Research Associate – Marine Ecosystems: Remote Sensing/Biological Floats

College/Division	College of Sciences and Engineering
School/Section	Institute for Marine and Antarctic Studies – Oceans and Cryosphere
Location	Hobart – Salamanca
Classification	Academic Level A/B
Reporting line	Reports to Prof. Philip Boyd – ARC Australian Centre for Excellence in Antarctic Science

Position Summary

The University of Tasmania (UTAS) is building a vision of a place-based University with a mission to enhance the intellectual, economic, social and cultural future of Tasmania, and from Tasmania, contribute to the world in areas of distinctive advantage. The University recognises that achieving this vision is dependent on the people we employ as well as creating a people-centred University that is values-based, relational, diverse, and development-focused.

This position is part of the Australian Research Council Australian Centre for Excellence in Antarctic Science (ACEAS), a national-scale, University-led, international centre focused on helping the world community prepare for climate risks emerging from East Antarctica and the Southern Ocean by integrating knowledge of the ocean, atmosphere, cryosphere and ecosystems, and their interplay. ACEAS will grow to support the activities of around 150 researchers, administrative staff, and students, with exciting opportunities to collaborate across disciplinary and institutional boundaries. Further information on ACEAS is available http://antarctic.org.au/

The 3-year Postdoctoral Research Associate will commence in mid-2022. The successful candidate will design and lead experiments to link phytoplankton physiology - across a wide range of Southern Ocean plankton - with the improved interpretation of particle property signatures obtained from regional time-series of BGC-Argo robotic profiling floats in East Antarctica. They will be responsible for teasing apart – using physiology and molecular biology - how backscatter (carbon) and fluorescence (chlorophyll) properties, and subsurface biological features, are jointly controlled by floristics (sub-polar and polar communities), nutrients and photo-physiology, along with water column vertical mixing characteristics. The successful candidate will liaise with research into satellite and robotic float remote-sensing to improve both regional and basin-scale understanding of key trends, such as backscatter spikes and subsurface features, and their ramifications for Southern Ocean biogeochemistry and ecology.

The successful candidate will contribute to ACEAS program 1 – Circum Antarctica and East Antarctica and program 2 – Regional East Antarctica and its provinces by contributing to the following research topics:

Program 1

- Use historical satellite records (ocean colour, temperature, altimetry, wind), BGC-Argo and other field observations to identify temporal signals in the phytoplankton ecosystems and their physical drivers from seasons to decadal timescales.
- Quantify the Southern Ocean biological carbon pump, assess drivers of its recent variability and how productivity may change in the future.

Program 2:

- Assess how regional changes in wind, oceanic circulation and sea-ice impact ocean biogeochemical properties and atmospheric CO_2.

- Design a framework to best link remote-sensing observations (satellite, robotic floats, moorings, tagged mammals), other observations (paleo, etc.) and model outputs within East Antarctica to provide a multi-faceted observational archive to explore the causal linkages between atmosphere, ocean, cryosphere, and their consequent effects on open water and under ice biogeochemistry and ecology. The successful candidate may participate in a planned marginal ice zone research voyage in 2023

We are an inclusive workplace committed to 'working from the strength that diversity brings' reflected in our Statement of Values. We are dedicated to attracting, retaining and developing our people and are committed to inclusive principles. We celebrate the range of diverse assets that gender identity, ethnicity, sexual orientation, disability, age and life course bring. Applications are encouraged from all sectors of the community. **Tell us how we can make this job work for you.**

What You'll Do

- Interpret bio-optical (chlorophyll fluorescence, particulate backscatter, irradiance) sensor data from BGC-Argo floats in the context of lab-based experiments using identical sensors.
- Demarcate the relative contributions of floristics, biomass and physiological status in setting chlorophyll fluorescence, particulate backscatter, and how they vary with keystone cultured Southern Ocean species.
- Develop novel proxies to further exploit the datasets from BGC-Argo floats.
- Collaborate with other Research Associates and PhD students working in Program 1 on satellite and water column remote sensing and modelling.
- Potentially participate in marginal ice zone field work in 2023, to investigate the role of sea-ice retreat in bloom formation.
- Contribute to the research excellence of ACEAS and UTAS, through publication in high-impact international journals and the co-supervision of higher degree research students.
- Visit and work collaboratively with staff at ACEAS partner organisations.
- Where appropriate, and with support from the ACEAS communications team, communicate research to stakeholders outside academia, such as through briefing notes or presentations to government or industry.
- Contribute to ACEAS culture through committee membership, Early Career Researcher representation, and contributing to and leading workshops.
- Undertake other duties as assigned by the supervisor.

What We're Looking For (success criteria)

- A PhD in a biogeochemical oceanography, or a relevant discipline area.
- A deep understanding of Southern Ocean phytoplankton physiology and how it links to regional biogeochemistry and ecology.
- Strong demonstrated expertise in culturing and conducting physiological experiments with a diverse range of phytoplankton functional types.
- Strong demonstrated expertise in linking physiology to 'omics'-based approaches, including extraction of RNA material.
- Expertise in analysis of bio-optical data from BGC-Argo floats.
- Demonstrated experience in visualising and analysing data in R, Matlab or Python.
- A strong record of, and continuing commitment to, research that is internationally recognized and has made worthwhile contributions to the field of phytoplankton physiology and/or biological oceanography, demonstrated by a strong record of quality publications and presentations at conferences.

- Demonstrated ability to work efficiently with minimal supervision, with a capacity to set and prioritise strategic research directions, and to design and complete collaborative research programs to achieve scientific goals.
- Demonstrated ability to work collaboratively in a research team covering multiple disciplines and achieve collective as well as individual outcomes.
- Strong interpersonal skills with demonstrated ability to communicate and interact with a diverse range of stakeholders and students.
- Commitment to equity and diversity principles and to respectful behaviours that contribute to an inclusive culture in the workplace.

Other desirable criteria

- Extraction and quantification of macromolecular (carbohydrate, lipid, protein), elemental (C, P, N, Si) and pigment (including HPLC) components from phytoplankton.
- Photophysiology (FRRf, PAM, flash yields, including use of stable (^{18}O) and radio (^{14}C) isotopes to measure photosynthesis).

University of Tasmania

The University of Tasmania is an institution with an enduring commitment to our state and community, and a strong global outlook. We are committed to enhancing the intellectual, economic, social and cultural future of Tasmania. Our Strategic Direction strongly reflects the University community's voice that our University must be place based but globally connected as well as regionally networked and designed to deliver quality access to higher education for the whole State.

We believe that from our unique position here in Tasmania we can impact the world through the contributions of our staff, students and graduates. We recognise that achieving this vision is dependent on the people we employ, as well as creating a university that is values-based, relational, diverse, and development-focused.

Check out more here:

https://www.utas.edu.au/jobs

https://www.utas.edu.au/careers/our-people-values-and-behaviours

The intention of this position description is to highlight the most important aspects, rather than to limit the scope or accountabilities of this role. Duties above may be altered in accordance with the changing requirements of the position.