## Interdisciplinary Research across Schools: Call for College Funding

For the academic year 2019-2020, £20,000 has been designated from College’s budget to support a culture of collaboration and interdisciplinary research across Schools. Interdisciplinary research projects and teams take time to mature and develop, and Calls from funders often have very tight deadlines. To support new interdisciplinary collaborations that are both challenge-led (responsive to external challenges) and curiosity-driven (led by academic inquiry), four or five clusters of academics from at least two Schools will be funded.

**Eligibility:** Academic members of staff at any career stage are invited to apply. At least two Schools must be involved in each application

**Costs:** Funding might be used to support networking events, speakers, postdoc support that would lead to increased collaboration and research across disciplines and Schools. Applicants would need to explain how leadership would be implemented, key milestones, outputs and a timeline. Projects would need to be completed, reported on and costs claimed, by July 2020.

***Challenge-led Collaborations***

Colleagues may wish to anticipate **how their research might address funders’ strategic priorities**

* **UKRI Interdisciplinary priorities** can be found at: <https://www.ukri.org/research/themes-and-programmes/>
* **Individual Research Council Delivery Plans** give more detail including examples of interdisciplinary collaboration can be found at: <https://www.ukri.org/about-us/delivery-plans/>
* **Current calls** UKRI strategic calls can be found at: <https://www.ukri.org/funding/funding-opportunities/>

Other funders such as **Wellcome** and **Nuffield** also have strategic priorities.

***Curiosity-driven Collaborations***

Colleagues may wish to target **UKRI responsive mode** funding or start preparations for a **Leverhulme Doctoral Scholarship or Leverhulme Research Centre** call.

Areas of shared interest are already emerging across the Schools e.g.:

* Modern Slavery and Human Rights
* Domestic inequalities

**Support:** Colleagues in Research and Innovation will be on-hand to give advice on potential collaborators and building research leadership capacity and can support successful applicants with advice on future funding opportunities, impact and knowledge exchange.

**Find out more**: Sue Starbuck and her team will be available in the Herringham Room between 1-2pm on 23rd October for informal conversations about this initiative and other interdisciplinary research.

***Sandpit: Tuesday 5 November, 10-12, WINDSOR-0-05***

*A sandpit event will take place on 5th November Please come along if you are interested in this initiative, whether you are interested in becoming a member of an interdisciplinary team, have an idea to pitch as a leader, would like to meet new colleagues, or if you are just interested in hearing more. It would be useful to have an idea of numbers for tea and coffee, so please email* [*researchservices@rhul.ac.uk*](mailto:researchservices@rhul.ac.uk) *if you would like to attend.*

**Application form** (below) should be returned to Helen Nicholson, VP Research Impact and Interdisciplinarity ([h.nicholson@rhul.ac.uk](mailto:h.nicholson@rhul.ac.uk)) by 29 November. Applications will be decided at Research and Knowledge Exchange Committee on 4th December 2019.

## Application form: Interdisciplinary Research Projects

Applications are invited that cover the following four areas:

1. identify clear area of interdisciplinary research
2. Define intellectual focus and research questions
3. Develop and test methods of interdisciplinary collaboration
4. Build new and/ or strengthen existing partnerships (academic and non-academic, national and international, different publics).

**These will be used by the panel as assessment criteria**

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| Named PI/ leader | Dr. Sasha Engelmann |
| Names of Research Team | Dr. Sasha Engelmann (Geography / GeoHumanities);  Dr. Alin Tisan (Electronic Engineering);  Dr. Stefanie Kuenzel (Electronic Engineering)  Dr. Kevin Clemitshaw (Earth Sciences)  Dr. Dave Lowry (Earth Sciences)  Dr. Rebecca Fisher (Earth Sciences) |
| Title of Project | Developing Creative Methods for Sensing Air between the GeoHumanities, Earth Sciences and Electronic Engineering |
| Brief summary of Project | Addressing the intricacies and urgencies of the air pollution crisis requires the development of novel datasets, visual vocabularies and ‘bottom-up’ tactics that inspire communities. The proposed collaboration between Dr. Engelmann, Dr. Kuenzel, Dr. Tisan, Dr. Clemitshaw, Dr. Lowry and Dr. Fisher will investigate the role of an artistic, community driven project ([Aerocene](https://aerocene.org)) in exploring and communicating issues of air quality and air movement. Aerocene is a global network of researchers, activists, citizen scientists and members of the public who make, launch and fly solar powered balloon-like ‘sculptures’ in order to investigate the links between fossil fuel extraction, atmospheric inequalities and public health. Since 2015, Dr. Engelmann has been a member and leading advocate of the project.  To this date, and due in part to the project’s primary position in the art world, the air-sensing capacities of Aerocene sculptures have been limited largely to pressure and temperature data. While this project has huge potential for community engagement on issues of air quality, climate and public health, its capacities to make quality assured datasets need to be improved. Combining skills from the arts, geohumanities, earth sciences and electronic engineering, the project team will develop a new prototype for the Aerocene ‘sensing kit’ that will enable the creation of reliable datasets on air pollution and related variables like air movement, as well as novel visual and aesthetic vocabularies for representing air quality issues. The Interdisciplinary Funding Across Schools grant will support the testing and development of prototypes; integration of Aerocene case study materials into existing undergraduate courses in Earth Sciences, Electronic Engineering and Geography (this will implement collaborative student work projects across Schools); and enable a networking event featuring RHUL-based and invited participants with the goal of developing interdisciplinary networks for air quality research and new forms of aerial data representation aimed toward a larger funding bid in future. |
| Research aims or questions | 1. How can an artistic community driven project contribute to the creation of novel atmospheric datasets for both specialist and non-specialist audiences? 2. What data acquisition system(s) for the Aerocene ‘sensing kit’ will best support the creation and visualisation in real-time of new datasets while meeting the existing constraints of the sculptures? (A ‘data acquisition system’ is an assemblage of sensors, data inputs, data processing, communication and storage) 3. How can the creation of quality assured atmospheric datasets through the Aerocene project achieve wider public participation, feedback and interaction, and recognised credibility within the atmospheric scientific and air quality management communities? How does this work scale up to larger regions? |
| Project Plan | This project will evolve in three intersecting modes of collaborative work: technical prototyping and testing; pedagogical activities; and networking within and beyond RHUL.  The initial phase of the project will involve further building of collaborative relationships between the project team members as well as others with relevant expertise at RHUL. It will include an internal RHUL workshop on the existing ‘state of the art’ of the Aerocene ‘appropriate’ air sensing kits, with presentations on the history of the Aerocene project, and a demonstration of Aerocene technical capabilities. Potential targets for air pollution measurement will be discussed and agreed. The initial phase of the project will also include planning for the involvement of Earth Science, Electronic Engineering and Geography students in the prototyping process, testing and calibration of equipment, and the generating and representing of new datasets.  The next phase of the project will centre on developing and iterating Aerocene sensing kit prototypes that will enable a larger degree of flexibility as well as targeted sensing of air pollutants and air movements. The prototype design will benefit from the expertise of engineering team members on data acquisition systems, from earth science team members on reliability and calibration of data, as well as experience in the Aerocene community on engaging publics in aesthetic, participatory and collective relationships to air. This phase will involve students, whether on an individual undergraduate dissertation or other project basis, or through existing courses related to atmosphere and climate change in the School of Life Sciences and the Environment and the School of Engineering, Physical and Mathematical Sciences. The aim is to develop interdisciplinary pedagogies that can be run in future years.  The collaboration will culminate in a larger networking event focused on building novel interdisciplinary networks for air quality research in the UK. This event will feature a triple Aerocene sculpture launch on RHUL Campus and a demonstration of the new prototype. Relevant work from students will be presented. Invited participants will include key experts across RHUL Schools, external guests from academic and non-academic spheres, and potential funders. |
| Timeline | December   * Preparations among project team members * Liaising with Aerocene Coordinating Team in Berlin to organize shipment of three Aerocene Backpacks to London * Creation of shared archive of materials and technical documentation   January   * First internal working group meeting with team members and other RHUL researchers and practitioners; including technical ‘state of the art’ presentations from Dr. Engelmann and Aerocene technical leads (Joaquin Ezcurra; Erik Vogler) via Skype from Buenos Aires and Berlin * Setting goals for the prototype and data acquisition system * Ordering materials: sensors (air quality), computing systems (such as Raspberry Pi), satellite-based navigation systems (such as Garmin eTrex), etc. * Pedagogical planning in conversation with course leaders * Discussion on air pollutants: CO, CO2, CH4, NO2, PM   February   * Meetings between project team members to strategize prototype development and desired outputs * Honing and further developing student engagement * Brainstorming and drafting ideas for building of networks on air quality research in the UK; drafting possible invitations for the larger networking event in June   March   * Second internal working group meeting with team members and other RHUL researchers / practitioners; * Updates on technical development and direction of the work; updates on student-led work * Building interdisciplinary networks on air quality research by contacting relevant experts and stakeholders in the UK * Sending invitations for the large Networking Event in June * Arranging practical details for the June networking event, including arranging travel for external participants, finding adequate venue and arranging catering   April   * Testing and calibration of new prototype for Aerocene air sensing kit with RHUL students in Geography, ES and EE departments * Working with recorded data in both traditional and creative ways (e.g. focusing on accuracy and precision as well as developing visual and sensory vocabulary to engage wider audiences with air quality issues) * Preparation of large networking event: identifying structure of the networking event, key speakers and discussions   May   * Continued testing and iteration of Aerocene air sensing kit and further developing of new datasets and data visualizations * Continued experiments in working with data in both traditional and creative / alternative ways with students * Meeting among core team members to discuss further funding opportunities and draft future goals * Final preparation of large networking event   June   * Hosting Large Networking Event with invited guests from UK air research networks and two Aerocene core team members from Berlin * Setting goals for project development (does the prototype need more technical development? is the measurement precision good enough to answer key questions? does it need further testing in different sites? where to implement?) * Participation in Geography Department and Electronic Engineering Taster Days for prospective undergraduate students * Participation in RHUL Earth Day Activities   July   * Project completed (reports made and costs claimed) * Outlining and writing a larger funding application for GCRF or other suitable call |
| Budget *(please note that we would like to fund 4 to 5 clusters and our* ***total*** *fund is £20,000)* | Brief Budget Summary:  Prototyping Materials: £1,922.47  Pedagogical Materials: £184.95  Networking Events and Workshops: £1,953.74  Total: 4,101.96  Please see a full budget attached to this application. |
| Future Plans for external funding | We are actively exploring options via the Global Challenges Research Fund, such as a pump priming grant from one of the College GCRF Cluster Groups. Since the Aerocene Community has long-standing relationships in shantytown communities in Buenos Aires, Argentina, which have for decades withstood extreme air quality issues, we are interested in linking the prototyping, networking and capacity building of the proposed interdisciplinary Royal Holloway based project to the ongoing community initiatives and political struggles in Buenos Aires. In preparation for a GCRF bid we are positioning this project in line with UN Sustainable Development Goals, especially goal 3 (Good Health and Well Being), 11 (Sustainable Cities and Communities) and 13 (Climate Action). Dr. Engelmann is liaising with Professor Peter Adey to pursue this further. We anticipate a GCRF pump priming grant from college would lay the foundation for a larger application for GCRF funding submitted in Summer or Autumn 2020.  We are also exploring potential funding and potential collaboration via the UKRI Strategic Priorities Fund Clean Air programme focused on “building interdisciplinary networks to address air quality challenges at the indoor/outdoor interface”.  The objective of the call is to fund a cohort of networks that will start to build a new influential UK interdisciplinary community in the area of the indoor/outdoor air quality interface, comprising academics, Public Sector Research Establishment researchers, and relevant stakeholders from across healthcare, policy, practice, industry, and other publics, as appropriate.  As it includes an established artistic project and expertise from across engineering and earth sciences, the interdisciplinary work at the core of this project may also form the basis for outreach and public-engagement focused funding bids connected to leading atmospheric science institutions. |
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Please return completed form to Helen Nicholson, VP Research Impact and Interdisciplinarity ([h.nicholson@rhul.ac.uk](mailto:h.nicholson@rhul.ac.uk)) by 29 November.