any questions about the funding or application criteria, please contact Sarah Hughes or Maura Lydon at admin@prosquared.org.

GDPR Statement

pro^2 handles all personal data in accordance with current U.K. data protection legislation and the EU General Data Protection Regulation (GDPR) where appropriate.

Useful Documents

Application Form

Sub-award Terms