University of St Andrews

St Andrews Interdisciplinary Research Support (STAIRS)

Round 2 – 2022

The catalyst funding scheme, St Andrews Interdisciplinary Research Support (STAIRS) aims to support high-quality collaborative interdisciplinary research that closely aligns to the University Strategic objectives. Launched in May 2022 by the Vice Principal for Research, Collections and Innovation, the call was extremely popular and was oversubscribed. It received 28 applications totalling £1,314,811 for a share of the £270,000.00 fund available. A review panel awarded the full £270K amongst the following five projects.

Funded Projects:

PI: Andrea Burke
School/dept: School of Earth & Environmental Sciences

Project Title: Towards net zero and a circular economy: Testing the suitability of a carbon capture by-product for use in aquaculture.

Our research team (comprised of three Schools and an external commercial partner) has expertise in environmental science, geochemistry, ecology, aquaculture, and chemical engineering, and thus is well suited to address this interdisciplinary challenge. This project will fund culturing experiments at the Rastech facilities at Eden campus to examine growth rate and mortality in shrimp grown with product water from our AWL reactor. Geochemical measurements will be used to monitor water chemistry and test for toxins in shrimp tissue. New understanding of the environmental, ecological, and biological impacts of AWL product water will be translated into system engineering modifications of the AWL reaction, to improve the suitability of the chemistry of the product water for aquaculture.

PI: Silvia Paracchini
School/Dept: School of Medicine

Project Title: Multi-omics data and mental health: finding patterns with machine learning.

This project will bring together three research teams with complementing expertise in psychiatric genetics (School of Medicine), bioinformatics (School of Mathematics & Statistics) and artificial intelligence applied to imaging data (School of Computer Science). We will combine genetic, clinical, and imaging data to develop tools that can better identify individuals at risk of psychiatric symptoms, transcending classical classifications.

PI: Emily Finer
School/Dept: School of Modern Languages

Project Title: Forecasting Reproduction in Space.

Our interdisciplinary approach combines expertise in Transnational Literatures (School of Modern Languages), Artificial Intelligence (School of Biology), and Medical Ethics (School of Medicine). We will collect scientific papers and science fiction addressing reproduction in space from different eras and cultures. Our focus includes physiology, ethics, and agency. We will analyse this collection of texts to find thematic patterns, solutions proposed, and to identify gaps (e.g. the paucity of scientific data on women astronauts). A data set combining scientific papers and science fiction will allow us to investigate the techniques used in literary and scientific writing to communicate complex ethical issues. We will apply artificial intelligence methods to the whole collection by extracting key features from each text and building probabilistic models connecting the features.

PI: Cornelia Helmcke & Lydia Cole
School/dept: School of Geography & Sustainable Development

Project Title: Community priorities in the creation of sustainable futures: an exploration of community-led decision making in peatland restoration projects in rural Scotland.

This interdisciplinary research looks at political, economic, and societal barriers to the adoption of carbon-reducing technologies based on a case study of Scotland. The project actively engages with the planned activities at Eden Campus surrounding carbon capture and green hydrogen. The interdisciplinary team harnesses the strengths of chemistry, political science, and management from conceptual frameworks to methodologies. The goal is to develop a survey instrument measuring key stakeholders' susceptibility to institutional pressures that can enable better-informed decisions at the level of policymaking and implementation.

PI: Rachel Sippy
School/dept: School of Mathematics & Statistics

Project Title: Who bears the burden of antibiotic resistance in East Africa? Mathematical modelling of socioeconomic disadvantage and resistance

This project proposes to build a mathematical model to investigate this using unique data assembled specially for this project, collected in two MRC- and NIHR-funded interdisciplinary global health projects - HATUA and CARE in East Africa. Usually, mathematical models of disease risk are based solely on biological principles, but here we propose to include social and geographic aspects such as poverty, education, knowledge, health service availability, and to understand how these factors affect the distribution of ABR in East Africa. The project will be led by experienced ecological/epidemiological modellers and statisticians, with a complementary interdisciplinary team of social scientists, genomic experts, computational biologists, and clinicians to guide the development and interpretation of the model.

PI: Ariadne Collins
School/dept: School of International Relations

Project Title: Toward a Political Ecology of Volume

This project principally questions the sustainability and equity of current and developing governance structures and use practices of the Earth's 'commons', which we describe as volumetric. It recognises that traditionally, international relations scholarship has represented the territory of a state as a contained claim to the flat surface of the earth. This conception has become common since the inception of the very idea of statehood and the subsequent proliferation of states in Africa, Asia and the Caribbean after decolonisation in the lead up to and after World War 2.

PI: Alice Collett
School/dept: School of Divinity

Project Title: Restoring History through Digital Applications

This project involves the intersection of science and the humanities, and we seek, within this project, to enable cutting-edge research progress within both the domains of ancient Indian history and computational linguistics. The aim of the project is to design an app to correctly identify inscriptions, novel computer science techniques will be developed that consider the visual properties of ancient objects.