



# Careers in Space

Career Practitioner  
& Educators  
Webinar





# Acknowledgement of Country

The Australian Centre for Career Education acknowledges that the lands that we work and live on are the traditional lands of the Aboriginal People.

We acknowledge that their connection to these lands has endured for thousands of years and continues still today.

We pay our respect to their Elders past and present.





**Natalie Maharaj**

**Project Manager,  
Australian Centre  
For Career Education**



# Session Outline

## **Introduction**

*Kerrie Dougherty OAM, Senior Heritage and Outreach Officer, Australian Space Agency*

## **Workforce Insights**

*Sybilla Wilson, Assistant Manager – Inspire Program, Australian Space Agency*

## **ASA Keynote**

*Katherine Bennell-Pegg, Australian Astronaut Candidate, Australian Space Agency*

## **Early Career Guest Presenter**

*Tori Tasker, Senior Space Technology Officer – Human Spaceflight, Chief Technology Office – Australian Space Agency*

## **Early Career Guest Presenter**

*Lachlan Mackie, Mechatronics Engineer, Skykraft*

## **Industry Resources for Educators and Students**

## **Where to next?**

## **Q&A, Final Words**



# Australia in Space

Kerrie Dougherty OAM  
Senior Heritage and Outreach Officer

[Kerrie.Dougherty@space.gov.au](mailto:Kerrie.Dougherty@space.gov.au)

Twitter:  
**spacecurator**  
@KerrieDougherty

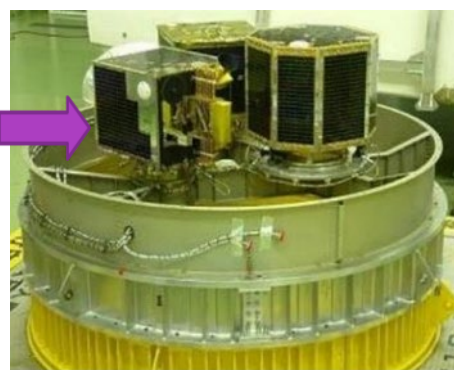
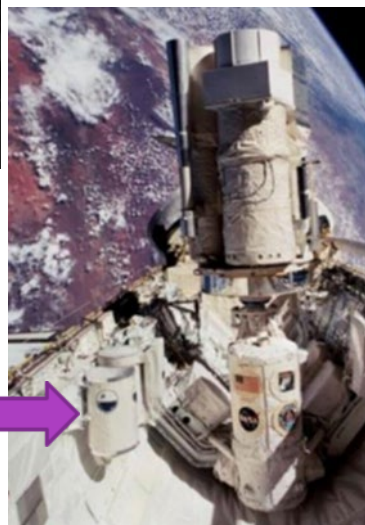
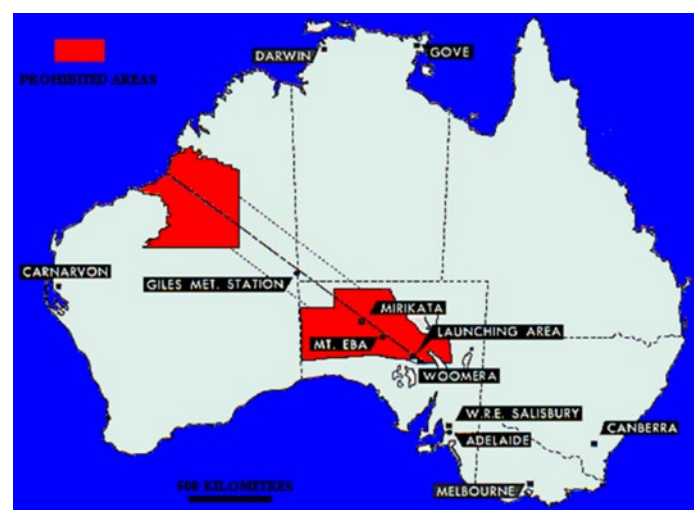
## Acknowledgement of Country

I wish to acknowledge the Traditional Custodians of Country and recognise their continuing connections to land, waters, sky and community.

Indigenous Australians are the world's oldest astronomers, and I pay my respect to their elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples here today.

### Australian Space Agency Logo





### NASA FACILITIES IN AUSTRALIA-1969

MSFN-MANNED SPACEFLIGHT NETWORK  
 DSN-DEEP SPACE NETWORK  
 STADAN-SPACE TRACKING AND DATA ACQUISITION NETWORK

Carnarvon (MSFN/STADAN)

Cooby Creek (STADAN)

Orroral Valley (STADAN)

Tidbinbilla (DSN)

Honeysuckle Creek (MSFN)

Island Lagoon (DSN)

Muccha (MSFN closed)



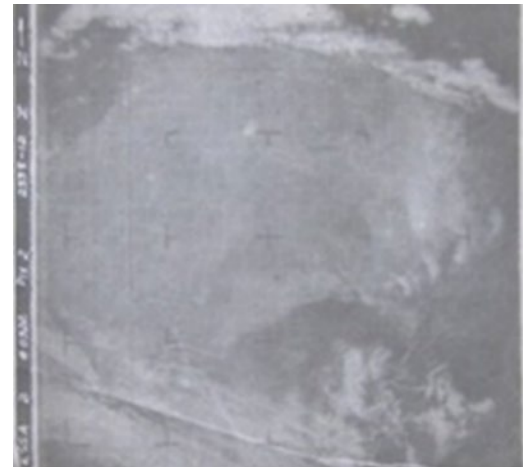
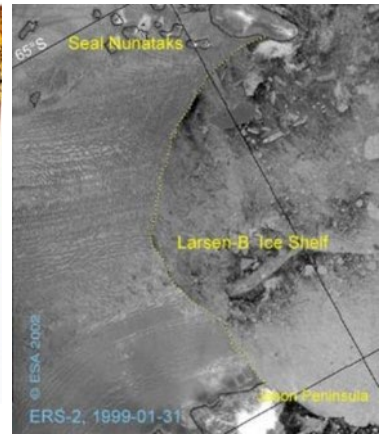
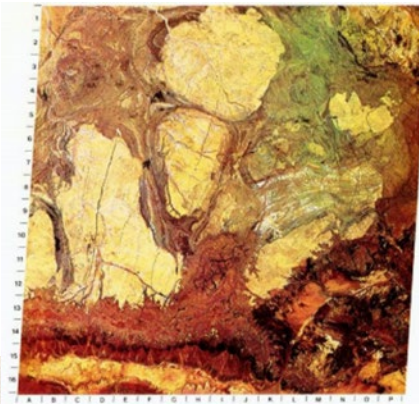
### New Norcia Ground Station - The gate to European Deep Space missions

esa [www.esa.int](http://www.esa.int)



UNITED NATIONS

Committee on the Peaceful Uses of Outer Space



# EVERYDAY LIFE

Space technologies are seamlessly integrated into the modern world



# SUSTAINABILITY

Space technologies play a key role as we pursue a more sustainable Earth



# INSPIRATION

Space inspires us all, pushing the boundaries of what is possible



Why does  
**SPACE**   
 matter 

*Click on the images to explore how space positively impacts life here on Earth*

# SAFETY

Space technologies help keep Australia in safe hands



# HEALTH

Space environments and tech create opportunities to improve health on Earth





## SPACE IS PART OF EVERYDAY LIFE

### Why does SPACE matter?

Space technologies are seamlessly integrated into the modern world

- ONLINE SHOPPING**: Communication satellites and GPS make it easy to shop anywhere, anytime. *Want WiFi in the sky?*
- STAYING CONNECTED**: Satellites provide phone and internet access in planes, boats and remote areas.
- NAVIGATION**: Find your way, avoid traffic and drop a location pin - all using GPS. *Need directions?*
- WEATHER**: Weather satellites help improve accuracy of the forecasts. *Not sure what to wear?*
- NEWS/ENTERTAINMENT**: Live broadcasts are available due to communication satellites. *Watching live TV?*
- E-BANKING**: Transferring funds is instant and secure, with the help of GPS and communication satellites. *Want to transact online?*

Australian Government | Australian Space Agency

BACK

## SPACE TECH KEEPS YOU SAFE

### Why does SPACE matter?

Space technologies help keep Australia in safe hands

- DISASTER RESPONSE**: Earth observation satellites improve responses to bushfires, floods and droughts. *Want to stay informed about incoming natural disasters?*
- BORDER PROTECTION**: Communication, GPS and remote sensing satellites help protect Australia's borders. *Enjoying our way of life?*
- DEFENCE**: Defence uses a range of satellite technologies to protect Australia. *Did you know space helps combat terrorism?*
- INTELLIGENCE**: Intelligence gathering activities are used to enhance Australia's national security and protect our way of life.
- PLANETARY DEFENCE**: We can calculate the trajectory of falling objects from space, such as asteroids, before they impact Earth. *Are we protected from asteroids?*
- EMERGENCIES**: GPS improves response times in critical emergencies. *Need an ambulance?*

Australian Government | Australian Space Agency

BACK

## SPACE INSPIRES US TO GO BEYOND

### Why does SPACE matter?

Space inspires us all, pushing the boundaries of what is possible

- NEW TECHNOLOGY**: Space takes our tech further, challenging us to solve problems in innovative ways. *Do you think there is life outside our solar system?*
- EXPLORATION**: Australia has a vital role in future missions to the Moon, Mars and beyond. *Are you interested in STEM?*
- EDUCATION**: Space makes us "think bigger" and develops knowledge of science, tech, engineering and maths. *Have you got a fave space song?*
- ARTS & CULTURE**: Colonial and Sci-Fi themes have inspired film/TV, music, games, literature, fashion and art for decades.
- PHILOSOPHY**: Studying the universe gives us valuable perspectives, prompting us to ponder our position in the cosmos. *Can space bring new perspectives?*
- INTERNATIONAL RELATIONS**: Space activities promote cooperation across the globe. *Want to work with other countries?*

Australian Government | Australian Space Agency

BACK

## SPACE IS KEY TO SUSTAINABILITY

### Why does SPACE matter?

Space technologies play a key role as we pursue a more sustainable Earth

- CLEAN ENERGY**: Space tech forecasts energy production and identifies the best locations for renewable energy. *Want a better environmental footprint?*
- TRANSPORT PLANNING**: Satellites help us map and maintain roads, which reduces fuel consumption. *Want to depend less on fossil fuels?*
- ZERO HUNGER**: Satellites sense soil moisture and vegetation and land characteristics to help increase crop yield. *Want to use less petrol?*
- SMARTER FARMING**: Agricultural equipment can be remotely controlled with the help of satellites to maximize farm productivity and efficiency. *Did you know space helps our farmers?*
- WILDLIFE CONSERVATION**: Satellites collect and relay sensor data to track wildlife, which helps manage and protect their habitats. *Can space benefit land and marine wildlife?*
- CLIMATE CHANGE**: Satellites monitor changing environmental conditions of our oceans, land and atmosphere. *Want a better environmental footprint?*

Australian Government | Australian Space Agency

BACK

## SPACE HELPS KEEP US HEALTHY

### Why does SPACE matter?

Space environments and tech create opportunities to improve health on Earth

- REMOTE HEALTHCARE**: Satellites help connect people in remote communities to doctors and specialists. *Need a doctor in the outback?*
- WEARABLE DEVICES**: Tech developed to monitor astronaut wellbeing, like smart watches, can help promote better health. *Want to live a healthier lifestyle?*
- PREVENT PANDEMICS**: Satellites monitor migration, weather conditions and vaccine rollout to slow the spread of disease. *Concerned about diseases spreading?*
- TREATMENTS & CURES**: We learn about our bodies by testing and managing effects of space environment on astronauts. *Can health solutions originate in space?*
- MEDICAL BREAKTHROUGHS**: Space research has spawned medical innovations including pacemakers and better artificial limbs. *Will space data help us here on Earth?*
- AIR QUALITY**: Satellites monitor pollution to inform how we protect the air we breathe. *Need a doctor in the outback?*

Australian Government | Australian Space Agency

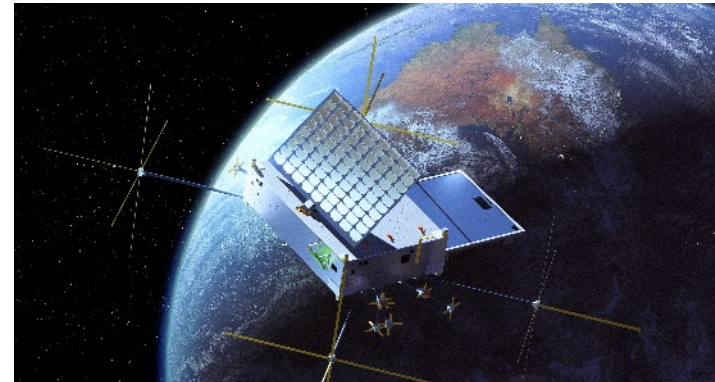
BACK



The Australian Space Agency works to establish our national space sector to ensure long-term industry growth, the development of critical space technologies, and to foster international collaboration. The Agency is focused on bringing the Australian space sector together with the civil, defence and science sectors to take advantage of Australia's unique capabilities and to improve our lives on Earth.

*61% of new jobs will require STEM qualifications. The Australian Government has set a goal to generate 1.2 million tech-related jobs by 2030. Space can play an important part in achieving this, with many opportunities for young Australians to contribute.*

- Launch, rockets, and hypersonics is the fastest growing subsector at 13.6%.
- Defence (Space) subsector is growing at 7.5%
- Position, Navigation, and Timing subsector is growing at 7.8%
- Earth Observation subsector is growing at 6.2%
- There were almost 17,000 employees in the space sector in 2021
- The average wage in the space sector was \$107,000 in 2021
- The total investment pipeline for the Australian civil space sector is worth approximately A\$3 billion.
- 20% of Australia's space research industry is female. 37% in Australia's space, spatial and surveying workforce



The size of the Australian space sector was **\$4.5bn AUD** (or \$3.4bn USD) in turnover in financial year 2021. This equates to a contribution of approximately **0.2%** towards the Australian Gross Domestic Product (GDP).

The Australian space sector is approximately *1/60th* of the size of the US, *1/6th* the size of the UK, *1/3rd* the size of India, *4/5th* the size of Canada, and almost 3 times larger than New Zealand, when compared on a straight \$ to \$ comparison.



Highlight of the largest space projects in Australia right now:

1. The square kilometre array in WA (via CSIRO), receiving a total **\$0.67bn** or **~23%** of sector investment to date. <https://www.skao.int/en>
2. The Satellite Based Augmentation System (SBAS) (via Geoscience Australia), receiving **\$0.28bn** or **~9%** of sector investment to date. <https://www.ga.gov.au/scientific-topics/positioning-navigation/positioning-australia/about-the-program/southpan>
3. Establishing SmartSat CRC, receiving **\$0.25bn** or **~8%** of sector investment to date. The majority of investment comes from industry, but federal government contributing a significant portion. <https://smartsatcrc.com/>
4. Grant to the Australian Space Manufacturing Network (industry-led network of 31 space companies) to manufacture launch vehicles and satellites, receiving **\$0.11bn** or **~4%** of sector investment to date. This is split approx. 50/50 across industry and government investment.
5. National Positioning Infrastructure Capability (NPIC), receiving **\$99m** or **~3%** of sector investment to date. <https://www.ga.gov.au/scientific-topics/positioning-navigation/positioning-australia/about-the-program/national-positioning-infrastructure-capability>





# Workforce Insights

**Sybilla Wilson,  
Assistant Manager  
Inspire Program,  
Australian Space Agency**



# Workforce Insights

*The Australian space sector will benefit from a broad range of skills, including:*

- **Technical skills** (e.g. engineering, design, software, programming, computer, robotics, cyber)
- **Operational skills** (e.g. data analysis, navigation, satellite control, remote operation, situational awareness, technicians, space safety)
- **Support skills** (e.g. visualisation, communication, management, regulation, law, space medicine, sales and marketing)
- **Downstream skills** (data science, AI and machine learning, image processing)
- **Soft skills** (communication skills, decision making & problem solving, leadership)

## Workforce Insights

- VET qualified skills with the highest demand are **manufacturing** related skills, some VET training options include: **robotics, electronics, communications engineering** and **computer systems engineering** and capabilities developed for the **aerospace** and **defence** industries
- Australian Government's goal for 1.2 million tech jobs by 2030
- University qualified skills with the highest demand are **systems engineering, project management** and **software skills**
- University programs in fields such as **aerospace engineering, space science** and **astronomy** provide students with the theoretical knowledge and practical skills needed to design, build and operate space-based systems

## Workforce Insights

- Vocational training programs in **management, electronics** and **computer science** can produce skilled workers that can play a role in building and supporting the launch of satellites and other space-based systems.
- A broad range of non-STEM professionals will be needed to contribute to technology intensive sectors, including space. Examples include **law, economics, finance, business** and **advisory services**
- Australia's strengths: **autonomous robotics** and **remote sensing, astronomy** and **astrophysics research**.

## Workforce Insights: SA Highlight

*This study found that within five years:*

- Requirements for people with VET based space skills will grow more than 12 fold
- 106 additional new VET based space skills will be required – a 176% increase above the current number of skills
- University based space skills requirements will increase by 2.4 times and 28 new skills will be required – a 14% increase above the current number of skills

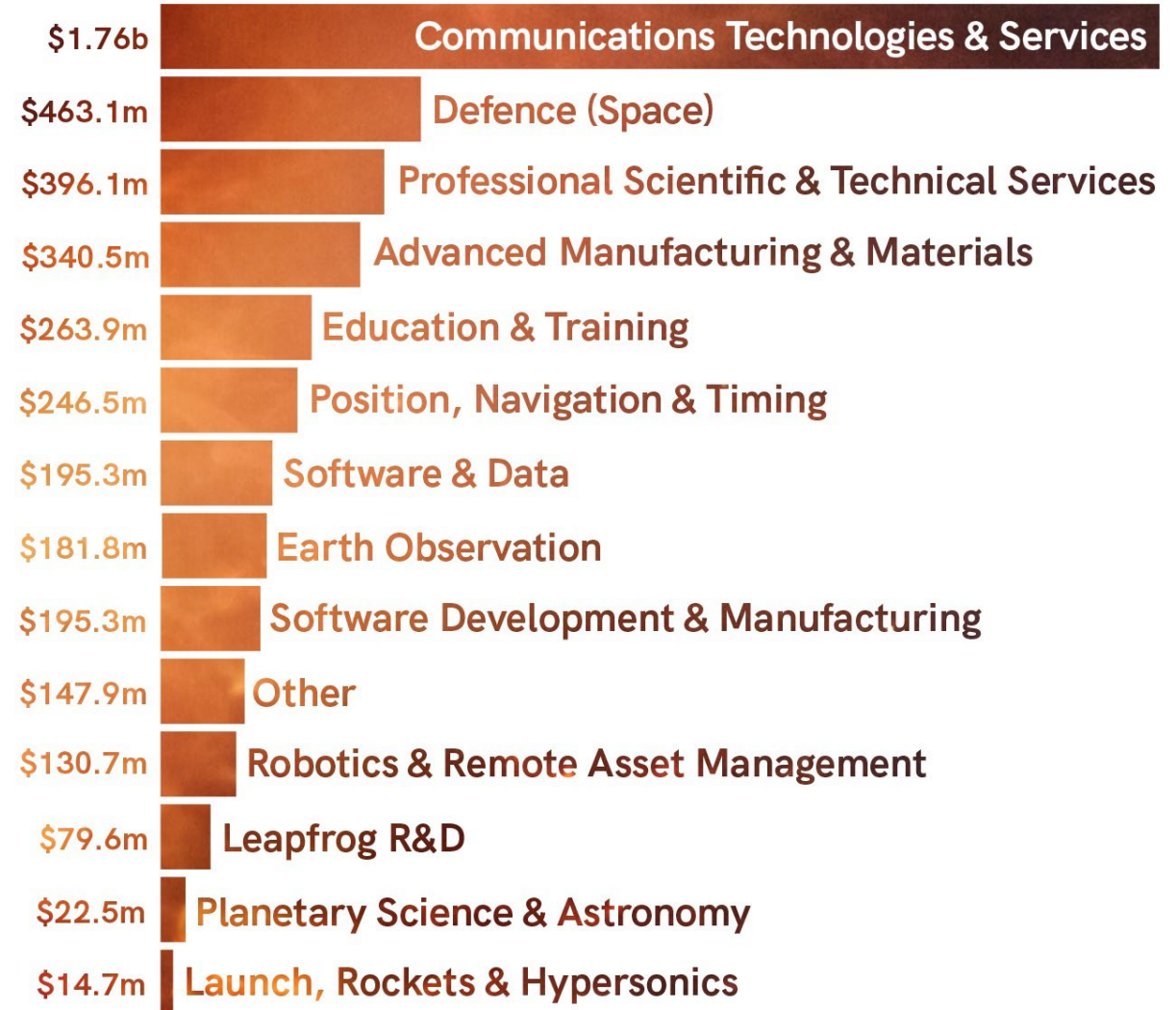


# Workforce Insights: Skill Shortages

- **Engineers** (including space systems, electrical, electronic, avionics, mechanical, propulsion, computer hardware, software, robotics)
- **Scientists** (atmospheric and space, planetary, rocket propulsion, astrophysicists, earth observation, chemists, geologists, materials)
- **IT and data specialists** (data scientist and analysts, software and intelligent game developers, cybersecurity)
- **Technicians** (electrical, avionics, automation and robotics, assembly, engineering technologists)

## Workforce Insights

*Communications Technologies and Services* also contains the most participants, with **1 in every 4 (150/608)** of the space-related organisations operating in this subsector. This dominance in market structure is not unique to Australia, but in fact reflective of most space sectors globally.



# Education Insights

## Space Systems Engineers

Design, build and test spacecraft, launches and ground-based systems. Specialty areas include **Analysts, System and Subsystem Leads and Subsystem Architects** for:

- Mechanical, structures and mechanisms
- Thermal
- Propulsion
- Guidance, navigation and control
- Operations, Fault Detection Isolation and Recovery (FDIR) and Software
- Assembly, Integration and Test
- Systems
- Mission systems

### Further specialty areas include:

- Aerothermodynamics
- Operations
- Payload types such as radar and optical

## Study pathways

At Australian Universities, study:

Bachelor of Engineering (Honours) (Mechanical)

Bachelor of Engineering Honours (Mechanical and Mechatronic)

Bachelor of Engineering (Mechanical and Advanced Manufacturing)

Bachelor of Engineering Technology (Systems and Security)

/ Bachelor of Science (Physics)

For higher level industry and research jobs, postgraduate aerospace engineering study at Masters and/or PhD level is recommended.

MEDIAN AUSTRALIAN SALARY:  
**Entry Level \$90,000**  
**Experienced \$145,000**

**SPACE CAREERS**

I want to be a <space>...  
**Engineer**

**My Journey**

**Strengths**  
Curiosity  
Teamwork  
Problem solving

**School Subjects**  
Mathematics  
Physics  
Chemistry  
CAD

**Tertiary Courses**  
Engineering  
Engineering Technology

**Space Careers**  
Aerospace/Avionics Engineer  
Space System Engineer  
Mechatronics/Robotics Engineer  
Electrical/Electronics Engineer  
Civil/Mechanical Engineer

**LEARN MORE**

ARTS & COMMUNICATION | **ENGINEERING** | ICT | LAW | MEDICINE | SCIENCE | TECHNICAL & TRADES

discover.space.gov.au

Australian Space Agency | Australian Space Discovery Centre

BACK

# Education Insights

## Electricians and Electrical Technicians

Construct, install, test and repair electrical systems, equipment and components.

MEDIAN AUSTRALIAN SALARY:  
Early Career \$69,000  
Experienced \$118,000

### Study pathways

At TAFEs across Australia, study:

Certificate III in Electrotechnology Electrician (UEE30820) and undertake an apprenticeship to become a licensed electrician.

Certificate IV in Electrical Instrumentation (UEE40420)

Diploma of Electrical Engineering (UEE50420)

Diploma of Applied Technologies (22460VIC)

Associate Degrees in Electrical Engineering

**SPACE CAREERS**

I want to be a <space>...  
**Technician**

**My Journey**

**Strengths**  
Practical  
Good with hands  
Problem solving

**School Subjects**  
Mathematics  
Physical Education  
English

**Vocational Courses**  
Electrical Engineering  
Aeroskills/Avionics  
Aircraft Maintenance Engineering  
Electronics and Communications

**Space Careers**  
Automation/Robotics Technician  
Mechanical/Assembly Technician  
Electrician/Electrical Technician  
Space Facility Management  
CNC Machinist

**LEARN MORE**

ARTS & COMMUNICATION | ENGINEERING | ICT | LAW | MEDICINE | SCIENCE | TECHNICAL & TRADES

discover.space.gov.au

BACK

Australian Space Agency | Australian Space Discovery Centre

***Katherine Bennell-Pegg***

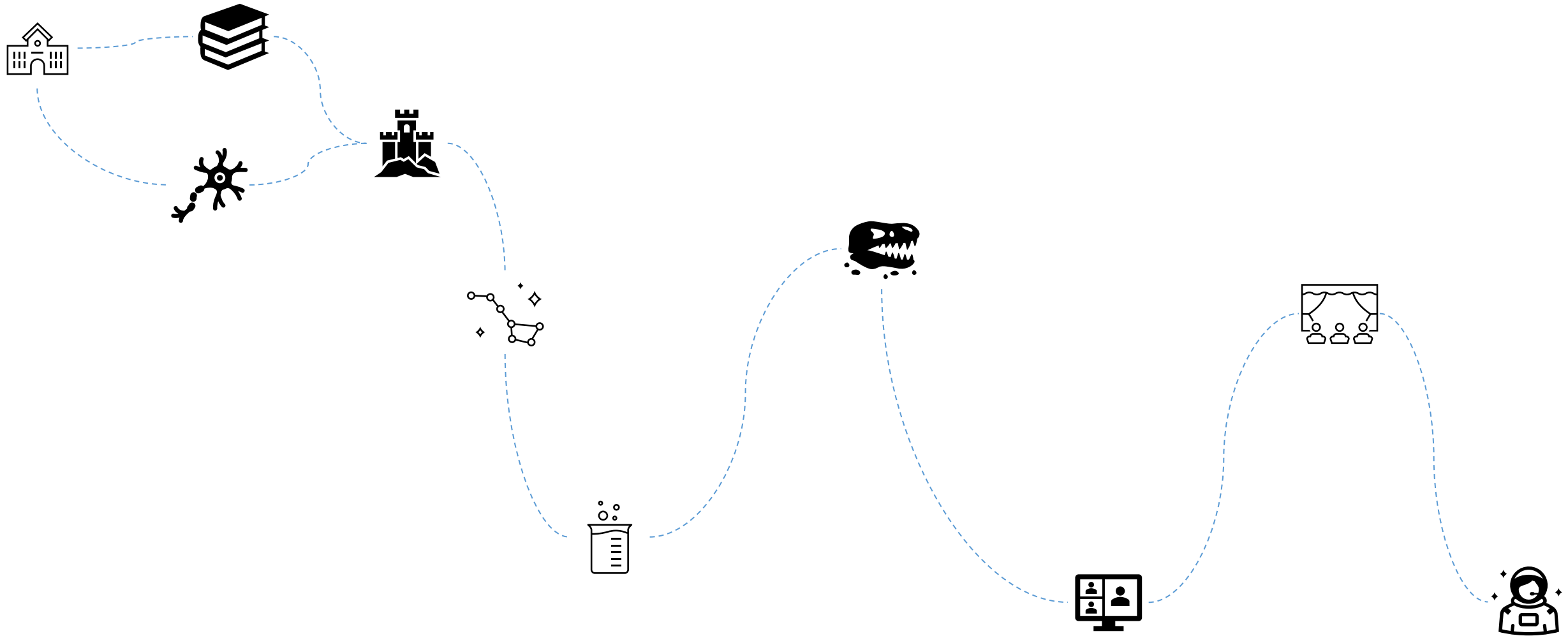
*Australian Astronaut Candidate  
Inspire Program, Australian Space Agency*

<https://youtu.be/LUbjQYpJFs>



**Tori Tasker**

**Assistant Director,  
Space Technology –  
Human Spaceflight a/g**







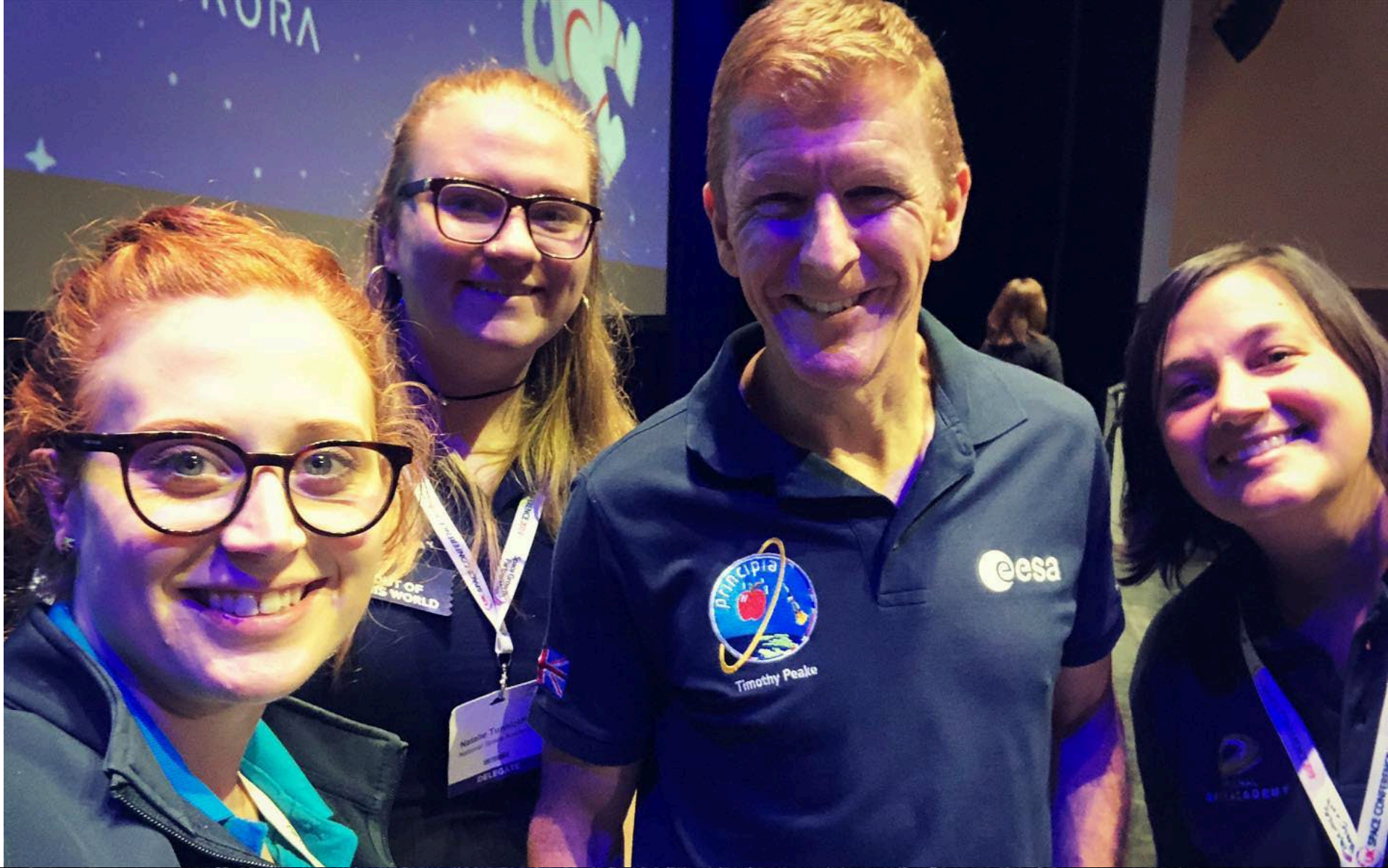


Australian  
Space Agency



Australian Centre  
for Career Education











COMMUNICATIONS  
ONLINE

A green wireframe globe is on the left. To its right, a satellite is shown in orbit, with lines representing communication signals connecting it to a map of Australia. A Wi-Fi symbol is in the top right corner.

FOUNDATION SERVICES  
ONLINE

A green wireframe rover is on the left. To its right, a signal path leads to a set of server racks. A Wi-Fi symbol is in the top right corner.

HEALTH SYSTEMS  
ONLINE

A green wireframe helmet is on the left. To its right, several circular icons represent health monitoring: a heart rate monitor, a pulse line, and a brain scan. A Wi-Fi symbol is in the top right corner.

# Lachlan Mackie Mechatronics Engineer

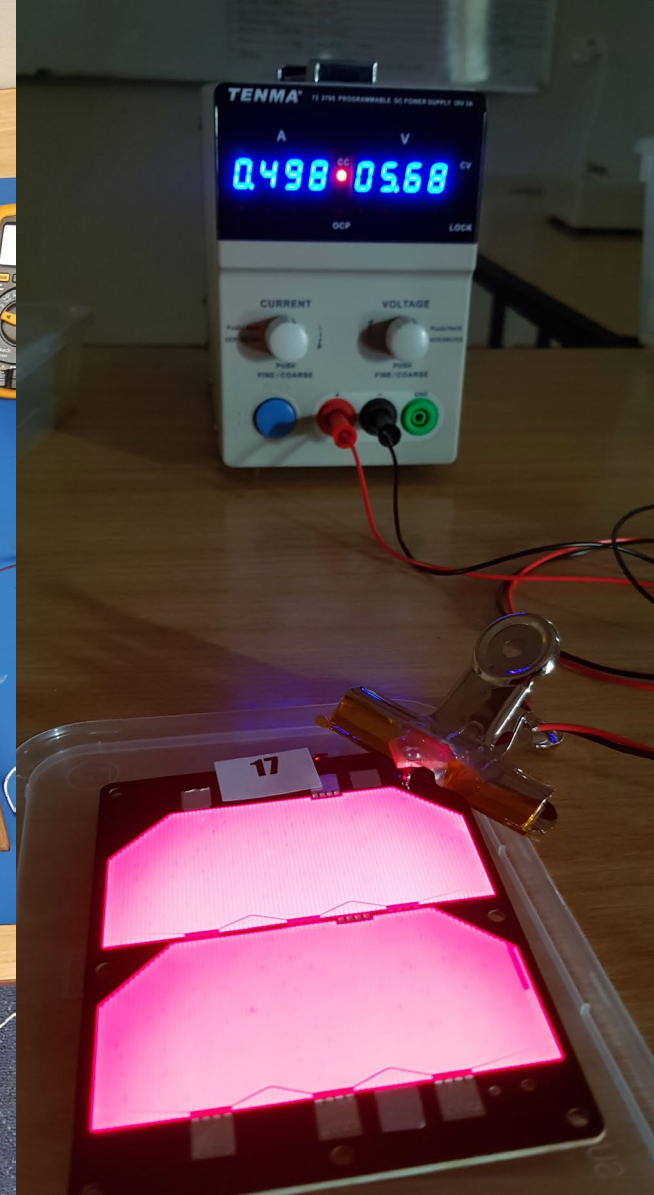
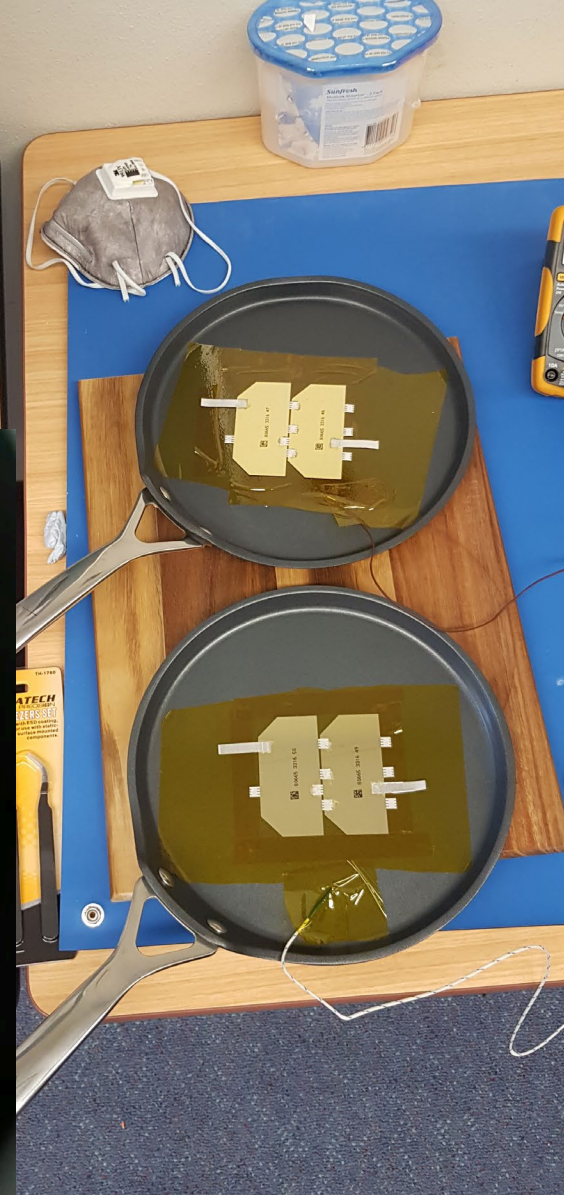
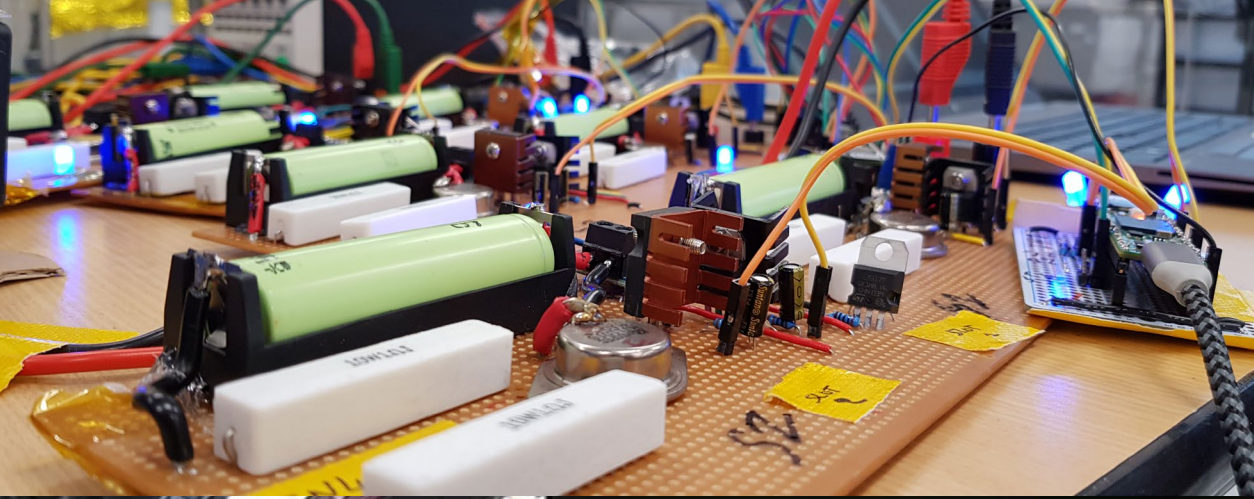


- What is a Mechatronics Engineer?
- What does Skykraft build?
- What do I do at Skykraft?





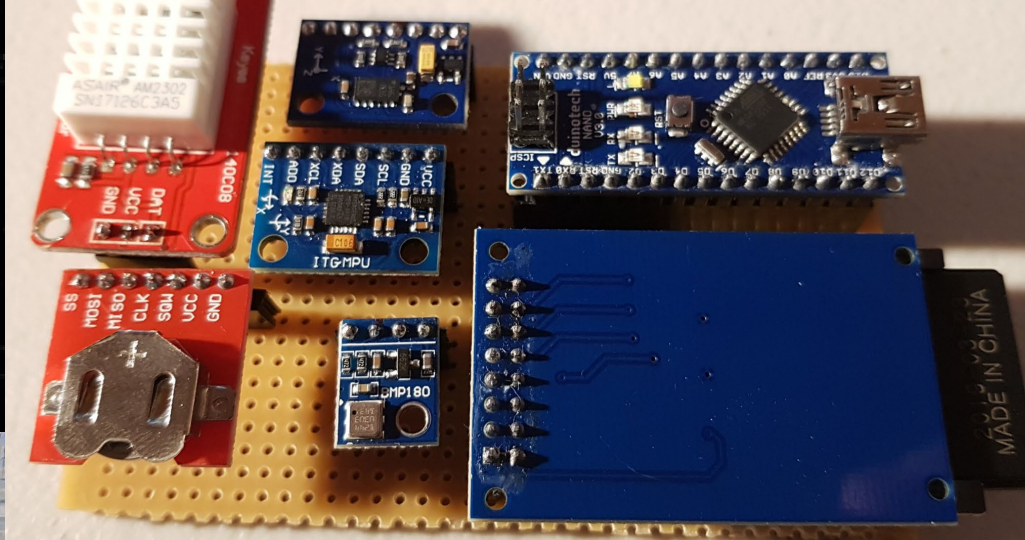
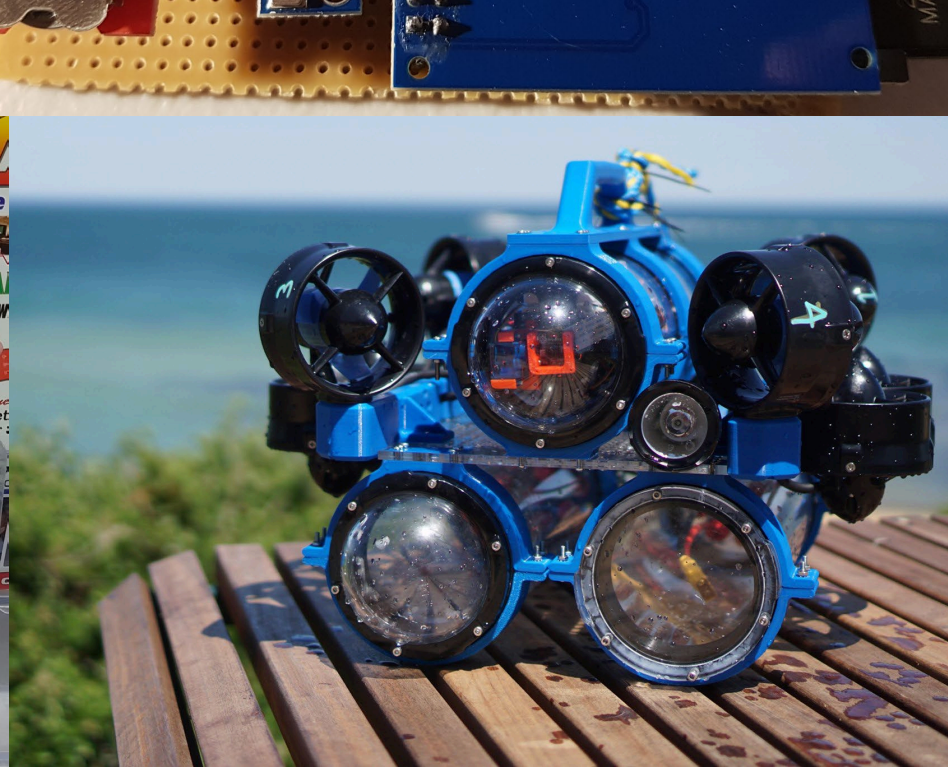
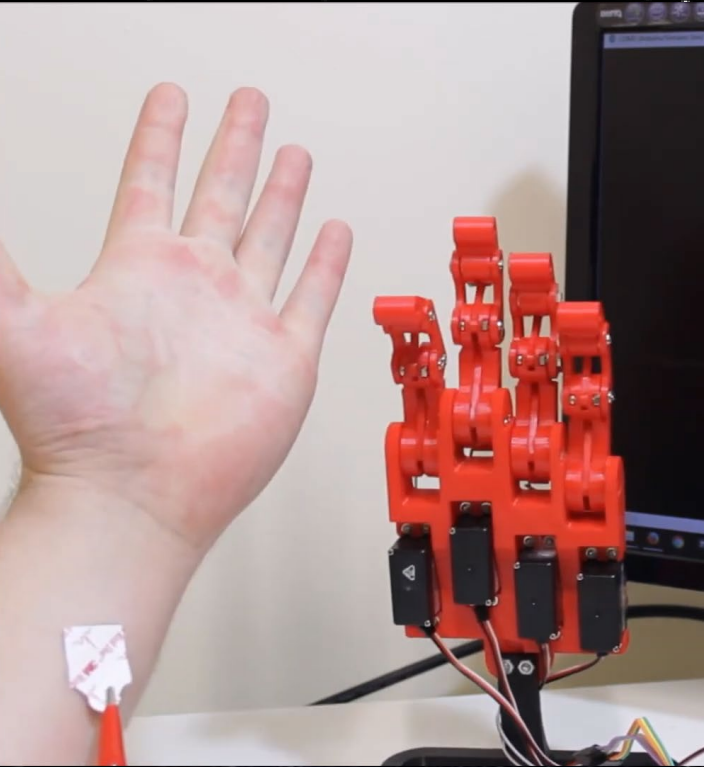




SPEED 27578 KM/H  
ALTITUDE 545 KM  
STAGE 2 TELEMETRY

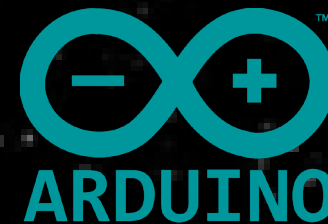
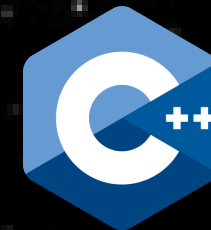
# How did I get here?

- Pathways
- University clubs
- Personal projects
- Portfolio website
- Networking
- University Degree



# Advice for students looking to get into Engineering

- Start now.
  - Grab an Arduino.
  - Grab a 3D printer.
  - Learn to solder.
  - Make fun projects.
  - Join a “Maker” club, a STEM Club, a Hackerspace.
  - Learn CAD don't worry about if it's the correct tool, learning something is better than nothing.
  - Learn: C, C++, Python.
  - Build a project portfolio website.
  - Freelance.
- Apply for internships and or get a job in a related field.
  - Defence Industry Internship Program (DIIP)
  - Jaycar/Altronics
  - Camping Stores
  - Arts and Crafts Stores
  - Fabrication shops



# Advice for students looking to get into Engineering

- Develop soft skills:
  - Speaking and Listening
  - Teamwork
  - Problem solving
  - Critical thinking
  - Decision Making
  - Flexibility and Adaptability
  - Focus on being a well-rounded person rather than being too specific.
- Places you can learn these skills
  - Playing sports
  - Working on projects with others
  - At STEM Clubs, Maker Spaces and Hackerspaces.  
e.g: <https://www.hackmelbourne.org/>



FOOTBALL  
AUSTRALIA





## Roles

### Engineering:

- Electrical, Mechanical, Software, Aerospace, Systems, Power, Radio.

### Business:

- Marketing & Social Media
- Finance
- Project Managers
- Team Leads
- Business Development

### Internships:

- Apply at: [www.skykraft.com.au/team](http://www.skykraft.com.au/team)
- Defence Industry Internship Program (DIIP):  
<https://diip.com.au/student-information/about-the-program/>



## EDUCATION

### Senior Secondary

VCE, VCE VM, Victorian Pathways Certificate, Visual Arts, Design & Technologies, Mathematics, Science, English, Digital Technologies

### VET

Certificate II in Electronics, Certificate III in Electronics and Communications, Certificate III in Electrotechnology/Electrical, Certificate IV in Electrical Instrumentation, Certificate IV in Information Technology, Diploma of Information Technology (Networking), Diploma of Electrical Engineering, Diploma of Electronics and Communications, Diploma of Electronic Engineering, Diploma of Aeronautical Engineering, Diploma of Maintenance Engineering, Diploma of Information Technology

## Higher Education

- Bachelor of Computer Science
- Bachelor of Mathematics and Computer Science
- Bachelor of Applied Data Analytics
- Bachelor of Software Engineering
- Bachelor of IT
  - Software Development
  - Networking and Cyber Security
  - Simulation and Serious Games
- Bachelor of Creative Industries
- Bachelor of Engineering
  - Computer and Network Engineering
- Master of Cyber Security
- Master of Information Technology
  - Software
  - Network and Cybersecurity
- Master of Data Science
- Master of Mechanical Engineering
  - AI

## Useful Links

### Australian Apprenticeships Pathways

Information Service for students, job hunters and employers considering career options. <https://www.aapathways.com.au/>

### Labour Market Insights

Labour market insights can help you make decisions about study and training, your first job, or the next step in your career. <https://labourmarketinsights.gov.au/>

### myfuture

myfuture provides resources to explore career pathways and tools to develop self-knowledge to help with career decision-making. <https://myfuture.edu.au/>

### Australian Space Discovery Centre

There are many exciting career paths to follow right here on Earth. Space law, medicine, design and manufacturing, robotics and data analysis. The Australian space discovery centre has a range of skills to support our growing space sector. <https://www.industry.gov.au/australian-space-discovery-centre/pathways-career-space>

### RMIT

Careers in space aren't all about astronauts in spacesuits. In fact, if you want to make the world a better place, space is the perfect sector to start. <https://www.rmit.edu.au/study-with-us/science/discover-science/facts-everyone-should-know-about-careers-in-space>

### Careers with STEM

Australia's space sector is taking off, and there are loads of ways you could be a part of it. <https://careerswithstem.com.au/a-to-z-of-space-jobs/#gsc.tab=0>

### C4 Space

SA Space Industry Skills Development <https://www.c4space.com.au/>

### Indeed Career Guide

Benefits and skills for a career in Space. <https://www.indeed.com/career-advice/finding-a-job/careers-in-space-science>

### Australian Space Agency – Careers in Space

This booklet will help you explore the many different types of careers that Australia's space industry has to offer and the skills and study pathways to get there. <https://www.indeed.com/career-advice/finding-a-job/careers-in-space-science>

### Australian Space Agency and the Australian Space Discovery Centre – A Space for everyone

Discover the journey of professionals and their Strengths, School Subjects, Tertiary Courses, Space Careers and more!

<https://www.industry.gov.au/sites/default/files/2022-11/careers-in-space-booklet.pdf>

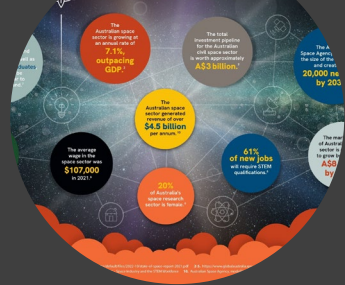
### Australian Space Agency – International Lunar Base Interactive Quiz

You have been chosen to participate in the next phase of lunar settlement. Here you will undergo a quiz to determine your roles and interests before embarking on a journey to your new home on the Moon! <http://space-aus-career-tools3-website-ap-southeast-2.amazonaws.com/>

### Australian Centre for Career Education – Industry Resources

View and download resources designed in collaboration with industry experts. Click on each resource to access more information for both teachers and students! <https://ceav.vic.edu.au/resources/industry-resources/>

## Fast Facts



# Careers In Space

## Student Workbook

Name: \_\_\_\_\_

# Careers In Space

## Teacher Answer Guide

# Educator and Student Resources

## Careers in space

Be part of Australia's space workforce





# Fast Facts

Around **300** new qualified scientists and **900** engineers, as well as **800** non-STEM graduates, are required to be trained each year to meet this demand.<sup>7</sup>

The Australian space sector is growing at an annual rate of **7.1%, outpacing GDP.**<sup>2</sup>

The total investment pipeline for the Australian civil space sector is worth approximately **A\$3 billion.**<sup>3</sup>

The Australian Space Agency aims to triple the size of the space sector and create up to **20,000 new jobs by 2030.**<sup>1</sup>

**30,000 people** could be working in the Australian space sector by **2030.**<sup>5</sup>

The average wage in the space sector was **\$107,000** in 2021.<sup>6</sup>

The Australian space sector generated revenue of over **\$4.5 billion** per annum.<sup>10</sup>

**61% of new jobs** will require STEM qualifications.<sup>8</sup>

The market size of Australia's space sector is estimated to grow by more than **A\$8 billion by 2030.**<sup>4</sup>

**20%** of Australia's space research sector is female.<sup>9</sup>

## Pathways to a job in... Information Technology, Systems and Data

### EDUCATION

#### Senior Secondary

VCE, VCE VM, Victorian Pathways Certificate, Visual Arts, Design & Technologies, Mathematics, Science, English, Digital Technologies

#### VET

Certificate II in Electronics, Certificate III in Electronics and Communications, Certificate III in Electrotechnology Electrician, Certificate IV in Electrical Instrumentation, Certificate IV in Information Technology, Diploma of Information Technology (Networking), Diploma of Electrical Engineering, Diploma of Electronics and Communications, Associate Degree in Electronic Engineering, Certificate II-IV in Aeroskills, Diploma of Aircraft Maintenance Engineering, Diploma of Screen and Media, Advanced Diploma of Information Technology

### Higher Education

- Bachelor of Computer Science
- Bachelor of Mathematics and Computer Science
- Bachelor of Applied Data Analytics
- Bachelor of Software Engineering
- Bachelor of IT
  - Software Development
  - Networking and Cyber Security
  - Simulation and Serious Games
- Bachelor of Creative Industries
- Bachelor of Engineering
  - Computer and Network Engineering
- Master of Cyber Security
- Master of Information Technology
  - Software
  - Network and Cybersecurity Systems
- Master of Data Science
- Master of Machine Learning
  - AI

To find out more about these jobs and how to get there, check out the ASA Careers in Space booklet.

### POSSIBLE ROLES

Avionics Technicians, Electricians and Electrical Technicians, Robotics Engineers, CAD Drafters and Designers, Engineers, Technicians, Computer Scientists,

## Pathways to a job in... Engineering and Design

### EDUCATION

#### Senior Secondary

VCE, VCE VM, Victorian Pathways Certificate, Visual Arts, Design & Technologies, Mathematics, Science, English, Digital Technologies

#### VET

Certificate II – IV in Engineering, Diploma of Engineering – Technical, Diploma of Engineering Technology, Diploma of Digital Technologies, Diploma of Applied Technologies, Advanced Diploma of Electronics and Communications Engineering

### Higher Education

- Bachelor of Engineering
  - (Mechanical and Advanced Manufacturing)
  - Honours (Mechanical)
  - Honours (Electrical and Electronic)
  - Honours (Mechanical and Mechatronic)
  - Honours (Electrical and Mechatronic)
  - Honours (Robotics)
- Bachelor of Engineering Technology
  - (Electronic Systems and Security)
- Bachelor of Digital Technologies
- Bachelor of Engineering Technology
- Bachelor of Product Design

For higher level industry and research jobs, postgraduate study at Masters and/or PhD level is recommended.

To find out more about these jobs and how to get there, check out the ASA Careers in Space booklet.

### POSSIBLE ROLES

Space Systems Engineers, Electrical, Electronics and Avionics Engineers, Robotics Engineers, CAD Drafters and Designers, Engineers, Technicians,

## Pathways to a job in... Operations and Communications

### EDUCATION

#### Senior Secondary

VCE, VCE VM, Victorian Pathways Certificate, Visual Arts, Design & Technologies, Mathematics, Science, English, Business and Economics, Health and Physical Education, Digital Technologies

#### VET

Certificate IV in Work Health and Safety, Certificate IV in Project Management Practice, Certificate IV in Marketing and Communication, Diploma of Project Management, Diploma in Work, Health and Safety, Diploma of Marketing and Communication, Diploma of Graphic Design, Advanced Diploma of Graphic Design

### Higher Education

- Graduate Certificate in Organisational Safety and Human Factors
- Graduate Certificate and Masters programs in Project Management
- Bachelor of Law
- Bachelor of Commerce
- Bachelor of Project Management
- Bachelor of Marketing
- Bachelor of Marketing and Communication
- Bachelor of Media
- Bachelor of Creative Arts
- Bachelor of Science with a Bachelor/ Master of Teaching

To find out more about these jobs and how to get there, check out the ASA Careers in Space booklet.

### POSSIBLE ROLES

Work Health and Safety Officers, Space Law, Project Management, Project Managers, Communications, Technicians,

## Pathways to a job in... Science, Testing and Manufacturing

### EDUCATION

#### Senior Secondary

VCE, VCE VM, Victorian Pathways Certificate, Design & Technologies, Mathematics, Science, English, Digital Technologies, Health and Physical Education

#### VET

Certificate II – IV in Engineering, Diploma of Engineering – Advanced Trade, Certificate II – IV in Aeroskills, Diploma of Aircraft Maintenance Engineering, Diploma of Applied Technologies

### Higher Education

- Bachelor of Science
  - Physics/Chemistry,
  - Biochemistry,
  - Biomedical Science,
  - Mathematical Science,
  - High Performance Computational Physics,
  - Geographical Information Systems Statistics,
  - Space Science and Astrophysics Geoscience,
- Bachelor of Computer Science
- Bachelor of Mathematical Sciences
- Bachelor of Medicine
- Bachelor of Surgery

To find out more about these jobs and how to get there, check out the ASA Careers in Space booklet.

### POSSIBLE ROLES

Avionics Technicians, Electricians and Electrical Technicians, Automation and Robotics, Technicians, Computer Scientists, Data Scientists and Analysts, Software Developers and Software Engineers, Intelligent Game Developers, Technicians,

# Career Pathway Posters



# Useful Links



## Australian Apprenticeships Pathways

Information Service for students, job hunters and employers considering career options.  
<https://www.aapathways.com.au/>

## Labour Market Insights

Labour market insights can help you make decisions about study and training, your first job, or the next step in your career.

<https://labourmarketinsights.gov.au/>

## myfuture

myfuture provides resources to explore career pathways and tools to develop self-knowledge to help with career decision-making.

<https://myfuture.edu.au/>

## Australian Space Discovery Centre

There are many exciting career paths to follow right here on Earth. Space law, medicine, design and manufacturing, robotics and data analysis. The Australian space discovery centre has a range of skills to support our growing space sector.

<https://www.industry.gov.au/australian-space-discovery-centre/pathways-career-space>

## RMIT

Careers in space aren't all about astronauts in spacecrafts. In fact, if you want to make the world a better place, space is the perfect sector to start.

<https://www.rmit.edu.au/study-with-us/science/discover-science/facts-everyone-should-know-about-careers-in-space>

## Careers with STEM

Australia's space sector is taking off, and there are loads of ways you could be a part of it.

<https://careerswithstem.com.au/a-to-z-of-space-jobs/#gsc.tab=0>



## C4 Space

SA Space Industry Skills Demand Study

<https://www.c4space.com.au/sa-skills-demand-study/>

## Indeed Career Guide

Benefits and skills for a career in Space.

<https://www.indeed.com/career-advice/finding-a-job/careers-in-space-science>

## Australian Space Agency – Careers in Space

This booklet will help you explore the many different types of careers that Australia's space industry has to offer and the skills and study pathways to get there.

<https://www.indeed.com/career-advice/finding-a-job/careers-in-space-science>



## Australian Space Agency and the Australian Space Discovery Centre – A Space for everyone

Discover the journey of professionals and their Strengths, School Subjects, Tertiary Courses, Space Careers and more!

<https://www.industry.gov.au/sites/default/files/2022-11/careers-in-space-booklet.pdf>



## Australian Space Agency – International Lunar Base Interactive Quiz

You have been chosen to participate in the next phase of lunar settlement. Here you will undergo a quiz to determine your roles and interests before embarking on a journey to your new home on the Moon!

<http://space-aus-career-tool.s3-website-ap-southeast-2.amazonaws.com/>



## Australian Centre for Career Education – Industry Resources

View and download resources designed in collaboration with industry experts. Click on each resource to access more information for both teachers and students!

<https://ceav.vic.edu.au/resources/industry-resources/>

# Useful Links Poster



# Interactive Student Workbook

## Coming Soon

Be inspired by written and video case stories from employees in the Space sector

### 4c. Chloe Leclerc

**Role:** Chief Marketing Officer  
**Organisation:** Fleet Space  
**Qualifications:** Master's degree in International Business

**Employability Skills:**  
Multilingual, Research, Written & Verbal Communication, Leadership, Collaboration, Technology



My journey began in communications at the AIRBUS Aviation manufacturing plant in China. Returning to Europe, I joined the AIRBUS Headquarters, assuming responsibility for global communications activities, then transitioning to overseeing product marketing for satellite-based earth observation services. This role honed my ability to translate intricate technical knowledge and services into actionable strategies, catering to a diverse range of commercial sectors.

My next venture led me to the position of Head of Marketing and Business Development. Here, I expanded my focus to include satellite telecommunications and navigation, blending satellite data with Artificial Intelligence capabilities. When I relocated to Australia, I observed the dynamic nature of the local space industry and recognised an opportunity to contribute my expertise to benefit the country I now call home. This realisation motivated me to apply for the role of CMO at Fleet Space Technologies.

As I kick off my day with a cup of coffee, I dive into the latest industry news and trends. This info helps us make smart decisions, adjust our strategies, and spot new opportunities in the market. Market research is a big deal for me and I believe this is a key value added from a marketing department. We dig into customer insights, conduct research, and keep an eye on industry trends.

As the CMO at Fleet Space Technologies, I am responsible for driving our marketing strategy and managing our reputation, and also contribute to decision making processes that impact the entire organisation. One of my key strengths lies in leading a diverse team. Within this team, we have individuals from various backgrounds and experiences, each bringing their own valuable perspectives. This diversity of thought enables us to think outside the box and approach challenges from different angles. I absolutely love my current job as the CMO at Fleet Space Technologies. Anything can happen. It's a fast-paced environment where new priorities can pop up any time. Whether it is my direct marketing team, or the leadership team I am part of, I'm surrounded by some of the smartest, most talented people.

Strategic thinking is at the heart of everything I do. It's all about developing and executing marketing strategies that align with our business goals and drive growth. Analytical skills come into play here. Creativity is another key skill that I rely on daily. It is what helps us make a lasting impact.



The beauty of this profession is that it allows me to combine my creative instincts with a structured approach. You don't necessarily need the typical engineering or science background to thrive in this industry. Like me, you can enter and learn from some of the most brilliant minds in their respective fields. Australia is making significant strides in attracting exceptional talent from around the globe, and this is where the magic happens. So, go ahead, dive in, and be a part of this incredible journey. The possibilities are endless, and we're excited to have you on board!

Where did Chloe's career journey begin?

What is one of the key strengths of Chloe and her team?

What are the five skill sets Chloe requires for her role?

What advice does Chloe give for anyone thinking about working in the industry?

A chimpanzee named 'Enos' was sent into space by NASA to test the spacecraft's ability to orbit the Earth and return safely. Enos was trained to perform various tasks during the flight, spending almost three hours in orbit before returning to Earth.



## Careers in Space

### 3b. Making Australian Space History

**Katherine Benall-Pegg**  
Australian Astronaut Candidate

Hear about the fascinating and inspiring journey of Katherine Bennell-Pegg, the first Australian-born female trained as an astronaut, as she prepares to embark on an extraordinary training program



What did Katherine like to do when she was young?

What did Katherine refuse to do in highschool?

What country and where will Katherine train as an astronaut?

Unlike previous astronauts, what will Katherine get to do?

What percentage of Australia's STEM workforce are women?

What is Katherine most excited about?

Astronauts are the ultimate operators, what do they do?

# Careers In Space

Student Workbook

Name: \_\_\_\_\_



# Interactive Student Workbook Employability Skills Chart

**Careers in Space**

## 2. Employability Skills

### 2a. Employability Skills Chart

As you may have guessed from the title, employability skills are abilities or talents that can help set you apart from the crowd when looking for work. These skills can't always be taught in a traditional way, like in a classroom or a workshop, but can be developed over time simply by taking part and trying things. You might develop teamwork and collaboration skills by participating in a sporting team or a school play. You can develop communication skills on the school debating team, or by creating content to suit your audience on TikTok or YouTube. There are many ways to develop these skills and you don't have to follow the traditional path to do so.

Consider the following table that outlines the skills required for many occupations in the Space sector. Further, click on the highlighted careers and discover more about those jobs in action, and the skills and capabilities required of those working in them.

	Public Relations Officer	Flight Surgeon	Engineer Professional	Space Lawyer	Space Scientist	Software Developer	Mechanical Technician
Communication and Interpersonal skills	✓	✓	✓	✓		✓	✓
Teamwork / Collaboration	✓	✓	✓	✓	✓		✓
Customer service skills	✓			✓			✓
Organisational and administrative skills	✓	✓	✓	✓	✓	✓	✓
Planning, analytical and problem solving skills	✓	✓	✓	✓	✓	✓	✓
Information Technology	✓	✓	✓	✓	✓	✓	✓
Working with tools		✓	✓		✓	✓	✓
Adaptability / Flexibility	✓	✓	✓	✓	✓	✓	✓
Safety Awareness		✓	✓	✓	✓		✓

5

**Careers in Space**

**Public Relations Officer:**  
Public Relations Professionals plan, develop, implement and evaluate information and communication strategies that create an understanding and a favourable view of organisations, their goods and services, and their role in the community.<sup>1</sup>

**Flight Surgeon:**  
Flight Surgeons Support the health, safety and wellbeing of astronauts, utilising medical science and technology to prevent and control hazards. Flight surgeons are specialised doctors assigned to manage and oversee the health of aerospace personnel like astronauts or pilots. Mission crews have very specialised health and medical needs.<sup>2</sup>

**Engineering Professional:**  
Other Engineering Professionals include Aeronautical Engineer, Agricultural Engineer, Biomedical Engineer, Engineering Technologist, Environmental Engineer and Naval Architect occupations. They perform and supervise engineering work concerned with the design, development, manufacture, maintenance and modification of aircraft for flight.<sup>3</sup>

**Space Lawyers:**  
Space lawyers provide advice and prepare legal contracts and documentation to ensure compliance with Australian and international laws and treaties. Space belongs to everyone, but there are rules about what we can do in space. There are a number of international and domestic treaties, rules and principles involved in conducting any activities in space.<sup>4</sup>

**Space Scientist:**  
Space scientists apply the laws of physics, chemistry and geology to understand the universe and its contents. Space science is all about looking outwards from Earth to the stars and beyond. Space scientists try to find answers to big questions.<sup>5</sup>

**Software Developer:**  
Software developers and software engineers design, program, test, implement and maintain software programs. Software helps run almost every organisation and business in the world, and the space sector is no different. In fact, space exploration helped pioneer software engineering. In the space sector, software developers and engineers create tools and applications that set the standards for other industries.<sup>6</sup>

**Mechanical Technician:**  
Mechanical technicians install machinery, parts and equipment onto aircraft and spacecraft. Spacecraft consist of many parts and systems that all need maintenance to keep them in optimal working order. Mechanical technicians are responsible for checking the quality of the parts and systems and ensuring they are correctly assembled.<sup>7</sup>

1 <https://myfuture.edu.au/occupations/details/2253-public-relations-professionals#overview>  
2 <https://www.industry.gov.au/australian-space-discovery-centre/pathways-career-space/flight-surgeons>  
3 <https://myfuture.edu.au/occupations/details/2339-other-engineering-professionals#overview>  
4 <https://www.industry.gov.au/australian-space-discovery-centre/pathways-career-space/space-lawyer>  
5 <https://www.industry.gov.au/australian-space-discovery-centre/pathways-career-space/space-scientist>  
6 <https://www.industry.gov.au/australian-space-discovery-centre/pathways-career-space/software-developers-and-software-engineers>  
7 <https://www.industry.gov.au/australian-space-discovery-centre/pathways-career-space/mechanical-technicians>

6

Employability skills  
required for occupations  
in the Space Sector

# Interactive Student Workbook Australian Space Milestones

Discover more about Australia's involvement in space exploration

### Australian Space Milestones

*Click on the images to learn more*

**1957**  
Space activities commence at Woomera, including rocket launches and space tracking.

**1964-1970**  
European Launcher Development Organisation makes 10 test flights from Woomera - including largest rocket to be launched in Australia.

**1967-1970**  
Australia's first satellites launched: WRESAT-1 (1967) and Australs OSCAR-5 (1970).

**1968-1972**  
Australia supports NASA's Apollo program and helps share the Apollo 11 Moon landing with the world.

**1984**  
Paul Scully-Power becomes first Australian-born person to fly in space.

**1985-1995**  
A number of Australian experiments and scientific instruments go to space on satellites and NASA Space Shuttles.

**2002**  
FedSat (Federation Satellite) technology demonstrator satellite launches.

**2002**  
Australia joins the Artemis Accords to support NASA's Moon to Mars program.

**2018**  
Australian Space Agency established.

**2020**  
Artemis Accords to support NASA's Moon to Mars program.

**2021**  
Australia announces the Trailblazer lunar rover program - Australia is going to the Moon.

**2022**  
NASA launches rockets in Northern Territory - first ever launch from a commercial spaceport outside the US.

### Careers in Space

#### 3. Australian Space Milestones

##### 3a: Let's explore Australia's Space History!

Use the Australian Space Milestones document to discover more about Australia's involvement in space exploration.

In what year did the Australian Space Agency commence operations as a whole-of-government entity within the Department of Industry, Science and Resources?

Explain the role of the Australian Space Agency and some of its primary responsibilities:

When and how did Australia contribute to the Apollo lunar program?

Identify two major milestones in Australia's space history and explain their importance and in what year they occurred.

### Australian Space Milestones

#### 1996-2005

Dr Andrew ("Andy") Thomas was the first Australian-born NASA Mission Specialist. Mission Specialists were permanent members of the astronaut corps, responsible for experiments and research programs carried out on Shuttle missions. Thomas made four spaceflights, totalling just over 177 days in space. His first flight was STS 77 (1996) aboard the Space Shuttle Endeavour. Changes in US citizenship laws enabled Thomas to reapply for Australian citizenship and he made his second spaceflight as a dual US-Australian citizen.

In 1998, Thomas became the last US astronaut on the Russian Mir space station, spending 141 days in space. Between 2001 and 2003, Thomas served as Deputy Chief of the Astronaut Office. His third flight, in 2001 on STS 102, included his first spacewalk. Thomas spent six and a half hours installing components on the exterior of the ISS. Thomas' final space mission was STS 114, in July 2005, the first flight following the loss of Space Shuttle Columbia. He tested and evaluated new procedures for flight safety, and inspection and repair techniques for the Shuttle's thermal protection system.

The picture shows Andy Thomas with some Australian souvenirs during his first spaceflight in 1996.

Credit: NASA

### Australian Space Milestones

#### 1957

The International Geophysical Year (IGY) was a global scientific research program operating from July 1957 to December 1958. One area of interest was the relationship of the Earth to the space environment.

Both the USA and USSR planned to launch satellites during the IGY and Australia agreed to host two tracking stations at Woomera Rocket Range, South Australia. These stations used optical and radio tracking techniques to support the US Vanguard satellite program. This was the beginning of space tracking in Australia, which is our longest continuous space activity.

In addition, Australia and the UK both developed sub-orbital sounding rockets, which were launched from Woomera to study the upper atmosphere during the IGY. The Australian sounding rocket program continued until 1975, while the UK program used Woomera until 1979.

Pictured is an Australian-developed Long Tom sounding rocket, operational from 1958-1966.

Credit: Defence, Science and Technology Group

### Australian Space Milestones

#### 2022

Between 27 June and 11 July 2022, three suborbital sounding rocket launches took place on behalf of NASA at the Arnhem Space Centre (ASC) operated by Equatorial Launch Australia (ELA). They were the first NASA launches from a commercial facility outside the US, and the first NASA rockets launched from Australia since 1995, when launches were conducted from Woomera.

The ASC is located near Nhulunbuy, in the Northern Territory, on the lands of the Yolngu people. Traditional Owners were consulted as part of the launch approval process and local Indigenous contractors worked on the construction of the facility.

The three NASA missions investigated heliophysics, astrophysics, and planetary science phenomena only observable from the southern hemisphere.

The image shows one of the Canadian-built Black Brant IX rockets used in the launch campaign.

Credit: Equatorial Launch Australia

# Interactive Student Workbook Study Table

Some of the possible education and training pathways available to jobs in the Space Sector

## Careers in Space

### 5. Study Table

Use this table to discover more about possible pathways to a career in the Australian Space Sector. Choose 8 jobs from the ASA Careers in Space booklet <https://www.industry.gov.au/sites/default/files/2022-11/careers-in-space-booklet.pdf> and use the job information from the booklet and also [www.myskills.gov.au](http://www.myskills.gov.au) to help you find the information and complete the table. Information for the first job in the table has been completed for you. The Careers in Space booklet can help you find out more about where your passions and interests can take you in the Australian Space Sector, and [www.myskills.gov.au](http://www.myskills.gov.au) can help you find nationally accredited courses to start your journey. Remember that these are just some of the possible pathways that are out there, and they don't take into account your specific wants and needs. For a more detailed pathways discussion, speak to your school's Career Department.

JOB	DESCRIPTION	SPECIALTY AREAS	FURTHER SPECIALTY AREAS	STUDY PATHWAYS			MEDIAN AUSTRALIAN SALARY	
				VET Pathway (Certificate level courses, Diploma, Adv. Diploma, etc.)	Bachelors Degree/ Honours	Post Graduate Study (Masters, PhD)	Entry Level	Experienced
Space Systems Engineers	Design, build and test spacecraft, launches and ground-based systems.	Analysts, System and Subsystem Leads and Subsystem Architects	Aerothermodynamics, Operations, Payload types such as radar and optical	Visit <a href="http://www.myskills.gov.au">www.myskills.gov.au</a> and search for a relevant course. This can become a pathway into a University Degree if you choose. Cert II-IV in Engineering, Cert IV in Electrical Equipment and Systems, Diploma of Engineering - Technical, Advanced Diploma of Instrumentation and Control Engineering	Bachelor of Engineering (Honours) (Mechanical), Bachelor of Engineering Honours (Mechanical and Mechatronic), Bachelor of Engineering (Mechanical and Advanced Manufacturing)	Aerospace Engineering study recommended for higher level industry and research jobs	\$72,000	\$140,000



## Careers in space

Be part of Australia's space workforce

Developed in partnership with **tafESA** Government of South Australia



## Work, Health and Safety Officers

Ensure compliance of health and safety systems, conduct risk assessments and advise managers and employees.

MEDIAN AUSTRALIAN SALARY:  
Entry Level \$70,000  
Experienced \$152,000

### Study pathways

At TAFEs across Australia, study:

Certificate IV in Work Health and Safety (BSB41419)

Diploma in Work, Health and Safety (BSB51319)

At Australian Universities, study:

Graduate Certificate in Organisational Safety and Human Factors

Graduate Diploma in Human Factors and Safety Management Systems



## Robotics Engineers

Build, install, operate, test and maintain robots, robotic components, devices and systems.

MEDIAN AUSTRALIAN SALARY:  
Early Career \$90,000  
Experienced \$160,000

### Study pathways

At Australian Universities, study:

Bachelor of Engineering (Honours) and postgraduate qualifications in specialised engineering areas including: Mechanical, Electrical, Electronics, Mechatronics or Robotics

## Space Communicators

Promote or create an intended image for individuals and space industry companies to increase awareness of capability, goals and achievements.

MEDIAN AUSTRALIAN SALARY:  
Entry Level \$54,000  
Experienced \$119,000

### Study pathways

At TAFEs across Australia, study:

Certificate IV in Marketing and Communication (BSB40820)

Diploma of Marketing and Communication (BSB50620)

At Australian Universities, study:

Bachelor of Marketing

Bachelor of Marketing and Communication

Bachelor of Business (Marketing)

# Interactive Student Workbook Jobs in Space Quiz

Find out what career you might  
be suited to in the Space Sector

new Tab x +  
→ ↻ Search Google or type a URL

**CONGRATULATIONS  
AGENT 1124**

Australian Space Agency

**You've been successful in your application  
to the International Lunar Base.**

Together with representatives from around the world, you've been selected to be part of the next phase of settlement on the Moon. In the coming days you will launch into space toward your new lunar home, with a full induction awaiting you upon landing. To help us assign you to your new role on the Base, we have a short quiz to help us understand your strengths and interests.

We look forward to you joining our team on the Moon.

Sincerely,  
The Australian Space Agency.

Next >

DAY 01.  
0740 HRS

Australian Space Agency

**You go to take a shower.  
What stray shower thought goes  
through your head?**

- 1 Must be hard getting such good pressure in low gravity.
- 2 I'd better get out after 6 minutes so I only use 75 litres.
- 3 Note: I had bathroom 300 years ago.
- 4 What did they do 300 years ago before showers?

< Back Next >

Search Google or type a URL

**You might be suited to a career as:  
SPACE ENGINEER**

Australian Space Agency

When you see a problem, you come up with a clever idea to solve it — whether that's building and testing a new machine, designing a product or simply thinking about it in a different way.

You have an interest in maths, physics and chemistry and are a great team player — all stellar traits to help you launch your space career.

[Get to know real-life Space Engineer Eloise Matheson.](#)

Or click on the specific Space Engineer careers below to learn more and explore study pathways.

**Space Systems Engineer**  
**Electrical Electronics and Avionics Engineers**  
**Robotics Engineers**

< Back Take the quiz again Other careers Follow us



# Where to next?

- Access the Career Practitioner Resources
- Download the student workbook – Coming soon
- Look out for an email with information and opportunities from organisations participating in the program
- Get in touch with ACCE for further Information

[projects@ceav.vic.edu.au](mailto:projects@ceav.vic.edu.au)





Questions?



# Thank you.

Please complete our brief survey.

For more information on ACCE  
Membership and Member  
Events please email  
[membership@cea.vic.edu.au](mailto:membership@cea.vic.edu.au)

