



# NATIONAL YOUTH SCIENCE FORUM ANNUAL REPORT 2021 - 2022

[WWW.NYSF.EDU.AU](http://WWW.NYSF.EDU.AU)



This report is for the financial year  
April 2021 to March 2022 for the  
National Youth Science Forum  
(NYSF).

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The NYSF acknowledges the Traditional  
Owners of the country throughout Australia  
and pay respect to their scientific knowledge  
and continuing connection to land, sea and  
community. We pay our respect to their  
Elders past, present, and emerging.

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# MESSAGE FROM THE CHAIR AND CEO

Now in our 39th year, the National Youth Science Forum (NYSF) has delivered more than 14,000 alumni from our flagship NYSF Year 12 Program. In 2022, we connected a record 630 participants from all parts of Australia with a wide array of STEM areas and the study and training pathways towards a career in science and technology.

A diverse and inclusive program, 65% of participants identified as female, and 45% were from regional and remote areas. Thanks to the Department of Industry, Science, Energy and Resources, the WA Department of Jobs, Tourism, Science and Innovation, the Office of the NSW Chief Scientist & Engineer, and private donors, we were able to award a record 92 NYSF Access and Equity Scholarships for students in need.

The 2022 NYSF Year 12 Program ran as an immersive digital and in-person program to ensure the safety of our participants during the pandemic. This design ensured that all students had access to the best science experiences, regardless of pandemic impacts on a range of in-person STEM visits in January 2022.

The digital program connected participants with science and technology facilities Australia-wide and internationally, including the Natural History Museum London, CERN in Switzerland and three different Antarctic research bases. 2022 saw a bumper year for extra-curricular STEM Challenges at the NYSF, and we were blown away by the entries in terms of vision, professionalism and teamwork. The future is in safe hands!

The NYSF experience would not be possible without our partners and supporters, Rotary and Student Staff Leader Volunteers, NYSF alumni, and the myriad of organisations and individuals that host visits, speak and generously give their time. We are proud of our collaborative approach and to be part of a strong and supportive network of organisations in the STEM sector.

We thank NYSF Patrons, His Excellency General the Honourable David Hurley AC DSC (Retd), Governor-General of the Commonwealth of Australia and Her Excellency Mrs Linda Hurley, and our Science Patron, Professor Tanya Monro AC FAA FTSE FOSA FAIP GAICD, an NYSF alumna and Australia's Chief Defence Scientist.

We thank our [NYSF partners](#) for their much-needed support and engagement, and particularly acknowledge our Major Partner, Lockheed Martin Australia, Rotary, the Department of Industry, Science, Energy and Resources, and our two host University partners, The Australian National University (ANU) and The University of Queensland (UQ).

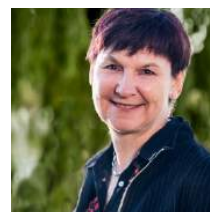
We acknowledge the time and support given to NYSF programs by the Chief Scientist of Australia and the Chief and Leading Scientists in each State of Australia. Likewise, we thank State Governors and Administrators across Australia for their support.

It was a pleasure to round out the 2022 financial year with a special in-person event at the Australian Parliament House. After so long online, it was great to come together in-person to celebrate NYSF's successful pivot during the pandemic and to network with Australia's top decision-makers, NYSF alumni and STEM leaders.

In finishing, we thank our terrific colleagues on the NYSF Board and NYSF Corporate Team for their hard work, passion and unwavering support.

Thank you and best wishes.

**Kerri Hartland**  
Chair of the Board  
National Youth Science Forum



**Dr Melanie Bagg**  
Chief Executive Officer  
National Youth Science Forum





# WHAT WE DO

The National Youth Science Forum (NYSF) is a not-for-profit charity that delivers youth-led immersive programs to encourage young people's passion for science, technology, engineering and maths (STEM).

Our flagship program, the NYSF Year 12 Program, runs in January each year for students entering year 12. The program has run for over 38 years and is one of the best-known STEM experiences in Australia for young people. It has helped over 14,000 alumni connect with STEM interest, study and careers. The NYSF Year 12 Program is designed to give students a broader understanding of the diverse study and career options available in STEM and to encourage continued studies in these fields.

Thanks to our long-time relationship with Rotary, and our extensive STEM network, we are able to reach students from all over Australia. Deeply connected to the community, local Rotary districts across Australia work with us as volunteers to locally champion the program, run student selections, and participate in the NYSF Year 12 Program activities. Other volunteers include local industry and educational institutions, and NYSF alumni who return as Student Staff Leaders.

## VISION

To inspire young Australians to value science, technology, engineering and maths (STEM) and its importance in our communities.

## PURPOSE

NYSF delivers immersive and transformative youth-led experiences to young Australians to encourage life-long STEM literacy.

## PROGRAMS IN 2021 - 2022

**NYSF Year 12 Program** – for students about to enter year 12 with an interest in STEM

**Student Staff Leadership Program (SSLP)** – a leadership and training program for recent NYSF Year 12 Program alumni

**NYSF Connect** – a professional development and networking program for all NYSF Year 12 Program/National Science Summer School alumni



# GOVERNANCE

The NYSF is governed by an active Board of Directors. The board comprises nine highly respected and accomplished members of the STEM sector and business community, as well as the NYSF CEO. Board members throughout 1 April 2021 to 31 March 2022 were:

## BOARD OF DIRECTORS



**Chair (until Aug 21)  
Deputy Chair (from Aug 21)**  
The Hon Kate Lundy



**Deputy Chair (until Aug 21)  
Chair (from Aug 21)**  
Kerri Hartland



**Deputy Chair**  
Dr Geoff Garrett AO



**Secretary (until Aug 21)**  
Rowley Tompsett



**Finance Director (from Jul 21)**  
Bruce Hunter



**Alumni Director**  
Dr Renée Kidson



**Ordinary Director**  
Professor Sally-Ann Poulsen



**Ordinary Director**  
Loren Atkins



**Rotary Liaison Officer**  
Kenneth R Hall



**CEO**  
Dr Melanie Bagg  
GAICD

## NYSF COUNCIL

The NYSF is guided by the NYSF Council. The council includes representatives of organisations relevant to the purpose and mission of NYSF, including:

- Australian Academy of Science
- Australian Academy of Technological Sciences and Engineering (ATSE)
- The Australian National University (ANU)
- University of Canberra (UC)
- Commonwealth Scientific Industrial Research Organisation (CSIRO)
- Former NYSF Chiefs of Staff

## NYSF PATRONS

- His Excellency General the Honourable David Hurley AC DST (Retired), The Governor-General of the Commonwealth of Australia
- Her Excellency Mrs Linda Hurley

## NYSF SCIENCE PATRON

- Professor Tanya Monro AC FAA FTSE FOSA FAIP GAICD, Australia's Chief Defence Scientist, NYSF Science Patron, and NYSF 1990 Alumna

# ACKNOWLEDGEMENTS

The NYSF has relationships with many organisations all over Australia. These relationships allow the NYSF to offer our participants engaging opportunities to participate in STEM programs and events throughout the year.

The work and programs offered by the NYSF would not be possible without the support of a large number of collaborators. We thank all the organisations and their staff for opening their labs and workplaces to our participants in 2021-2022. They volunteer not only their time but also their passion, knowledge, and enthusiasm for STEM.

We thank Rotary who provide invaluable support to participants throughout the year, running student selections for the NYSF Year 12 Program and providing in-program support to NYSF Year 12 Program participants.

Finally, we thank our NYSF Staff and alumni volunteers, particularly our Student Staff Leaders who provide tremendous support to both the NYSF as an organisation and the experience of participating students.



*Thank you so much for the amazing experience of the NYSF Year 12 Program! I have met a myriad of astounding and interesting people all of whom I would have never met without the program. The enthusiasm and outstanding dedication the Staffies have provided to us is phenomenal and I can't thank each Staffie enough for their amazing work! The program has certainly changed my outlook for possible STEM career pathways in my journey through life and I am so excited for what the future holds.*

NYSF 2022 Participant





# OUR PARTNERS

NYSF Funding Partners are essential for the delivery of NYSF programs. The NYSF acknowledges the financial and strategic support of our Funding Partners and thanks them for their commitment to the development of Australia's future STEM workforce. A diversified funding base ensures the NYSF is not dependent upon any single organisation for financial security.

The NYSF extends our thanks and appreciation to all Funding Partners, particularly for their understanding and overwhelming support following our January session postponements and the current challenges we face as a result of the COVID-19 pandemic.

In particular, we thank our major Funding Partner, Lockheed Martin Australia (LMA) for their continued support of the program.

Between 1 April 2021 to 31 March 2022, NYSF welcomed new partnerships with:

- The University of Adelaide
- Australian Space Agency
- Monash University
- Naval Shipbuilding College
- The University of Newcastle
- Quantum Brilliance
- Telethon Kids Institute
- WA Department of Jobs, Tourism, Science and Innovation



## MAJOR FUNDING PARTNERS



## HOST UNIVERSITIES



## CORPORATE AND GOVERNMENT PARTNERS



## UNIVERSITY PARTNERS



## SUPPORTING ORGANISATIONS



# 2022 NYSF YEAR 12 PROGRAM

## PROGRAM SUMMARY

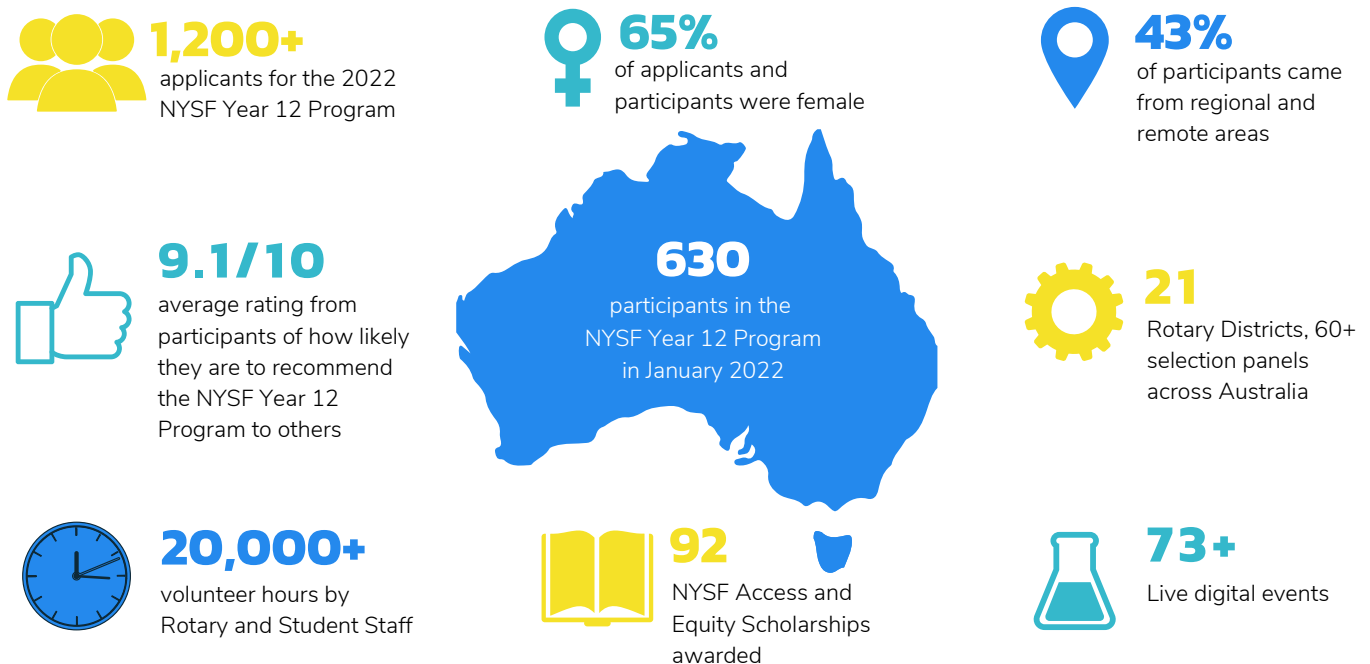
The 2022 NYSF Year 12 Program was delivered as an immersive digital and in-person experience.

Historically delivered in a two-week residential format in Canberra and Brisbane, for the second year running, we adapted the program to a non-residential delivery mode due to the ongoing COVID-19 pandemic. We are proud to continue to provide a highly engaging NYSF Year 12 Program with all the STEM experiences we are renowned for.

A record 630 participants attended the 12-day program which featured 195 speakers and a combination of 73 live digital events, experiments and lectures. Five days of in-person STEM visits were held in Perth. Planned in-person STEM Hubs in other states were postponed to later in 2022 due to COVID-19 restrictions at the time.

The 2022 program featured amazing experiences, including talks from two Nobel Laureates, several Chief Scientists, workshops with leading scientists and STEM organisations, careers days, social events, STEM challenges, an evening with Dr Karl Kruszelnicki, and live crosses to some of the world's best science and technology facilities including research stations in Antarctica, the Natural History Museum in London, and CERN in Switzerland.

*Note: Planned in-person STEM Hubs in locations other than Perth took place in the 2022 April and July school holidays. The STEM Hub in Hobart was cancelled due to low numbers and students were provided with support to attend STEM Hubs in other locations.*



## IN-PERSON STEM HUB SUMMARY

In-person Adelaide visits took place in April at The University of Adelaide, Flinders University, Defence Science Technology Group and the Australian Space Discovery Centre.

In-person Brisbane visits took place in July at Griffith University, Defence Force Recruiting, ARC for Plant Success, The University of Queensland, Centre for Advanced Imaging, Integrated Pathology Learning Centre, Australian Institute for Bioengineering and Nanotechnology, and the Centre for Microscopy and Microanalysis.

In-person Canberra visits took place in July at The Australian National University, Defence Science Technology Group, CSIRO, Geoscience Australia, National Computational Infrastructure, Australian Signals Directorate, Defence Force Recruiting, 3A Institute, and Quantum Brilliance.

In-person Melbourne visits took place in July at CSIRO, CSL, Monash University, The University of Melbourne, Defence Force Recruiting, Defence Science Technology Group, and Lockheed Martin Australia.

In-person Perth visits took place in July at CSIRO, Defence Science and Technology Group, Murdoch University, Perth Zoo, Telethon Kids Institute, The Harry Perkins Institute of Medical Research and The University of Western Australia.

In-person Sydney and Newcastle visits took place in July at The University of Newcastle, Macquarie University, The University of Sydney, Defence Force Recruiting, and The University of New South Wales.



*At the Hydraulics Lab in UWA, we got to see a big physical model of the Swan River. I found it really interesting to learn about hydrodynamics and ocean engineering as a potential career path.*

**NYSF 2022 Participant**



*It was interesting to learn about the power grid and jobs in electrical engineering at UWA. Additionally it was quite interesting to hear from Navy Submariners at the Speed Meet and ask about the careers available for engineers, and later talk to an observational astrophysicist!*

**NYSF 2022 Participant**



## DIGITAL PROGRAM HIGHLIGHTS

### 2022 NYSF Year 12 Program Opening Event

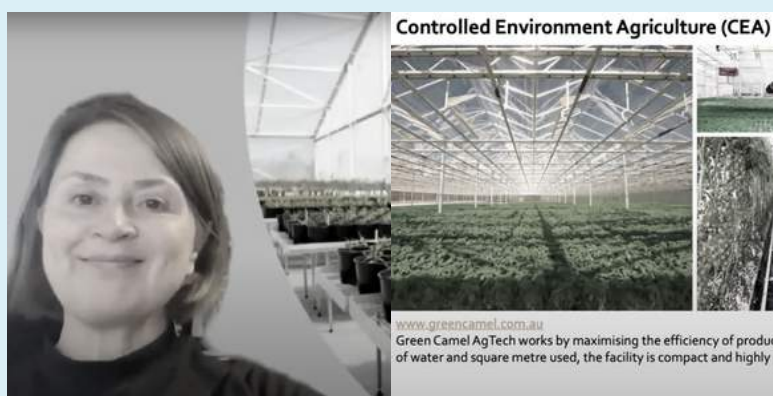
The 2022 NYSF Year 12 Program opening event featured a panel of professionals who discussed their STEM journeys and the insights they've gathered along the way, as well as advice on how to make the most of time as an NYSFer.

Dr Melanie Bagg GAICD, Professor Tanya Monro AC FAA FTSE FOSA FAIP GAICD, Kerri Hartland, Air Marshal (Retd) Warren McDonald AO CSC, Councillor Declan Clausen, Student Staff Leader Rahn Starvar



### STEM Challenge: Ag2030

Dr Gabrielle Vivian-Smith, Australia's Chief Plant Protection Officer, delivered a challenge to 2022 NYSF Year 12 Program participants. Can you develop an innovation proposal that uses science at the interface of agriculture, environment and technology to consistently and sustainably meet the Ag2030 target of \$100 billion in production by 2030?



### STEM Challenge: Net Zero by 2050

Nobel Laureate and Vice-Chancellor of The Australian National University, Professor Brian Schmidt AC FRS FAA, set the second STEM Challenge for the 2022 NYSFers. In 100 words or less, where should Australia invest money now to fill the 15% gap in emissions reduction in the technology roadmap to net zero greenhouse gas emissions by 2050?



### Critical Thinking Workshop proudly supported by The University of Queensland

Dr Peter Ellerton invited NYSFers to think critically about the content that was presented during the program and in future studies. Through this workshop, Dr Ellerton challenged NYSFers' thinking through a series of problems and learned about the psychology behind why we think the way we do.



## DIGITAL PROGRAM HIGHLIGHTS



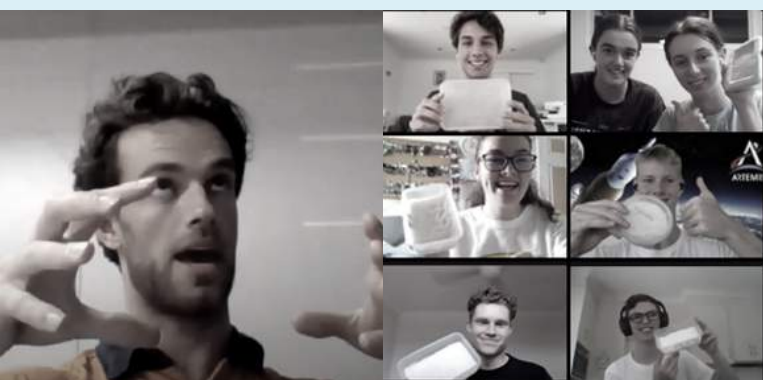
### **Science @ Home with the Science Nomad, proudly supported by the Naval Shipbuilding College**

With Stuart Kohlhaben, NYSFers explored the nature of understanding, and how clear their critical thinking is. NYSFers were also challenged to explain how to solve complex problems, and consider how flexible their thinking was.



### **Science @ Home: Biochemistry and DNA, proudly supported by the Naval Shipbuilding College**

With Dr Bianca Warnock, NYSFers extracted DNA in their kitchen! What do scientists do with the DNA once it's extracted? Dr Warnock also spoke about research developments and the applications of genetic information.



### **Science @ Home: The Wonders of Pykrete, proudly supported by the Naval Shipbuilding College**

Scott Jones demonstrated the capabilities of a composite material compared to its base materials. He showed how to produce pykrete at home using toilet paper and water and also highlighted the difference in fracture toughness between pykrete and ice.



### **STEM Communication Panel and Challenge, proudly supported by the WA Department of Jobs, Tourism, Science and Innovation and Telethon Kids Institute**

NYSers were joined by ABC RN radio host, Tegan Taylor, evolutionary biologist and senior media officer at the Australian Science Media Centre, Dr Joe Milton, and astrophysicist and social media STEM communicator extraordinaire Kirsten Banks (@AstroKirsten)!

## DIGITAL PROGRAM HIGHLIGHTS

### Dr Karl's House Party

Dr Karl Kruszelnicki, Australia's most recognisable and much-loved science media personality hosted an exclusive NYSF House Party where NYSFers asked the STEM questions they've always wanted to know the answer to!



### Startup Panel, proudly supported by Defence Science Technology Group

NYSF participants heard from Michael Molinari, Managing Director of IP Group, Katie Gray, Special Projects Lead for Cub Care, Mark Luo, co-founder and Chief Operating Officer of Quantum Brilliance, and Megan Forrest, Ventures Manager at UQ Ventures for a masterclass on starting a startup!



### 2022 NYSF Year 12 Program Nobel Laureate Lecture: Professor Peter Doherty AC, proudly supported by CSL Ltd

NYSFers had an exclusive session with immunologist Professor Peter Doherty AC, Director of the Doherty Institute and 1996 Nobel Prize Laureate, to chat about his work and insights from an incredible career.



### CERN Live Cross, proudly supported by the Office of the NSW Chief Scientist & Engineer

Dr Steven Goldfarb and Dr Muhammad Alhroob provided an introduction to the world of particle physics research at CERN, the Large Hadron Collider and the ATLAS Experiment. They took participants on a tour of the detector, pointing out various components and describing how they can be used to improve our understanding of the universe we live in.



## DIGITAL PROGRAM HIGHLIGHTS



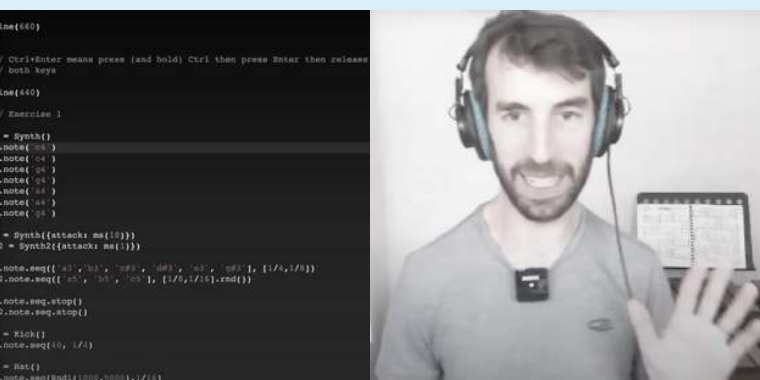
### Antarctica Live Cross

Participants were met by the Antarctic Medical Practitioner, an Environmental Assessment Officer, and Remediation Team from three of the Australian Antarctic Division's research bases. The Antarctic teams spoke about what it's like living and working in Antarctica and shared challenges and highlights of living in the coldest, driest, and windiest place on Earth!



### RV Investigator

Science communicator and marine ecologist, Dr Ben Arthur, shared some fascinating insight into ocean science, why it is important for Australia, and what the RV Investigator does on its expeditions. Dr Arthur also showed off some never-publicly released footage for everyone and gave his tips on how to become an ocean-going STEM expert.



### Music coding

With help from The Australian National University, NYSFers learned about digital synthesis and algorithmic composition music at the laptop music coding workshop! NYSFers tried out some of the tools used in the ANU Laptop Ensemble for making music with code and have a computer music jam with a group!



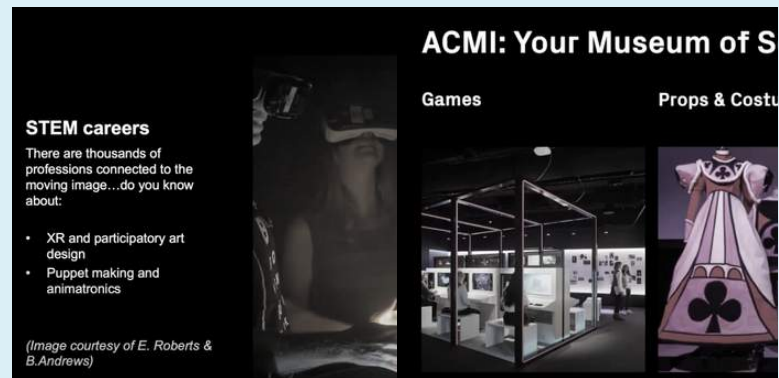
### Genetics workshop

Dr Gurion Ang introduced NYSFers to how genetics is used in biotechnology and human health. Using everyday household items, NYSFers explored how to extract, amplify and analyse DNA, and even saw some polymerase chain reaction (PCR) running in real-time!

## DIGITAL PROGRAM HIGHLIGHTS

## Working in screen culture

How do screen museums such as ACMI use data, API and machine learning to become more visitor-facing and interactive? NYSFers were told all about ACMI's Lens experience, the eXperience Operating System and how it exposes never seen before collections to a world of possibilities!



## Science of crime solving

NYSFers delved into some of the tricks of the crime-scene trade, going right from the crime scene to analysing and comparing evidence. NYSFers learned about a number of different common types of evidence and how some of these are processed in the lab to help solve crimes.



## Finding jurassic monsters

Combined with geology, rocks and fossils can tell us about how the environment and climate on Earth has changed, and life with it. Dr Knutsen was part of a team that excavated a number of sites on an Arctic Archipelago named Svalbard and spoke about his work on this project and about similar fossils he is now working on in Australia.



## Discovering gravitational waves

Monash researchers spoke about the new ground-breaking science and discovery of gravitational-waves in astronomy and its impact on fundamental physics and our understanding of the Universe.



## DIGITAL PROGRAM HIGHLIGHTS



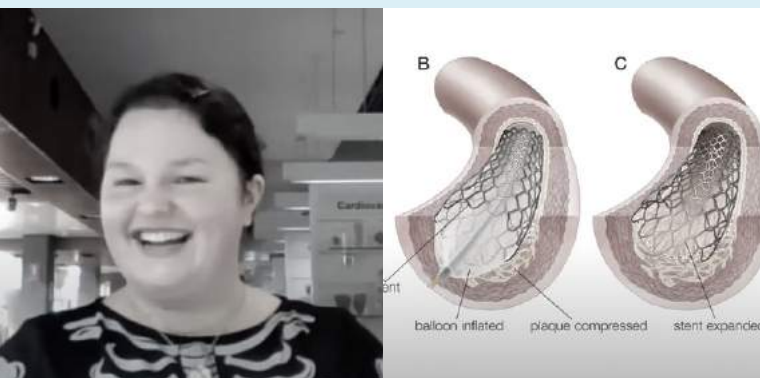
### Great Barrier Reef Legacy

Dr Dean Miller from Great Barrier Reef Legacy presented on the role of science and communication in the conservation of the Great Barrier Reef and other important natural habitats. Dr Miller also answered several questions from the NYSFers - including how they can look after a piece of the reef at their own school!



### The Natural History Museum, London

NYSFers joined Science Communicator Alison Shean and Researcher Lauren Cook from the Natural History Museum in London. Students chatted with Lauren about her research exploring how we can use environmental DNA to monitor biodiversity, as well as discovering some of the creative ways she shares her science with the wider public.



### Disease pathology

Students came face-to-face with a diversity of diseases from the collection of The University of Queensland's Integrated Pathology Learning Centre. As well as viewing real human specimens, students had the opportunity to delve deeper into public health campaigns and what it means to be healthy.



### Live Cross Pulse @ Parks

NYSFers learned how researchers use the iconic 64m Parkes radio telescope, Murriyang, remotely from around Australia. NYSFers observed some of the most extreme astrophysical objects known, pulsars, in real-time, how the telescope is operated and discussed the science behind the images with CSIRO's team of astronomers.

# OUR IMPACT

Participants are surveyed on the first and last day of the program to measure impact.

The data shows the NYSF Year 12 Program influences participants' future career and study decisions by giving them access to a range of the very best STEM facilities and leading STEM professionals across Australia and internationally.

The NYSF Year 12 Program plays a crucial role in exposing youth to STEM jobs they may not have previously considered, in addition to the study and training pathways to get there.



**72%**

of participants said NYSF expanded their choices in STEM. 26% said it confirmed their choice.



**98%**

of participants rated their digital NYSF experience as 'good' to 'brilliant'



*It will be one of the best experiences of your life. Whether it's in-person, online or hybrid you will learn so much from the sessions and meet so many new people. NYSF will make expand your future options and opportunities, and give you experiences that otherwise you wouldn't experience. You will be immersed in a community that are on your wavelength and understand your thinking. The speakers and presenters are all inspiring and knowledgable. Additionally, you will see a different side of science and developed an understanding of areas that you hadn't even thought you could or should pursue in the future. Definitely worth it!*

Ruby, NYSF 2022



# NYSF PARTICIPANT STORIES



## MAKAYLA BLYTHMAN

Where Makayla calls home is just about as remote as you can get – out in the Indian Ocean around 1,500km west off the coast of mainland Australia!

“I’ve grown up on Christmas Island my whole life, I moved there when I was just 10 days old! I’ve always gone to the same school, but we’ve always had really good opportunities there, like this one to attend the NYSF.”

“Human biology has always been something I’ve loved. I’ve always leaned towards the medical side of things. I love the thought of being able to help people, but I also just love that ‘gory’ stuff as well, it’s great and so interesting!”

“I want to be a paediatrician. Knowing that I’m helping kids, I want to be that person in the hospital the kids love, so they don’t feel like they’re in a bad place. I want to be someone who makes their day a little bit better when they’re in a not very good situation.”

Makayla's story:



## XAVIER HULLS

Xavier has a powerful story to tell about how his interests shifted to biomedical engineering after his father experienced a severe accident leaving him hospitalised for several years.

Xavier and his family were confronted at how difficult and financially inaccessible some areas of medical care such as prosthetics were, which steered him down the path of biomedical engineering and prosthetics.

“After that confrontation, I’ve now switched lanes and spent the last two, maybe three, years working as hard as I could to get towards a biomedical engineering degree.”

After finishing year 11, Xavier took the initiative to complete a base certificate in engineering and fabrication and also completed a white card industry certificate, which has put him at the front of the queue for engineering courses around the world.

“My dream is to open up a stream or line of clinics across Australia, or even globally, that offer prosthetics to people who are disabled from birth, or trauma-induced patients, and offer those prosthetics to them at an affordable price, so they’re not dying in debt and struggling to get back as a working member of society.”

Xavier's story:



# NYSF ACCESS AND EQUITY SCHOLARSHIPS

In 2022, a record 92 NYSF Access and Equity Scholarships were awarded to assist participants from disadvantaged backgrounds in attending the NYSF Year 12 Program. These students may not have attended nor contributed to the extensive diversity of NYSF students and alumni network without this support.

NYSF Access and Equity Scholarships were made possible thanks to funding from the Australian Government's Department for Industry, Science, Energy and Resources, the WA Department of Jobs, Tourism, Science and Innovation, the NSW Office of the Chief Scientist & Engineer, and donations from generous members of the NYSF alumni community.

“

*I received an Access and Equity scholarship through NYSF and was also supported by my local Rotary Club. These were extremely appreciated as without them I would have had a lot of trouble attending the NYSF.*

NYSF 2022 Scholarship Recipient

“

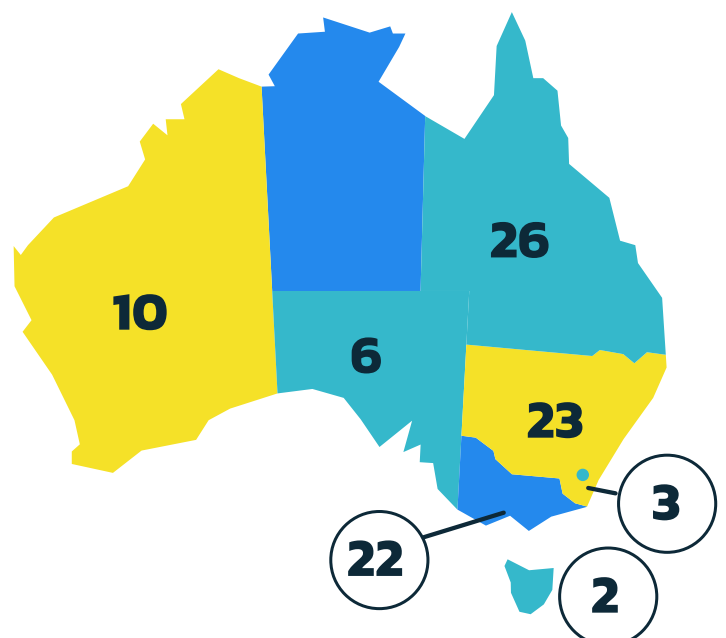
*I received both the Rotary support and NYSF Access and Equity scholarship. It meant a great deal to me as someone that comes from a low socio-economic background. It made me feel as though I could have access to this brilliant program despite facing financial hardship.*

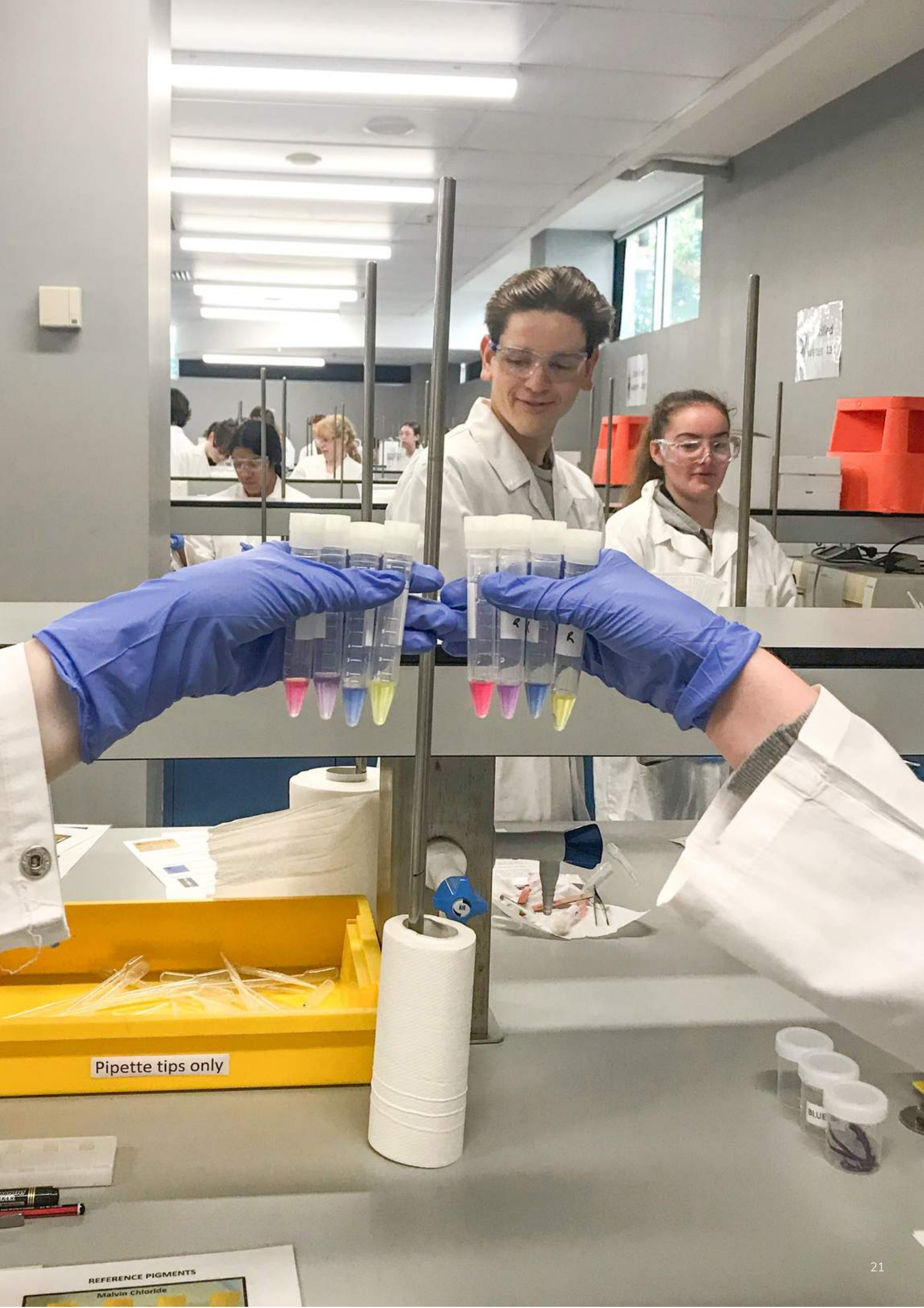
NYSF 2022 Scholarship Recipient

“

*The scholarship meant that I was being noticed in my small corner of the world.*

NYSF 2022 Scholarship Recipient





Pipette tips only

REFERENCE PIGMENTS  
Malvin Chloride

# NYSF STUDENT STAFF LEADERSHIP PROGRAM (SSLP) 2021-2022

Each year, former NYSF Year 12 Program participants are selected for the NYSF Student Staff Leadership Program (SSLP). The SSLP is a voluntary program that provides practical, outcomes-focused training, culminating in workplace experience as Student Staff Volunteers, or 'Staffies' as they are affectionally known, in the NYSF Year 12 Program.

The 2021/22 SSLP saw the introduction of an application process for positions in the program. The process involved a written application followed by interviews with shortlisted applicants. From over 160 applications, 53 positions were offered (three Chiefs of Staff, 18 Admin Staff and 32 Group Staff) forming our Staffie team.

Over the course of the year, the Staffie team participated in a training program that focused on developing leadership, teamwork and facilitation skills to prepare them for their role in January. The planned program was a mixture of digital and in-person experiences delivered both by the NYSF and external providers, including;

- Two-day in-person training in hub locations in July
- Monthly digital training sessions
- Child protection training delivered by Childwise
- Completion of first aid qualification
- Digital and in-person pre-session training in January

Like other NYSF programs, the SSLP was impacted by Covid with the cancellation of in-person training days and the postponement of most hub visits in January 2022. While understandably disappointed, the team took this in their stride and handled the changes with professionalism and enthusiasm, making the most of the opportunities offered to them.

In the 2022 Year 12 Program in January, Student Staff volunteers were able to put all they had learnt into practice as they facilitated the student experience. They were an energetic and enthusiastic presence in all aspects of the program, keeping students engaged by chairing digital sessions, managing Q&As, hosting social events and interacting with students on our Whova app and Discord server. They did an excellent job of connecting students to each other and the program, value-adding to the student experience. They are commended for their commitment to the NYSF and the manner they fulfilled their role.



“ Thank you so much to everyone involved, for making this experience as awesome as it was, and I believe I learned so much and grew so much as a person.

Prior to the SSLP, I never would have believed that I could have facilitated such varied activities and introduced so many amazing people, but now, post-session, I've done all that and more!

It's made me so much more confident in my own abilities and who I am. My confidence in my ability to facilitate both talks and social events grew immensely as the program unfolded, and I'm so grateful for the support of the entire program, as without you, all that wouldn't have been possible.

NYSF 2022 Student Staff Leader



# NYSF CONNECT

## WEBINAR SERIES

NYSF alumni of all ages and career stages can access a range of opportunities through our NYSF Connect alumni program. NYSF Connect provides resources, information, professional development, and networking opportunities to our 14,000+ alumni community.

The NYSF Connect program remains relevant to alumni in an ever-changing world. Through NYSF Connect, alumni have access to experts and leaders in STEM, information to further their careers and study, and opportunities to connect with one another and network.

In 2021, the NYSF Connect webinar series continued, providing high-quality content on issues and areas of STEM relevant to NYSF alumni. The webinar series saw 17 STEM leaders present a variety of STEM content, 494 alumni attend the webinars, and 215 viewed recorded sessions on the NYSF YouTube channel. The NYSF's top ten webinars were made available to the broader community during National Science Week.

Recent NYSF alumni are invited to host webinars, providing a further opportunity for professional development and networking.

## NYSF Connect Webinars

### 2021

April	Thinking outside the STEM box
May	The science behind mental health
June	Traditional knowledge and contemporary sciences for NAIDOC week
July	The role of leadership
August	How did I get here? The twists and turns of a STEM career with Australia's Chief Scientist, Dr Cathy Foley AO
September	Vaccines and infectious diseases: research to results
October	Space jobs: not just for rocket scientists!

## IN-PERSON EVENT

A two-day in-person STEM visit for 2021 alumni was held in Melbourne at The University of Melbourne and Monash University campuses. Other planned NYSF Connect STEM visits and networking events were cancelled due to pandemic restrictions at the time.



## Thank you to all of our incredible webinar guests in 2021:

- Dr Lisa Bailey, Senior Exhibition Manager, Museum of Discovery
- David Ball, Regional Director Australia and NZ, Lockheed Martin Space
- A/P Asha Bowen, Program Head of Vaccines and Infectious Diseases, Telethon Kids Institute
- Andrea Boyd, Deputy Lead of Astronaut Operations, European Space Agency
- Dr Malcolm Burt, Amusement Academic and Digital Experience Designer
- Mibu Fischer, Marine Ethnobiologist, Oceans and Atmosphere, CSIRO
- Dr Cathy Foley AO PSM, Chief Scientist of Australia
- Kerri Hartland, NYSF Board Chair and Principal Advisor at Proximity
- Dr Chris Hatherly, CEO, Academy of Social Sciences Australia
- Martin James, Ground Systems Lead, Lockheed Martin Space
- Professor Bradley Moggridge, Kamilaroi Water Scientist, A/P in Indigenous Water Science, Indigenous Liaison Officer, TSR Hub
- Dr Samantha Moyle, Lead Teacher, Think Big Special Interest Program, Brighton Secondary School
- A/P Jill Newby, MRFF Career Development Fellow and Clinical Psychologist, Black Dog Institute UNSW
- Catriona Nguyen-Robertson, Science Communicator, "The Singing Scientist"
- Aude Vignelles, Chief Technology Officer, Australian Space Agency
- Georgeina Whelan AM CSC and Bar, ACT Commissioner of Emergency Services
- Professor Stephen Wood, Associate Director, Research and Research Lead in Clinical Neuroscience, Orygen

## And to our hosts:

- Holstein Wong, 2008 NYSF alum
- Connor McMahon, 2016 NYSF alum
- Benjamin Millar, 2015 NYSF alum
- Philip Chan, 2007 NYSF alum
- Dr Catherine Wheller, 2008 NYSF alum
- Dr Melanie Bagg, GAICD, NYSF CEO



*The Q&A, specifically the focus on women in STEM and overcoming imposter syndrome in the workplace, I think there was some really valuable information that will significantly benefit me in the coming years.*

NYSF alum



*I was really happy to have my question answered because it gave me more insight into how I can contribute to science moving forward.*

NYSF alum



**88%**

of participants rated the series "Extremely valuable" (33%) or "Very valuable" (55%)



**4.4**

out of 5 weighted average star rating for the series



**71**

participants attended each webinar on average



# NYSF IN THE COMMUNITY

## STEM CHALLENGES

During the 2022 NYSF Year 12 Program, two STEM challenges were set: The first by Australia's Chief Plant Protection Officer, Dr Gabrielle Vivian-Smith, and the second by Nobel Laureate and Vice-Chancellor of the Australian National University, Professor Brian Schmidt AC FRS FAA.

Dr Vivian-Smith's challenge invited students to think about how Australia can achieve its AG2030 goal of reaching \$100B in agricultural productivity by 2023, both sustainably and consistently. Dr Vivian-Smith received 23 submissions from 60 individuals from all over Australia featuring entomology, algaculture, lab-grown meats and novel fuel sources as ways to meet Australia's Ag2030 goal!

Prof Schmidt's challenged NYSFers to think of where Australia should invest money to meet its goal of net-zero emissions by 2050. The top 5 entrants were selected by Professor Schmidt and Australia's Chief Scientist, Dr Cathy Foley AO PSM FAA FTSE, with the winning submission to be presented to the Prime Minister through the National Science and Technology Council.

[Ag2030 Challenge:](#)



[Net Zero Challenge:](#)



## NATIONAL SCIENCE WEEK

National Science Week is an Australia-wide annual celebration of STEM. Scientists and STEM professionals from around the country connect to host events, answer hard-hitting questions, and inspire STEM learning through interactive workshops for people of all ages.

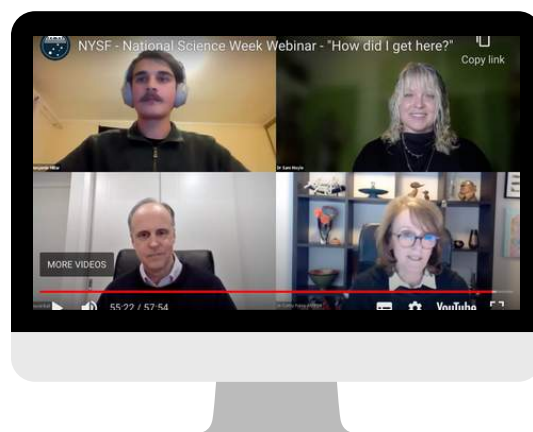
Due to COVID-19 restrictions, like many other organisations, the NYSF went virtual to host events and engage the public in a wide range of STEM topics.

In celebration of National Science Week 2021, the NYSF hosted a public webinar that explored the theme, 'How did I get here? The twists and turns of a STEM career.'

The webinar had an excellent lineup of guest panellists:

- Australia's Chief Scientist, Dr Cathy Foley AO PSM
- David Ball, Regional Director Australia New Zealand for Lockheed Martin Space
- Dr Sam Moyle, STEM teacher at Brighton Secondary School and the 2019 recipient of the Prime Minister's Prize for Excellence in Science Teaching

The webinar was hosted by 2016 NYSF alumnus Benjamin Millar and was open to the general public as well as NYSF alumni.



## CELEBRATING THE NYSF AT PARLIAMENT HOUSE

NYSF alumni attended an intimate event at Australian Parliament House to celebrate the successful pivot of the NYSF Year 12 Program to an immersive digital and in-person program, and the positive impact the program has had on Australia's youth.

NYSF alumni Sophie Burgess, Isaac Kozlovskis, Vaishnavi Muddam, Hamish Pearce, and Tobias Devilla Cherukuru spoke with some of Australia's top decision-makers and international STEM experts including:

- The Minister for Science and Technology and Minister for Defence Industry, The Hon Melissa Price MP;
- Nobel Laureate and ANU Vice-Chancellor and President, Professor Brian Schmidt AC FAA FRS; and
- Parliamentarians and representatives from NYSF partner organisations, government departments and Rotary.

The audience heard from NYSF Chair, Kerri Hartland, about the incredible contributions the NYSF's partners have made over its 38-year history, with major partner Lockheed Martin Australia (LMA) and host universities, The University of Queensland and the Australian National University receiving special mentions for their commitment and support of the NYSF to provide programs educating and inspiring the next generation of STEM leaders.

NYSF CEO, Dr Melanie Bagg, Kerri Hartland and the NYSF alumni extend their thanks to the distinguished guests and speakers for their continuous support of the NYSF and the next generation of STEM experts. We believe there is, even more, we can do together as we continue to grow Australia's STEM capability and march towards greater equality and diversity in STEM.



## NYSF AT THE WOMEN IN AI AWARDS

“ Having the opportunity to attend the Women in AI awards [courtesy of Lockheed Martin Australia] was absolutely incredible. Being in a room with so many inspiring women meant so much to me and opened my eyes to the stories and successes of women paving their way to the future of women in STEM. Not knowing that law and artificial intelligence, let alone gender equality could be combined into the world of STEM, I was specifically interested in the work of Dr Ramona Vijayarasa; the Chief Investigator behind the Gender Legislative Index. Her work using tools powered by human evaluation and machine learning to assess the gender responsiveness of individual laws is so unique to me and I loved seeing her take away 2nd Runner Up during the night.

Taking away many words of advice, one aspect that struck me the most was those who told me how important diverse and interdisciplinary skills are before immersing oneself in the world of artificial intelligence. Not knowing originally how to advance into the field of computer-aided intelligence, I was excited to open my eyes to this new and exciting area of STEM as I continue throughout my university studies.

After having many different conversations with a vast range of individuals during the night, my ideas and passions within STEM have definitely been challenged. I now have a very deep and complex understanding of the many aspects artificial intelligence can positively impact the world and as someone who seeks to do just that, I am incredibly excited to take future steps and opportunities in this field as a woman.

Overall, this event was not only eye-opening but extremely empowering for myself and the many women who attended the awards and I am forever grateful to the NYSF for providing me with this unique opportunity.

**Ruby, NYSF 2022 Student Staff Leader**



## CELEBRATING SUCCESS

The NYSF has a much-loved tradition where each of the State Governors and Administrators across Australia offers their congratulations and encouragement to incoming NYSF Year 12 Program students.

Due to the pandemic, these messages were relayed via video and letter.

[Watch/read the words of encouragement:](#)





# FINANCIALS

For the 2021-2022 financial year (1 April 2021 to 31 March 2022), the NYSF ended the year with a surplus of \$222,935.

COVID-19 uncertainty continued to financially impact the NYSF throughout 2021-2022. The 2021-2022 surplus is better than initially budgeted, primarily due to planned projects, programs and events being reduced in scope, postponed, or cancelled due to COVID-19.

The NYSF is optimistic that stabilising COVID-19 restrictions in 2022-2023 onwards will enable the organisation to continue to reintroduce in-person programming, whilst ensuring activities remain safe, engaging, and accessible. The surplus operating result of 2021-2022 provides a secure financial position for the NYSF to continue operations in the coming years.

To access the full financial report, download it from the Australian Charities and Not-for-profits Commission by scanning the QR code.



For more information visit  
[www.nysf.edu.au](http://www.nysf.edu.au)

