An ideal location for science research

Tasmania's science research sector is endowed with world-class infrastructure, critical mass and significant expertise in a number of important scientific disciplines. Tasmanian scientists and research institutions are among the world's leaders in delivering results from agriculture, aquaculture and population health research, as well as climate science and Southern Ocean and Antarctic studies.

Other disciplines in which Tasmania excels include marine sciences, ICT, oceanography, system modelling, biological (including biodiversity and plant) sciences, food safety/microbiology, radio astronomy, population genetics, maritime engineering, veterinary sciences, fisheries and chemical, physical and earth sciences.

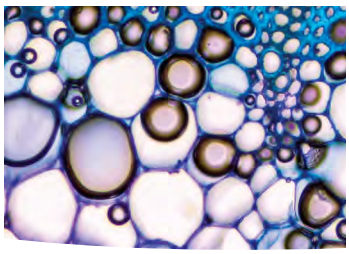
This sector attracts around $500 million in investment annually and has significant potential to grow sustainably into the future.

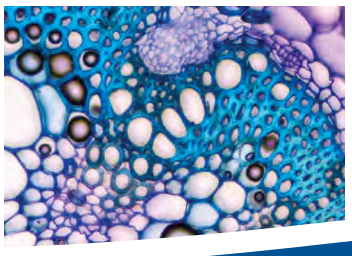
Tasmania's 'public good' science research institutions include:

- the University of Tasmania (UTAS)
- the Australian Antarctic Division (AAD)
- divisions of the Commonwealth Scientific and Industrial Research Organisation (CSIRO)
- offices of the Bureau of Meteorology
- a Defence Science and Technology Organisation facility.

A number of Tasmanian Government agencies, such as the Department of Primary Industries, Parks, Water and Environment (DPIPWE), sponsor science in the public interest. The outputs from such endeavours provide scientific advice for informed decision-making on matters of high importance in environmental management, food security, biosecurity, water management and human health.

Commercial science research facilities in the state include Peracto, Tasmanian Alkaloids, Marinova and Botanical Resources Australia.





Competitive advantages

Tasmania's natural advantages make it an ideal laboratory for science research. The island's relative geographic isolation, rich ecological diversity and small population serve as attributes for 'road testing' complex ecological experiments, as well as economic pilot models. Tasmania's demographic profile makes it an excellent microcosm of regional Australia, in which to observe the effects of human behaviour on the ecosystem.

Furthermore, Tasmania's temperate maritime climate, isolated landmass, fertile soils, abundant water availability, strict quarantine regulations and relative disease-free status all provide attractive natural advantages for agriculture and associated research. Such research has laid the ground work for many of the world-renowned, high-quality niche products for which the island is well known.

The island is home to skilled farmers and researchers who help to ensure Tasmanian science research contributes significantly to the agriculture industry's productivity. Situated on one per cent of Australia's land mass, Tasmania has the highest ratio of arable land to population nationally, and has 27 per cent of Australia's freshwater dam storage capacity. This provides for relatively high levels of on-farm innovation, as well as expertise to produce the high-quality products that are already a feature of the state's agriculture industry. Tasmania is also an excellent location for developing and testing agricultural technology.

These advantages are important for future economic and human capital investment by agritech companies interested in research and development opportunities.

Similar natural advantages make Tasmania an excellent location for aquaculture, mariculture and fisheries research. Tasmania's proximity to the Southern Ocean and Antarctica makes it a natural choice for research in these areas. Such research is vital to underpinning Australia's scientific and strategic leadership in the region, and contributes significantly to understanding the multiple implications of climate change as well as responsible environmental stewardship.

Abundant water and wind, as well as a long history of generating hydroelectric power, also provide Tasmania with research advantages for studying renewable energy and its potential uses. Micro-grids, such as King Island's electricity grid, are excellent test sites for integrating multiple electricity generation sources.

Not only are island-wide studies possible (for example, studies in down-scaled climate impacts, predictions and experiments), the use of Geographical Information Systems allows the mapping of observations or phenomena at a manageable scale. This means that Tasmania is the first to benefit from such studies and leads the way for Australia and the rest of the world.

Recent examples of whole-of-island projects include:

» the Climate Futures for Tasmania project[1]

» the Tasmanian roll-out of the National Broadband Network[2]

» the Sense-T project.

Sense-T is a world-first intelligent sensor network that integrates different data sources Tasmania-wide, geographically and economically. It is a partnership between CSIRO, UTAS, the Tasmanian Government and private investors, including IBM.

Sense-T will provide better information to business, government and communities to make improved decisions. The project will integrate different data sources and provide a unique data archive for science research in a number of key sectors, including agriculture, natural resource management and environmental management. Focusing initially on primary industries applications, future applications will be limited only by imagination.

Tasmania's stable population and extensive genealogical records provide a unique foundation for epidemiological studies. UTAS's Menzies Research Institute has built a worldwide reputation for its population research and clinical studies on the epidemiology and pathology of diseases, such as rickets, multiple sclerosis, broad-based vitamin D deficiency, obesity and certain types of cancer.

1. www.dpac.tas.gov.au/divisions/climatechange/adapting/climate_futures
2. www.nbnco.com.au

Major public science research organisations in Tasmania

1. Cape Grim

» Bureau of Meteorology

2. Burnie

» Tasmanian Institute of Agriculture – Cuthbertson Research Laboratories
» Tasmanian Institute of Agriculture – Dairy Research Facility
» University of Tasmania (UTAS), Cradle Coast Campus

3. Forth

» Tasmanian Institute of Agriculture – Vegetable Research Facility

4. Launceston

» Australian Maritime College (AMC), Newnham Campus
» Clifford Craig Medical Research Trust
» Tasmanian Institute of Agriculture – Extensive Agriculture Research Facility
» Tasmanian Institute of Agriculture – Mt Pleasant Research Laboratories
» University of Tasmania (UTAS), Newnham Campus

5. Scottsdale

» Defence Science and Technology Organisation (DSTO)

6. Hobart

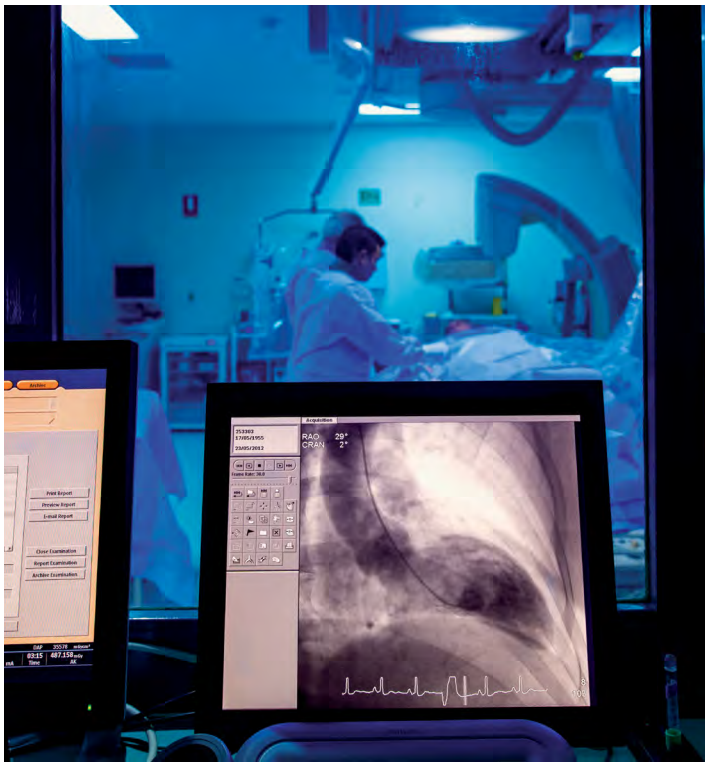
» Secretariat for the Agreement on the Conservation of Albatrosses and Petrels (ACAP)
» Australian Centre for Broadband Innovation node
» Australian Innovation Research Centre (AIRC)
» Bureau of Meteorology
» CSIRO Ecosystem Science Division
» CSIRO Marine and Atmospheric Research
» Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)
» Intelligent Sensing Systems Laboratory (ISSL)
» Menzies Research Institute
» Royal Hobart Hospital Research Foundation
» Royal Tasmanian Botanical Gardens
» Tasmanian Institute of Agriculture – New Town Research Laboratories
» Tasmanian Institute of Agriculture – University Farm
» Tasmanian Museum and Art Gallery biological collections and taxonomic services
» Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC)
» Institute for Marine and Antarctic Studies (IMAS)
» Integrated Marine Observing System (IMOS)

7. Sandy Bay

» Australian Centre for Research on Separation Science (ACROSS)
» Centre of Excellence in Ore Deposits (CODES)
» Food Safety Centre
» Tasmanian Institute of Agriculture
» University of Tasmania (UTAS), Sandy Bay Campus

8. Kingston

» Australian Antarctic Division (AAD)



Recognised capabilities

The University of Tasmania (UTAS)

Tasmania's research sector is recognised as world-leading in a number of disciplines, with the recent QS World University Rankings highlighting that the University of Tasmania is amongst the best in the world for earth and marine sciences and agriculture and forestry.

UTAS also performs at above world standard in astronomical and space sciences, organic chemistry, environmental science and management and fisheries sciences.

A range of UTAS institutions, including the Tasmanian Institute of Agriculture, the Menzies Research Institute, the Centre of Excellence in Ore Deposits, the Australian Centre for Research on Separation Science, the Institute for Marine and Antarctic Studies, and the Australian Maritime College (including the Cavitation Research Laboratory), all attract high-quality science researchers of international standing to the university's three campuses (Hobart, Launceston and north-west Tasmania).

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is Australia's national science agency and one of the world's largest and most diverse research agencies. CSIRO aims to work collaboratively with local and international partners to build Tasmania as a national centre of excellence in marine, ocean, atmospheric and climate science with international standing.

Tasmania hosts the CSIRO Marine and Atmospheric Research Division. It also hosts a node of Data61, a leading digital research network in Australia.

Australian Antarctic Division (AAD) and the Antarctic sector

Tasmania, particularly Hobart, is home to Australia's operations in the Australian Antarctic Territory. The Australian Antarctic Division (AAD) conducts significant science research activities in the Antarctic and Tasmania, as well as on Macquarie Island (with DPIPWE) and around Heard and McDonald Islands.

Hobart is also the home port of the French Antarctic program, as well as its research and supply vessel, *L'Astrolabe*.

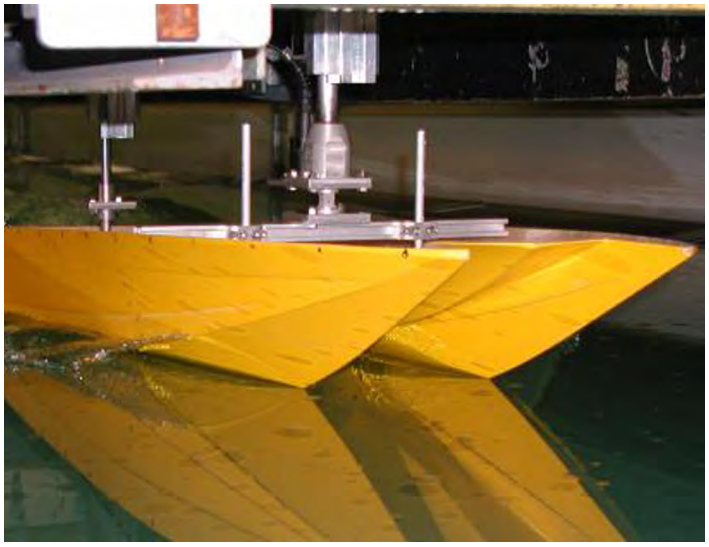
The location of the AAD in Tasmania has played a key role in developing a world-leading science research community focused on Antarctic and Southern Ocean studies.

The Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC) provides a focus for Australia's national effort to understand Antarctic and Southern Ocean processes, their role in regional and global climate and the dynamics of Antarctic marine ecosystems.

Research at the ACE CRC addresses issues of global significance relating to ocean circulation, sea-level rise, extreme storm events, ocean uptake of carbon dioxide and sustainable harvest of Southern Ocean resources. It is a focus for many international collaborations in Antarctic and Southern Ocean research.

Situated at the University of Tasmania, the ACE CRC is a research partnership involving the AAD, the University of Tasmania, CSIRO and the Australian Bureau of Meterology as core partners.

The Antarctic sector in Tasmania enjoys support from all levels of government. Tasmania has a long history of providing support for international expeditions to Antarctica, the Sub-Antarctic and the Southern Ocean.



People

The Tasmanian public science research sector is characterised by a highly educated, highly skilled, internationally mobile workforce.

It attracts talented students to postgraduate programs and trains and employs skilled technicians, while employing research scientists and engineers at all career levels.

Visiting scientists and researchers collaborate with, and learn from, Tasmanian research organisations. These visitors provide a rich source of learning and an avenue for promoting Tasmania's science research standing to the rest of the world.

Strategic assets and infrastructure

A number of strategic advantages make Tasmania attractive as a place to invest in science research. These include national research infrastructure programs and a growing presence of internationally competitive digital infrastructure and research assets.

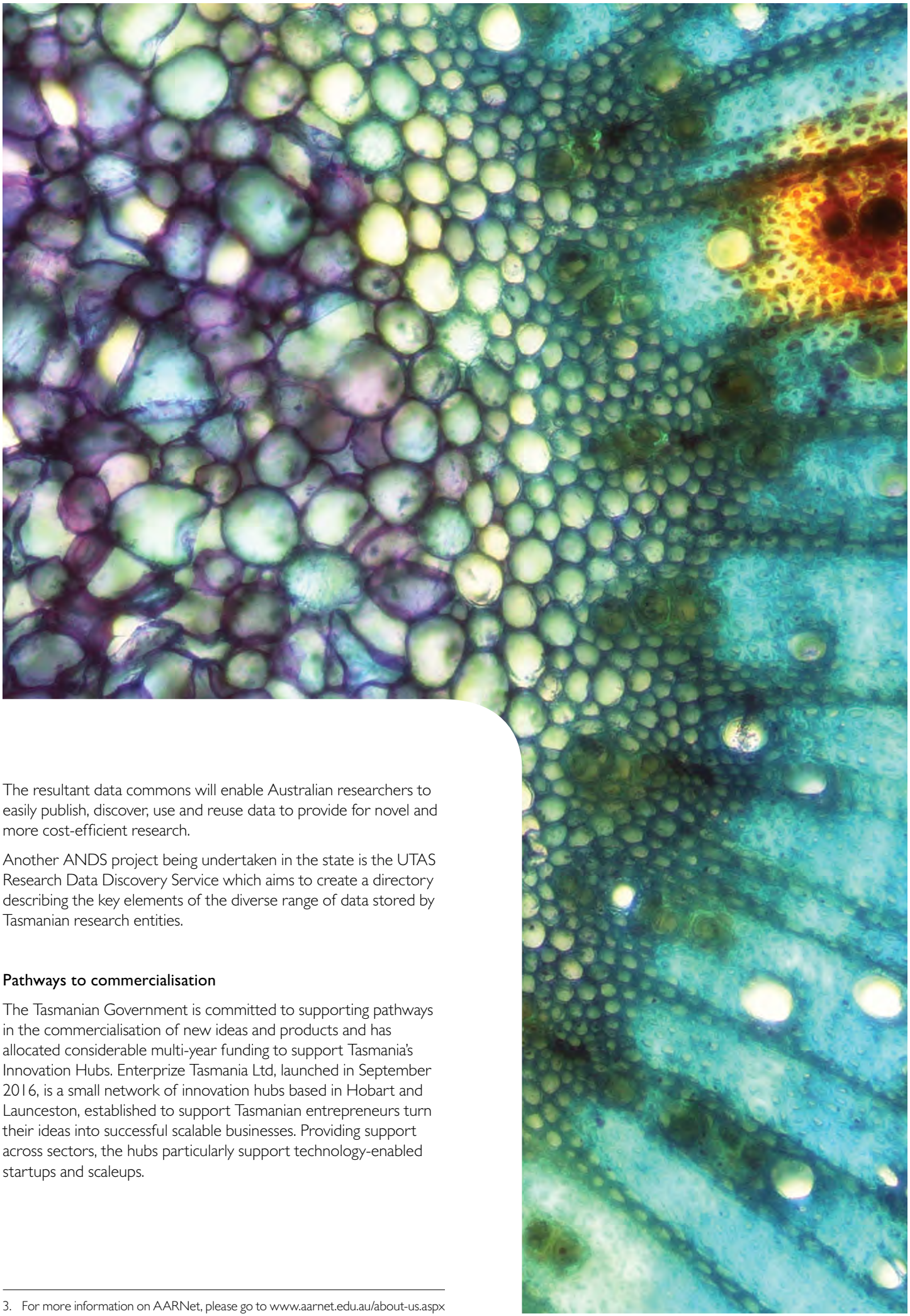
National research infrastructure assets located in Tasmania include the Australian Antarctic research and supply vessel, *Aurora Australis*, the Australian Marine National Facility vessel *RV Investigator* and associated scientific equipment.

Other assets include the nationally significant Integrated Marine Observing System, the Tasmanian Partnership for Advanced Computing, the Very Long Baseline Interferometry Array, the Mount Pleasant Radio Observatory, and the National Hydrodynamic Research Centre at the Australian Maritime College.

Tasmania also hosts a significant and growing digital infrastructure presence. The National Broadband Network roll-out in Tasmania is on track and Tasmania will enjoy full coverage by December 2018. Investment is being pursued in a number of associated projects that seek to capitalise on the advantages of this early roll-out.

UTAS has obtained funding to establish a virtual laboratory and data repository node, and currently hosts a network presence on Australia's Academic and Research Network[3]. In addition, TasNetworks owns TasGovNet, the core fibre network linking Tasmania's four major cities (Hobart, Launceston, Devonport and Burnie) with national telecommunications infrastructure. Consequently, Tasmania's growing digital infrastructure will enable a wider range of science research activities to take place within the state and deepen capability in areas of established expertise.

The AAD, CSIRO and UTAS are partners with the Australian National Data Service (ANDS) in building the Australian Research Data Commons. This Australian Government initiative will establish the necessary infrastructure to ensure that Australia's publicly funded research data outputs become strategic and usable assets.



The resultant data commons will enable Australian researchers to easily publish, discover, use and reuse data to provide for novel and more cost-efficient research.

Another ANDS project being undertaken in the state is the UTAS Research Data Discovery Service which aims to create a directory describing the key elements of the diverse range of data stored by Tasmanian research entities.

Pathways to commercialisation

The Tasmanian Government is committed to supporting pathways in the commercialisation of new ideas and products and has allocated considerable multi-year funding to support Tasmania's Innovation Hubs. Enterprize Tasmania Ltd, launched in September 2016, is a small network of innovation hubs based in Hobart and Launceston, established to support Tasmanian entrepreneurs turn their ideas into successful scalable businesses. Providing support across sectors, the hubs particularly support technology-enabled startups and scaleups.

3. For more information on AARNet, please go to www.aarnet.edu.au/about-us.aspx

Useful contacts

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