



SCIENCE | EYENZULULWAZI NGEZENDALO | NATUURWETENSKAPPE
Mathematics Division | ICandelo leMathematika | Wiskunde Afdeling

Call for Applications
Multiple Postdoctoral Fellowships and PhD Scholarships

Mathematical Modelling of Eco-evolutionary Responses of Intertidal and Marine Food Webs to Climate Change

The Biomathematics Research Group in the Department of Mathematical Sciences, Stellenbosch University, South Africa, invites applications for multiple Postdoctoral Fellowships and PhD Scholarships funded through the Human Frontier Science Program (HFSP). The successful candidates will join an interdisciplinary research programme investigating how climate change reshapes intertidal and marine food webs through ecological and evolutionary processes.

Project Overview

The project focuses on the world's four major eastern boundary upwelling systems—the California, Humboldt, Benguela and Canary Current systems. Although these regions occupy only about 1% of the global ocean surface, they support approximately 25% of global seafood production, making them among the most productive and socioeconomically important marine ecosystems. Understanding how intertidal and marine food webs respond to climate change is essential for predicting future biodiversity, ecosystem functioning, fisheries productivity, and the resilience of coastal socioecological systems.

This project aims to develop integrated mathematical and computational models that combine systems ecology with trait-based ecological and evolutionary theory to investigate how historical and projected climate change influences:

- species distributions;
- food-web structure and ecosystem functioning;
- eco-evolutionary stability;
- adaptive responses and selection gradients; and
- ecosystem resilience under changing thermal and oceanographic conditions.

The research will integrate large ecological surveys, biodiversity databases, and oceanographic datasets to infer ecosystem status and forecast future responses under climate change.

Modelling approaches will include:

- spatially explicit ecological models;
- allometric trait-based food-web networks;
- adaptive ecological networks with trait-mediated interactions;
- eco-evolutionary systems models; and
- data-driven ecosystem inference using large environmental and biodiversity datasets.

Research Environment

Both Postdoctoral Fellows and PhD students will become members of the Biomathematics Research Group, an interdisciplinary team led by Prof. Cang Hui, SARChI Chair in Mathematical & Theoretical Physical Biosciences, Department of Mathematical Sciences, Stellenbosch University (<https://math.sun.ac.za/hui>). Team members work at the interface of mathematics, ecology, evolution, physics, and data science, collaborating with international researchers to address fundamental questions in biodiversity and global change.

Eligibility

Postdoctoral Fellows

Applicants should:

- Hold a PhD in Ecology, Theoretical Ecology, Applied Mathematics, Mathematics, Physics, Computational Biology, Environmental Science, or a closely related discipline;
- Have completed their PhD in 2023 or later;
- Demonstrate a strong publication record appropriate to career stage;
- Possess excellent numerical and computational skills;
- Be proficient in MATLAB, R, or Python;
- Demonstrate expertise in ecological modelling, community ecology, network ecology, or related quantitative ecological research.

Applicants from mathematics, applied mathematics, physics, statistics, computer science or related quantitative disciplines are welcome, provided they can demonstrate substantial knowledge of ecology and ecological modelling.

PhD Scholarships

Applicants should:

- Hold (or be completing) an MSc in Mathematics, Applied Mathematics, Physics, Statistics, Computer Science, or Data Science (or a closely related quantitative discipline);
- Demonstrate strong academic performance through official transcripts;
- Possess strong programming and computational skills (MATLAB, R and/or Python);
- Demonstrate a clear interest in mathematical modelling of ecological and eco-evolutionary systems.

Please note: Applicants whose highest qualification is an MSc in Ecology or Biological Sciences alone will not be considered for these PhD positions. The project is designed primarily for candidates with rigorous quantitative training who wish to apply mathematical and computational approaches to ecological and evolutionary questions. Applicants from countries where English is not the primary language must satisfy Stellenbosch University's English language admission requirements.

Application

Applications are now open and will close on **10 September 2026**.

Applications will be assessed on a rolling, case-by-case basis. Shortlisted candidates may be contacted for further information or interviews. All applicants will be informed of the outcome of their application by 12 October 2026.

Applications should be submitted as a single PDF file containing:

- a cover letter describing research interests and suitability for the position;
- curriculum vitae;
- publication list (Postdoctoral applicants only);
- academic transcripts (PhD applicants must include complete undergraduate and postgraduate transcripts);
- contact details of at least two academic referees; and
- copies of degree certificates (if available).

Postdoctoral Fellowship (3-year appointment): ZAR 350,000–400,000 per annum (tax-free), commensurate with qualifications, research experience, and publication record.

PhD Scholarship (3-year scholarship): ZAR 250,000–300,000 per annum, depending on qualifications and academic merit.

Research support: Conference travel and research-related expenses are supported through the HFSP project, subject to budget availability and project approval.

Start date: Successful candidates are expected to commence their appointments between **1 December 2026 and 28 February 2027**.

Applications should be emailed to:

Mrs Hanlie Swart
Department of Mathematical Sciences
Stellenbosch University
Email: jer@sun.ac.za

Please indicate in the email subject line whether you are applying for a Postdoctoral Fellowship or a PhD Scholarship.

06-08-2026